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APPENDIX1 TRAFFIC SURVEY

Zone Code and Population

Large Zone No.	District	Small Zone No.	Ward/VDC	2001 Zone Population	2011 Zone Population
100	KATHMANDU N.P.	101	Ward 1	8,464	13,700
		102	Ward 2	13,655	13,600
		103	Ward 3	50,321	85,900
			Ward 4		
		104	Ward 5	15,340	18,500
		105	Ward 6	78,846	116,700
			Ward 7		
		106	Ward 8	38,697	57,300
			Ward 9		
		107	Ward 10	72,113	110,500
			Ward 34		
		108	Ward 11	15,244	17,700
		109	Ward 12	22,682	26,700
			Ward 21		
		110	Ward 13	64,209	100,300
			Ward 14		
		111	Ward 15	32,441	52,000
		112	Ward 16	45,450	87,000
		113	Ward 17	37,167	46,100
			Ward 18		
Ward 26					
Ward 28					
114	Ward 19	39,351	44,200		
	Ward 20				
	Ward 22				
	Ward 23				
	Ward 24				
115	Ward 25	17,685	16,300		
	Ward 27				
116	Ward 29	24,543	44,600		
	Ward 30				
117	Ward 31	14,502	16,600		
118	Ward 32	45,952	62,200		
	Ward 33				
119	Ward 35	35,184	76,600		
		100 Total		671,846	1,006,500
200	KIRTIPUR N.P.	201	Ward 1	37,054	63,000
			Ward 2		
			Ward 3		
			Ward 4		
			Ward 5		
			Ward 6		
			Ward 7		
			Ward 8		
			Ward 9		
			Ward 10		
			Ward 11		
			Ward 12		
			Ward 16		
			Ward 17		
			Ward 18		
			Ward 19		
202	Ward 13	6,652	7,100		
	Ward 14				
	Ward 15				
		200 Total		43,706	70,100

Zone Code and Population

Large Zone No.	District	Small Zone No.	Ward/VDC	2001 Zone Population	2011 Zone Population
300	LALITPUR N.P.	301	Ward 1	33,616	48,600
			Ward 2		
			Ward 3		
			Ward 10		
		302	Ward 4	17,524	31,300
			Ward 13		
		303	Ward 5	29,455	43,100
			Ward 14		
			Ward 15		
		304	Ward 6	43,456	60,100
			Ward 7		
			Ward 8		
			Ward 9		
			Ward 17		
		305	Ward 11	28,172	27,700
			Ward 12		
			Ward 16		
			Ward 18		
		306	Ward 19	10,768	12,500
			Ward 20		
		300 Total			162,991
400	BHAKTAPUR N.P.	401	Ward 1	19,316	23,800
			Ward 3		
			Ward 4		
			Ward 5		
		402	Ward 2	11,707	14,300
			Ward 6		
			Ward 7		
		403	Ward 11	23,340	26,800
			Ward 12		
			Ward 14		
			Ward 16		
		404	Ward 17	18,180	19,000
			Ward 8		
			Ward 9		
			Ward 10		
		404	Ward 13	18,180	19,000
Ward 15					
400 Total			72,543	83,900	
500	MADHYAPUR THIMI N.P.	501	Ward 1	23,989	37,600
			Ward 2		
			Ward 3		
			Ward 4		
			Ward 5		
			Ward 6		
			Ward 7		
			Ward 8		
		502	Ward 10	23,762	46,700
			Ward 17		
			Ward 9		
			Ward 11		
			Ward 12		
			Ward 13		
			Ward 14		
			Ward 15		
		500 Total			47,751

Zone Code and Population

Large Zone No.	District	Small Zone No.	Ward/VDC	2001 Zone Population	2011 Zone Population
600	Kathmandu Dist.	601	GOTHATAR	8,269	26,800
		602	MULPANI	18,579	29,800
			DAANCHHI		
			BHADRBAS		
			AALAPOT		
		603	INDRAYANI	29,489	31,200
			PUKHULACHHI		
			SUNTOL		
			BAJRAYOGINI (SANKHU)		
			GAGALPHEDI		
		604	LAPSEPHEDI	73,038	156,200
			NAGLEBHARE		
			KAPAN		
			JORPATI		
			GOKARNESWOR		
			BALUWA		
		605	NAYAPATI	73,713	162,100
			SUNDARIJAL		
			GONGGABU		
			DHAPASI		
			KHADKA BHADRAKALI		
			MAHANKAL		
			TOKHA SARSWOTI		
			TOKHA CHANDESWORI		
			CHUNIKHEL		
		CHAPALI BHADRAKALI			
		606	BUDANILKANTHA	37,268	80,600
			JHOR MAHANKAL		
			MANMAIJU		
GOLDHUNGA					
DHARMASTHALI					
FUTUNG					
607	JITPURPHEDI	33,055	66,800		
	KABHRESTHALI				
	SANGLA				
	ICHANG NARAYAN				
608	SITAPAILA	13,873	22,500		
	BHIMDHUNGA				
	RAMKOT				
609	SEUCHATAR	38,288	62,500		
	NAIKAP NAYA BHANJYANG				
	NAIKAP PURANO BHANJYANG				
	TINTHANA				
	BALAMBU				
	SATUNGAL				
610	CHOUKETAR DAHACHOK	3,636	4,400		
	MATATIRTHA				
	MAHADEVATHAN				
	THANKOT				
	BAAD BHANJYANG				
	610	CHALNAKHEL	3,636	4,400	
	600 Total		329,208	642,900	

Zone Code and Population

Large Zone No.	District	Small Zone No.	Ward/VDC	2001 Zone Population	2011 Zone Population	
700	Lalitpur Dist.	701	SAINBU	25,239	40,000	
			KHOKANA			
			BUNGAMATI			
			CHHAMPI			
			DUKUCHHAP			
		702	SUNAKOTHI	39,886	57,200	
			DHAPAKHEL			
			THECHO			
			JHARUWARASI			
			CHAPAGAUN			
		703	BADIKHEL	27,489	37,300	
			HARISIDDHI			
			THAIBA			
			GODAMCHAUR			
		704	BISANKHUNARAYAN	35,802	63,700	
			GODAWARI			
IMADOL						
TIKATHALI						
SIDDHIPUR						
700 Total			128,416	198,200		
800	Bhaktapur Dist.	801	BALKOT	45,034	67,400	
			SIRUTAR			
			DADHIKOT			
			KAUTUNJE			
			GUNDU			
		802	SIPADOL	28,428	28,500	
			NANKHEL			
			CHITAPOL			
			TATHALI			
		803	SUDAL	30,747	39,000	
			BAGESWORI			
			CHANGUNARAYAN			
			CHHALING			
			DUWAKOT			
		800 Total			104,209	134,900
		Survey Area Total Total			1,560,670	2,444,100

Appendix 1.1.4 Person Trip OD Table (2011, All purposes, All Modes)

Appendix 1.2.2 Traffic Volume

Survey Point	No. Vehicle Type pcu factor	Daily Traffic Volume in pcu/day										Total Traffic Volume			Daily Traffic Volume in pcu/day		
		1 Bicycle 0.3	2 Motorcycle 0.3	3 Car 1.0	4 Taxi 1.0	5 Light Truck 1.5	6 Tempo 1.0	7 Micro Bus 1.5	8 Mini Bus 3.0	9 Large Bus 4.0	10 Heavy Truck 4.0	Total(3-10) vehicles	Total(2-10) vehicles	Total(1-10) vehicles	Total(3-10) pcu	Total(2-10) pcu	Total(1-10) pcu
23	Volume(16h) Volume(24h)	1,050 1,124	9,585 9,872	1,541 1,649	368 415	895 1,012	3 3	915 1,034	354 397	71 81	180 237	4,327 4,828	13,912 14,700	14,962 15,824	6,691 7,597	9,567 10,559	9,882 10,896
24	Volume(16h) Volume(24h)	3,894 4,167	57,159 58,873	14,190 15,184	4,165 4,707	1,696 1,917	685 685	3,956 4,358	2,930 3,282	115 131	106 139	27,745 30,403	84,903 89,276	88,797 93,443	37,044 40,916	54,191 58,578	55,359 59,828
25	Volume(16h) Volume(24h)	2,501 2,601	15,898 16,216	8,694 9,813	3,549 4,011	772 872	167 173	1,094 1,182	674 687	13 13	14 25	14,966 16,776	33,964 32,992	33,966 35,594	17,326 19,292	22,096 24,157	22,646 24,937
26	Volume(16h) Volume(24h)	2,527 2,704	13,080 13,472	1,405 1,504	736 832	1,013 1,144	412 412	1,442 1,499	386 432	7 8	74 98	4,476 4,930	17,556 18,402	20,083 21,106	6,220 6,935	10,144 10,977	10,902 11,788
27	Volume(16h) Volume(24h)	2,217 2,438	27,628 28,191	5,503 5,943	2,616 3,112	2,966 3,322	1,649 1,666	1,644 1,907	2,361 2,547	309 395	848 1,187	17,913 20,078	45,542 48,259	47,758 50,697	28,447 32,530	36,735 40,985	37,401 41,716
28	Volume(16h) Volume(24h)	2,476 2,724	37,234 37,979	8,861 9,570	2,717 3,233	2,888 3,234	2,146 2,167	2,775 3,219	3,086 3,302	381 501	94 131	22,958 25,356	60,192 63,336	62,668 66,060	33,417 37,086	44,587 48,479	45,330 49,296
29	Volume(16h) Volume(24h)	2,439 2,537	18,621 18,994	2,768 3,129	1,242 1,403	583 659	1,303 1,355	544 588	116 118	3 3	16 29	6,576 7,284	25,198 26,278	27,637 28,815	7,429 8,240	13,015 13,938	13,747 14,699
30	Volume(16h) Volume(24h)	1,831 2,014	41,293 42,119	11,547 12,470	2,543 3,027	4,286 4,801	316 319	2,298 2,666	3,611 3,864	761 975	1,161 1,626	26,524 29,747	67,817 71,866	69,649 73,880	42,807 49,010	55,195 61,645	55,744 62,249
31	Volume(16h) Volume(24h)	1,384 1,522	22,252 22,697	8,555 9,238	4,968 5,910	3,103 3,476	397 401	2,273 2,637	2,935 3,141	490 627	419 587	23,140 26,018	45,392 48,715	46,776 50,238	34,426 38,998	41,102 45,807	41,517 46,264
32	Volume(16h) Volume(24h)	171 178	5,723 5,838	7,101 8,024	3,526 3,984	203 230	0 0	767 828	155 158	61 65	32 58	11,845 13,347	17,569 19,185	17,740 19,363	12,921 14,562	14,638 16,313	14,684 16,360
33	Volume(16h) Volume(24h)	2,795 2,990	25,936 26,713	3,977 4,255	4,292 4,849	2,125 2,401	1,391 1,391	3,364 3,801	1,448 1,622	161 184	333 439	17,090 18,943	43,025 45,656	45,820 48,646	24,212 27,156	31,993 35,170	32,831 36,067
34	Volume(16h) Volume(24h)	915 979	9,507 9,792	2,752 2,944	1,510 1,706	611 690	1,080 1,080	1,416 1,600	259 290	55 63	56 73	7,738 8,447	17,245 18,239	18,160 19,218	9,601 10,580	12,453 13,518	12,728 13,812
35	Volume(16h) Volume(24h)	1,079 1,154	7,906 8,143	970 1,036	543 614	1,778 2,009	1 1	1,056 1,193	587 657	64 72	234 309	5,233 5,894	13,139 14,037	14,217 15,191	8,716 9,954	11,088 12,387	11,412 12,743
36	Volume(16h) Volume(24h)	921 985	3,302 3,401	319 341	249 282	257 290	0 0	767 867	439 492	9 11	10 13	2,050 2,295	5,353 5,697	6,274 6,682	3,498 3,929	4,489 4,949	4,765 5,245
37	Volume(16h) Volume(24h)	786 865	19,018 19,398	3,816 4,121	385 458	1,895 2,122	1 1	346 401	2,304 2,466	1,125 1,440	2,463 3,448	12,333 14,455	31,350 33,853	32,136 34,718	28,824 35,310	34,529 41,129	34,765 41,389
38	Volume(16h) Volume(24h)	576 617	6,234 6,421	589 630	91 103	1,495 1,689	0 0	60 68	768 860	11 13	74 97	3,089 3,462	9,323 9,883	9,899 10,499	5,656 6,392	7,528 8,318	7,701 8,503
39	Volume(16h) Volume(24h)	396 436	8,153 8,316	1,962 2,119	156 185	2,752 3,082	0 0	115 133	939 1,005	321 411	617 863	6,862 7,800	15,015 16,116	15,411 16,551	12,987 15,240	15,433 17,735	15,552 17,865
40	Volume(16h) Volume(24h)	845 905	5,027 5,178	764 818	73 82	945 1,068	0 0	52 58	507 568	51 58	57 76	2,449 2,727	7,475 7,905	8,321 8,809	4,284 4,825	5,792 6,379	6,046 6,650
41	Volume(16h) Volume(24h)	590 649	5,425 5,534	1,263 1,364	93 99	1,892 1,895	0 0	150 173	1,453 1,554	109 140	745 1,044	5,495 6,269	11,920 12,452	11,510 12,452	11,885 13,963	13,513 15,623	13,690 15,818
42	Volume(16h) Volume(24h)	304 334	4,697 4,791	1,030 1,112	79 94	1,142 1,279	0 0	136 158	1,092 1,168	101 130	645 903	4,225 4,843	8,922 9,635	9,226 9,969	9,286 10,906	10,695 12,433	10,766 12,533
43	Volume(16h) Volume(24h)	646 692	4,904 5,051	607 650	283 320	580 656	0 0	461 521	120 134	1 1	63 84	2,116 2,365	7,020 7,416	7,666 8,108	3,068 3,475	4,539 4,990	4,733 5,197
44	Volume(16h) Volume(24h)	1,034 1,107	6,101 6,264	426 456	239 270	767 867	0 0	656 741	125 140	0 0	118 155	2,330 2,629	8,432 8,913	8,432 10,020	3,645 4,179	5,476 6,064	5,786 6,397

Appendix 1.1.4 Person Trip OD Table (2011, All purposes, All Modes)

Appendix 1.2.2 Traffic Volume

Survey Point	No. Vehicle Type pcu factor	Total Traffic Volume										Daily Traffic Volume in pcu/day				
		1 Bicycle 0.3	2 Motorcycle 0.3	3 Car 1.0	4 Taxi 1.0	5 Light Truck 1.5	6 Tempo 1.0	7 Micro Bus 1.5	8 Mini Bus 3.0	9 Large Bus 4.0	10 Heavy Truck 4.0	Total(3-10) vehicles	Total(1-10) vehicles	Total(2-10) pcu	Total(1-10) pcu	
1	Volume(16h) Volume(24h)	56 62	4,361 4,448	1,628 1,758	254 302	1,428 1,600	1 1	1,414 1,640	756 809	388 496	687 962	6,556 7,588	10,916 12,016	12,714 15,181	14,022 16,516	14,039 16,534
2	Volume(16h) Volume(24h)	653 719	13,077 13,338	2,858 3,086	1,177 1,400	2,083 2,333	284 287	2,100 2,435	1,037 1,109	548 702	796 1,114	10,881 12,487	23,958 25,805	19,077 22,516	23,000 26,518	23,195 26,733
3	Volume(16h) Volume(24h)	913 913	12,668 14,062	3,100 3,503	1,745 1,134	2,341 3,535	169 171	2,861 3,604	2,218 2,838	380 380	557	13,306 15,723	25,975 29,785	22,960 27,780	26,760 31,988	27,034 32,272
4	Volume(16h) Volume(24h)	587 628	4,373 4,504	893 956	401 453	574 649	10 10	78 88	210 235	5 5	24	2,195 2,427	6,567 6,931	3,026 3,377	4,338 4,728	4,514 4,916
5	Volume(16h) Volume(24h)	540 577	6,249 6,437	2,059 2,214	986 1,115	634 716	2 2	1,080 1,220	714 800	97 111	67	5,649 6,266	11,899 12,703	8,428 9,433	10,302 11,364	10,464 11,537
6	Volume(16h) Volume(24h)	2,195 2,283	15,614 15,926	3,044 3,440	1,734 1,960	1,509 1,705	5 5	1,553 1,677	825 842	57 61	37	8,764 9,755	24,378 25,681	12,228 13,510	16,912 18,288	17,570 18,973
7	Volume(16h) Volume(24h)	3,568 3,925	41,628 42,461	8,235 8,894	3,753 4,467	3,070 3,438	1,732 1,749	3,991 4,629	1,927 2,061	490 627	269	23,466 26,242	65,095 68,703	33,125 37,408	45,614 50,146	46,684 51,324
8	Volume(16h) Volume(24h)	3,123 3,342	15,470 15,934	1,039 1,111	1,089 1,208	584 660	196 196	70 79	20 22	2 3	6	2,987 3,288	18,456 19,222	3,379 3,735	8,020 8,515	8,957 9,517
9	Volume(16h) Volume(24h)	3,000 3,119	23,442 23,911	2,411 2,724	1,590 1,797	1,254 1,417	1 1	581 627	89 91	77 82	269	7,066 7,970	29,594 32,593	7,766 9,031	14,821 16,226	15,721 17,162
10	Volume(16h) Volume(24h)	1,320 1,373	9,951 10,150	1,394 1,576	1,241 1,403	506 571	210 219	409 441	56 58	23 24	131	3,970 4,524	13,921 14,674	5,197 6,177	8,173 9,213	8,589 9,625
11	Volume(16h) Volume(24h)	3,208 3,433	30,764 31,687	3,837 4,106	2,104 2,377	1,680 1,899	0 0	2,299 2,588	352 394	277 315	361	10,910 12,166	41,674 43,853	15,517 17,578	24,746 27,084	25,708 28,114
12	Volume(16h) Volume(24h)	644 689	5,830 6,004	596 638	489 553	573 647	0 0	498 563	208 233	45 51	85	2,796 3,233	8,800 9,489	4,355 6,156	5,581 6,363	5,774 6,363
13	Volume(16h) Volume(24h)	1,049 1,122	8,454 8,707	2,617 2,800	1,450 1,638	658 744	4 4	270 305	686 768	38 43	57	5,778 6,376	14,232 15,083	7,898 8,791	10,494 11,403	10,748 11,740
14	Volume(16h) Volume(24h)	1,361 1,497	13,083 13,345	4,275 4,617	1,635 1,945	2,363 2,647	13 13	1,894 2,197	1,851 1,981	306 392	1,019	13,356 15,218	26,439 28,563	23,161 27,056	27,086 31,059	27,495 31,508
15	Volume(16h) Volume(24h)	1,666 1,804	36,880 37,987	11,649 12,464	2,972 3,359	1,341 1,515	1,718 1,718	2,672 3,019	691 774	58 67	86	21,187 23,029	58,067 61,015	25,006 27,382	36,070 38,777	36,576 39,319
16	Volume(16h) Volume(24h)	5,702 6,101	55,833 57,508	16,919 18,103	3,504 3,959	2,015 2,277	2,089 2,089	2,783 3,145	693 776	352 402	249	28,604 31,080	84,437 88,588	34,193 37,534	50,943 54,786	52,653 56,616
17	Volume(16h) Volume(24h)	2,097 2,243	34,524 35,559	8,498 9,092	6,356 7,184	2,274 2,569	1,493 1,493	6,614 7,474	1,134 1,271	109 124	94	26,574 29,332	61,097 64,891	33,895 37,639	44,252 48,306	44,881 48,979
18	Volume(16h) Volume(24h)	1,231 1,317	7,481 7,706	1,117 1,196	1,750 1,977	153 173	0 0	1,642 1,855	101 113	0 0	0	4,764 5,315	12,245 13,021	5,865 6,558	8,110 8,870	8,479 9,265
19	Volume(16h) Volume(24h)	2,162 2,378	20,253 20,658	3,298 3,551	2,997 3,091	2,108 2,361	1 1	3,118 3,617	1,742 1,864	591 756	580	10,337 16,054	25,511 36,712	23,637 27,478	29,713 33,675	30,362 34,389
20	Volume(16h) Volume(24h)	1,192 1,275	8,426 8,679	1,804 1,930	743 840	1,890 2,136	729 729	882 996	346 387	5 6	141	6,539 7,210	14,965 15,889	9,056 10,128	11,584 12,731	11,942 13,114
21	Volume(16h) Volume(24h)	2,671 2,778	40,260 41,066	13,826 15,624	5,940 6,712	651 736	237 247	1,408 1,520	252 257	21 22	73	22,376 25,191	62,637 66,257	24,095 27,118	36,173 39,438	36,974 40,271
22	Volume(16h) Volume(24h)	2,351 2,515	29,366 30,247	7,785 8,330	2,279 2,575	1,132 1,279	1,252 1,252	2,388 2,699	1,015 1,137	87 99	60	15,999 17,451	45,365 47,699	20,231 22,250	29,041 31,324	29,746 32,079

Appendix 1.2.1 Traffic Volume at Survey Points

Appendix 1.2.2 Traffic Volume

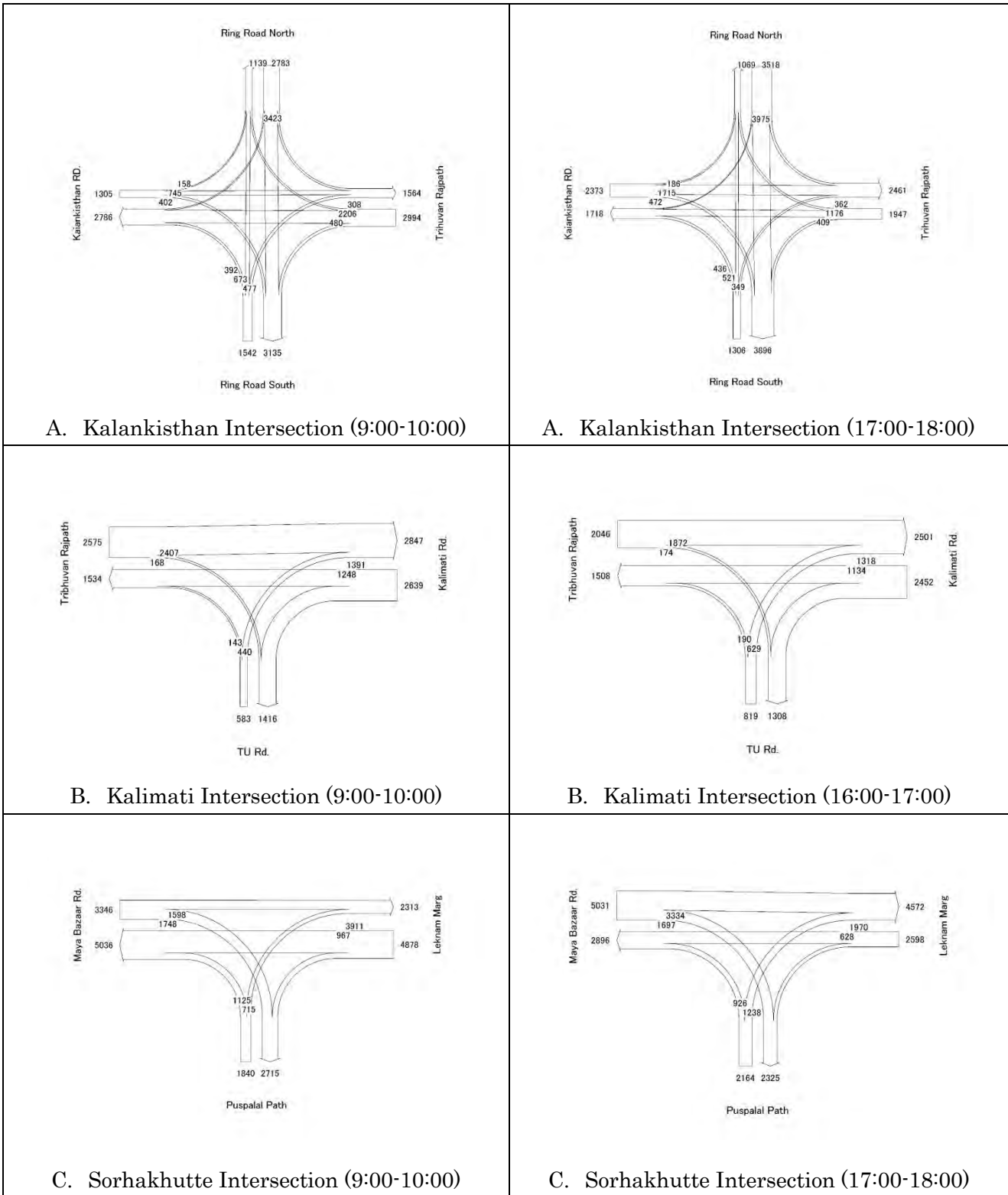
Survey Point	No. Vehicle Type pcu factor	Total Traffic Volume										Daily Traffic Volume in pcu/day				
		1 Bicycle 0.3	2 Motorcycle 0.3	3 Car 1.0	4 Taxi 1.0	5 Light Truck 1.5	6 Tempo 1.0	7 Micro Bus 1.5	8 Mini Bus 3.0	9 Large Bus 4.0	10 Heavy Truck 4.0	Total(3-10) vehicles	Total(1-10) vehicles	Total(2-10) pcu	Total(1-10) pcu	
1	Volume(16h) Volume(24h)	56 62	4,361 4,448	1,628 1,758	254 302	1,428 1,600	1 1	1,414 1,640	756 809	388 496	687 962	6,556 7,588	10,916 12,016	12,714 15,181	14,022 16,516	14,039 16,534
2	Volume(16h) Volume(24h)	653 719	13,077 13,338	2,858 3,086	1,177 1,400	2,083 2,333	284 287	2,100 2,435	1,037 1,109	548 702	796 1,114	10,881 12,487	23,958 25,805	19,077 22,516	23,000 26,518	23,195 26,733
3	Volume(16h) Volume(24h)	913 913	12,668 14,062	3,100 3,503	1,745 1,134	2,341 3,535	169 171	2,861 3,604	2,218 2,838	380 380	557 557	13,306 15,723	25,975 29,785	22,960 27,780	26,760 31,988	27,034 32,272
4	Volume(16h) Volume(24h)	587 628	4,373 4,504	893 956	401 453	574 649	10 10	78 88	210 235	5 5	24 31	2,195 2,427	6,567 6,931	3,026 3,377	4,338 4,728	4,514 4,916
5	Volume(16h) Volume(24h)	540 577	6,249 6,437	2,059 2,214	986 1,115	634 716	2 2	1,080 1,220	714 800	97 111	67 89	5,649 6,266	11,899 12,703	8,428 9,433	10,302 11,364	10,464 11,537
6	Volume(16h) Volume(24h)	2,195 2,283	15,614 15,926	3,044 3,440	1,734 1,960	1,509 1,705	5 5	1,553 1,677	825 842	57 61	37 66	8,764 9,755	24,378 25,681	12,228 13,510	16,912 18,288	17,570 18,973
7	Volume(16h) Volume(24h)	3,568 3,925	41,628 42,461	8,235 8,894	3,753 4,467	3,070 3,438	1,732 1,749	3,991 4,629	1,927 2,061	490 627	269 376	23,466 26,242	65,095 68,703	33,125 37,408	45,614 50,146	46,684 51,324
8	Volume(16h) Volume(24h)	3,123 3,342	15,470 15,934	1,039 1,111	1,089 1,208	584 660	196 196	70 79	20 22	2 3	6 8	2,987 3,288	18,456 19,222	21,579 22,563	8,020 8,515	8,957 9,517
9	Volume(16h) Volume(24h)	3,000 3,119	23,442 23,911	2,411 2,724	1,590 1,797	1,254 1,417	1 1	581 627	89 91	77 82	269 269	7,066 7,006	29,594 30,917	32,593 34,037	14,821 16,226	15,721 17,162
10	Volume(16h) Volume(24h)	1,320 1,373	9,951 10,150	1,394 1,576	1,241 1,403	506 571	210 219	409 441	56 58	23 24	131 233	3,970 4,524	13,921 14,674	15,241 16,047	8,173 9,213	8,589 9,625
11	Volume(16h) Volume(24h)	3,208 3,433	30,764 31,687	3,837 4,106	2,104 2,377	1,680 1,899	0 0	2,299 2,588	352 394	277 315	361 476	10,910 12,166	41,674 43,853	44,882 47,286	24,746 27,084	25,708 28,114
12	Volume(16h) Volume(24h)	644 689	5,830 6,004	596 638	489 553	573 647	0 0	498 563	208 233	45 51	85 112	2,796 2,796	8,800 8,800	9,489 9,489	6,156 6,156	6,363 6,363
13	Volume(16h) Volume(24h)	1,049 1,122	8,454 8,707	2,617 2,800	1,450 1,638	658 744	4 4	270 305	686 768	38 43	57 75	5,778 6,376	14,232 15,083	15,281 16,205	10,494 11,403	10,748 11,740
14	Volume(16h) Volume(24h)	1,361 1,497	13,083 13,345	4,275 4,617	1,635 1,945	2,363 2,647	13 13	1,894 2,197	1,851 1,981	306 392	1,019 1,426	13,356 15,218	26,439 28,563	27,800 30,060	27,086 31,059	27,495 31,508
15	Volume(16h) Volume(24h)	1,686 1,804	36,880 37,987	11,649 12,464	2,972 3,359	1,341 1,515	1,718 1,718	2,672 3,019	691 774	58 67	86 113	21,187 23,029	58,067 61,015	59,753 62,819	36,070 38,777	36,576 39,319
16	Volume(16h) Volume(24h)	5,702 6,101	55,833 57,508	16,919 18,103	3,504 3,959	2,015 2,277	2,089 2,089	2,783 3,145	693 776	352 402	249 329	28,604 31,080	84,437 88,588	90,139 94,689	50,943 54,786	52,653 56,616
17	Volume(16h) Volume(24h)	2,097 2,243	34,524 35,559	8,498 9,092	6,356 7,184	2,274 2,569	1,493 1,493	6,614 7,474	1,134 1,271	109 124	94 124	26,574 29,332	61,097 64,891	63,194 67,134	44,252 48,306	44,881 48,979
18	Volume(16h) Volume(24h)	1,231 1,317	7,481 7,706	1,117 1,196	1,750 1,977	153 173	0 0	1,642 1,855	101 113	0 0	0 0	4,764 5,315	12,245 13,021	13,475 14,338	8,110 8,870	8,479 9,265
19	Volume(16h) Volume(24h)	2,162 2,378	20,253 20,658	3,298 3,551	2,997 3,091	2,108 2,361	1 1	3,118 3,617	1,742 1,864	591 756	580 812	10,337 16,054	25,511 36,712	26,637 39,080	29,713 33,675	30,362 34,389
20	Volume(16h) Volume(24h)	1,192 1,275	8,426 8,679	1,804 1,930	743 840	1,890 2,136	729 729	882 996	346 387	5 6	141 186	6,539 7,210	14,965 15,889	16,157 17,164	11,584 12,731	11,942 13,114
21	Volume(16h) Volume(24h)	2,671 2,778	40,260 41,066	13,826 15,624	5,940 6,712	651 736	237 247	1,408 1,520	252 257	21 22	73	22,376 25,191	62,637 66,257	65,308 69,035	36,173 39,438	36,974 40,271
22	Volume(16h) Volume(24h)	2,351 2,515	29,366 30,247	7,785 8,330	2,279 2,575	1,132 1,279	1,252 1,252	2,388 2,699	1,015 1,137	87 99	60 80	15,999 17,451	45,365 47,699	47,716 50,214	29,041 31,324	29,746 32,079

Appendix 1.2.1 Traffic Volume at Survey Points

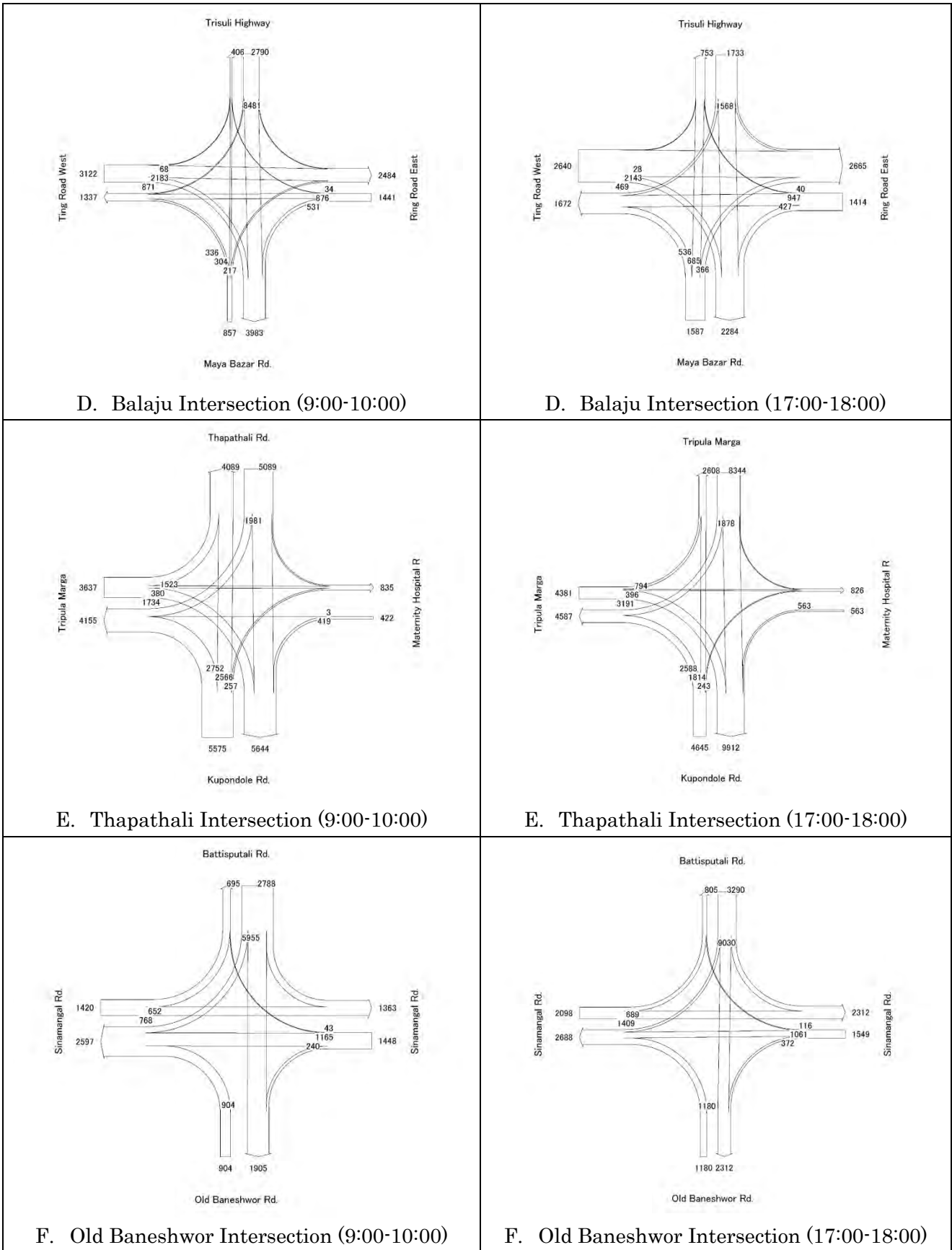
Appendix 1.2.2 Traffic Volume

Survey Point	No. Vehicle Type pcu factor	Daily Traffic Volume in pcu/day										Total Traffic Volume			Daily Traffic Volume in pcu/day		
		1 Bicycle 0.3	2 Motorcycle 0.3	3 Car 1.0	4 Taxi 1.0	5 Light Truck 1.5	6 Tempo 1.0	7 Micro Bus 1.5	8 Mini Bus 3.0	9 Large Bus 4.0	10 Heavy Truck 4.0	Total(3-10) vehicles	Total(2-10) vehicles	Total(1-10) vehicles	Total(3-10) pcu	Total(2-10) pcu	Total(1-10) pcu
23	Volume(16h) Volume(24h)	1,050 1,124	9,585 9,872	1,541 1,649	368 415	895 1,012	3 3	915 1,034	354 397	71 81	180 237	4,327 4,828	13,912 14,700	14,962 15,824	6,691 7,597	9,567 10,559	9,882 10,896
24	Volume(16h) Volume(24h)	3,894 4,167	57,159 58,873	14,190 15,184	4,165 4,707	1,696 1,917	685 685	3,956 4,358	2,930 3,282	115 131	106 139	27,745 30,403	84,903 89,276	88,797 93,443	37,044 40,916	54,191 58,578	55,359 59,828
25	Volume(16h) Volume(24h)	2,501 2,601	15,898 16,216	8,694 9,813	3,549 4,011	772 872	167 173	1,094 1,182	674 687	13 13	14 25	14,966 16,776	33,964 32,992	33,966 35,594	17,326 19,292	22,096 24,157	22,646 24,937
26	Volume(16h) Volume(24h)	2,527 2,704	13,080 13,472	1,405 1,504	736 832	1,013 1,144	412 412	442 499	386 432	7 8	74 98	4,476 4,930	17,556 18,402	20,083 21,106	6,220 6,935	10,144 10,977	10,902 11,788
27	Volume(16h) Volume(24h)	2,217 2,438	27,628 28,191	5,503 5,943	2,616 3,112	2,966 3,322	1,649 1,666	1,644 1,907	2,361 2,547	309 395	848 1,187	17,913 20,078	45,542 48,259	47,758 50,697	28,447 32,530	36,735 40,985	37,401 41,716
28	Volume(16h) Volume(24h)	2,476 2,724	37,234 37,979	8,861 9,570	2,717 3,233	2,888 3,234	2,146 2,167	2,775 3,219	3,086 3,302	381 501	94 131	22,958 25,358	60,192 63,336	62,668 66,060	33,417 37,086	44,587 48,479	45,330 49,296
29	Volume(16h) Volume(24h)	2,439 2,537	18,621 18,994	2,768 3,129	1,242 1,403	583 659	1,303 1,355	544 588	116 118	3 3	16 29	6,576 7,284	25,198 26,278	27,637 28,815	7,429 8,240	13,015 13,938	13,747 14,699
30	Volume(16h) Volume(24h)	1,831 2,014	41,293 42,119	11,547 12,470	2,543 3,027	4,286 4,801	316 319	2,298 2,666	3,611 3,864	761 975	1,161 1,626	26,524 29,747	67,817 71,866	69,649 73,880	42,807 49,010	55,195 61,645	55,744 62,249
31	Volume(16h) Volume(24h)	1,384 1,522	22,252 22,697	8,555 9,238	4,968 5,910	3,103 3,476	397 401	2,273 2,637	2,935 3,141	490 627	419 587	23,140 26,018	45,392 48,715	46,776 50,238	34,426 38,998	41,102 45,807	41,517 46,264
32	Volume(16h) Volume(24h)	171 178	5,723 5,838	7,101 8,024	3,526 3,984	203 230	0 0	767 828	155 158	61 65	32 58	11,845 13,347	17,569 19,185	17,400 19,363	12,921 14,562	14,638 16,313	14,684 16,360
33	Volume(16h) Volume(24h)	2,795 2,990	25,936 26,713	3,977 4,255	4,292 4,849	2,125 2,401	1,391 1,391	3,364 3,801	1,448 1,622	161 184	333 439	17,090 18,943	43,025 45,656	45,820 48,646	24,212 27,156	31,993 35,170	32,831 36,067
34	Volume(16h) Volume(24h)	915 979	9,507 9,792	2,752 2,944	1,510 1,706	611 690	1,080 1,080	1,416 1,600	259 290	55 63	56 73	7,738 8,447	17,245 18,239	18,160 19,218	9,601 10,580	12,453 13,518	12,728 13,812
35	Volume(16h) Volume(24h)	1,079 1,154	7,906 8,143	970 1,036	543 614	1,778 2,009	1 1	1,056 1,193	587 657	64 72	234 309	5,233 5,894	13,139 14,037	14,217 15,191	8,716 9,954	11,088 12,387	11,412 12,743
36	Volume(16h) Volume(24h)	921 985	3,302 3,401	319 341	249 282	257 290	0 0	767 867	439 492	9 11	10 13	2,050 2,295	5,353 5,697	6,274 6,682	3,498 3,929	4,489 4,949	4,765 5,245
37	Volume(16h) Volume(24h)	786 865	19,018 19,398	3,816 4,121	385 458	1,895 2,122	1 1	346 401	2,304 2,466	1,125 1,440	2,463 3,448	12,333 14,455	31,350 33,853	32,136 34,718	28,824 35,310	34,529 41,129	34,765 41,389
38	Volume(16h) Volume(24h)	576 617	6,234 6,421	589 630	91 103	1,495 1,689	0 0	60 68	768 860	11 13	74 97	3,089 3,462	9,323 9,883	9,899 10,499	5,656 6,392	7,528 8,318	7,701 8,503
39	Volume(16h) Volume(24h)	396 436	8,153 8,316	1,962 2,119	156 185	2,752 3,082	0 0	115 133	939 1,005	321 411	617 863	6,862 7,800	15,015 16,116	15,411 16,551	12,987 15,240	15,433 17,735	15,552 17,865
40	Volume(16h) Volume(24h)	845 905	5,027 5,178	764 818	73 82	945 1,068	0 0	52 58	507 568	51 58	57 76	2,449 2,727	7,475 7,905	8,321 8,809	4,284 4,825	5,792 6,379	6,046 6,650
41	Volume(16h) Volume(24h)	590 649	5,425 5,534	1,263 1,364	83 99	1,892 1,895	0 0	150 173	1,453 1,554	109 140	745 1,044	5,495 6,269	11,920 11,510	11,885 12,452	11,885 13,963	13,513 15,623	13,690 15,818
42	Volume(16h) Volume(24h)	304 334	4,697 4,791	1,030 1,112	79 94	1,142 1,279	0 0	136 158	1,092 1,168	101 130	645 903	4,225 4,843	8,922 9,635	9,226 9,969	9,286 10,996	10,695 12,433	10,766 12,533
43	Volume(16h) Volume(24h)	646 692	4,904 5,051	607 650	283 320	580 656	0 0	461 521	120 134	1 1	63 84	2,116 2,365	7,020 7,416	7,666 8,108	3,068 3,475	4,539 4,990	4,733 5,197
44	Volume(16h) Volume(24h)	1,034 1,107	6,101 6,264	426 456	239 270	767 867	0 0	656 741	125 140	0 0	118 155	2,330 2,629	8,432 8,913	8,432 10,020	3,645 4,179	5,476 6,064	5,786 6,397

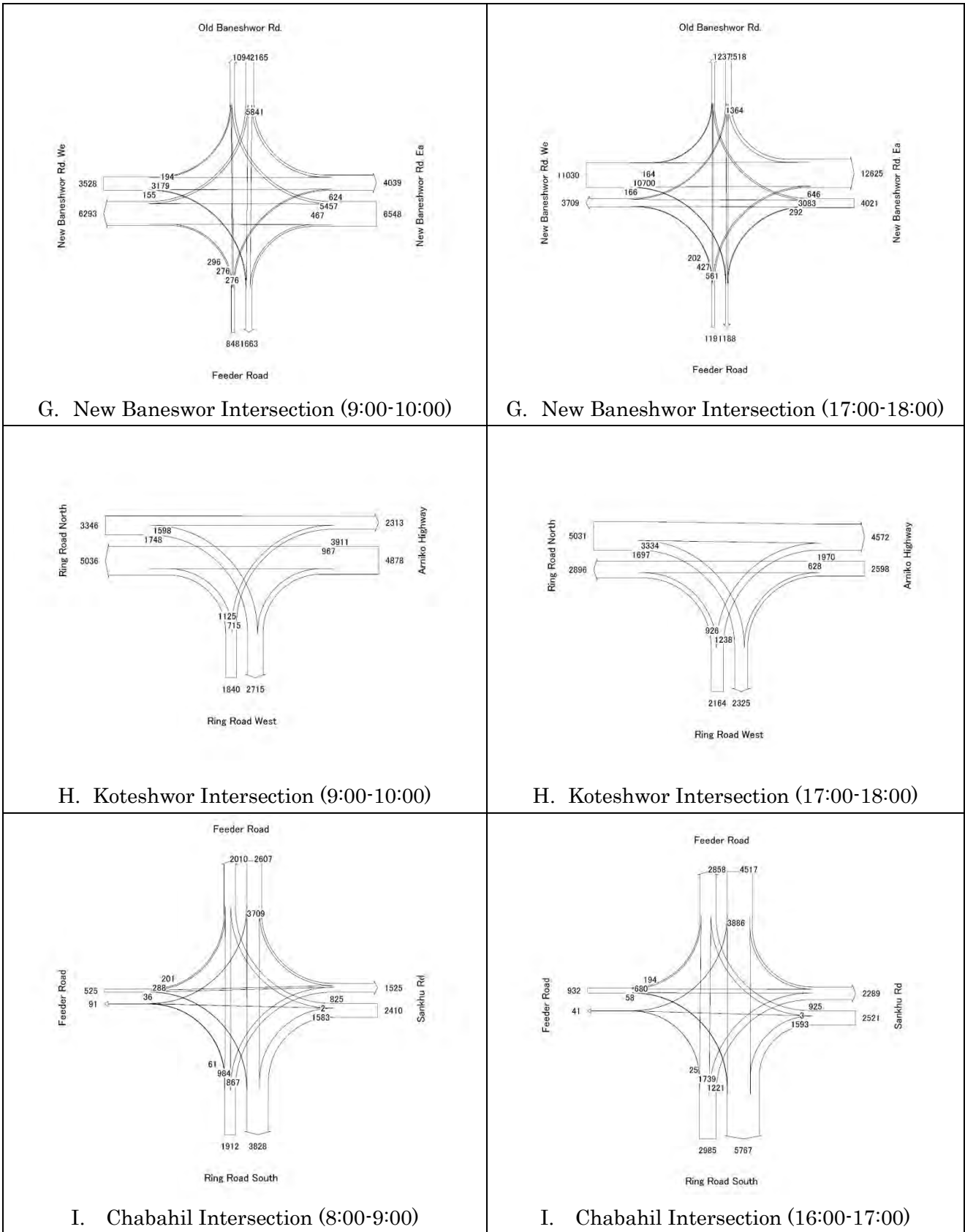
Traffic Count Survey at Major Intersection



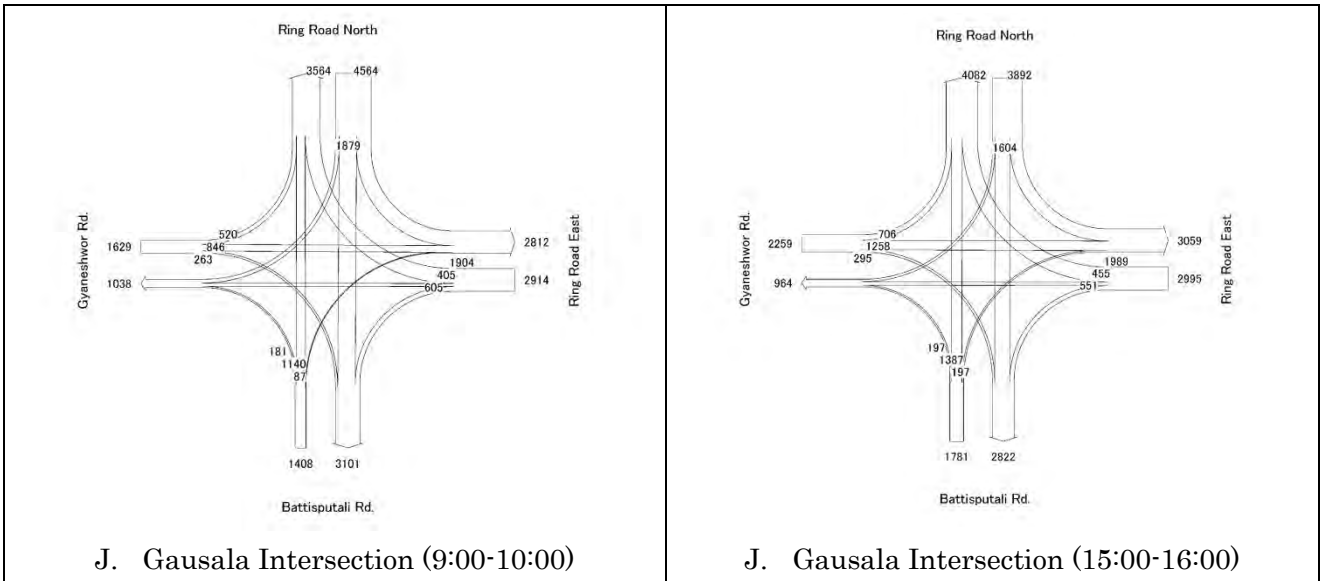
Appendix 1.2.3 Traffic Count Survey at Major Intersection



Appendix 1.2.3 Traffic Count Survey at Major Intersection



Appendix 1.2.3 Traffic Count Survey at Major Intersection



Appendix 1.2.4 Road Capacity

1. Calculation Formula

Basic capacities and adjustment factors are based on the Japanese capacity standard.

a) Calculation of Design Capacity

$$C_L = C_B \times \gamma_L \times \gamma_C \times \gamma_N \times \gamma_I$$

C_L : Possible capacity (PCU/h/lane)

C_B : Basic traffic capacity

Multi-lane road, one direction: 2,200 (PCU/h/lane)

Two-lane road, both direction: 2,500 (PCU/h/2-lanes)

γ_L : Lane width adjustment factor

$$\gamma_L = 0.24W_L + 0.22$$

W_L : Carriageway width (m)

γ_C : Lateral clearance adjustment factor

$$\gamma_C = 0.187W_C + 0.86$$

γ_N : Bicycle and motorcycle adjustment factor (0.85)

γ_I : Land use adjustment factor

Inside the Ring Road: 0.80

Outside the Ring Road: 0.90

$$C_D = C_L \times \gamma_P \times \gamma_j$$

C_D : Design capacity (PCU/h)

C_L : Basic traffic capacity

γ_P : Service level (1.0)

γ_j : Intersection adjustment factor

Inside the Ring Road: 0.95

Outside the Ring Road: 1.00

b) Calculation of 24-hour Capacity

$$C_{24} = C_D \times 500 / (K \times D) \times R_{24} \quad \text{Multi-lane road}$$

$$C_{24} = C_D \times 100 / K \times R_{24} \quad \text{One-lane road and two-lane road}$$

C_{24} : 24-hour capacity (PCU/24 hr)

K : Ratio of ADT against the 30th hourly traffic volume

D : Directional distribution

R_{24} : Day-night ratio (24-hour traffic/12-hour traffic)

2. Road Capacity (Result of calculation)

Number of Lanes	Location of Road Section	Basic Traffic Capacity C_B	Lane Number	Carrageway Width	Lane Width Adjustment Factor Y_L	Lateral Clearance Adjustment Factor	Lateral Clearance	Lateral Clearance Adjustment Factor	Motorcycle and Bicycle Adjustment Factor Y_M	Land Use Adjustment Factor Y_U	Traffic Capacity Volume C	Service Level Y_P	Intersection Adjustment Factor Y_I	Design Traffic Capacity C_D	K value K	D value D	12hrs Capacity C_{12}	Day-night Ratio R_{24}	Daily Traffic Capacity C_{24}	Applied Daily Traffic Capacity
1lane	Inside of RR	2200	1	5.50							650	1	0.95	618	11.6	55.2	5,323	1.2	6,388	6,000
1lane	Outside of RR	2500	1	5.50							650	1	1.00	650	12.2	58.8	5,328	1.3	6,926	7,000
2lanes	Inside of RR	2500	1	3.50	1	0.75	1.00	0.85	0.80	0.80	1,700	1	0.95	1,615	11.6	55.2	13,926	1.2	16,711	17,000
2lanes	Outside of RR	2500	1	3.50	1	0.75	1.00	0.85	0.90	0.90	1,913	1	1.00	1,913	12.2	58.8	15,680	1.3	20,384	20,000
4lanes	Inside of RR	2200	4	3.50	1	0.63	0.98	0.85	0.80	0.80	5,846	1	0.95	5,553	11.6	55.2	43,364	1.2	52,037	52,000
4lanes	Outside of RR	2200	4	3.50	1	0.38	0.93	0.85	0.90	0.90	6,262	1	1.00	6,262	12.2	58.8	43,643	1.3	56,736	57,000
6lanes	Inside of RR	2200	6	3.50	1	0.42	0.94	0.85	0.80	0.80	8,419	1	0.95	7,998	11.6	55.2	62,452	1.2	74,942	75,000
6lanes	Outside of RR	2200	6	3.50	1	0.25	0.91	0.85	0.90	0.90	9,156	1	1.00	9,156	12.2	58.8	63,820	1.3	82,966	83,000

Appendix 1.2.5 Result of Parking Survey

Date : 20 Jan, 2012 ; 11pm - 3am

Parking Survey Along Ring Road - Summary

Direction	Vehicle Type	Start Point : 0-2.5km	2.5-5km	5-7.5km	7.5-10km	10-12.5km	12.5-15km	15-17.5km	17.5-20km	20-22.5km	22.5-25km	25-27.4km	RR Total	RR Total Both sides	Grand Total
Left Side when going Clockwise	Heavy Truck	29	50	8	11	25	28	28	6	5	7	7	204	492	1429
	Light Truck	5	14	2	2	4	0	4	0	0	2	0	33	115	
	Tempo	1	0	0	0	0	0	0	0	0	0	0	1	12	
	Minibus	1	7	0	0	1	0	0	0	0	0	1	10	102	
	Micro Bus	2	1	0	5	13	0	8	1	2	1	0	33	88	
	Large Bus	11	7	4	5	29	8	13	6	2	5	2	92	316	
	Private Cars	2	9	1	14	6	0	2	6	0	0	0	40	172	
	Others	9	16	0	4	3	2	7	8	0	0	0	49	132	
	Total	60	104	15	41	81	38	62	27	9	15	10	462	1429	
	Right Side when going Clockwise	Heavy Truck	28	69	16	19	32	30	51	17	9	17	0	288	
Light Truck		6	20	8	11	6	0	1	7	9	7	7	82	11	
Tempo		0	0	1	0	0	0	10	0	0	0	0	11	92	
Minibus		3	7	3	22	5	2	28	4	2	11	5	55	224	
Micro Bus		4	6	1	12	2	0	12	13	4	1	0	132	83	
Large Bus		3	31	11	21	24	40	64	16	9	5	0	967	16	
Private Cars		5	30	6	60	2	7	4	6	0	8	4	49	36	
Others		7	19	6	14	11	4	7	12	3	0	0	83	177	
Total		56	182	52	159	82	83	177	75	36	49	16	967		

Appendix 1.2.5 Result of Parking Survey

Date : 23 Jan, 2012 ; 11pm - 3am

Parking Survey Along Ring Road - Summary

Direction	Vehicle Type	Start Point : Tinkune	0-2.5km	2.5-5km	5-7.5km	7.5-10km	10-12.5km	12.5-15km	15-17.5km	17.5-20km	Maharajgunj	Chabahil	Chabahil	Gaushala	Airport	Tinkune	RR Total	RR Total Both sides	Grand Total
Left Side when going Clockwise	Heavy Truck		29	22	15	13	16	42	27	1		11		9	2		187	418	1088
	Light Truck		1	7	2	11	3	2	4	0		1		0	3		34	94	
	Tempo		0	0	0	0	0	0	0	0		0		0	0		0	1	
	Minibus		2	0	0	2	0	0	0	0		0		0	0		4	44	
	Micro Bus		2	2	0	3	8	0	2	0		2		0	0		19	51	
	Large Bus		5	12	1	7	40	19	11	2		3		9	0		109	246	
	Private Cars		13	3	3	27	5	0	0	0		5		0	0		56	136	
	Others		6	10	8	1	2	0	3	1		10		3	0		44	98	
	Total		58	56	29	64	74	63	47	4	4	32	21	33	5	453	1088		

Right Side when going Clockwise	Heavy Truck		33	17	27	42	26	18	35	6		13		7	7		231		
	Light Truck		9	3	7	8	2	3	6	3		6		5	8		60		
	Tempo		1	0	0	0	0	0	0	0		0		0	0		1		
	Minibus		3	0	6	2	8	4	8	3		3		2	1		40		
	Micro Bus		0	2	5	5	5	2	1	0		6		5	1		32		
	Large Bus		15	6	7	14	10	16	52	1		2		8	6		137		
	Private Cars		5	13	6	8	10	9	7	2		12		4	4		80		
	Others		8	7	5	5	8	5	3	2		7		2	2		54		
	Total		74	48	63	84	69	57	112	17	49	33	29	635					

Appendix 1.2.5 Result of Parking Survey

Day 1 Date : 20 Jan, 2012 ; 11pm - 3am
Day 2 Date : 23 Jan, 2012 ; 11pm - 3am

Parking Survey Along Ring Road - Summary

Direction	Vehicle Type	0-2.5km		2.5-5km		5-7.5km		7.5-10km		10-12.5km		12.5-15km		15-17.5km		17.5-20km		20-22.5km		22.5-25km		25-27.4km		Grand Total				
		Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	
Left Side when going Clockwise	Heavy Truck	29	29	50	22	8	15	11	13	25	16	28	42	28	27	6	1	5	11	7	9	7	2	204	187	492	418	
	Light Truck	5	1	14	7	2	2	2	11	4	3	0	2	4	4	0	0	0	1	2	0	0	3	33	34	115	94	
	Tempo	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	12	1	
	Minibus	1	2	7	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	10	4	102	44	1429	1088
	Micro Bus	2	2	1	2	0	0	0	5	3	13	8	0	0	8	2	1	0	2	2	1	0	0	33	19	88	51	
	Large Bus	11	5	7	12	4	1	3	14	27	29	40	8	19	13	11	6	2	2	3	5	9	2	92	109	316	246	
	Private Cars	2	13	9	3	1	3	1	3	14	6	5	0	0	2	0	6	0	0	5	0	0	0	40	56	172	136	
	Others	9	6	16	10	0	8	4	1	3	2	2	0	2	0	7	3	8	1	0	10	0	3	0	49	44	132	98
	Total	60	58	104	56	15	29	41	64	81	74	38	63	62	47	27	4	9	32	15	21	10	5	462	453	1429	1088	Diff. 23%
	Right Side when going Clockwise	Heavy Truck	28	33	69	17	16	27	19	42	32	26	30	18	51	35	17	6	9	13	17	7	0	7	288	231		
Light Truck		6	9	20	3	8	7	11	8	6	2	0	3	1	6	7	3	9	6	7	5	7	8	82	60			
Tempo		0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1			
Minibus		3	3	7	0	3	6	22	2	2	5	8	2	4	28	8	4	3	2	3	11	2	5	1	92	40		
Micro Bus		4	0	6	2	1	5	12	5	2	5	0	2	12	1	13	0	4	6	1	5	0	1	55	32			
Large Bus		3	15	31	6	11	7	21	14	24	10	40	16	64	52	16	1	9	2	5	8	0	6	224	137			
Private Cars		5	5	30	13	6	6	60	8	2	10	7	9	4	7	6	2	0	12	8	4	4	4	132	80			
Others		7	8	19	7	6	5	14	5	11	8	4	5	7	3	12	2	3	7	0	2	0	2	83	54			
Total		56	74	182	48	52	63	159	84	82	69	83	57	177	112	75	17	36	49	49	33	16	29	967	635			

Others Vehicles Breakdown:

	Tractor		Taxi		Excavator		Others	
	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2	Day 1	Day 2
Left Side	27	28	18	6	2	6	2	4
Right Side	39	20	22	8	20	19	2	7
Total	66	48	40	14	22	25	4	11

Appendix 1.2.6 Vehicle Trip OD Table (2011)

Motorcycle Motorcyc ■ Motorcycle VT OD Table (Present in 2011) Unit: Vehicle Trips

Origin	Destination																																Total
	306	401	402	403	404	501	502	601	602	603	604	605	606	607	608	609	610	701	702	703	704	801	802	803	900	900	Total						
101	38	7	24	71	0	122	8	5	21	19	80	168	135	14	57	47	5	50	88	123	147	25	4	27	70	70	18,978						
102	36	4	14	42	0	72	4	4	17	13	52	86	69	6	24	20	2	31	45	63	75	14	3	16	38	38	9,012						
103	62	24	78	237	0	410	27	21	86	68	279	441	292	26	162	113	12	64	173	257	387	84	14	109	191	46,119							
104	14	4	8	27	0	47	4	2	10	8	30	47	38	4	16	14	1	0	24	34	41	9	1	9	25	6,443							
105	5	50	100	117	0	41	166	155	989	818	1,971	1,064	79	0	23	60	7	160	50	163	129	297	107	75	453	10,555							
106	29	16	100	351	0	850	38	10	121	77	936	360	19	51	63	69	8	33	272	381	395	56	9	117	136	26,540							
107	65	22	74	227	0	391	25	12	77	62	201	364	253	16	101	82	9	59	175	244	480	79	12	66	168	40,877							
108	64	7	24	72	0	126	9	3	28	23	104	160	97	6	47	39	4	224	88	123	147	26	4	22	60	11,924							
109	0	2	6	19	0	3	3	2	7	5	26	61	56	2	20	16	2	0	19	50	44	6	2	6	24	6,336							
110	154	15	50	155	0	266	17	9	37	30	192	473	439	27	3,168	62	7	291	178	250	215	56	9	50	220	49,172							
111	26	4	15	47	0	82	5	4	9	8	40	104	97	10	82	46	5	62	31	44	75	17	3	17	59	20,250							
112	0	12	37	115	0	197	12	10	49	39	159	351	165	33	275	155	17	88	151	211	152	34	6	59	164	31,313							
114	22	12	36	117	0	201	15	9	35	27	115	312	271	21	115	94	10	47	119	167	257	40	9	37	124	37,321							
115	65	7	18	56	0	95	7	5	13	12	62	129	104	11	44	35	4	116	68	94	113	21	4	21	53	13,117							
116	79	10	31	96	0	165	11	7	36	28	117	196	158	16	56	45	5	142	103	143	171	34	6	38	85	21,144							
117	105	7	26	79	0	136	9	4	24	19	87	182	126	15	62	50	6	82	95	133	159	28	4	26	72	26,212							
118	112	14	46	144	0	247	16	9	46	39	167	325	241	27	110	89	10	54	170	237	284	50	7	49	132	50,861							
119	5	354	788	670	0	1,148	221	387	32	63	179	27	32	0	169	14	2	0	63	199	579	279	63	557	627	12,123							
201	8	15	22	110	0	97	169	0	0	19	42	15	26	514	17	44	5	95	118	223	107	0	0	29	32	7,091							
202	2	0	0	12	0	0	0	0	0	0	0	2	0	0	23	26	3	0	85	0	0	0	0	0	10	783							
301	790	9	28	93	0	158	11	6	27	21	82	169	180	9	82	68	7	101	180	253	302	37	6	26	90	23,884							
302	249	5	16	48	0	77	5	3	13	10	42	28	42	2	26	23	2	2,019	83	115	138	27	4	13	33	15,063							
303	326	15	55	161	0	256	16	9	30	25	100	61	93	6	60	49	5	210	188	262	313	68	9	46	104	19,107							
304	173	10	31	87	0	138	10	6	18	15	54	64	83	6	34	28	3	19	102	142	679	36	6	26	62	20,008							
305	311	10	20	66	0	100	8	5	13	13	49	49	79	5	26	21	2	182	97	136	162	35	6	18	50	10,297							
306	362	2	5	13	0	19	3	1	5	4	10	12	21	2	4	4	0	21	21	29	34	8	1	5	13	3,329							
401	2	31	89	145	0	49	58	48	36	0	34	11	0	0	21	0	0	0	0	0	0	0	0	58	602	32	1,924						
402	4	89	936	408	231	1,107	87	0	0	25	57	16	0	34	0	0	0	90	65	0	105	0	166	313	5	5,401							
403	13	145	407	530	461	14	63	47	67	39	70	42	13	101	28	5	1	0	189	0	61	29	121	1,084	334	7,120							
404	0	0	230	460	0	655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,434							
501	19	49	1,107	14	654	84	0	0	32	0	121	220	6	51	0	30	3	0	124	178	661	145	21	556	390	9,987							
502	2	58	87	63	0	0	1,584	0	0	0	81	0	0	0	0	0	0	0	0	0	62	224	20	119	46	3,167							
601	1	48	0	47	0	0	0	0	0	0	29	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	825						
602	4	36	0	67	0	31	0	0	0	0	455	16	0	0	0	0	0	0	29	53	0	0	3	64	32	2,540							
603	3	0	25	39	0	0	0	0	0	0	119	246	0	0	0	0	0	0	31	0	0	0	89	44	6	2,076							
604	11	34	57	70	0	120	81	29	454	118	1,667	563	40	0	29	10	1	82	0	50	38	88	13	59	155	8,984							
605	12	10	15	42	0	219	0	0	0	16	246	563	264	105	343	35	16	2	48	21	68	21	0	51	0	77	7,532						
606	21	0	0	13	0	6	0	0	0	0	40	105	309	263	0	5	1	0	6	40	0	0	0	0	0	6	4,271						
607	2	0	34	101	0	50	0	0	0	0	0	342	262	2,230	1,210	338	38	110	52	55	0	0	0	87	0	5,744							
608	4	0	0	28	0	0	0	8	0	8	0	29	35	0	1,209	1,016	734	82	0	52	28	10	0	0	0	6	8,155						
609	4	21	0	5	0	29	0	0	0	0	10	15	5	338	734	569	63	302	5	4	3	72	0	2	198	3,733							
701	0	2	0	0	0	3	0	0	0	0	1	2	1	37	82	63	7	33	1	0	0	8	0	0	22	411							
702	21	0	90	0	0	0	0	0	0	0	82	48	0	110	0	302	33	1	288	2,701	260	161	26	52	31	828	6,052						
703	29	0	65	189	0	123	0	0	29	31	0	21	6	52	52	5	1	288	0	260	161	26	52	31	0	6,825							
704	34	0	104	60	0	661	62	0	0	53	0	68	40	55	28	3	0	59	260	0	76	0	0	26	0	5,100							
801	7	58	0	29	0	145	224	0	0	89	88	0	0	0	10	3	0	44	160	75	121	110	0	20	0	7,170							
802	1	65	166	121	0	21	20	0	3	44	13	51	0	0	0	72	8	0	26	0	109	0	0	55	15	2,302							
803	4	602	312	1,084	89	556	119	0	64	0	0	87	0	0	0	0	0	0	51	0	0	0	0	124	41	11,316							
900	12	31	5	334	0	389	45	0	31	5	154	77	5	0	6	198	22	827	0	0	0	0	15	115	63	5,800							
Total	3,335	1,922	5,395	7,120	1,435	9,979	3,168	826	2,542	2,075	8,981	7,531	4,272	5,747	8,157	3,732	412	6,051	6,822	5,102	7,171	2,298	1,138	5,062	5,806	664,437							

Appendix 1.2.6 Vehicle Trip OD Table (2011)

Unit: Vehicle Trips

	Destination																														
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	201	202	301	302	303	304	305					
101	584	140	418	177	13	222	152	243	54	146	123	198	160	691	309	104	452	1,264	4	34	15	66	31	92	30	305					
102	139	211	486	58	7	86	48	42	10	89	31	72	87	116	96	194	75	153	3	18	7	62	22	50	10	10					
103	417	485	2,535	250	789	542	435	91	28	401	151	517	231	306	228	288	206	407	15	83	37	272	49	99	55	54					
104	175	58	249	143	29	57	126	21	0	59	24	146	8	69	61	13	229	83	2	10	5	59	24	34	11	3					
105	13	7	789	28	0	2,132	32	9	5	32	12	49	18	22	21	14	13	24	0	40	6	15	5	14	13	10					
106	220	86	542	57	2,129	5,233	1,019	47	13	236	63	205	43	98	53	179	252	3,223	244	94	27	41	34	55	889	31					
107	149	48	434	126	32	1,020	3,300	473	49	322	42	124	29	284	69	80	349	2,314	12	69	30	347	141	237	116	105					
108	243	41	89	21	9	47	391	41	42	428	53	116	66	322	56	48	177	440	3	34	15	175	95	113	94	95					
109	54	10	26	0	5	11	47	47	0	356	57	57	0	209	35	59	100	37	3	10	4	68	15	17	2	9					
110	144	89	400	59	32	232	319	428	355	1,783	361	503	180	1,077	159	132	232	179	16	81	34	408	1,313	956	69	64					
111	121	31	151	24	12	63	42	53	57	361	206	512	309	181	51	75	81	74	4	18	8	59	23	25	6	45					
112	198	72	516	146	49	207	124	116	57	503	512	675	485	269	110	1,462	165	202	18	57	23	146	95	113	18	33					
113	159	85	229	6	18	44	28	66	40	180	307	485	42	300	289	341	100	71	2	17	8	104	23	28	13	25					
114	691	113	306	68	22	92	280	321	208	1,076	180	268	300	787	467	498	878	1,295	10	57	27	134	104	98	94	52					
115	309	95	227	13	21	53	67	56	34	158	49	109	287	463	5,862	152	219	639	4	26	12	35	43	26	83	52					
116	103	193	288	28	14	179	80	46	59	132	75	1,461	343	498	151	0	282	102	4	41	19	52	39	11	8	33					
117	452	74	206	82	13	254	349	175	99	232	79	163	101	877	219	281	591	6,725	3	38	16	179	95	117	49	23					
118	1,264	151	407	227	24	3,223	2,311	439	34	177	73	201	69	1,291	638	101	6,724	2,358	6	68	29	288	45	175	42	100					
119	3	2	15	2	0	244	13	3	3	14	4	16	2	10	4	3	3	7	227	105	0	10	5	10	911	13					
201	34	18	83	10	41	95	68	34	10	81	18	57	17	57	25	41	38	68	104	73	0	50	24	47	34	25					
202	15	7	35	5	6	27	29	15	4	34	8	23	8	27	12	19	16	29	0	0	26	21	10	22	13	11					
301	66	62	266	59	15	41	340	175	69	406	56	145	103	130	35	52	179	286	10	48	20	1,035	444	263	204	239					
302	31	20	47	24	5	33	137	95	15	1,313	23	95	22	104	43	39	94	45	5	24	10	444	466	323	115	168					
303	92	50	97	34	13	884	111	229	112	17	956	25	112	27	92	26	117	175	9	47	22	262	322	666	733	534					
304	30	10	49	9	13	884	111	94	1	62	5	17	12	92	82	8	49	41	911	33	13	197	112	730	1,268	330					
305	55	10	51	3	10	27	101	95	9	58	36	31	21	48	51	33	23	99	13	25	11	238	167	532	328	171					
306	11	11	2	2	2	20	19	15	0	19	2	0	0	9	6	3	7	22	2	8	4	116	22	124	84	146					
401	2	1	12	1	4	8	10	5	2	16	4	12	4	9	4	6	3	4	36	30	0	7	4	8	4	4					
402	9	5	38	4	78	65	32	7	3	41	13	35	6	12	6	10	8	17	149	0	0	19	8	22	13	10					
403	18	9	75	11	110	133	62	15	5	86	26	72	11	31	13	21	17	33	220	7	2	40	19	44	25	21					
404	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					
501	41	21	164	22	151	292	137	34	13	182	54	163	28	63	25	45	34	69	649	50	0	80	38	93	55	52					
502	6	2	22	2	55	21	19	5	2	25	8	20	4	8	5	6	5	9	53	3	0	13	5	14	7	8					
601	2	1	7	1	61	23	6	2	1	6	2	7	1	4	3	2	2	4	108	0	0	4	2	4	2	3					
602	4	2	13	1	133	79	14	4	1	14	3	15	5	8	4	6	4	8	16	0	0	7	3	7	4	5					
603	2	1	5	5	86	20	6	2	1	8	2	7	4	5	6	2	4	5	3	3	0	3	2	4	2	2					
604	15	9	50	6	478	421	27	13	5	40	14	49	16	27	11	17	33	32	1	0	0	16	6	18	12	12					
605	65	33	170	18	466	397	155	71	37	306	70	224	76	162	49	75	70	125	21	8	9	138	41	93	71	69					
606	26	13	53	6	25	55	45	21	6	47	10	33	12	37	19	29	23	43	9	1	0	21	7	14	14	13					
607	8	6	26	4	0	210	9	4	2	14	6	17	4	17	8	17	8	17	0	11	0	8	4	6	6	4					
608	13	8	53	3	20	45	25	13	4	1,219	19	61	13	29	10	20	14	26	20	6	9	22	9	19	17	11					
609	11	7	33	4	45	34	23	13	4	12	9	30	11	24	10	16	12	22	11	26	4	17	7	18	14	8					
610	1	1	4	0	5	4	3	1	0	1	1	3	1	3	1	2	1	2	1	3	0	2	1	2	1	1					
701	22	11	46	7	12	136	41	22	9	63	14	57	17	41	16	25	23	41	0	107	0	43	685	44	24	23					
702	48	25	93	14	51	123	107	48	14	97	24	119	23	80	36	56	51	92	37	8	0	64	29	67	36	34					
703	26	14	56	7	46	61	60	26	10	57	13	67	15	44	20	31	29	52	17	14	7	36	17	37	20	20					
704	40	20	103	11	58	70	96	40	11	87	32	63	29	71	30	46	43	76	70	22	0	55	25	58	143	30					
801	11	6	47	5	63	65	38	9	4	33	10	20	8	17	10	12	10	19	94	0	22	2	12	33	16	16					
802	1	1	3	0	9	2	4	1	0	4	1	3	1	3	3	1	3	2	19	0	2	0	2	1	3	2	1				
803	10	5	48	6	146	66	32	7	3	46	14	62	6	12	6	13	8	17	44	29	0	20	9	20	14	11					
900	28	15	89	11	143	114	75	31	9	101	26	68	19	53	23	38	32	61	142	9	1	50	21	55	30	25					
Total	6,181	2,395	10,153	1,810	5,568	17,563	11,305	4,090	1,418	12,119	2,950	7,564	3,324	9,194	9,428	4,746	11,924	21,284	3,387	1,496	479	5,572	4,723	5,660	5,824	2,819					

Appendix 1.2.6 Vehicle Trip OD Table (2011)

Unit: Vehicle Trips

Origin	Destination																														Total
	306	401	402	403	404	501	502	601	602	603	604	605	606	607	608	609	610	701	702	703	704	801	802	803	900						
101	11	4	9	19	0	41	6	2	5	3	16	65	26	10	14	13	1	22	48	26	40	12	1	10	31	6,212					
102	11	2	5	10	0	21	3	1	3	1	9	33	13	7	8	8	7	11	25	14	20	6	1	5	15	2,414					
103	2	11	38	73	0	162	22	6	13	7	49	170	53	25	52	33	4	46	95	58	103	45	3	48	91	10,177					
104	2	1	5	11	0	23	2	1	1	5	6	18	6	6	5	4	0	7	14	7	11	6	6	6	12	1,825					
105	2	5	78	110	0	152	55	59	133	87	478	466	25	0	18	44	5	12	30	46	58	62	9	147	143	5,567					
106	22	14	66	134	0	290	21	23	79	19	421	398	55	209	44	44	34	4	135	122	61	71	65	2	67	17,577					
107	20	10	30	62	0	136	18	5	13	5	27	153	46	10	27	24	3	42	106	58	98	37	3	31	78	11,343					
108	5	7	15	5	0	34	2	1	4	2	13	72	21	4	13	13	1	22	44	26	40	9	1	7	31	4,096					
109	0	2	1	5	0	11	2	1	1	1	5	37	2	4	4	4	0	9	14	10	11	3	0	2	8	1,412					
110	19	14	41	86	0	181	25	6	14	6	41	306	46	13	1,219	12	1	63	97	57	87	34	6	45	99	12,123					
111	2	4	14	27	0	56	9	3	4	2	16	70	10	6	19	9	1	14	24	13	32	12	1	15	27	2,982					
112	0	13	35	73	0	163	20	9	16	8	50	224	33	17	61	30	3	57	119	67	63	21	4	63	70	7,590					
113	0	4	7	11	0	25	5	1	5	5	17	75	12	4	12	10	1	19	23	15	26	7	1	7	17	3,319					
114	9	9	12	31	0	64	8	4	8	4	23	162	37	14	26	21	2	41	80	44	71	17	3	12	51	9,179					
115	6	4	6	13	0	25	6	3	4	6	12	49	19	8	9	9	1	16	36	20	30	10	3	6	23	9,418					
116	3	6	11	21	0	46	6	2	7	3	21	75	29	17	20	16	2	25	56	31	46	14	1	14	38	4,751					
117	7	3	8	17	0	34	5	2	5	3	18	70	25	10	15	14	1	23	51	29	43	10	3	9	36	11,933					
118	22	3	16	33	0	68	9	3	8	5	34	125	45	17	26	23	3	41	92	52	76	19	2	17	63	21,267					
119	2	36	151	220	0	651	54	108	16	5	34	22	11	0	20	11	1	0	38	18	70	94	19	44	144	3,398					
201	8	30	0	8	0	50	3	0	0	3	1	9	1	11	11	8	26	3	107	14	22	0	0	29	10	1,504					
202	4	0	0	3	0	0	0	0	0	0	0	9	0	0	9	4	0	0	0	7	0	23	0	0	2	483					
301	117	6	18	37	0	77	10	4	7	4	14	137	19	8	21	17	2	43	64	35	55	21	2	18	48	5,532					
302	22	3	9	18	0	40	5	2	3	2	6	42	9	4	9	7	1	685	29	17	25	12	1	9	22	4,722					
303	124	7	22	42	0	92	13	4	5	4	17	93	14	6	19	18	2	44	67	37	58	33	3	20	53	5,633					
304	84	4	13	25	0	55	7	2	4	2	12	69	13	6	17	14	1	24	36	20	143	16	2	13	28	5,633					
305	145	4	11	21	0	50	8	3	2	2	12	66	13	4	11	11	8	1	23	34	20	16	1	11	25	2,767					
306	55	1	3	4	0	10	1	0	1	1	3	15	4	2	4	2	0	5	7	4	6	3	0	3	4	794					
401	1	118	78	66	0	23	7	0	0	0	4	0	0	0	4	0	0	0	0	0	4	4	0	37	58	33	11	640			
402	2	78	13	65	66	90	9	0	0	4	18	43	2	1	1	4	0	0	14	15	2	63	35	87	101	1,850					
403	5	65	65	53	74	27	21	15	9	4	18	43	2	1	1	1	4	0	0	0	4	0	0	0	0	0	193				
404	0	66	74	0	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1				
501	10	22	90	27	40	20	0	0	10	0	18	6	6	1	33	9	1	0	3	18	35	68	15	47	80	3,108					
502	1	7	8	20	0	121	0	0	0	0	4	0	0	0	0	0	0	0	0	0	13	17	5	10	14	547					
601	0	0	0	14	0	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	315				
602	1	0	0	9	0	10	0	0	0	0	58	6	0	0	0	0	0	0	0	1	0	0	0	0	0	1	457				
603	1	0	0	4	0	0	0	0	0	0	40	14	0	0	0	0	0	0	1	0	0	4	3	0	3	259					
604	3	0	20	17	0	18	3	34	57	39	387	98	4	0	2	2	0	45	0	2	0	6	0	13	43	2,142					
605	15	3	2	42	0	5	0	0	5	13	96	116	16	149	18	7	1	43	9	5	13	0	4	0	23	3,604					
606	4	0	0	2	0	1	0	0	0	0	4	16	40	11	0	0	1	0	7	2	0	0	0	0	0	2	672				
607	2	0	31	1	0	32	0	0	0	0	0	148	11	17	166	47	5	3	47	8	0	0	0	168	71	1,173					
608	4	0	0	1	0	0	0	0	0	0	2	17	0	166	9	418	46	0	0	0	1	0	0	0	0	2	2,374				
609	2	4	1	4	0	9	0	0	4	0	2	7	1	47	418	32	4	2	2	9	1	5	0	0	8	48	1,035				
610	5	0	0	0	0	1	0	0	0	0	1	0	0	0	5	46	4	0	0	0	1	0	1	0	1	5	110				
701	5	0	0	0	0	3	0	0	0	0	44	43	7	3	0	2	0	0	267	28	127	0	0	14	22	2,091					
702	7	0	0	13	0	3	0	0	0	1	0	9	2	46	0	2	0	266	30	27	30	0	0	0	1	9	1,820				
703	4	0	3	14	0	18	0	0	1	0	2	5	0	8	1	9	1	0	28	37	0	13	0	0	12	6	954				
704	6	0	4	4	0	34	13	0	0	0	0	12	0	0	0	1	0	126	29	13	37	19	0	2	5	1,632					
801	3	37	0	61	0	66	16	6	0	2	6	0	0	0	0	0	5	1	0	0	18	0	0	0	10	5	838				
802	0	57	54	35	0	15	5	0	3	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	5	267				
803	3	32	17	87	11	46	9	0	4	0	13	0	0	0	0	0	8	1	14	1	0	0	0	10	5	1,136					
900	3	10	0	100	1	80	14	1	1	1	42	22	1	69	2	46	5	22	6	3	4	3	3	5	3	25	54	1,789			
Total	796	632	1,069	1,840	192	3,096	546	312	455	258	2,145	3,603	676	1,173	2,373	1,033	110	2,092	1,820	952	1,632	849	269	1,144	1,822	203,865					

Appendix 1.2.6 Vehicle Trip OD Table (2011)

Unit: Vehicle Trips

	Destination																				Total						
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	201		202	301	302	303	304	305
101	158	39	114	49	5	82	34	66	14	42	33	67	44	64	29	29	42	119	18	3	1	7	3	11	1	5	
102	38	58	133	17	2	28	13	12	3	31	12	15	24	33	26	53	21	43	7	1	0	7	3	5	0	0	
103	114	131	690	68	1,106	171	107	28	8	112	55	114	59	77	62	79	56	112	10	15	8	33	6	11	4	2	
104	48	17	68	40	17	20	32	6	0	17	6	30	2	20	5	8	23	62	4	4	0	6	3	4	1	0	
105	5	2	1,106	17	0	18	9	12	3	21	5	6	3	5	9	2	4	32	0	7	1	1	2	3	2	1	
106	82	28	171	20	18	2,947	318	4	0	13	5	54	14	11	18	57	68	1,150	17	2	1	3	3	9	934	2	
107	33	13	104	32	7	318	900	38	6	18	3	22	1	28	16	20	75	211	19	4	1	15	9	19	17	7	
108	66	11	28	6	12	4	38	106	7	52	6	14	7	64	17	13	49	121	64	6	2	22	11	15	9	9	
109	14	3	8	0	2	0	2	5	0	103	17	17	11	56	10	15	19	7	0	1	1	15	2	0	0	1	
110	40	30	109	17	21	12	14	51	101	618	98	106	49	184	43	43	45	36	26	18	10	117	448	987	8	12	
111	33	12	55	6	5	5	3	6	17	98	57	8	83	49	13	30	16	16	8	7	2	18	9	4	0	7	
112	66	14	113	30	6	56	23	14	16	105	79	186	133	74	32	321	45	51	12	11	6	28	9	15	1	4	
113	42	23	58	1	3	12	1	7	11	50	83	132	13	13	81	77	79	13	4	3	2	18	5	4	1	4	
114	64	31	76	19	4	9	27	63	57	184	47	73	82	216	44	133	69	102	10	6	3	14	27	8	2	8	
115	29	25	60	5	9	20	18	15	9	42	13	30	78	44	2,755	40	21	60	19	3	1	0	5	1	7	3	
116	27	52	79	8	3	57	21	13	16	43	30	319	79	134	41	0	78	29	5	3	1	4	5	0	0	4	
117	42	21	57	23	4	69	76	47	18	44	16	43	21	70	21	77	159	246	64	4	1	22	12	15	4	0	
118	117	42	112	62	29	1,151	211	120	7	31	13	50	11	99	61	28	246	643	50	5	2	33	5	20	1	11	
119	18	7	10	4	0	16	19	62	0	25	8	11	4	10	18	5	63	51	59	8	0	12	9	8	1,541	6	
201	3	1	15	4	7	2	4	6	1	19	7	11	3	5	3	3	4	5	8	35	0	7	3	9	4	1	
202	1	0	8	0	2	1	20	1	1	10	2	6	2	3	1	1	1	1	2	0	0	4	1	4	1	2	
301	7	6	30	6	2	1	11	21	14	114	14	26	17	15	0	4	22	32	11	6	3	283	120	72	49	65	
302	3	1	5	3	3	4	8	11	3	448	9	9	5	27	4	5	12	5	9	3	1	122	127	88	32	46	
303	11	4	11	4	1	7	11	15	0	987	4	13	3	9	1	0	15	20	8	9	4	71	88	181	206	145	
304	1	0	2	1	3	931	13	9	0	2	0	0	0	0	7	0	4	0	1,541	4	1	45	30	205	899	93	
305	5	0	2	0	0	0	3	9	1	9	5	4	2	2	3	2	4	0	10	3	1	2	64	45	145	93	46
306	1	1	0	1	0	2	1	1	0	3	0	0	0	1	0	1	1	2	1	0	0	33	7	33	23	40	
401	1	1	4	0	8	2	3	4	0	2	1	2	3	4	3	5	1	0	38	2	0	0	1	3	0	1	
402	1	0	30	2	74	21	26	1	0	5	1	11	1	1	1	1	2	6	173	4	2	2	4	4	12	11	
403	1	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	
404	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	
501	2	1	39	3	56	36	34	2	0	5	2	13	1	3	7	3	4	10	246	2	1	5	2	24	13	11	
502	4	1	2	0	5	3	10	6	0	2	1	3	0	4	3	2	5	3	19	1	0	1	0	4	0	2	
601	2	0	5	0	23	3	4	1	0	0	0	0	0	0	0	0	1	3	18	0	0	0	0	3	0	2	
602	5	2	15	1	113	47	11	1	0	2	2	12	0	2	2	6	3	6	6	0	0	0	0	6	2	1	
603	2	2	11	16	8	1	8	1	0	2	2	9	0	6	2	4	1	5	2	0	0	0	0	3	1	2	
604	13	7	41	4	202	64	18	2	0	6	13	32	10	24	9	18	14	25	29	0	0	0	3	13	5	7	
605	12	15	32	7	45	58	27	8	5	52	17	32	15	31	11	14	13	23	13	5	0	19	6	16	8	8	
606	40	23	114	12	53	99	14	19	8	71	23	41	15	59	33	47	32	66	2	0	0	27	8	22	12	13	
607	2	1	5	0	2	2	2	6	0	4	77	28	4	4	13	7	8	0	0	6	4	22	13	28	7	8	
608	11	12	45	3	1	5	4	9	4	1,197	12	22	9	23	8	29	14	23	3	4	4	22	13	28	7	8	
609	23	26	94	6	32	8	8	15	9	37	27	50	18	47	17	59	25	45	2	7	5	47	23	58	23	21	
701	3	3	10	1	3	1	1	2	1	4	3	6	2	5	2	6	3	5	0	1	0	5	3	6	2	2	
702	14	4	0	2	0	5	3	0	10	0	8	0	1	1	3	3	1	1	0	4	0	4	172	9	1	5	
703	9	3	25	2	4	17	9	9	5	73	8	18	6	13	5	10	10	17	35	8	3	36	12	30	14	14	
704	9	4	19	2	18	20	33	8	2	28	8	15	6	14	5	10	9	15	42	5	0	23	11	26	228	14	
801	2	1	7	0	7	2	4	6	0	4	5	0	0	0	4	5	6	5	4	28	0	0	3	1	3	1	1
802	1	1	2	0	3	0	2	0	0	0	0	0	0	1	2	1	0	4	16	0	0	0	0	0	0	0	1
803	0	0	13	1	32	17	6	1	0	2	2	3	1	2	2	0	2	0	2	50	1	3	0	8	4	4	
900	36	36	155	10	64	85	41	20	8	114	30	59	24	69	29	75	32	70	206	18	19	57	30	98	36	41	
Total	1,265	720	3,934	502	2,114	6,485	2,206	896	362	4,958	883	1,830	876	1,731	3,486	1,370	1,378	3,549	3,042	263	88	1,297	1,312	2,316	4,240	721	

Appendix 1.2.6 Vehicle Trip OD Table (2011)

Unit: Vehicle Trips

Origin	Destination																														Total
	306	401	402	403	404	501	502	601	602	603	604	605	606	607	608	609	610	701	702	703	704	801	802	803	900	900					
101	1	1	1	1	2	3	4	2	2	5	3	14	12	40	2	12	24	3	4	14	9	9	2	1	1	36	1,284				
102	1	1	0	1	0	1	1	0	2	2	7	7	15	23	1	12	26	3	0	9	4	4	1	1	0	36	736				
103	0	3	8	29	0	39	2	5	15	11	39	31	114	5	43	92	10	2	32	25	19	6	1	14	153	3,956					
104	1	0	1	3	0	3	0	0	0	1	4	7	12	0	4	7	1	1	0	4	2	2	1	0	1	13	511				
105	0	8	18	75	0	56	5	23	112	76	202	45	53	0	1	32	3	5	2	5	17	7	3	31	65	2,122					
106	3	2	5	21	0	36	2	3	48	14	63	57	98	2	4	9	1	2	28	17	30	2	2	0	16	85	6,487				
107	1	2	8	26	0	33	9	3	10	7	19	27	16	2	5	9	1	1	15	11	33	4	1	6	45	2,230					
108	2	4	2	1	0	2	6	0	1	1	3	9	19	6	6	15	2	10	15	9	8	6	0	1	20	911					
109	0	0	0	0	0	0	0	0	0	0	0	5	8	0	4	9	1	1	7	5	2	0	0	0	8	358					
110	3	2	3	4	0	6	2	1	0	2	6	52	71	3	1,197	37	4	7	98	73	28	2	0	2	114	4,960					
111	0	1	0	2	0	2	1	0	2	2	14	17	23	78	12	27	3	0	17	8	8	10	0	2	31	900					
112	0	2	3	11	4	15	4	2	13	9	33	32	41	30	22	50	6	1	26	18	15	5	1	4	61	1,854					
113	0	3	0	1	0	1	0	1	1	1	11	14	15	4	9	17	2	1	9	6	5	0	1	1	22	869					
114	1	4	4	3	0	2	4	3	2	2	24	31	59	4	20	42	5	4	24	13	15	4	2	2	63	1,715					
115	0	3	2	1	0	8	3	0	2	2	9	11	33	13	8	18	2	3	10	5	5	1	0	1	30	3,486					
116	1	5	2	2	0	4	2	1	6	4	18	14	47	7	29	59	6	1	16	10	8	6	0	3	75	1,377					
117	1	1	0	2	0	4	5	1	4	2	15	13	33	7	14	27	3	1	16	10	9	5	4	0	35	1,388					
118	2	0	3	4	0	8	4	3	7	5	25	23	67	7	23	47	5	1	27	17	15	3	0	2	70	3,528					
119	1	39	113	175	0	246	19	19	7	2	30	14	2	0	2	4	2	0	24	36	42	28	16	51	208	3,052					
202	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	4	5	0	4	5	0	0	0	0	1	19	267				
201	0	2	0	4	0	3	1	0	0	0	0	5	0	6	6	5	7	1	4	26	8	5	0	1	1	19	267				
301	32	0	0	2	0	4	1	0	0	0	0	0	0	0	4	5	0	0	4	0	0	0	0	0	0	20	90				
302	6	1	1	3	0	3	0	0	0	0	3	8	10	4	13	23	3	172	47	20	23	2	0	1	53	1,259					
303	34	3	9	25	0	24	4	2	6	3	11	15	22	1	28	58	6	9	48	30	26	3	1	0	9	97	2,302				
304	23	0	2	10	0	11	0	2	1	5	8	12	0	0	5	22	2	1	24	14	228	1	1	0	2	33	4,197				
305	40	1	4	9	0	6	1	0	0	0	4	8	12	0	8	21	2	5	24	14	14	1	1	1	3	37	673				
306	16	0	1	2	0	1	1	0	0	1	0	2	4	0	0	0	1	2	5	2	3	0	0	0	7	201					
401	0	57	14	80	0	23	4	4	3	0	13	3	0	0	0	2	0	0	3	0	0	0	0	0	32	169	868	38	463		
402	0	12	11	85	39	149	24	4	24	15	66	16	4	1	4	6	1	0	0	4	2	14	0	0	3	2	14	1,731			
403	2	78	85	92	13	43	1,345	12	28	5	132	24	4	1	4	6	1	0	54	77	62	26	40	263	239	3,074					
404	0	0	38	13	0	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112		
501	0	22	149	43	54	13	0	0	4	3	23	23	0	4	1	1	0	0	39	20	19	30	7	132	206	1,318					
502	1	4	22	1,345	0	17	0	0	0	0	0	1	0	0	0	0	0	0	2	0	4	6	6	7	27	1,523	1,318				
601	0	4	3	11	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	115				
602	0	3	23	27	0	4	0	0	0	0	82	15	4	0	0	0	0	0	4	0	0	0	0	11	23	13	454				
603	1	0	14	5	0	3	0	0	0	0	40	1	0	0	0	1	0	0	2	0	0	3	6	0	7	238					
604	0	13	65	130	0	23	1	22	81	39	339	41	21	0	0	0	0	1	4	10	15	9	37	78	1,488	1,488					
605	2	2	15	24	0	22	0	0	14	1	40	43	63	19	5	33	4	1	7	11	34	0	3	0	29	864	864				
606	4	0	0	2	0	0	0	0	3	0	20	63	10	114	0	31	3	0	1	1	0	0	0	0	0	11	1,116	1,116			
607	0	0	1	1	0	4	0	0	0	0	19	114	7	105	273	30	13	1	16	0	0	0	0	0	0	99	865	865			
608	0	0	0	4	0	1	0	0	0	0	0	5	0	105	0	314	35	24	4	1	0	0	0	0	0	5	2,018	2,018			
609	1	2	1	6	0	1	0	0	0	1	0	32	31	272	314	84	9	54	9	12	6	2	2	0	1	47	1,617	1,617			
610	0	0	0	0	0	0	0	0	0	0	0	4	3	30	35	9	1	6	1	1	1	0	0	0	0	5	177	177			
701	3	3	0	0	0	0	0	0	0	0	1	1	1	13	24	54	6	0	92	11	2	0	0	0	0	11	459	459			
702	5	0	4	54	0	37	2	0	3	2	7	1	4	8	1	4	8	1	91	75	38	53	3	0	10	17	993	993			
703	2	0	2	76	0	19	0	0	0	0	3	11	1	16	1	12	1	10	36	0	23	0	0	0	8	614	614				
704	3	0	13	62	0	18	4	0	0	0	9	34	0	0	0	5	1	2	52	22	9	10	0	1	12	829	829				
801	0	17	0	26	0	29	5	3	0	1	14	0	0	0	0	1	0	0	2	0	0	0	0	0	44	14	271	271			
802	0	94	169	281	7	131	6	3	23	0	36	0	0	0	0	0	0	0	10	8	0	0	0	0	72	15	251	251			
803	0	36	868	238	0	205	25	6	12	7	76	28	10	97	3	46	5	9	15	6	10	43	70	80	102	1,218	1,218				
900	6	199	453	1,718	3,065	113	1,308	1,520	116	454	229	1,485	866	1,120	863	2,013	1,615	177	455	993	623	829	276	251	1,227	3,471	77,263	77,263			

Appendix 1.2.6 Vehicle Trip OD Table (2011)

Unit: Vehicle Trips

	Destination																																								Total
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	201	202	301	302	303	304	305	999														
101	57	37	119	44	22	63	47	39	13	22	30	77	49	329	82	61	139	413	13	45	2	15	11	15	9	305															
102	36	50	97	19	10	31	18	10	2	22	22	83	72	85	19	36	6	36	4	23	1	11	6	11	6	1															
103	43	19	96	77	3,107	279	126	26	19	234	150	684	291	435	52	132	60	124	32	217	1	49	12	24	19	20															
104	49	19	76	33	10	37	25	9	0	16	10	84	5	32	8	20	17	59	6	11	0	9	11	3	10	1															
105	22	10	3,107	10	0	69	38	12	5	42	29	46	19	31	12	20	19	37	0	7	1	4	3	6	5	1															
106	61	31	279	37	68	4,212	508	26	2	63	9	260	23	77	32	98	81	1,127	22	37	0	15	7	27	1,431	11															
107	42	14	125	25	38	510	521	184	24	161	16	70	18	157	32	51	87	1,341	58	31	0	138	57	86	65	52															
108	39	10	25	8	11	26	182	53	13	90	11	33	20	79	14	30	26	74	22	47	6	35	22	26	36	13															
109	13	2	18	0	4	19	11	11	0	90	25	24	14	94	11	35	16	16	0	12	0	15	11	9	1	6															
110	42	22	235	15	41	61	160	89	87	788	112	198	55	305	46	133	54	68	16	135	8	128	497	1,244	32	26															
111	30	22	150	10	28	9	14	11	25	112	52	501	110	132	23	34	27	6	45	1	28	16	24	10	12	10															
112	74	83	684	84	46	260	71	33	24	199	500	237	121	141	39	1,847	59	109	64	347	4	36	234	81	13	10															
113	48	71	287	5	18	23	14	20	14	55	110	118	10	186	81	613	36	32	3	27	1	26	17	13	5	8															
114	329	83	436	32	30	70	152	78	95	305	130	141	183	95	326	383	263	650	19	76	4	69	45	63	52	32															
115	82	18	51	8	11	30	30	14	11	46	23	39	80	325	5,425	68	84	235	10	34	1	15	17	8	21	14															
116	40	60	133	20	20	98	51	30	35	133	150	1,847	616	384	68	37	78	64	16	50	5	38	29	15	6	10															
117	139	18	60	17	19	82	88	26	16	55	53	58	39	263	83	77	105	2,909	33	50	4	28	17	26	14	1															
118	412	35	124	59	37	1,125	1,335	73	14	63	33	107	31	645	255	62	2,909	306	21	85	2	58	19	37	13	20															
119	12	4	32	5	0	22	59	21	1	17	6	64	3	17	9	16	32	22	421	7	1	9	7	12	1,261	8															
201	45	23	217	11	7	38	31	47	12	136	45	347	27	76	34	50	49	85	7	119	0	67	36	80	46	41															
202	2	1	1	0	1	0	0	5	0	8	1	4	1	4	1	5	4	2	1	0	0	0	2	1	0	0	0														
301	15	11	46	9	4	12	128	35	15	125	26	35	25	69	15	38	28	58	9	66	0	172	104	75	87	81															
302	11	4	12	11	3	9	52	22	10	497	16	234	18	44	17	29	16	19	6	36	2	104	96	92	43	59															
303	15	11	22	3	4	21	76	26	9	1,244	24	81	13	63	8	15	26	36	10	80	1	75	91	252	196	145															
304	9	6	16	9	4	1,428	58	36	0	29	9	11	3	47	20	6	14	13	1,259	45	0	82	41	195	1,127	83															
305	9	1	20	1	1	7	42	13	6	25	8	9	8	27	14	10	1	19	5	41	0	79	58	82	96	6															
401	2	1	0	1	0	8	9	2	0	12	1	1	0	0	7	2	2	5	2	8	0	45	14	29	25	29															
402	6	0	68	9	3	26	46	4	1	19	6	176	4	12	4	14	4	8	6	0	6	4	26	14	9	0															
403	7	4	59	7	4	21	39	2	1	15	6	146	4	9	4	9	5	8	8	3	0	6	5	22	13	8															
404	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														
501	13	11	141	13	4	64	97	10	9	51	16	219	9	30	12	18	10	26	28	3	0	33	14	52	30	27															
502	9	1	1	1	3	1	17	10	0	3	2	2	2	15	7	6	9	5	35	1	0	1	3	1	0	1	0														
601	7	0	1	2	0	21	6	7	3	0	2	0	2	0	3	1	4	4	8	0	0	0	2	2	2	0	0														
602	7	1	2	0	2	16	28	21	3	1	7	2	11	2	9	3	5	4	10	1	0	0	1	1	6	2	4														
603	4	3	13	2	0	8	21	14	6	533	18	39	9	30	13	25	25	36	34	2	0	7	3	19	11	6															
604	28	9	56	7	215	87	29	14	6	17	27	13	13	38	27	107	69	60	24	6	3	2	2	1	2	0															
605	50	15	82	11	263	31	65	95	0	4	7	125	5	8	6	100	12	7	5	1	0	0	2	0	0	0															
606	6	6	12	2	2	0	0	2	8	0	4	7	10	20	8	33	13	16	0	7	0	19	12	19	4	4															
607	6	11	65	7	0	48	7	10	4	69	49	43	10	20	8	33	13	16	0	7	0	19	12	19	4	4															
608	3	2	5	1	1	2	10	15	1	1,873	4	4	2	5	2	6	8	10	4	2	2	3	3	3	2	1															
609	68	106	338	18	2	59	48	61	23	95	65	419	41	121	53	243	73	132	11	18	0	113	62	137	71	67															
610	7	12	37	2	0	6	5	7	3	10	7	47	5	13	6	27	8	15	1	2	0	13	7	15	8	7															
701	3	1	1	0	4	0	1	9	0	4	1	1	1	7	1	7	1	3	0	2	0	4	560	11	0	5															
702	17	9	40	5	2	54	97	21	1	30	5	5	1	19	13	23	20	33	22	5	0	32	19	42	18	19															
703	4	3	14	2	3	12	7	7	2	47	7	7	6	3	9	4	7	6	10	5	10	2	19	14	12	14															
704	14	5	20	2	3	6	39	24	2	1	4	5	4	18	9	14	13	14	27	6	0	12	12	29	449	14															
801	2	2	8	0	4	3	11	7	0	2	5	3	1	6	2	6	6	4	26	0	0	3	2	4	2	3															
802	2	4	0	0	1	0	3	1	0	1	2	1	2	2	3	0	1	4	0	1	4	0	0	0	0	0	0														
803	1	2	3	2	4	0	4	5	0	2	3	2	4	3	0	1	3	2	8	1	0	0	1	0	0	0	0														
900	11	12	66	5	0	38	51	11	5	43	9	33	10	27	11	27	13	27	0	0	0	24	14	43	21	21															
Total	2,031	968	7,901	649	4,117	9,025	4,470	1,284	511	7,437	1,815	6,695	1,988	4,561	6,914	4,717	4,569	8,351	2,353	1,751	52	1,649	2,223	3,358	5,274	999															

Appendix 1.2.6 Vehicle Trip OD Table (2011)

Unit: Vehicle Trips

Origin	Destination																														Total
	306	401	402	403	404	501	502	601	602	603	604	605	606	607	608	609	610	701	702	703	704	801	802	803	900						
101	2	9	6	7	0	15	0	9	7	7	4	28	52	6	7	4	69	8	3	17	4	14	3	2	1	14	2,060				
102	1	6	0	4	0	12	0	1	0	1	4	4	9	15	6	11	2	106	12	9	3	5	2	4	2	12	982				
103	0	68	0	58	0	141	1	1	3	14	56	81	12	65	5	338	37	1	41	14	20	9	0	3	64	7,914					
104	1	10	0	7	0	14	0	1	0	0	7	215	263	2	8	1	21	2	0	5	2	2	0	0	2	7	659				
105	0	3	0	4	0	5	3	18	22	17	17	215	263	2	8	1	2	0	4	2	3	3	4	1	4	4,131					
106	7	26	0	21	0	64	1	6	28	27	20	29	30	0	48	2	57	6	53	12	7	3	0	0	37	9,039					
107	8	46	3	39	0	96	17	7	7	20	15	65	8	2	11	49	5	1	97	8	42	11	3	4	51	4,532					
108	2	4	1	3	0	11	10	5	3	3	15	95	8	10	15	61	7	9	21	7	25	7	1	5	12	1,291					
109	0	0	0	0	0	8	0	0	0	0	0	5	0	0	4	1	23	3	0	1	2	0	0	0	4	501					
110	11	20	1	15	0	52	3	1	3	8	531	17	4	69	1,873	95	10	4	29	47	1	2	0	0	3	42	7,438				
111	1	7	0	7	0	16	2	0	0	3	19	27	7	50	4	65	7	1	5	6	4	5	1	3	10	1,834					
112	0	176	0	146	0	220	2	0	2	11	39	13	125	43	4	421	47	1	5	6	5	3	2	2	33	6,706					
113	0	3	0	1	0	9	2	2	2	0	2	9	13	5	10	2	39	4	1	1	3	5	1	2	8	1,967					
114	7	12	4	9	0	31	15	3	3	7	28	38	8	19	7	115	13	8	19	10	18	7	3	3	25	4,553					
115	0	5	0	4	0	12	7	1	3	3	12	27	6	6	2	54	6	2	13	4	9	1	0	0	12	6,911					
116	8	14	2	10	0	18	6	0	1	6	25	107	100	34	6	243	27	7	23	7	14	7	1	1	27	4,727					
117	5	4	0	8	0	11	9	5	4	5	27	71	12	13	8	75	8	1	20	6	13	6	1	3	15	4,584					
118	2	7	2	8	0	26	5	12	4	10	36	61	7	16	11	133	15	3	33	10	14	4	1	2	27	8,322					
119	2	6	5	9	0	28	35	28	8	1	35	24	5	0	4	12	1	0	23	5	28	26	4	8	0	2,365					
201	8	0	1	3	0	3	1	0	0	0	2	7	1	7	2	19	2	2	5	10	6	0	0	1	0	1,756					
202	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	51				
301	45	5	0	5	0	31	1	1	0	1	5	2	0	19	3	113	13	4	32	19	12	2	0	0	22	1,623					
302	14	4	1	4	0	14	3	0	2	1	3	62	7	560	19	14	12	2	0	0	2	0	0	1	13	2,217					
303	29	25	0	21	0	52	1	0	2	5	17	1	0	19	3	138	15	11	42	327	30	4	0	0	41	3,330					
304	25	11	0	10	0	28	0	0	0	2	11	2	0	4	2	69	8	0	18	12	449	2	0	0	19	5,222					
305	26	8	0	7	0	23	1	0	0	2	30	6	0	0	4	1	67	7	6	19	14	3	0	0	19	954					
306	10	2	1	2	0	4	1	0	0	2	0	0	0	0	1	0	12	1	3	4	3	0	0	0	3	261					
401	2	11	19	35	0	9	2	1	1	0	0	1	0	0	0	2	0	0	0	0	0	12	56	70	0	704					
402	1	18	21	60	10	7	4	0	0	1	1	1	1	1	1	0	0	0	1	0	1	0	0	26	5	217	400				
403	2	33	60	7	11	80	9	3	3	1	8	7	3	1	0	2	0	0	1	0	1	43	27	93	0	810					
404	0	9	11	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41					
501	4	8	7	80	18	68	0	0	4	0	7	4	0	1	0	1	0	0	1	1	9	56	3	19	0	1,231					
502	1	2	4	8	0	0	0	56	0	0	0	2	0	0	0	0	0	0	0	0	2	8	2	2	0	223					
601	0	1	0	3	0	0	0	0	0	0	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	133				
602	0	0	0	3	0	4	0	0	0	0	36	73	0	0	0	0	0	0	0	0	0	0	1	3	0	199					
603	2	0	1	1	0	0	0	0	0	0	30	6	0	0	0	0	0	0	2	0	0	1	0	0	0	202					
604	0	0	1	7	0	7	0	2	39	36	29	662	192	0	0	1	5	1	2	0	1	5	2	9	0	2,263					
605	0	0	1	7	0	3	0	0	0	72	6	189	224	31	4	2	9	1	4	3	1	2	0	0	0	1,584					
606	0	0	0	0	0	0	0	0	0	0	0	0	30	171	4	0	5	1	0	1	0	0	0	0	0	0	535				
607	1	0	1	1	0	1	0	0	0	0	0	4	4	4	8,913	7	8	1	2	5	1	0	0	0	0	0	9,433				
608	0	0	0	0	0	0	0	0	0	0	0	1	2	0	7	55	203	23	1	0	0	0	0	0	0	0	2,266				
609	12	2	0	2	0	1	0	0	0	0	5	8	5	8	203	167	19	3	5	6	2	1	0	2	0	2,895					
610	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	22	19	2	0	1	0	0	0	0	0	0	320				
701	3	0	0	0	0	0	0	0	0	0	0	2	4	0	2	0	2	0	12	1	1	0	0	0	0	0	654				
702	4	0	1	1	0	1	0	0	0	1	2	0	2	1	5	1	5	1	12	112	31	1	1	0	4	0	738				
703	3	0	0	0	0	1	0	0	0	0	1	1	0	1	0	6	1	0	1	31	0	4	0	0	0	0	607				
704	3	0	1	1	0	9	2	0	0	0	0	1	1	0	0	2	0	0	1	4	317	6	0	1	0	1,094					
801	0	12	0	42	0	53	8	0	0	0	5	0	0	0	0	1	0	0	1	0	4	0	0	0	0	0	244				
802	0	53	25	27	0	3	2	0	1	0	2	2	2	0	0	0	0	0	0	0	0	0	32	6	0	179					
803	0	69	5	92	2	19	2	0	3	0	9	0	0	0	0	2	0	0	4	1	0	6	6	100	0	371					
900	4	0	217	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	746				
Total	257	690	400	800	41	1,229	224	135	202	200	2,258	1,588	536	9,437	2,270	2,897	321	657	739	609	1,102	253	183	375	737	123,802					

APPENDIX2 FUTURE TRAFFIC DEMAND

APPENDIX2 FUTURE TRAFFIC DEMAND

Appendix2.1 Methodology of Traffic Demand Forecast

Appendix 2.1.1 Trip Attraction/Generation Ratio by small zone in 2011

zone	No of small zone	To Work	To School	Business	Others	total
Zones inside the Ring Road	101	5.571	2.626	1.532	1.785	3.050
	102	2.014	1.479	1.366	1.437	1.660
	103	1.097	1.407	1.128	1.264	1.225
	104	0.408	0.537	0.782	0.388	0.461
	107	1.111	1.516	0.964	0.797	1.187
	108	4.075	2.181	1.063	1.799	2.527
	109	0.323	0.232	0.312	0.196	0.269
	110	1.571	1.240	1.169	2.371	1.500
	111	0.790	0.965	0.676	1.137	0.895
	112	1.180	1.198	1.142	1.004	1.150
	113	0.452	0.831	0.650	0.539	0.605
	114	2.996	0.780	1.640	3.425	2.277
	115	2.961	1.099	1.646	4.060	2.355
	116	2.453	1.591	1.913	1.395	1.877
	117	7.157	2.697	0.940	3.242	3.010
	118	1.056	2.003	1.189	0.967	1.281
	301	1.412	1.663	1.252	0.844	1.361
	302	1.264	1.254	0.887	0.907	1.148
	303	2.013	2.519	1.339	1.758	2.014
	304	0.598	0.684	0.594	0.642	0.635
305	1.747	2.051	1.716	1.969	1.880	
306	0.080	0.077	0.182	0.107	0.092	
	Sub Total	1.462	1.359	1.169	1.419	1.386
Zones outside the Ring Road	105	1.073	1.134	0.834	1.031	1.059
	106	1.064	0.862	1.098	1.109	1.009
	119	1.041	0.993	0.942	1.045	1.013
	201	0.521	1.085	0.611	0.574	0.679
	202	0.321	1.694	0.383	0.348	0.599
	401	0.628	1.272	0.617	0.787	0.908
	402	1.354	0.938	1.719	3.552	1.444
	403	1.526	3.352	1.512	1.201	1.800
	404	0.461	0.337	0.540	0.297	0.401
	501	1.571	1.570	1.420	1.234	1.498
	502	0.229	0.308	0.127	0.364	0.276
	601	0.531	0.453	0.379	0.291	0.459
	602	0.465	0.697	0.345	0.586	0.568
	603	0.668	0.595	0.604	0.592	0.612
	604	0.495	0.676	0.965	0.492	0.590
	605	0.499	0.640	0.588	0.494	0.565
	606	0.313	0.550	0.429	0.374	0.443
	607	0.448	0.487	0.854	0.414	0.483
	608	0.410	0.669	1.032	0.408	0.525
	609	0.649	0.867	0.696	0.746	0.751
	610	0.468	0.658	0.000	0.800	0.593
	701	0.486	0.785	0.557	0.335	0.548
	702	0.397	0.688	0.610	0.472	0.525
	703	0.563	0.695	0.767	0.562	0.622
	704	0.388	0.616	0.436	0.497	0.491
	801	0.250	0.416	0.151	0.143	0.285
802	0.427	0.546	0.710	0.403	0.469	
803	0.516	0.539	0.458	0.375	0.511	
	Sub Total	0.628	0.757	0.756	0.662	0.693
	Total	0.998	0.999	0.998	0.997	0.998

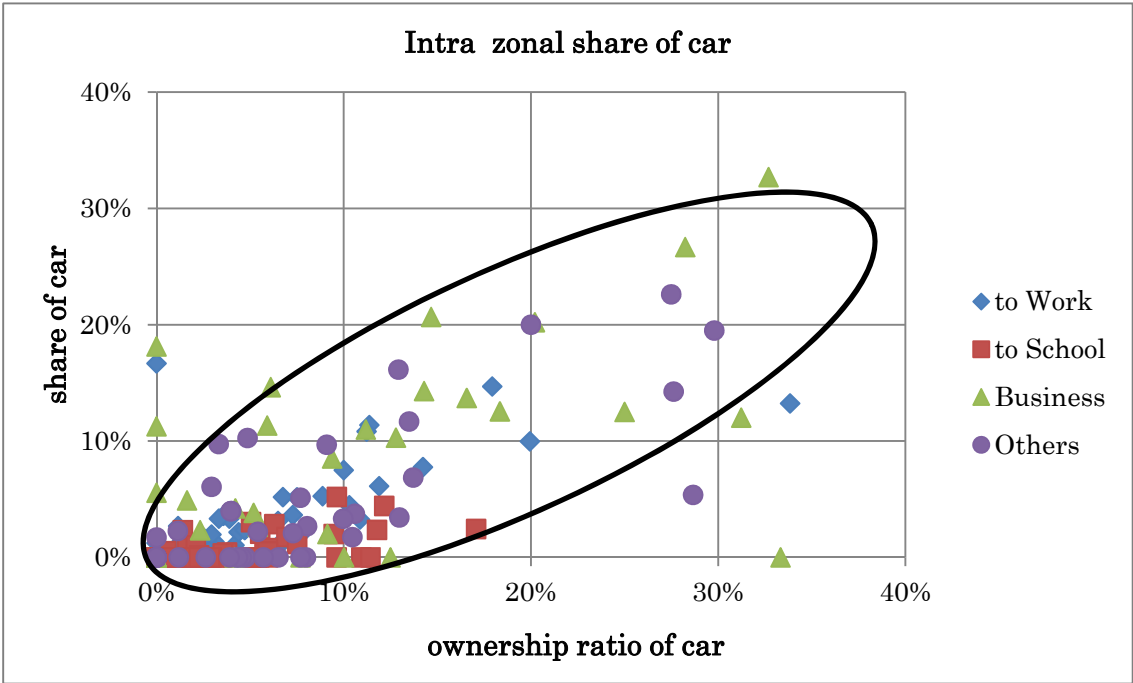
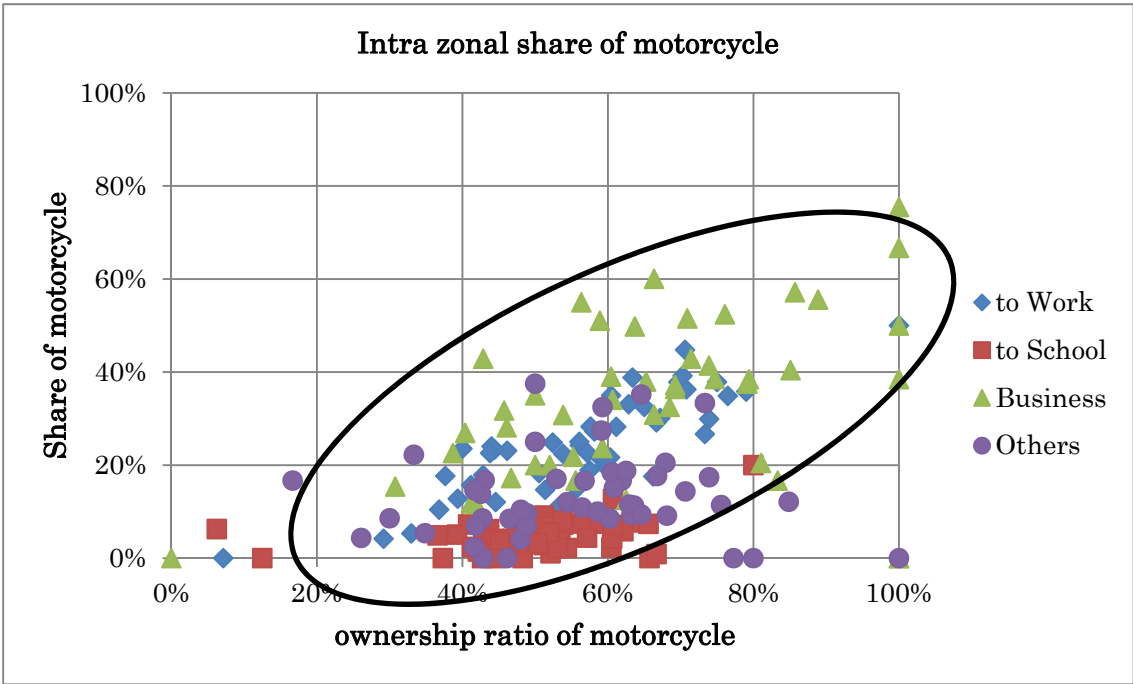
Note: The table shows the present value obtained from Household Interview Survey in 2011
Source: JICA Survey Team

Appendix2.1.2 Intra Zonal Trip Ratio by Trip Purpose in 2011

Area	small zone	To Wo r k	To School	Business	Others	total
Zones inside the Ring Road	101	45.6%	35.7%	10.7%	30.8%	30.8%
	102	28.4%	43.4%	34.4%	31.3%	31.3%
	103	36.0%	54.0%	27.9%	28.4%	28.4%
	104	10.8%	22.1%	13.8%	8.3%	8.3%
	107	23.6%	57.1%	28.3%	19.2%	19.2%
	108	24.0%	43.2%	11.6%	16.4%	16.4%
	109	18.3%	14.3%	14.0%	4.0%	4.0%
	110	35.2%	60.4%	29.7%	37.4%	37.4%
	111	25.3%	50.8%	30.6%	25.8%	25.8%
	112	35.1%	60.2%	39.3%	27.7%	27.7%
	113	15.8%	37.2%	16.6%	15.4%	15.4%
	114	32.8%	26.1%	15.6%	24.7%	24.7%
	115	14.8%	18.3%	38.9%	28.0%	28.0%
	116	24.8%	46.1%	14.7%	36.3%	36.3%
	117	23.1%	35.5%	29.8%	23.7%	23.7%
	118	27.2%	45.3%	28.6%	28.6%	28.6%
	301	28.8%	48.9%	14.7%	14.5%	14.5%
	302	30.5%	28.7%	15.1%	24.0%	24.0%
303	31.3%	54.4%	38.8%	40.7%	40.7%	
304	26.0%	29.7%	25.6%	23.3%	23.3%	
305	30.9%	25.7%	16.0%	18.2%	18.2%	
306	3.8%	5.3%	0.0%	6.3%	6.3%	
Zones outside the Ring Road	105	33.0%	50.2%	34.3%	29.7%	29.7%
	106	33.7%	33.1%	27.9%	29.3%	29.3%
	119	32.3%	51.7%	29.5%	38.1%	38.1%
	201	31.5%	44.7%	15.5%	38.1%	38.1%
	202	15.3%	38.1%	8.3%	30.1%	30.1%
	401	26.8%	45.2%	16.4%	24.8%	24.8%
	402	45.7%	50.3%	35.3%	14.7%	14.7%
	403	43.3%	62.3%	28.8%	36.8%	36.8%
	404	39.0%	31.0%	38.4%	24.7%	24.7%
	501	51.5%	53.8%	13.3%	26.8%	26.8%
	502	16.7%	24.9%	4.4%	22.9%	22.9%
	601	29.6%	42.7%	34.5%	5.7%	5.7%
	602	35.5%	49.8%	19.4%	19.1%	19.1%
	603	47.2%	58.0%	38.9%	33.1%	33.1%
	604	32.1%	54.4%	29.2%	27.8%	27.8%
	605	40.6%	55.3%	39.5%	30.8%	30.8%
	606	28.4%	52.4%	29.0%	31.4%	31.4%
	607	29.4%	40.0%	52.8%	28.2%	28.2%
	608	24.2%	47.3%	11.2%	27.1%	27.1%
	609	45.7%	55.4%	37.9%	47.4%	47.4%
	610	42.4%	63.5%	0.0%	66.7%	66.7%
	701	30.1%	65.9%	4.9%	14.4%	14.4%
	702	32.1%	45.6%	35.1%	33.9%	33.9%
703	39.7%	53.6%	55.6%	28.0%	28.0%	
704	35.3%	56.9%	36.7%	42.4%	42.4%	
801	19.6%	37.9%	0.0%	6.7%	6.7%	
802	26.7%	41.8%	31.9%	34.8%	34.8%	
803	39.7%	46.7%	29.7%	10.8%	10.8%	

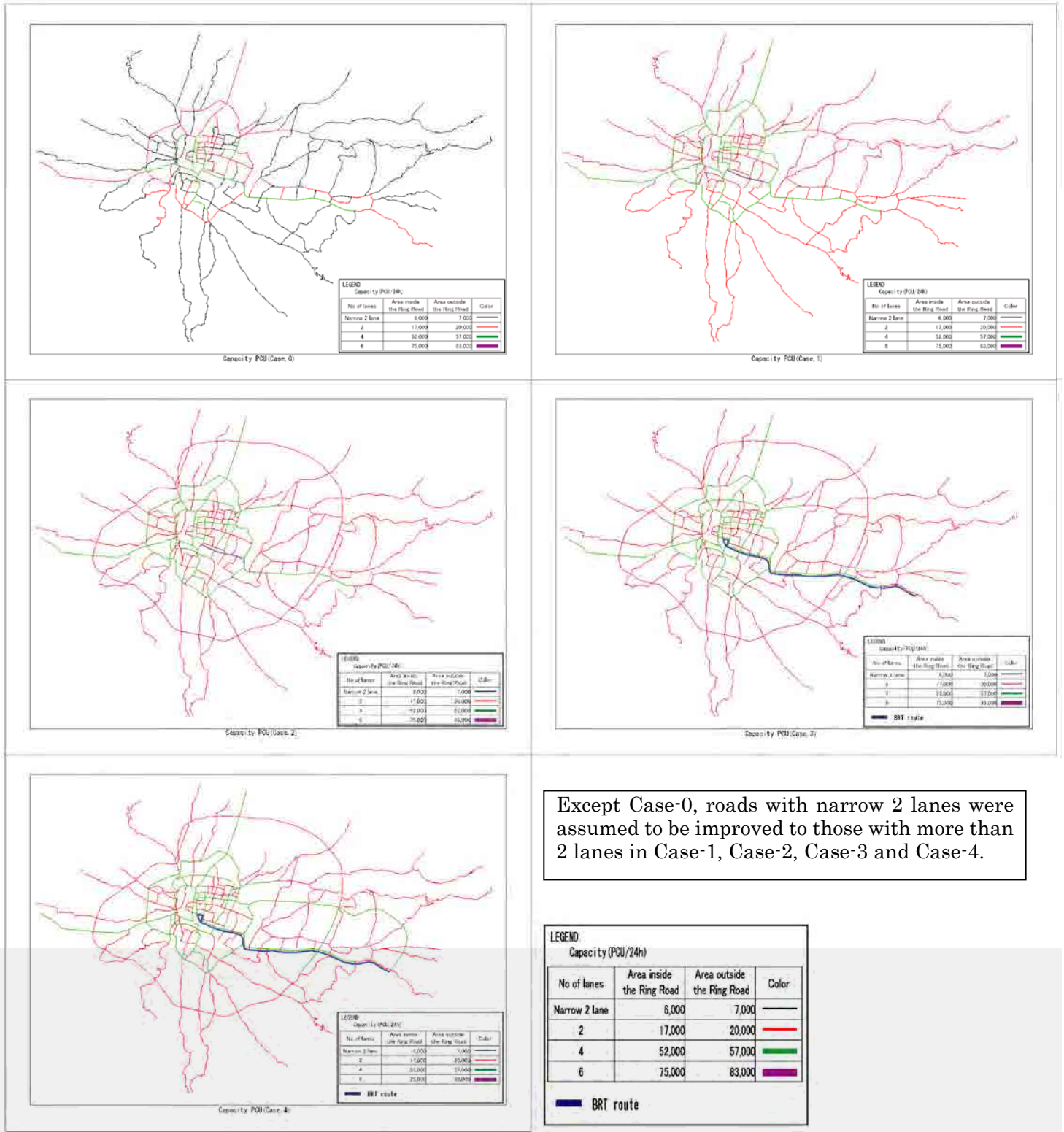
Note: The table shows the present value obtained from Household Interview Survey in 2011
Source: JICA Survey Team

Appendix 2.1.3 Relationship Between Intra Zonal Share of Motorcycle/ Car and Ownership Rate in 2011



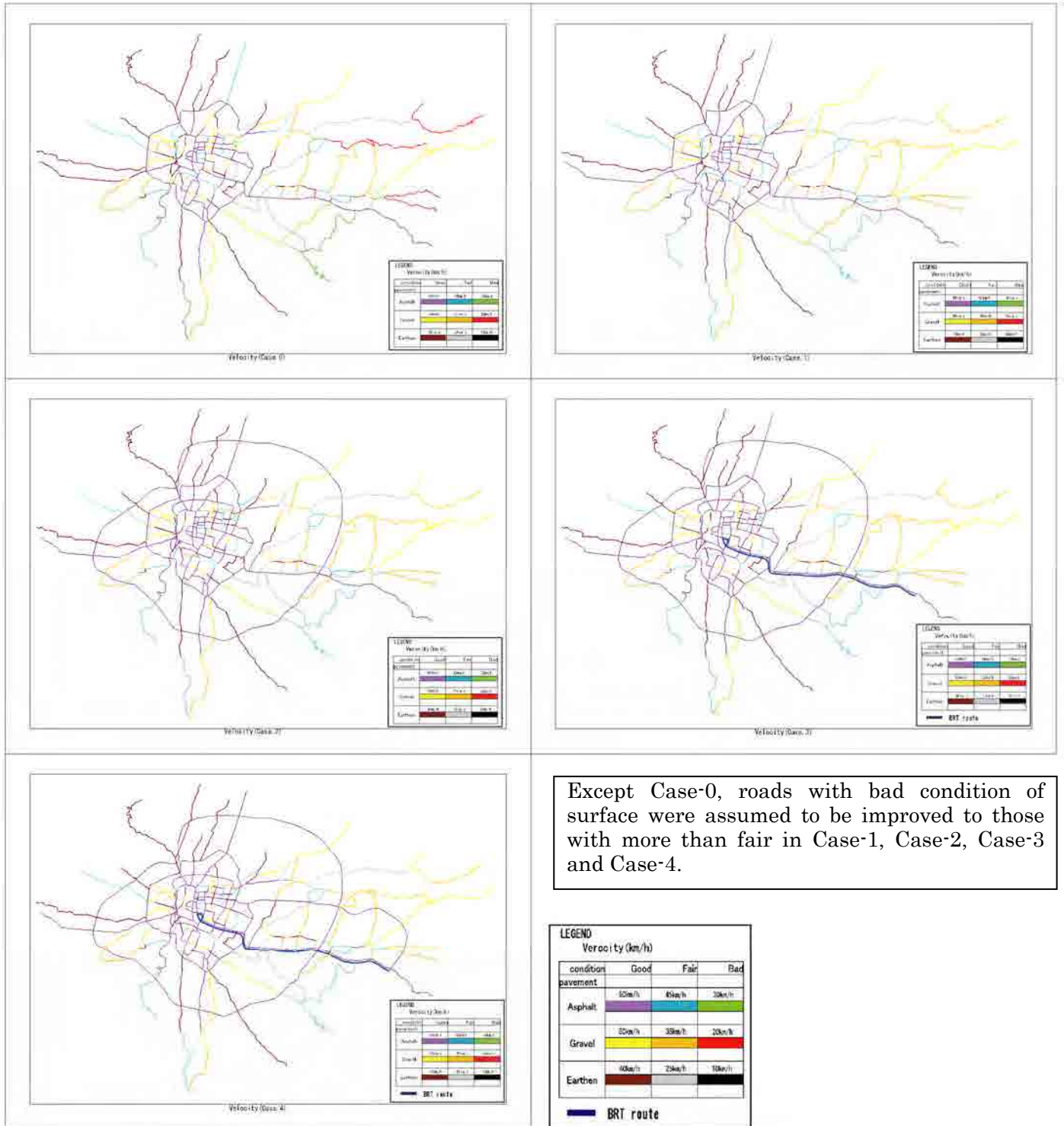
Note: The data is obtained from Household Interview Survey in 2011 for each small zone
 Source: JICA Survey Team

Appendix 2.1.4 Capacity of Roads for Case 0-4



Except Case-0, roads with narrow 2 lanes were assumed to be improved to those with more than 2 lanes in Case-1, Case-2, Case-3 and Case-4.

Appendix 2.1.5 Velocity (Free Flow) of Roads for Case 0-4



Except Case-0, roads with bad condition of surface were assumed to be improved to those with more than fair in Case-1, Case-2, Case-3 and Case-4.

Appendix2.2 Results of Traffic Demand Forecast

Appendix2.2.1 PTOD: Trip Generation in the Survey Area for the Present in 2011 and Case 0-4 in 2022

▼The Present in 2011

unit: person trips/day

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	193,076	14,291	254,992	34,349	137,753	634,461
To School	364,601	4,157	69,324	5,167	213,781	657,030
Business	33,790	3,433	73,306	20,389	22,551	153,469
Others	121,501	5,924	85,167	21,863	109,742	344,197
To Home	685,410	24,640	410,337	64,212	464,637	1,649,236
Total	1,398,378	52,445	893,126	145,980	948,464	3,438,393

▼Case-0, Case-1, Case-2 in 2022

unit: person trips/day

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	295,566	23,399	454,622	77,357	174,114	1,025,058
To School	552,400	7,474	133,604	30,118	308,150	1,031,746
Business	51,298	5,236	130,285	36,599	29,289	252,707
Others	182,390	10,550	144,180	58,232	144,506	539,858
To Home	1,033,741	41,614	735,131	166,718	629,629	2,606,833
Total	2,115,395	88,273	1,597,822	369,024	1,285,688	5,456,202

▼Case-3 in 2022

unit: person trips/day

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	297,957	23,797	435,512	76,015	191,777	1,025,058
To School	556,439	7,533	122,879	29,643	315,252	1,031,746
Business	51,760	5,329	123,388	36,333	35,897	252,707
Others	184,231	10,652	131,895	54,328	158,752	539,858
To Home	1,042,044	42,175	692,755	160,924	668,935	2,606,833
Total	2,132,431	89,486	1,506,429	357,243	1,370,613	5,456,202

▼Case-4 in 2022

unit: person trips/day

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	314,895	20,410	421,935	75,453	182,492	1,015,185
To School	539,250	7,028	135,820	32,896	317,149	1,032,143
Business	56,688	4,774	115,311	34,253	35,816	246,842
Others	193,778	10,633	138,878	53,173	142,706	539,168
To Home	1,051,962	38,281	699,543	162,578	645,530	2,597,894
Total	2,156,573	81,126	1,511,487	358,353	1,323,693	5,431,232

Source:JICA Survey Team

Appendix2.2.2 PTOD: Trip purpose Composition of Generation in the Survey Area for the Present in 2011 and Case 0-4 in 2022

▼The Present in 2011

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	13.8%	27.2%	28.6%	23.5%	14.5%	18.5%
To School	26.1%	7.9%	7.8%	3.5%	22.5%	19.1%
Business	2.4%	6.5%	8.2%	14.0%	2.4%	4.5%
Others	8.7%	11.3%	9.5%	15.0%	11.6%	10.0%
To Home	49.0%	47.0%	45.9%	44.0%	49.0%	48.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

▼Case-0, Case-1, Case-2 in 2022

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	14.0%	26.5%	28.5%	21.0%	13.5%	18.8%
To School	26.1%	8.5%	8.4%	8.2%	24.0%	18.9%
Business	2.4%	5.9%	8.2%	9.9%	2.3%	4.6%
Others	8.6%	12.0%	9.0%	15.8%	11.2%	9.9%
To Home	48.9%	47.1%	46.0%	45.2%	49.0%	47.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

▼Case-3 in 2022

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	14.0%	26.6%	28.9%	21.3%	14.0%	18.8%
To School	26.1%	8.4%	8.2%	8.3%	23.0%	18.9%
Business	2.4%	6.0%	8.2%	10.2%	2.6%	4.6%
Others	8.6%	11.9%	8.8%	15.2%	11.6%	9.9%
To Home	48.9%	47.1%	46.0%	45.0%	48.8%	47.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

▼Case-4 in 2022

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	14.6%	25.2%	27.9%	21.1%	13.8%	18.7%
To School	25.0%	8.7%	9.0%	9.2%	24.0%	19.0%
Business	2.6%	5.9%	7.6%	9.6%	2.7%	4.5%
Others	9.0%	13.1%	9.2%	14.8%	10.8%	9.9%
To Home	48.8%	47.2%	46.3%	45.4%	48.8%	47.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: JICA Survey Team

Appendix2.2.3 PTOD: Modal Split of Trip Generation in the Survey Area for the Present in 2011 and Case 0-4 in 2022

▼The Present in 2011

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	30.4%	2.3%	40.2%	5.4%	21.7%	100.0%
To School	55.5%	0.6%	10.6%	0.8%	32.5%	100.0%
Business	22.0%	2.2%	47.8%	13.3%	14.7%	100.0%
Others	35.3%	1.7%	24.7%	6.4%	31.9%	100.0%
To Home	41.6%	1.5%	24.9%	3.9%	28.2%	100.0%
Total	40.7%	1.5%	26.0%	4.2%	27.6%	100.0%

▼Case-0, Case-1, Case-2 in 2022

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	28.8%	2.3%	44.4%	7.5%	17.0%	100.0%
To School	53.5%	0.7%	12.9%	2.9%	29.9%	100.0%
Business	20.3%	2.1%	51.6%	14.5%	11.6%	100.0%
Others	33.8%	2.0%	26.7%	10.8%	26.8%	100.0%
To Home	39.7%	1.6%	28.2%	6.4%	24.2%	100.0%
Total	38.8%	1.6%	29.3%	6.8%	23.6%	100.0%

▼Case-3 in 2022

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	29.1%	2.3%	42.5%	7.4%	18.7%	100.0%
To School	53.9%	0.7%	11.9%	2.9%	30.6%	100.0%
Business	20.5%	2.1%	48.8%	14.4%	14.2%	100.0%
Others	34.1%	2.0%	24.4%	10.1%	29.4%	100.0%
To Home	40.0%	1.6%	26.6%	6.2%	25.7%	100.0%
Total	39.1%	1.6%	27.6%	6.5%	25.1%	100.0%

▼Case-4 in 2022

Mode	Walk	Bicycle	Motorcycle	Car	Bus	Total
To Work	31.0%	2.0%	41.6%	7.4%	18.0%	100.0%
To School	52.2%	0.7%	13.2%	3.2%	30.7%	100.0%
Business	23.0%	1.9%	46.7%	13.9%	14.5%	100.0%
Others	35.9%	2.0%	25.8%	9.9%	26.5%	100.0%
To Home	40.5%	1.5%	26.9%	6.3%	24.8%	100.0%
Total	39.7%	1.5%	27.8%	6.6%	24.4%	100.0%

Source: JICA Survey Team

Appendix2.2.4 PTOD: Trip Distribution by Trip Purpose between Large Zones in the Survey Area for the Present in 2011 and Case 0-4 in 2022

▼Trip Distribution by trip purpose (Present in 2011) unit: person trips/day

Purpose	Large Zone	100	200	300	400	500	600	700	800	900	合計
To Work	100	251,607	1,629	14,965	931	1,957	9,742	830	449	423	282,533
	200	8,280	4,920	1,531	90	120	600	160	0	30	15,731
	300	23,860	289	34,747	320	368	1,159	1,607	112	34	62,496
	400	4,641	0	694	15,257	1,752	216	0	928	507	23,995
	500	8,574	50	968	1,353	9,140	512	278	195	50	21,120
	600	83,161	634	4,601	698	928	61,371	710	186	75	152,364
	700	12,498	350	16,869	388	440	825	18,034	44	37	49,485
	800	10,379	0	1,453	4,398	2,437	292	67	7,371	340	26,737
	900	0	0	0	0	0	0	0	0	0	0
	Sub Total	403,000	7,872	75,828	23,435	17,142	74,717	21,686	9,285	1,496	634,461
To School	100	253,325	3,224	18,026	733	1,105	9,283	1,258	418	288	287,660
	200	3,310	4,270	1,070	0	0	210	170	0	0	9,030
	300	8,650	355	39,885	128	34	1,515	2,411	104	0	53,082
	400	2,362	92	1,029	13,745	816	99	0	317	65	18,525
	500	4,538	178	1,003	907	9,061	306	117	178	0	16,288
	600	79,221	1,597	2,690	600	748	113,230	224	194	46	198,550
	700	3,943	465	12,855	111	0	698	24,490	193	74	42,829
	800	4,713	129	956	8,468	2,138	383	370	13,784	125	31,066
	900	0	0	0	0	0	0	0	0	0	0
	Sub Total	360,062	10,310	77,514	24,692	13,902	125,724	29,040	15,188	598	657,030
Business	100	84,031	569	5,844	570	840	4,673	284	234	260	97,305
	200	1,389	290	242	0	32	33	0	0	0	1,986
	300	6,618	106	7,816	26	148	320	530	37	0	15,601
	400	1,341	0	224	1,898	160	64	32	156	70	3,945
	500	1,484	32	269	121	382	178	0	0	50	2,516
	600	11,981	162	592	216	189	9,626	186	0	0	22,952
	700	1,577	0	2,071	44	88	44	2,353	0	0	6,177
	800	622	0	104	1,102	247	0	0	710	37	2,822
	900	133	0	0	32	0	0	0	0	0	165
	Sub Total	109,176	1,159	17,162	4,009	2,086	14,938	3,385	1,137	417	153,469
Others	100	141,338	944	7,945	908	1,347	7,497	569	348	351	161,247
	200	5,278	4,110	785	110	30	270	250	30	0	10,863
	300	15,006	171	19,342	162	68	663	1,664	0	0	37,076
	400	3,683	0	1,177	6,204	860	225	28	310	98	12,585
	500	4,476	50	769	584	2,876	236	0	50	0	9,041
	600	44,435	268	1,295	422	320	25,730	346	71	138	73,025
	700	4,794	278	9,874	246	332	560	9,097	344	37	25,562
	800	3,657	37	742	5,226	953	634	148	2,815	529	14,741
	900	32	0	0	0	0	0	0	25	0	57
	Sub Total	222,699	5,858	41,929	13,862	6,786	35,815	12,102	3,993	1,153	344,197
To Home	100	656,961	16,161	45,304	11,445	17,727	197,876	21,404	18,542	0	985,420
	200	5,974	13,775	743	92	278	2,209	1,141	166	0	24,378
	300	37,611	3,447	98,426	3,028	2,875	8,496	39,519	2,918	0	196,320
	400	3,069	186	586	36,776	3,085	1,554	568	18,563	61	64,448
	500	3,512	120	643	3,437	22,025	2,151	826	5,454	0	38,168
	600	25,566	1,696	3,131	669	1,142	208,379	1,719	1,279	0	243,581
	700	1,935	540	5,883	97	435	1,043	53,249	585	0	63,767
	800	1,115	30	216	1,591	384	451	625	25,328	0	29,740
	900	934	30	34	675	50	289	148	919	335	3,414
	Sub Total	736,677	35,985	154,966	57,810	48,001	422,448	119,199	73,754	396	1,649,236
Total	100	1,387,262	22,527	92,084	14,587	22,976	229,071	24,345	19,991	1,322	1,814,165
	200	24,231	27,365	4,371	292	460	3,322	1,721	196	30	61,988
	300	91,745	4,368	200,216	3,664	3,493	12,153	45,731	3,171	34	364,575
	400	15,096	278	3,710	73,880	6,673	2,158	628	20,274	801	123,498
	500	22,584	430	3,652	6,402	43,484	3,383	1,221	5,877	100	87,133
	600	244,364	4,357	12,309	2,605	3,327	418,336	3,185	1,730	259	690,472
	700	24,747	1,633	47,552	886	1,295	3,170	107,223	1,166	148	187,820
	800	20,486	196	3,471	20,785	6,159	1,760	1,210	50,008	1,031	105,106
	900	1,099	30	34	707	50	289	148	944	335	3,636
	Total	1,831,614	61,184	367,399	123,808	87,917	673,642	185,412	103,357	4,060	3,438,393

Source:JICA Survey Team

▼Trip Distribution by trip purpose (Case-0, Case-1, Case-2, Case-3 in 2022)

unit: person trips/day

Purpose	Large Zone	100	200	300	400	500	600	700	800	900	Total
To Work	100	412,836	2,691	24,061	1,449	2,966	15,396	1,334	710	624	462,067
	200	14,144	8,094	2,534	146	187	947	259	0	46	26,357
	300	38,865	468	56,910	497	560	1,804	2,577	184	54	101,919
	400	7,788	0	1,143	23,783	2,654	347	0	1,602	808	38,125
	500	13,293	76	1,529	2,044	13,384	786	418	302	73	31,905
	600	133,194	1,008	7,067	1,071	1,387	94,318	1,109	332	111	239,597
	700	19,870	566	26,970	580	636	1,281	27,584	63	56	77,606
	800	18,348	0	2,424	7,859	3,866	532	112	13,737	604	47,482
	900	0	0	0	0	0	0	0	0	0	0
Sub Total	658,338	12,903	122,638	37,429	25,640	115,411	33,393	16,930	2,376	1,025,058	
To School	100	395,460	6,387	27,973	1,594	1,800	13,848	1,961	679	404	450,106
	200	6,531	10,630	2,175	0	0	405	344	0	0	20,085
	300	14,121	748	65,380	295	56	2,424	4,004	186	0	87,214
	400	3,732	189	1,634	26,125	1,399	145	0	569	96	33,889
	500	7,199	360	1,637	2,012	15,242	475	186	297	0	27,408
	600	117,425	3,078	4,036	1,282	1,080	160,280	344	303	61	287,889
	700	6,319	951	21,661	251	0	1,105	40,707	318	111	71,423
	800	7,528	263	1,604	16,642	3,481	552	600	22,834	228	53,732
	900	0	0	0	0	0	0	0	0	0	0
Sub Total	558,315	22,606	126,100	48,201	23,058	179,234	48,146	25,186	900	1,031,746	
Business	100	129,173	1,061	9,636	884	1,267	8,084	574	549	405	151,633
	200	2,586	710	514	0	62	86	0	0	0	3,958
	300	11,114	236	14,801	53	231	646	1,020	99	0	28,200
	400	2,046	0	413	3,237	268	147	53	318	116	6,598
	500	2,540	66	545	219	687	365	0	0	89	4,511
	600	19,736	303	1,094	379	306	17,308	421	0	0	39,547
	700	2,755	0	3,911	67	131	70	4,469	0	0	11,403
	800	1,481	0	258	2,309	661	0	0	1,781	97	6,587
	900	215	0	0	55	0	0	0	0	0	270
Sub Total	171,646	2,376	31,172	7,203	3,613	26,706	6,537	2,747	707	252,707	
Others	100	220,169	1,504	12,298	1,414	2,028	12,077	895	641	569	251,595
	200	8,140	6,013	1,108	156	44	426	355	57	0	16,299
	300	23,298	273	29,549	240	109	1,035	2,529	0	0	57,033
	400	5,567	0	1,811	9,847	1,354	343	52	583	148	19,705
	500	6,869	81	1,218	1,028	4,635	406	0	85	0	14,322
	600	69,947	398	1,960	787	647	41,502	550	145	226	116,162
	700	7,198	436	15,203	382	497	942	14,131	568	59	39,416
	800	5,965	58	1,145	9,366	1,592	1,163	237	4,873	838	25,237
	900	53	0	0	0	0	0	0	36	0	89
Sub Total	347,206	8,763	64,292	23,220	10,906	57,894	18,749	6,988	1,840	539,858	
To Home	100	1,032,611	28,969	76,723	17,194	27,490	321,884	33,520	31,956	54	1,570,401
	200	10,611	24,850	1,494	189	519	4,491	1,961	322	0	44,437
	300	64,564	5,838	152,396	4,622	4,407	13,101	64,121	5,195	0	314,244
	400	4,483	306	1,036	59,941	5,103	3,154	1,219	34,044	0	109,286
	500	6,832	232	727	5,432	33,349	3,126	1,142	8,969	0	59,809
	600	41,548	1,786	5,283	842	1,675	296,881	3,345	2,269	0	353,629
	700	4,206	966	9,157	53	604	2,012	82,688	953	0	100,639
	800	2,040	58	370	2,765	686	783	961	41,536	40	49,239
	900	1,607	46	54	1,055	73	402	227	1,685	0	5,149
Sub Total	1,168,502	63,051	247,240	92,093	73,906	645,834	189,184	126,929	94	2,606,833	
Total	100	2,190,249	40,612	150,691	22,535	35,551	371,289	38,284	34,535	2,056	2,885,802
	200	42,012	50,297	7,825	491	812	6,355	2,919	379	46	111,136
	300	151,962	7,563	319,036	5,707	5,363	19,010	74,251	5,664	54	588,610
	400	23,616	495	6,037	122,933	10,778	4,136	1,324	37,116	1,168	207,603
	500	36,733	815	5,656	10,735	67,297	5,158	1,746	9,653	162	137,955
	600	381,850	6,573	19,440	4,361	5,095	610,289	5,769	3,049	398	1,036,824
	700	40,348	2,919	76,902	1,333	1,868	5,410	169,579	1,902	226	300,487
	800	35,362	379	5,801	38,941	10,286	3,030	1,910	84,761	1,807	182,277
	900	1,875	46	54	1,110	73	402	227	1,721	0	5,508
Total	2,904,007	109,699	591,442	208,146	137,123	1,025,079	296,009	178,780	5,917	5,456,202	

Source: JICA Survey Team

▼Trip Distribution by trip purpose (Case-4 in 2022)

unit: person trips/day

Purpose	Large Zone	100	200	300	400	500	600	700	800	900	Total
To Work	100	318,536	1,602	18,145	1,553	30,035	9,656	783	13,024	616	393,950
	200	10,187	6,426	1,841	183	2,610	681	204	0	58	22,190
	300	29,494	275	44,596	468	6,108	939	1,473	3,226	46	86,625
	400	3,517	0	489	32,975	6,501	157	0	1,527	606	45,772
	500	6,023	18	836	13,679	45,869	689	182	2,742	27	70,065
	600	100,856	830	5,351	1,141	16,738	72,780	913	4,132	160	202,901
	700	14,088	449	18,912	642	8,120	887	21,456	1,466	74	66,094
	800	11,434	0	1,546	26,639	26,763	513	118	60,076	499	127,588
	900	0	0	0	0	0	0	0	0	0	0
Sub Total	494,135	9,600	91,716	77,280	142,744	86,302	25,129	86,193	2,086	1,015,185	
To School	100	300,263	3,489	21,376	3,944	37,661	8,844	1,331	6,399	454	383,761
	200	5,085	8,115	1,711	0	0	315	354	0	0	15,580
	300	10,900	368	51,490	601	1,251	1,162	2,369	5,099	0	73,240
	400	2,727	101	997	32,172	5,189	64	0	467	84	41,801
	500	4,555	208	1,099	18,798	43,478	613	345	900	0	69,996
	600	92,438	2,673	3,162	2,859	10,185	125,344	364	9,223	70	246,318
	700	3,645	580	13,042	886	0	679	29,773	10,382	149	59,136
	800	7,673	206	1,460	40,883	26,112	938	774	64,202	63	142,311
	900	0	0	0	0	0	0	0	0	0	0
Sub Total	427,286	15,740	94,337	100,143	123,876	137,959	35,310	96,672	820	1,032,143	
Business	100	112,415	785	8,117	1,712	4,964	6,038	400	0	298	134,729
	200	1,869	620	381	0	320	71	0	0	0	3,261
	300	9,266	154	12,367	99	925	426	682	0	0	23,919
	400	1,090	0	213	5,833	704	67	29	189	68	8,193
	500	1,549	57	243	1,407	8,068	224	0	193	34	11,775
	600	15,304	278	756	340	1,430	14,954	335	0	0	33,397
	700	2,069	0	2,850	123	609	52	3,809	0	0	9,512
	800	5,082	0	914	2,885	2,083	0	0	10,520	296	21,780
	900	172	0	0	104	0	0	0	0	0	276
Sub Total	148,816	1,894	25,841	12,503	19,103	21,832	5,255	10,902	696	246,842	
Others	100	177,328	959	9,972	3,173	16,773	7,785	673	790	619	218,072
	200	6,305	5,203	899	759	274	345	372	11	0	14,168
	300	19,316	163	26,116	606	915	635	1,751	0	0	49,502
	400	2,440	0	796	17,968	1,983	176	27	221	134	23,745
	500	4,367	29	687	4,206	24,577	297	0	136	0	34,299
	600	55,704	372	1,636	1,431	3,918	34,050	576	32	304	98,023
	700	4,862	297	10,421	2,326	3,325	631	11,050	1,061	77	34,050
	800	6,500	46	759	18,787	9,932	1,033	225	29,382	553	67,217
	900	28	0	0	0	0	0	0	64	0	92
Sub Total	276,850	7,069	51,286	49,256	61,697	44,952	14,674	31,697	1,687	539,168	
To Home	100	799,879	21,710	60,123	8,734	15,040	250,167	22,705	25,745	29	1,204,132
	200	6,072	19,853	810	101	256	3,882	1,332	253	0	32,559
	300	49,706	4,471	122,755	2,299	2,636	10,182	42,595	3,780	0	238,424
	400	8,738	958	1,688	83,498	36,772	5,462	3,903	86,706	0	227,725
	500	84,825	2,890	8,293	13,714	114,443	30,924	11,515	63,017	0	329,621
	600	26,453	1,349	2,751	400	1,606	232,893	2,211	2,506	0	270,169
	700	2,803	938	5,632	28	527	1,864	62,511	1,122	0	75,425
	800	20,229	11	8,325	2,220	3,781	13,387	12,932	154,281	45	215,211
	900	1,701	58	46	827	27	540	302	1,127	0	4,628
Sub Total	1,000,406	52,238	210,423	111,821	175,088	549,301	160,006	338,537	74	2,597,894	
Total	100	1,708,421	28,545	117,733	19,116	104,473	282,490	25,892	45,958	2,016	2,334,644
	200	29,518	40,217	5,642	1,043	3,460	5,294	2,262	264	58	87,758
	300	118,682	5,431	257,324	4,073	11,835	13,344	48,870	12,105	46	471,710
	400	18,512	1,059	4,183	172,446	51,149	5,926	3,959	89,110	892	347,236
	500	101,319	3,202	11,158	51,804	236,435	32,747	12,042	66,988	61	515,756
	600	290,755	5,502	13,656	6,171	33,877	480,021	4,399	15,893	534	850,808
	700	27,467	2,264	50,857	4,005	12,581	4,113	128,599	14,031	300	244,217
	800	50,918	263	13,004	91,414	68,671	15,871	14,049	318,461	1,456	574,107
	900	1,901	58	46	931	27	540	302	1,191	0	4,996
Total	2,347,493	86,541	473,603	351,003	522,508	840,346	240,374	564,001	5,363	5,431,232	

Source:JICA Survey Team

Appendix 2.2.5 PTOD: Modal Split between Large Zones in the Survey Area for the Present in 2011 and Case 0-4 in 2022

▼ Trip Distribution by mode (Present in 2011) unit: person trips/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Walk	100	612,180	3,044	7,713	671	1,207	41,651	1,009	1,084	0	668,559
	200	4,425	19,644	449	0	0	1,265	362	0	0	26,145
	300	9,041	285	115,059	812	79	531	4,661	30	0	130,498
	400	464	0	812	55,757	172	229	0	6,704	0	64,138
	500	730	0	39	139	27,928	178	138	978	0	30,130
	600	47,344	1,667	582	320	128	293,640	392	131	0	344,204
	700	1,024	393	4,859	259	168	348	78,247	428	37	85,763
	800	831	0	30	6,739	1,154	131	435	39,526	25	48,871
	900	40	0	0	0	0	30	0	0	0	70
	Sub Total	676,079	25,033	129,543	64,697	30,836	338,003	85,244	48,881	62	1,398,378
Bicycle	100	23,786	110	1,590	64	85	3,313	424	37	0	29,409
	200	202	0	60	0	0	25	44	0	0	331
	300	1,604	60	4,567	98	78	150	1,098	0	0	7,655
	400	64	46	98	1,961	146	0	0	459	0	2,774
	500	85	0	78	146	662	0	0	30	0	1,001
	600	3,495	71	150	46	0	3,828	0	30	0	7,620
	700	575	44	1,133	0	0	0	1,234	44	0	3,030
	800	37	0	0	484	30	30	44	0	0	625
	900	0	0	0	0	0	0	0	0	0	0
	Sub Total	29,848	331	7,676	2,799	1,001	7,346	2,844	600	0	52,445
Motorcycle	100	370,685	8,676	38,549	5,327	8,553	74,156	10,540	7,864	244	524,594
	200	9,275	3,790	1,501	64	302	880	554	0	30	16,396
	300	38,681	1,513	43,224	1,253	1,230	4,851	14,417	1,205	34	106,408
	400	5,526	64	1,244	8,658	2,802	966	326	3,651	315	23,552
	500	9,118	272	1,198	2,751	9,355	842	423	1,530	50	25,539
	600	78,834	1,039	4,962	1,082	807	48,894	796	387	0	136,801
	700	10,700	512	14,743	288	467	969	11,248	279	0	39,206
	800	8,028	0	1,235	3,854	1,657	412	323	3,775	365	19,649
	900	299	30	34	290	0	0	0	328	0	981
	Sub Total	531,146	15,896	106,690	23,567	25,173	131,970	38,627	19,019	1,038	893,126
Car	100	81,489	934	7,917	1,004	1,155	9,572	1,563	590	297	104,521
	200	838	346	0	0	0	36	37	0	0	1,257
	300	7,559	37	5,659	104	100	660	1,579	275	0	15,973
	400	975	0	134	1,234	230	67	0	115	37	2,792
	500	826	0	234	298	479	36	44	141	0	2,058
	600	9,735	36	5,02	34	36	3,146	81	125	36	13,731
	700	1,530	0	1,845	0	44	44	367	0	0	3,830
	800	622	0	312	120	178	125	0	85	0	1,442
	900	241	0	0	0	0	36	37	62	0	376
	Sub Total	103,815	1,353	16,603	2,794	2,222	13,722	3,708	1,393	370	145,980
Bus	100	299,122	9,763	36,315	7,521	11,976	100,379	10,809	10,416	781	487,082
	200	9,491	3,585	2,361	228	158	1,116	724	196	0	17,859
	300	34,860	2,473	31,707	1,397	2,006	5,961	23,976	1,661	0	104,041
	400	8,067	168	1,422	6,270	3,323	896	302	9,345	449	30,242
	500	11,825	158	2,103	3,068	5,060	2,327	616	3,198	50	28,405
	600	104,956	1,544	6,113	1,123	2,356	68,828	1,916	1,057	223	188,116
	700	10,918	684	24,972	339	616	1,809	16,127	415	111	55,991
	800	10,968	196	1,894	9,588	3,140	1,062	408	6,622	641	34,519
	900	519	0	0	417	50	223	111	554	335	2,209
	Sub Total	490,726	18,571	106,887	29,951	28,685	182,601	54,989	33,464	2,590	948,464
All Modes	100	1,387,262	22,527	92,084	14,587	22,976	229,071	24,345	19,991	1,322	1,814,165
	200	24,231	27,365	4,371	292	460	3,322	1,721	196	30	61,988
	300	91,745	4,368	200,216	3,664	3,493	12,153	45,731	3,171	34	364,575
	400	15,096	278	3,710	73,880	6,673	2,158	628	20,274	801	123,498
	500	22,584	430	3,652	6,402	43,484	3,383	1,221	5,877	100	87,133
	600	244,364	4,357	12,309	2,605	3,327	418,336	3,185	1,730	259	690,472
	700	24,747	1,633	47,552	886	1,295	3,170	107,223	1,166	148	187,820
	800	20,486	196	3,471	20,785	6,159	1,760	1,210	50,008	1,031	105,106
	900	1,099	30	34	707	50	289	148	944	335	3,636
	Total	1,831,614	61,184	367,399	123,808	87,917	673,642	185,412	103,357	4,060	3,438,393

Source: JICA Survey Team

▼Trip Distribution by mode (Case-0, Case-1, Case-2 in 2022)

unit: person trips/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Walk	100	939,364	7,856	28,405	1,403	5,702	52,707	2,830	1,960	0	1,040,227
	200	7,959	35,741	1,374	0	67	731	179	0	0	46,051
	300	28,329	1,353	169,052	508	789	1,340	9,128	423	0	210,922
	400	1,427	0	517	83,754	2,082	131	43	9,220	0	97,174
	500	5,761	67	802	2,094	41,857	865	195	2,038	0	53,679
	600	53,323	732	1,349	136	886	402,947	26	94	0	459,493
	700	2,911	179	9,273	44	199	26	115,827	331	56	128,846
	800	1,966	0	425	9,400	2,125	93	333	64,526	39	78,907
	900	0	0	0	0	0	0	56	40	0	96
	Sub Total	1,041,040	45,928	211,197	97,339	53,707	458,840	128,617	78,632	95	2,115,395
Bicycle	100	47,522	278	3,498	113	292	3,638	547	187	0	56,075
	200	304	0	96	0	1	21	12	0	0	434
	300	3,606	95	6,238	27	86	102	1,874	18	0	12,046
	400	111	0	27	2,383	289	4	1	785	0	3,600
	500	297	1	86	294	1,059	29	6	69	0	1,841
	600	3,971	22	102	4	31	4,519	1	1	0	8,651
	700	554	12	1,900	1	7	1	2,058	7	0	4,540
	800	189	0	18	798	69	1	7	4	0	1,086
	900	0	0	0	0	0	0	0	0	0	0
	Sub Total	56,554	408	11,965	3,620	1,834	8,315	4,506	1,071	0	88,273
Motorcycle	100	537,876	14,103	53,965	13,322	16,681	159,439	22,714	20,145	364	838,609
	200	15,061	8,937	2,928	352	612	3,677	1,762	178	46	33,553
	300	55,182	2,740	65,159	3,007	2,088	10,674	30,930	3,174	54	173,008
	400	14,162	356	3,292	18,661	5,470	2,750	1,135	10,376	450	56,652
	500	17,618	615	2,360	5,390	15,969	2,551	1,026	4,465	73	50,067
	600	165,665	3,737	11,074	2,879	2,611	106,094	4,380	1,749	0	298,189
	700	24,367	1,763	32,695	1,143	1,132	4,072	26,415	923	0	92,510
	800	20,802	179	3,304	11,255	4,762	1,733	926	9,951	694	53,606
	900	352	46	54	507	73	0	0	596	0	1,628
	Sub Total	851,085	32,476	174,831	56,516	49,398	290,990	89,288	51,557	1,681	1,597,822
Car	100	179,163	2,497	13,947	1,803	3,105	26,456	2,345	2,163	522	232,001
	200	2,637	598	442	58	14	425	296	51	0	4,521
	300	14,017	422	21,748	395	409	879	4,362	373	0	42,605
	400	1,810	58	390	7,947	1,206	276	60	5,023	65	16,835
	500	3,097	14	410	1,225	2,986	465	184	933	0	9,314
	600	27,565	431	879	274	492	12,245	335	445	52	42,718
	700	2,362	295	4,445	59	192	331	2,425	212	0	10,321
	800	2,124	50	376	5,323	1,048	443	214	691	0	10,269
	900	388	0	0	0	0	52	0	0	0	440
	Sub Total	233,163	4,365	42,637	17,084	9,452	41,572	10,221	9,891	639	369,024
Bus	100	486,324	15,878	50,876	5,894	9,771	129,049	9,848	10,080	1,170	718,890
	200	16,051	5,021	2,985	81	118	1,501	670	150	0	26,577
	300	50,828	2,953	56,839	1,770	1,991	6,015	27,957	1,676	0	150,029
	400	6,106	81	1,811	10,188	1,731	975	85	11,712	653	33,342
	500	9,960	118	1,998	1,732	5,426	1,248	335	2,148	89	23,054
	600	131,326	1,651	6,036	1,068	1,075	84,484	1,027	760	346	227,773
	700	10,154	670	28,589	86	338	980	22,854	429	170	64,270
	800	10,281	150	1,678	12,165	2,282	760	430	9,589	1,074	38,409
	900	1,135	0	0	603	0	350	171	1,085	0	3,344
	Sub Total	722,165	26,522	150,812	33,587	22,732	225,362	63,377	37,629	3,502	1,285,688
All Modes	100	2,190,249	40,612	150,691	22,535	35,551	371,289	38,284	34,535	2,056	2,885,802
	200	42,012	50,297	7,825	491	812	6,355	2,919	379	46	111,136
	300	151,962	7,563	319,036	5,707	5,363	19,010	74,251	5,664	54	588,610
	400	23,616	495	6,037	122,933	10,778	4,136	1,324	37,116	1,168	207,603
	500	36,733	815	5,656	10,735	67,297	5,158	1,746	9,653	162	137,955
	600	381,850	6,573	19,440	4,361	5,095	610,289	5,769	3,049	398	1,036,824
	700	40,348	2,919	76,902	1,333	1,868	5,410	169,579	1,902	226	300,487
	800	35,362	379	5,801	38,941	10,286	3,030	1,910	84,761	1,807	182,277
	900	1,875	46	54	1,110	73	402	227	1,721	0	5,508
	Total	2,904,007	109,699	591,442	208,146	137,123	1,025,079	296,009	178,780	5,917	5,456,202

Source:JICA Survey Team

▼Trip Distribution by mode (Case-3 in 2022)

unit: person trips/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Walk	100	945,094	7,865	29,675	1,441	5,708	53,590	2,888	2,015	0	1,048,276
	200	7,968	35,941	1,374	0	67	843	257	0	0	46,450
	300	29,583	1,353	169,052	509	792	1,395	9,147	424	0	212,255
	400	1,465	0	518	83,754	2,082	259	45	9,220	0	97,343
	500	5,768	67	805	2,094	41,857	907	233	2,056	0	53,787
	600	54,223	847	1,402	273	916	406,489	54	233	0	464,437
	700	2,969	257	9,292	45	237	49	117,316	385	56	130,606
	800	2,026	0	426	9,400	2,143	232	387	64,528	39	79,181
	900	0	0	0	0	0	0	56	40	0	96
	Sub Total	1,049,096	46,330	212,544	97,516	53,802	463,764	130,383	78,901	95	2,132,431
Bicycle	100	47,989	278	3,628	115	292	3,706	557	190	0	56,755
	200	304	0	96	0	1	21	14	0	0	436
	300	3,759	95	6,238	27	87	105	1,878	18	0	12,207
	400	113	0	27	2,383	289	11	1	785	0	3,609
	500	297	1	87	294	1,059	29	8	74	0	1,849
	600	4,048	22	105	13	31	4,697	4	19	0	8,939
	700	564	14	1,904	1	9	3	2,070	10	0	4,575
	800	193	0	18	798	74	19	10	4	0	1,116
	900	0	0	0	0	0	0	0	0	0	0
	Sub Total	57,267	410	12,103	3,631	1,842	8,591	4,542	1,100	0	89,486
Motorcycle	100	518,147	13,718	51,851	7,707	11,608	155,636	21,937	12,070	364	793,038
	200	14,665	8,821	2,926	190	452	3,523	1,668	88	46	32,379
	300	53,128	2,738	65,159	1,957	1,592	10,314	30,890	2,071	54	167,903
	400	7,912	192	2,192	18,661	5,151	2,548	1,103	9,707	450	47,916
	500	12,113	454	1,821	5,075	15,969	2,353	985	4,202	73	43,045
	600	161,669	3,572	10,634	2,660	2,421	101,892	4,305	1,569	0	288,722
	700	23,498	1,670	32,654	1,105	1,092	4,001	24,804	856	0	89,680
	800	12,102	89	2,183	10,518	4,469	1,553	861	9,649	694	42,118
	900	352	46	54	507	73	0	0	596	0	1,628
	Sub Total	803,586	31,300	169,474	48,380	42,827	281,820	86,553	40,808	1,681	1,506,429
Car	100	174,648	2,617	13,950	734	2,051	26,164	2,256	1,240	522	224,182
	200	2,761	650	442	45	12	479	318	44	0	4,751
	300	14,009	422	21,748	200	242	845	4,340	224	0	42,030
	400	750	45	194	7,947	1,150	288	62	4,564	65	15,065
	500	2,051	12	243	1,157	2,986	470	170	877	0	7,966
	600	27,312	490	844	292	500	13,264	355	499	52	43,608
	700	2,279	317	4,419	61	178	350	2,723	217	0	10,544
	800	1,225	44	229	4,847	976	496	219	621	0	8,657
	900	388	0	0	0	0	52	0	0	0	440
	Sub Total	225,423	4,597	42,069	15,283	8,095	42,408	10,443	8,286	639	357,243
Bus	100	504,371	16,134	51,587	12,538	15,892	132,193	10,646	19,020	1,170	763,551
	200	16,314	4,885	2,987	256	280	1,489	662	247	0	27,120
	300	51,483	2,955	56,839	3,014	2,650	6,351	27,996	2,927	0	154,215
	400	13,376	258	3,106	10,188	2,106	1,030	113	12,840	653	43,670
	500	16,504	281	2,700	2,115	5,426	1,399	350	2,444	89	31,308
	600	134,598	1,642	6,455	1,123	1,227	83,947	1,051	729	346	231,118
	700	11,038	661	28,633	121	352	1,007	22,666	434	170	65,082
	800	19,816	246	2,945	13,378	2,624	730	433	9,959	1,074	51,205
	900	1,135	0	0	603	0	350	171	1,085	0	3,344
	Sub Total	768,635	27,062	155,252	43,336	30,557	228,496	64,088	49,685	3,502	1,370,613
All Modes	100	2,190,249	40,612	150,691	22,535	35,551	371,289	38,284	34,535	2,056	2,885,802
	200	42,012	50,297	7,825	491	812	6,355	2,919	379	46	111,136
	300	151,962	7,563	319,036	5,707	5,363	19,010	74,251	5,664	54	588,610
	400	23,616	495	6,037	122,933	10,778	4,136	1,324	37,116	1,168	207,603
	500	36,733	815	5,656	10,735	67,297	5,158	1,746	9,653	162	137,955
	600	381,850	6,573	19,440	4,361	5,095	610,289	5,769	3,049	398	1,036,824
	700	40,348	2,919	76,902	1,333	1,868	5,410	169,579	1,902	226	300,487
	800	35,362	379	5,801	38,941	10,286	3,030	1,910	84,761	1,807	182,277
	900	1,875	46	54	1,110	73	402	227	1,721	0	5,508
	Total	2,904,007	109,699	591,442	208,146	137,123	1,025,079	296,009	178,780	5,917	5,456,202

Source: JICA Survey Team

▼ Trip Distribution by mode (Case-4 in 2022)

unit: person trips/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Walk	100	741,073	5,514	23,132	1,528	19,692	40,738	1,921	3,053	0	836,651
	200	5,577	28,760	998	0	222	724	195	0	0	36,476
	300	23,057	984	136,432	392	1,736	994	5,865	661	0	170,121
	400	1,496	0	395	113,903	13,600	306	218	26,442	0	156,360
	500	19,581	215	1,713	13,700	141,256	5,571	1,462	13,014	0	196,512
	600	41,227	728	1,001	323	5,668	318,575	41	2,479	0	370,042
	700	1,983	195	5,971	218	1,480	36	88,582	2,351	74	100,890
	800	3,200	0	677	26,816	13,177	2,477	2,356	240,720	12	289,435
	900	0	0	0	0	0	0	74	12	0	86
	Sub Total	837,194	36,396	170,319	156,880	196,831	369,421	100,714	288,732	86	2,156,573
Bicycle	100	37,039	196	2,843	97	1,151	2,789	330	155	0	44,600
	200	218	0	73	0	14	12	10	0	0	327
	300	2,945	73	5,045	14	143	67	1,190	14	0	9,491
	400	92	0	14	4,099	762	11	10	1,636	0	6,624
	500	1,136	13	139	783	3,509	200	67	794	0	6,641
	600	3,038	13	67	13	211	3,777	1	56	0	7,176
	700	333	10	1,209	10	70	1	1,573	181	0	3,387
	800	170	0	16	1,637	798	56	181	22	0	2,880
	900	0	0	0	0	0	0	0	0	0	0
	Sub Total	44,971	305	9,406	6,653	6,658	6,913	3,362	2,858	0	81,126
Motorcycle	100	405,650	9,620	40,096	6,843	29,857	118,950	15,278	19,561	350	646,205
	200	10,286	7,067	2,046	462	2,256	2,896	1,349	123	58	26,543
	300	41,096	1,895	52,075	1,396	4,602	7,307	21,173	3,757	46	133,347
	400	6,334	470	1,479	29,296	17,756	3,677	3,277	21,982	340	84,611
	500	28,118	2,071	4,043	17,926	61,850	15,876	6,948	29,186	27	166,045
	600	123,817	2,947	7,557	3,770	16,459	80,651	3,286	4,106	0	242,593
	700	16,472	1,353	22,510	3,311	7,420	3,050	19,424	8,036	0	81,576
	800	21,500	123	4,469	22,717	29,894	4,091	8,046	37,616	741	129,197
	900	328	58	46	446	27	0	0	465	0	1,370
	Sub Total	653,601	25,604	134,321	86,167	170,121	236,498	78,781	124,832	1,562	1,511,487
Car	100	137,592	1,885	10,938	573	8,669	19,663	1,589	2,535	431	183,875
	200	1,983	522	321	268	65	395	242	23	0	3,819
	300	10,955	305	17,460	124	412	602	2,914	1,802	0	34,574
	400	573	274	114	12,369	5,695	259	195	10,437	46	29,962
	500	8,333	65	403	5,750	9,486	2,759	1,426	5,184	0	33,406
	600	20,544	406	599	267	2,885	10,538	276	2,120	77	37,712
	700	1,601	243	2,965	192	1,454	272	2,095	507	0	9,329
	800	2,543	23	1,817	11,063	5,373	2,116	512	1,815	0	25,262
	900	337	0	0	0	0	77	0	0	0	414
	Sub Total	184,461	3,723	34,617	30,606	34,039	36,681	9,249	24,423	554	358,353
Bus	100	387,067	11,330	40,724	10,075	45,104	100,350	6,774	20,654	1,235	623,313
	200	11,454	3,868	2,204	313	903	1,267	466	118	0	20,593
	300	40,629	2,174	46,312	2,147	4,942	4,374	17,728	5,871	0	124,177
	400	10,017	315	2,181	12,779	13,336	1,673	259	28,613	506	69,679
	500	44,151	838	4,860	13,645	20,334	8,341	2,139	18,810	34	113,152
	600	102,129	1,408	4,432	1,798	8,654	66,480	795	7,132	457	193,285
	700	7,078	463	18,202	274	2,157	754	16,925	2,956	226	49,035
	800	23,505	117	6,025	29,181	19,429	7,131	2,954	38,288	703	127,333
	900	1,236	0	0	485	0	463	228	714	0	3,126
	Sub Total	627,266	20,513	124,940	70,697	114,859	190,833	48,268	123,156	3,161	1,323,693
All Modes	100	1,708,421	28,545	117,733	19,116	104,473	282,490	25,892	45,958	2,016	2,334,644
	200	29,518	40,217	5,642	1,043	3,460	5,294	2,262	264	58	87,758
	300	118,682	5,431	257,324	4,073	11,835	13,344	48,870	12,105	46	471,710
	400	18,512	1,059	4,183	172,446	51,149	5,926	3,959	89,110	892	347,236
	500	101,319	3,202	11,158	51,804	236,435	32,747	12,042	66,988	61	515,756
	600	290,755	5,502	13,656	6,171	33,877	480,021	4,399	15,893	534	850,808
	700	27,467	2,264	50,857	4,005	12,581	4,113	128,599	14,031	300	244,217
	800	50,918	263	13,004	91,414	68,671	15,871	14,049	318,461	1,456	574,107
	900	1,901	58	46	931	27	540	302	1,191	0	4,996
	Total	2,347,493	86,541	473,603	351,003	522,508	840,346	240,374	564,001	5,363	5,431,232

Source: JICA Survey Team

Appendix2.2.6 VTOD:Vehicle OD Table Converted Pcu by type of Vehicle between Large Zones in the Survey Area for the Present in 2011 and Case 0-4 in 2022

▼VTOD by type of vehicle (Present in 2011) unit: pcu/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Motorcycle	100	111,395	711	9,090	1,427	1,596	6,800	3,116	828	830	135,793
	200	710	979	118	49	80	223	189	9	13	2,370
	300	9,056	117	15,447	209	243	577	1,737	98	107	27,591
	400	1,422	49	210	1,249	610	209	154	759	112	4,774
	500	1,589	80	248	609	500	163	307	326	131	3,953
	600	6,788	223	589	209	162	4,673	343	175	152	13,314
	700	3,118	189	1,737	153	307	343	1,379	82	249	7,557
	800	828	9	101	758	326	175	80	208	57	2,542
	900	833	13	107	111	131	150	248	57	99	1,749
	Sub Total	135,739	2,370	27,647	4,774	3,955	13,313	7,553	2,542	1,750	199,643
Car	100	117,678	1,219	10,471	1,656	2,464	7,512	3,391	1,101	1,091	146,583
	200	1,218	99	269	41	53	84	159	52	12	1,987
	300	10,341	265	11,330	248	368	794	1,511	184	180	25,221
	400	1,649	39	256	881	218	159	39	397	113	3,751
	500	2,464	53	376	214	141	82	69	162	94	3,655
	600	7,494	81	808	155	79	2,895	202	227	200	12,141
	700	3,388	158	1,512	36	68	199	1,046	48	42	6,497
	800	1,093	51	188	391	157	223	44	58	36	2,241
	900	1,078	10	184	111	94	190	35	33	54	1,789
	Sub Total	146,403	1,975	25,394	3,733	3,642	12,138	6,496	2,262	1,822	203,865
Truck	100	64,432	316	11,120	1,216	964	9,256	1,752	526	2,706	92,288
	200	310	68	69	18	9	64	113	2	91	744
	300	10,908	65	7,344	160	102	812	1,341	56	625	21,413
	400	1,212	18	179	1,472	5,978	707	425	1,355	2,438	13,784
	500	961	7	121	5,971	88	105	169	364	543	8,329
	600	9,223	60	846	675	104	6,415	373	211	649	18,556
	700	1,736	111	1,339	417	162	363	894	72	153	5,247
	800	523	2	64	1,344	351	196	61	568	223	3,332
	900	2,689	89	654	2,428	537	616	127	215	365	7,720
	Sub Total	91,994	736	21,736	13,701	8,295	18,534	5,255	3,369	7,793	171,413
Bus	100	122,400	2,453	14,737	2,357	1,694	16,185	1,578	428	1,411	163,243
	200	2,458	306	554	11	11	111	62	3	0	3,516
	300	14,520	550	7,859	316	268	1,538	3,353	40	402	28,846
	400	2,357	11	355	657	335	96	12	801	551	5,175
	500	1,682	11	289	330	312	47	31	212	0	2,914
	600	16,132	107	1,561	87	44	33,144	116	68	0	51,259
	700	1,557	62	3,351	12	31	106	1,373	33	0	6,525
	800	416	3	43	789	206	65	28	419	0	1,969
	900	1,408	0	436	551	0	0	0	0	12	2,407
	Sub Total	162,930	3,503	29,185	5,110	2,901	51,292	6,553	2,004	2,376	265,854
Total	100	415,905	4,699	45,418	6,656	6,718	39,753	9,837	2,883	6,038	537,907
	200	4,696	1,452	1,010	119	153	482	523	66	116	8,617
	300	44,825	997	41,980	933	981	3,721	7,942	378	1,314	103,071
	400	6,640	117	1,000	4,259	7,141	1,171	630	3,312	3,214	27,484
	500	6,696	151	1,034	7,124	1,041	397	576	1,064	768	18,851
	600	39,637	471	3,804	1,126	389	47,127	1,034	681	1,001	95,270
	700	9,799	520	7,939	618	568	1,011	4,692	235	444	25,826
	800	2,860	65	396	3,282	1,040	659	213	1,253	316	10,084
	900	6,008	112	1,381	3,201	762	956	410	305	530	13,665
	Total	537,066	8,584	103,962	27,318	18,793	95,277	25,857	10,177	13,741	840,775

Pcu (Passenger Car Unit) : Motorcycle=0.3 Car, Taxi=1.0 Light Truck=1.5 Heavy Truck=4.0
 Tempo=1.0 MicroBus=1.5 MiniBus=3.0 Large Bus=4.0 Source : JICA Survey Team

▼VTOD by type of vehicle (Case-0, Case-1, Case-2 in 2022)

unit: pcu/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Motorcycle	100	204,749	1,293	16,167	2,333	2,524	11,240	5,046	1,373	1,229	245,954
	200	1,288	2,039	214	77	143	357	320	13	20	4,471
	300	16,100	209	28,935	304	319	928	3,008	192	172	50,167
	400	2,323	78	323	2,364	1,024	346	253	1,358	163	8,232
	500	2,533	143	336	1,028	850	274	452	517	192	6,325
	600	11,191	354	928	362	260	7,718	493	227	223	21,756
	700	5,050	320	3,017	247	446	476	2,534	95	364	12,549
	800	1,364	14	205	1,333	518	235	95	481	89	4,334
	900	1,229	20	177	163	192	221	364	87	152	2,605
Sub Total	245,827	4,470	50,302	8,211	6,276	21,795	12,565	4,343	2,604	356,393	
Car	100	204,378	1,785	16,480	2,176	2,970	12,259	5,135	3,238	1,699	250,120
	200	1,788	164	404	58	77	125	229	114	19	2,978
	300	16,187	395	21,073	448	669	1,432	2,189	372	297	43,062
	400	2,159	54	470	1,393	311	456	48	734	173	5,798
	500	2,996	77	678	306	366	341	225	265	144	5,398
	600	12,166	121	1,451	457	335	5,443	302	137	307	20,719
	700	5,093	227	2,185	46	219	297	1,678	37	65	9,847
	800	3,144	112	378	723	253	133	31	284	58	5,116
	900	1,676	17	303	170	144	293	55	53	82	2,793
Sub Total	249,587	2,952	43,422	5,777	5,344	20,779	9,892	5,234	2,844	345,831	
Truck	100	137,367	629	23,491	2,558	2,020	19,680	3,661	1,030	5,712	196,148
	200	616	145	130	34	15	134	230	3	191	1,498
	300	23,088	124	15,278	299	200	1,654	2,813	88	1,262	44,806
	400	2,548	34	331	3,147	12,821	1,505	911	2,899	5,223	29,419
	500	2,014	12	231	12,806	187	217	363	763	1,160	17,753
	600	19,582	126	1,718	1,440	214	13,756	791	433	1,389	39,449
	700	3,624	227	2,808	895	342	765	1,904	138	322	11,025
	800	1,027	3	100	2,877	734	397	116	1,188	474	6,916
	900	5,678	185	1,323	5,204	1,144	1,307	260	457	781	16,339
Sub Total	195,544	1,485	45,410	29,260	17,677	39,415	11,049	6,999	16,514	363,353	
Bus	100	180,765	4,176	21,048	3,690	2,634	23,699	2,181	721	2,219	241,133
	200	4,173	577	930	21	18	192	99	6	0	6,016
	300	20,663	925	12,800	597	494	2,146	5,172	78	668	43,543
	400	3,708	21	678	1,070	540	177	24	1,407	852	8,477
	500	2,621	18	535	532	505	84	53	343	0	4,691
	600	23,552	185	2,176	157	79	46,456	156	122	0	72,883
	700	2,153	103	5,143	24	53	142	2,063	61	0	9,742
	800	706	6	84	1,388	334	116	51	718	0	3,403
	900	2,223	0	716	852	0	0	0	0	20	3,811
Sub Total	240,564	6,011	44,110	8,331	4,657	73,012	9,799	3,456	3,759	393,699	
Total	100	727,259	7,883	77,186	10,757	10,148	66,878	16,023	6,362	10,859	933,355
	200	7,865	2,925	1,678	190	253	808	878	136	230	14,963
	300	76,038	1,653	78,086	1,648	1,682	6,160	13,182	730	2,399	181,578
	400	10,738	187	1,802	7,974	14,696	2,484	1,236	6,398	6,411	51,926
	500	10,164	250	1,780	14,672	1,908	916	1,093	1,888	1,496	34,167
	600	66,491	786	6,273	2,416	888	73,373	1,742	919	1,919	154,807
	700	15,920	877	13,153	1,212	1,060	1,680	8,179	331	751	43,163
	800	6,241	135	767	6,321	1,839	881	293	2,671	621	19,769
	900	10,806	222	2,519	6,389	1,480	1,821	679	597	1,035	25,548
Total	931,522	14,918	183,244	51,579	33,954	155,001	43,305	20,032	25,721	1,459,276	

Pcu (Passenger Car Unit) : Motorcycle=0.3 Car, Taxi=1.0 Light Truck=1.5 Heavy Truck=4.0

Tempo=1.0 MicroBus=1.5 MiniBus=3.0 Large Bus=4.0

Source : JICA Survey Team

▼VTOD by type of vehicle (Case-3 in 2022)

unit: pcu/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Motorcycle	100	195,711	1,199	15,217	1,411	1,861	10,734	4,729	919	1,192	232,973
	200	1,195	1,988	204	40	99	343	295	10	19	4,193
	300	15,145	200	28,233	197	238	860	2,925	128	164	48,090
	400	1,385	40	209	2,278	894	308	234	1,330	159	6,837
	500	1,855	98	242	891	820	243	428	465	187	5,229
	600	10,688	340	855	320	231	7,279	462	201	216	20,592
	700	4,713	296	2,936	229	424	452	2,303	89	355	11,797
	800	900	10	138	1,311	467	208	87	464	87	3,672
	900	1,194	19	166	158	186	214	355	85	152	2,529
	Sub Total	232,786	4,190	48,200	6,835	5,220	20,641	11,818	3,691	2,531	335,912
Car	100	200,343	1,886	16,478	964	1,959	12,113	5,035	2,120	1,699	242,597
	200	1,883	164	404	44	50	140	245	115	19	3,064
	300	16,231	395	21,105	164	399	1,318	2,169	239	297	42,317
	400	960	41	174	1,365	270	434	52	689	174	4,159
	500	1,953	50	403	264	361	170	217	263	144	3,825
	600	12,083	140	1,348	439	167	6,164	317	146	308	21,112
	700	5,023	243	2,159	50	211	312	2,897	37	65	10,997
	800	2,050	113	249	674	257	137	32	278	58	3,848
	900	1,676	17	303	171	144	294	55	53	82	2,795
	Sub Total	242,202	3,049	42,623	4,135	3,818	21,082	11,019	3,940	2,846	334,714
Truck	100	137,367	629	23,491	2,558	2,020	19,680	3,661	1,030	5,712	196,148
	200	616	145	130	34	15	134	230	3	191	1,498
	300	23,088	124	15,278	299	200	1,654	2,813	88	1,262	44,806
	400	2,548	34	331	3,147	12,821	1,505	911	2,899	5,223	29,419
	500	2,014	12	231	12,806	187	217	363	763	1,160	17,753
	600	19,582	126	1,718	1,440	214	13,756	791	433	1,389	39,449
	700	3,624	227	2,808	895	342	765	1,904	138	322	11,025
	800	1,027	3	100	2,877	734	397	116	1,188	474	6,916
	900	5,678	185	1,323	5,204	1,144	1,307	260	457	781	16,339
	Sub Total	195,544	1,485	45,410	29,260	17,677	39,415	11,049	6,999	16,514	363,353
Bus	100	189,721	4,276	21,762	6,890	4,787	24,575	2,418	1,314	2,240	257,983
	200	4,277	585	933	45	42	200	106	12	0	6,200
	300	21,364	928	12,838	951	748	2,244	5,229	332	671	45,305
	400	7,067	45	1,068	1,150	586	190	25	1,500	860	12,491
	500	4,840	42	810	579	547	87	52	366	0	7,323
	600	24,495	194	2,308	188	84	46,773	177	134	0	74,353
	700	2,381	103	5,204	25	53	156	2,043	61	0	10,026
	800	1,308	12	341	1,475	360	118	51	739	0	4,404
	900	2,240	0	719	860	0	0	0	0	20	3,839
	Sub Total	257,693	6,185	45,983	12,163	7,207	74,343	10,101	4,458	3,791	421,924
Total	100	723,142	7,990	76,948	11,823	10,627	67,102	15,843	5,383	10,843	929,701
	200	7,971	2,882	1,671	163	206	817	876	140	229	14,955
	300	75,828	1,647	77,454	1,611	1,585	6,076	13,136	787	2,394	180,518
	400	11,960	160	1,782	7,940	14,571	2,437	1,222	6,418	6,416	52,906
	500	10,662	202	1,686	14,540	1,915	717	1,060	1,857	1,491	34,130
	600	66,848	800	6,229	2,387	696	73,972	1,747	914	1,913	155,506
	700	15,741	869	13,107	1,199	1,030	1,685	9,147	325	742	43,845
	800	5,285	138	828	6,337	1,818	860	286	2,669	619	18,840
	900	10,788	221	2,511	6,393	1,474	1,815	670	595	1,035	25,502
	Total	928,225	14,909	182,216	52,393	33,922	155,481	43,987	19,088	25,682	1,455,903

Pcu (Passenger Car Unit) : Motorcycle=0.3 Car, Taxi=1.0 Light Truck=1.5 Heavy Truck=4.0

Tempo=1.0 MicroBus=1.5 MiniBus=3.0 Large Bus=4.0

Source : JICA Survey Team

▼VTOD by type of vehicle (Case-4 in 2022)

unit: pcu/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Motorcycle	100	151,445	833	11,506	1,355	5,430	8,085	3,164	1,284	1,148	184,250
	200	829	1,530	135	125	402	286	233	16	17	3,573
	300	11,445	135	21,733	99	667	591	1,946	153	164	36,933
	400	1,356	124	99	7,027	4,283	469	401	4,740	153	18,652
	500	5,431	401	667	4,279	14,833	1,626	3,437	6,849	180	37,703
	600	8,079	285	599	467	1,625	5,648	377	621	207	17,908
	700	3,158	232	1,947	401	3,437	374	1,743	1,100	342	12,734
	800	1,284	16	157	4,739	6,848	621	1,100	7,947	82	22,794
	900	1,148	17	165	153	180	207	342	82	152	2,446
Sub Total	184,175	3,573	37,008	18,645	37,705	17,907	12,743	22,792	2,445	336,993	
Car	100	167,277	1,465	13,272	1,133	9,819	9,912	3,676	4,869	1,754	213,177
	200	1,457	140	299	589	303	121	211	10	19	3,149
	300	13,115	280	17,570	165	1,520	988	1,526	1,541	303	37,008
	400	1,136	584	170	4,693	2,219	1,095	186	3,883	182	14,148
	500	9,812	301	1,527	2,208	3,592	1,089	1,373	2,061	150	22,113
	600	9,891	119	1,005	1,086	1,081	5,258	274	387	315	19,416
	700	3,666	209	1,537	184	1,368	268	2,707	114	64	10,117
	800	4,855	10	1,544	3,873	2,057	385	112	607	56	13,499
	900	1,750	17	306	180	150	310	60	55	82	2,910
Sub Total	212,959	3,125	37,230	14,111	22,109	19,426	10,125	13,527	2,925	335,537	
Truck	100	137,396	623	23,325	2,560	2,019	19,648	3,646	1,047	5,696	195,960
	200	623	145	128	34	14	130	229	4	188	1,495
	300	23,320	128	15,284	323	221	1,693	2,810	104	1,294	45,177
	400	2,559	34	323	3,147	12,814	1,477	903	2,888	5,213	29,358
	500	2,019	14	221	12,812	187	215	355	748	1,152	17,723
	600	19,635	130	1,691	1,472	215	13,758	780	418	1,354	39,453
	700	3,645	229	2,810	903	351	775	1,902	128	295	11,038
	800	1,047	4	104	2,886	747	417	128	1,185	466	6,984
	900	5,699	188	1,298	5,213	1,151	1,343	287	466	781	16,426
Sub Total	195,943	1,495	45,184	29,350	17,719	39,456	11,040	6,988	16,439	363,614	
Bus	100	162,871	3,351	17,958	12,861	9,904	21,658	1,793	2,728	2,489	235,613
	200	3,351	519	764	128	121	188	77	90	0	5,238
	300	17,736	761	10,813	1,693	1,389	1,541	3,889	286	712	38,820
	400	12,830	122	1,734	1,061	616	1,280	357	3,026	963	21,989
	500	9,890	115	1,438	603	866	931	427	811	0	15,081
	600	21,592	176	1,573	1,245	907	42,796	134	1,386	0	69,809
	700	1,758	77	3,887	351	418	123	1,675	754	0	9,043
	800	2,707	83	307	3,009	801	1,372	743	2,673	0	11,695
	900	2,476	0	736	963	0	0	0	0	20	4,195
Sub Total	235,211	5,204	39,210	21,914	15,022	69,889	9,095	11,754	4,184	411,483	
Total	100	618,989	6,272	66,061	17,909	27,172	59,303	12,279	9,928	11,087	829,000
	200	6,260	2,334	1,326	876	840	725	750	120	224	13,455
	300	65,616	1,304	65,400	2,280	3,797	4,813	10,171	2,084	2,473	157,938
	400	17,881	864	2,326	15,928	19,932	4,321	1,847	14,537	6,511	84,147
	500	27,152	831	3,853	19,902	19,478	3,861	5,592	10,469	1,482	92,620
	600	59,197	710	4,868	4,270	3,828	67,460	1,565	2,812	1,876	146,586
	700	12,227	747	10,181	1,839	5,574	1,540	8,027	2,096	701	42,932
	800	9,893	113	2,112	14,507	10,453	2,795	2,083	12,412	604	54,972
	900	11,073	222	2,505	6,509	1,481	1,860	689	603	1,035	25,977
Total	828,288	13,397	158,632	84,020	92,555	146,678	43,003	55,061	25,993	1,447,627	

Pcu (Passenger Car Unit) : Motorcycle=0.3 Car, Taxi=1.0 Light Truck=1.5 Heavy Truck=4.0

Tempo=1.0 MicroBus=1.5 MiniBus=3.0 Large Bus=4.0

Source : JICA Survey Team

**Appendix2.2.7 VTOD: Vehicle OD Table by type of Vehicle between Large Zones
in the Survey Area for the Present in 2011 and Case 0-4 in 2022**

▼VTOD by type of vehicle (Present in 2011)

unit: vehicles/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Motorcycle	100	371,087	2,370	30,142	4,747	5,298	22,607	10,367	2,756	2,751	452,125
	200	2,369	3,264	381	159	266	736	628	29	42	7,874
	300	30,027	378	51,375	674	801	1,916	5,788	377	352	91,688
	400	4,739	158	681	4,162	2,033	697	510	2,528	371	15,879
	500	5,290	265	809	2,032	1,668	544	1,025	1,085	436	13,154
	600	22,585	735	1,937	694	539	15,557	1,142	580	502	44,271
	700	10,367	628	5,790	508	1,023	1,141	4,597	265	828	25,147
	800	2,752	29	386	2,526	1,085	579	262	685	195	8,499
	900	2,750	42	357	370	434	498	827	193	329	5,800
	Sub Total	451,966	7,869	91,858	15,872	13,147	44,275	25,146	8,498	5,806	664,437
Car	100	117,678	1,219	10,471	1,656	2,464	7,512	3,391	1,101	1,091	146,583
	200	1,218	99	269	41	53	84	159	52	12	1,987
	300	10,341	265	11,330	248	368	794	1,511	184	180	25,221
	400	1,649	39	256	881	218	159	39	397	113	3,751
	500	2,464	53	376	214	141	82	69	162	94	3,655
	600	7,494	81	808	155	79	2,895	202	227	200	12,141
	700	3,388	158	1,512	36	68	199	1,046	48	42	6,497
	800	1,093	51	188	391	157	223	44	58	36	2,241
	900	1,078	10	184	111	94	190	35	33	54	1,789
	Sub Total	146,403	1,975	25,394	3,733	3,642	12,138	6,496	2,262	1,822	203,865
Truck	100	28,840	154	4,729	617	542	4,403	983	266	1,170	41,704
	200	153	35	36	8	5	33	47	1	39	357
	300	4,643	34	3,647	73	56	453	761	26	259	9,952
	400	614	8	82	617	1,642	369	216	687	1,145	5,380
	500	540	4	63	1,639	30	60	84	188	233	2,841
	600	4,391	32	469	357	59	3,006	225	118	295	8,952
	700	978	46	761	214	80	220	516	32	48	2,895
	800	265	1	30	682	184	110	28	309	131	1,740
	900	1,163	37	268	1,142	230	284	40	127	151	3,442
	Sub Total	41,587	351	10,085	5,349	2,828	8,938	2,900	1,754	3,471	77,263
Bus	100	61,779	1,328	6,815	807	918	7,437	855	177	400	80,516
	200	1,328	119	281	4	4	45	25	1	0	1,807
	300	6,702	279	3,951	106	159	652	1,627	14	117	13,607
	400	805	4	119	305	130	37	4	334	217	1,955
	500	910	4	167	127	124	19	13	90	0	1,454
	600	7,416	43	660	34	18	11,588	45	26	0	19,830
	700	844	25	1,625	4	13	41	528	13	0	3,093
	800	173	1	15	327	87	25	10	156	0	794
	900	399	0	127	217	0	0	0	0	3	746
	Sub Total	80,356	1,803	13,760	1,931	1,453	19,844	3,107	811	737	123,802
Total	100	579,384	5,071	52,157	7,827	9,222	41,959	15,596	4,300	5,412	720,928
	200	5,068	3,517	967	212	328	898	859	83	93	12,025
	300	51,713	956	70,303	1,101	1,384	3,815	9,687	601	908	140,468
	400	7,807	209	1,138	5,965	4,023	1,262	769	3,946	1,846	26,965
	500	9,204	326	1,415	4,012	1,963	705	1,191	1,525	763	21,104
	600	41,886	891	3,874	1,240	695	33,046	1,614	951	997	85,194
	700	15,577	857	9,688	762	1,184	1,601	6,687	358	918	37,632
	800	4,283	82	619	3,926	1,513	937	344	1,208	362	13,274
	900	5,390	89	936	1,840	758	972	902	353	537	11,777
	Total	720,312	11,998	141,097	26,885	21,070	85,195	37,649	13,325	11,836	1,069,367

Source : JICA Survey Team

▼VTOD by type of vehicle (Case-0, Case-1, Case-2 in 2022)

unit: vehicles/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Motorcycle	100	682,245	4,295	53,723	7,728	8,369	37,400	16,797	4,493	4,051	819,101
	200	4,295	6,794	691	256	477	1,186	1,067	48	62	14,876
	300	53,461	676	96,386	1,003	1,059	3,014	10,011	591	545	166,746
	400	7,709	259	1,059	7,877	3,416	1,147	837	4,515	544	27,363
	500	8,406	476	1,111	3,425	2,833	913	1,506	1,719	640	21,029
	600	37,223	1,173	3,041	1,197	864	25,734	1,633	759	737	72,361
	700	16,813	1,067	10,048	823	1,490	1,579	8,449	318	1,215	41,802
	800	4,462	50	638	4,432	1,722	787	317	1,589	288	14,285
	900	4,049	62	550	543	637	732	1,213	284	500	8,570
	Sub Total	818,663	14,852	167,247	27,284	20,867	72,492	41,830	14,316	8,582	1,186,133
Car	100	204,378	1,785	16,480	2,176	2,970	12,259	5,135	3,238	1,699	250,120
	200	1,788	164	404	58	77	125	229	114	19	2,978
	300	16,187	395	21,073	448	669	1,432	2,189	372	297	43,062
	400	2,159	54	470	1,393	311	456	48	734	173	5,798
	500	2,996	77	678	306	366	341	225	265	144	5,398
	600	12,166	121	1,451	457	335	5,443	302	137	307	20,719
	700	5,093	227	2,185	46	219	297	1,678	37	65	9,847
	800	3,144	112	378	723	253	133	31	284	58	5,116
	900	1,676	17	303	170	144	293	55	53	82	2,793
	Sub Total	249,587	2,952	43,422	5,777	5,344	20,779	9,892	5,234	2,844	345,831
Truck	100	61,705	321	10,085	1,312	1,153	9,412	2,089	554	2,490	89,121
	200	319	75	73	16	10	71	98	2	82	746
	300	9,908	69	7,714	149	116	956	1,620	52	540	21,124
	400	1,307	16	167	1,322	3,523	791	463	1,474	2,456	11,519
	500	1,149	8	130	3,516	64	127	180	400	499	6,073
	600	9,383	69	986	764	125	6,455	483	249	634	19,148
	700	2,078	96	1,620	459	171	471	1,104	65	101	6,165
	800	552	2	60	1,463	391	232	57	658	280	3,695
	900	2,476	78	559	2,450	492	607	83	272	324	7,341
	Sub Total	88,877	734	21,394	11,451	6,045	19,122	6,177	3,726	7,406	164,932
Bus	100	91,632	2,270	9,730	1,267	1,428	10,856	1,186	310	629	119,308
	200	2,262	224	476	8	7	78	41	2	0	3,098
	300	9,535	474	6,489	201	293	911	2,506	28	193	20,630
	400	1,270	8	228	496	209	69	8	589	336	3,213
	500	1,422	7	308	205	200	35	22	148	0	2,347
	600	10,791	76	921	63	34	16,313	62	50	0	28,310
	700	1,170	43	2,491	8	22	57	794	24	0	4,609
	800	305	2	30	577	144	48	19	279	0	1,404
	900	630	0	207	336	0	0	0	0	5	1,178
	Sub Total	119,017	3,104	20,880	3,161	2,337	28,367	4,638	1,430	1,163	184,097
Total	100	1,039,960	8,671	90,018	12,483	13,920	69,927	25,207	8,595	8,869	1,277,650
	200	8,664	7,257	1,644	338	571	1,460	1,435	166	163	21,698
	300	89,091	1,614	131,662	1,801	2,137	6,313	16,326	1,043	1,575	251,562
	400	12,445	337	1,924	11,088	7,459	2,463	1,356	7,312	3,509	47,893
	500	13,973	568	2,227	7,452	3,463	1,416	1,933	2,532	1,283	34,847
	600	69,563	1,439	6,399	2,481	1,358	53,945	2,480	1,195	1,678	140,538
	700	25,154	1,433	16,344	1,336	1,902	2,404	12,025	444	1,381	62,423
	800	8,463	166	1,106	7,195	2,510	1,200	424	2,810	626	24,500
	900	8,831	157	1,619	3,499	1,273	1,632	1,351	609	911	19,882
	Total	1,276,144	21,642	252,943	47,673	34,593	140,760	62,537	24,706	19,995	1,880,993

Source : JICA Survey Team

▼VTOD by type of vehicle (Case-3 in 2022)

unit: vehicles/day

Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Motorcycle	100	652,098	3,970	50,464	4,698	6,201	35,744	15,740	3,078	3,944	775,937
	200	3,969	6,626	671	134	327	1,143	986	33	61	13,950
	300	50,296	656	94,015	640	782	2,816	9,739	375	527	159,846
	400	4,613	135	682	7,594	2,976	1,024	781	4,427	531	22,763
	500	6,172	326	792	2,971	2,733	815	1,427	1,552	624	17,412
	600	35,572	1,131	2,815	1,065	769	24,254	1,533	667	717	68,523
	700	15,716	986	9,774	764	1,412	1,502	7,669	294	1,184	39,301
	800	2,984	33	408	4,360	1,556	693	292	1,530	281	12,137
	900	3,944	61	531	530	620	714	1,182	277	500	8,359
	Sub Total	775,364	13,924	160,152	22,756	17,376	68,705	39,349	12,233	8,369	1,118,228
Car	100	200,343	1,886	16,478	964	1,959	12,113	5,035	2,120	1,699	242,597
	200	1,883	164	404	44	50	140	245	115	19	3,064
	300	16,231	395	21,105	164	399	1,318	2,169	239	297	42,317
	400	960	41	174	1,365	270	434	52	689	174	4,159
	500	1,953	50	403	264	361	170	217	263	144	3,825
	600	12,083	140	1,348	439	167	6,164	317	146	308	21,112
	700	5,023	243	2,159	50	211	312	2,897	37	65	10,997
	800	2,050	113	249	674	257	137	32	278	58	3,848
	900	1,676	17	303	171	144	294	55	53	82	2,795
	Sub Total	242,202	3,049	42,623	4,135	3,818	21,082	11,019	3,940	2,846	334,714
Truck	100	61,705	321	10,085	1,312	1,153	9,412	2,089	554	2,490	89,121
	200	319	75	73	16	10	71	98	2	82	746
	300	9,908	69	7,714	149	116	956	1,620	52	540	21,124
	400	1,307	16	167	1,322	3,523	791	463	1,474	2,456	11,519
	500	1,149	8	130	3,516	64	127	180	400	499	6,073
	600	9,383	69	986	764	125	6,455	483	249	634	19,148
	700	2,078	96	1,620	459	171	471	1,104	65	101	6,165
	800	552	2	60	1,463	391	232	57	658	280	3,695
	900	2,476	78	559	2,450	492	607	83	272	324	7,341
	Sub Total	88,877	734	21,394	11,451	6,045	19,122	6,177	3,726	7,406	164,932
Bus	100	95,404	2,325	10,031	2,378	2,595	11,235	1,311	565	635	126,479
	200	2,319	227	478	17	16	82	44	4	0	3,187
	300	9,832	476	6,506	339	440	948	2,532	124	194	21,391
	400	2,435	17	378	528	229	74	9	628	339	4,637
	500	2,619	16	463	224	217	36	21	160	0	3,756
	600	11,190	80	969	74	35	16,414	69	54	0	28,885
	700	1,290	43	2,518	9	22	61	786	24	0	4,753
	800	575	4	127	612	157	48	19	286	0	1,828
	900	635	0	208	339	0	0	0	0	5	1,187
	Sub Total	126,299	3,188	21,678	4,520	3,711	28,898	4,791	1,845	1,173	196,103
Total	100	1,009,550	8,502	87,058	9,352	11,908	68,504	24,175	6,317	8,768	1,234,134
	200	8,490	7,092	1,626	211	403	1,436	1,373	154	162	20,947
	300	86,267	1,596	129,340	1,292	1,737	6,038	16,060	790	1,558	244,678
	400	9,315	209	1,401	10,809	6,998	2,323	1,305	7,218	3,500	43,078
	500	11,893	400	1,788	6,975	3,375	1,148	1,845	2,375	1,267	31,066
	600	68,228	1,420	6,118	2,342	1,096	53,287	2,402	1,116	1,659	137,668
	700	24,107	1,368	16,071	1,282	1,816	2,346	12,456	420	1,350	61,216
	800	6,161	152	844	7,109	2,361	1,110	400	2,752	619	21,508
	900	8,731	156	1,601	3,490	1,256	1,615	1,320	602	911	19,682
	Total	1,232,742	20,895	245,847	42,862	30,950	137,807	61,336	21,744	19,794	1,813,977

Source : JICA Survey Team

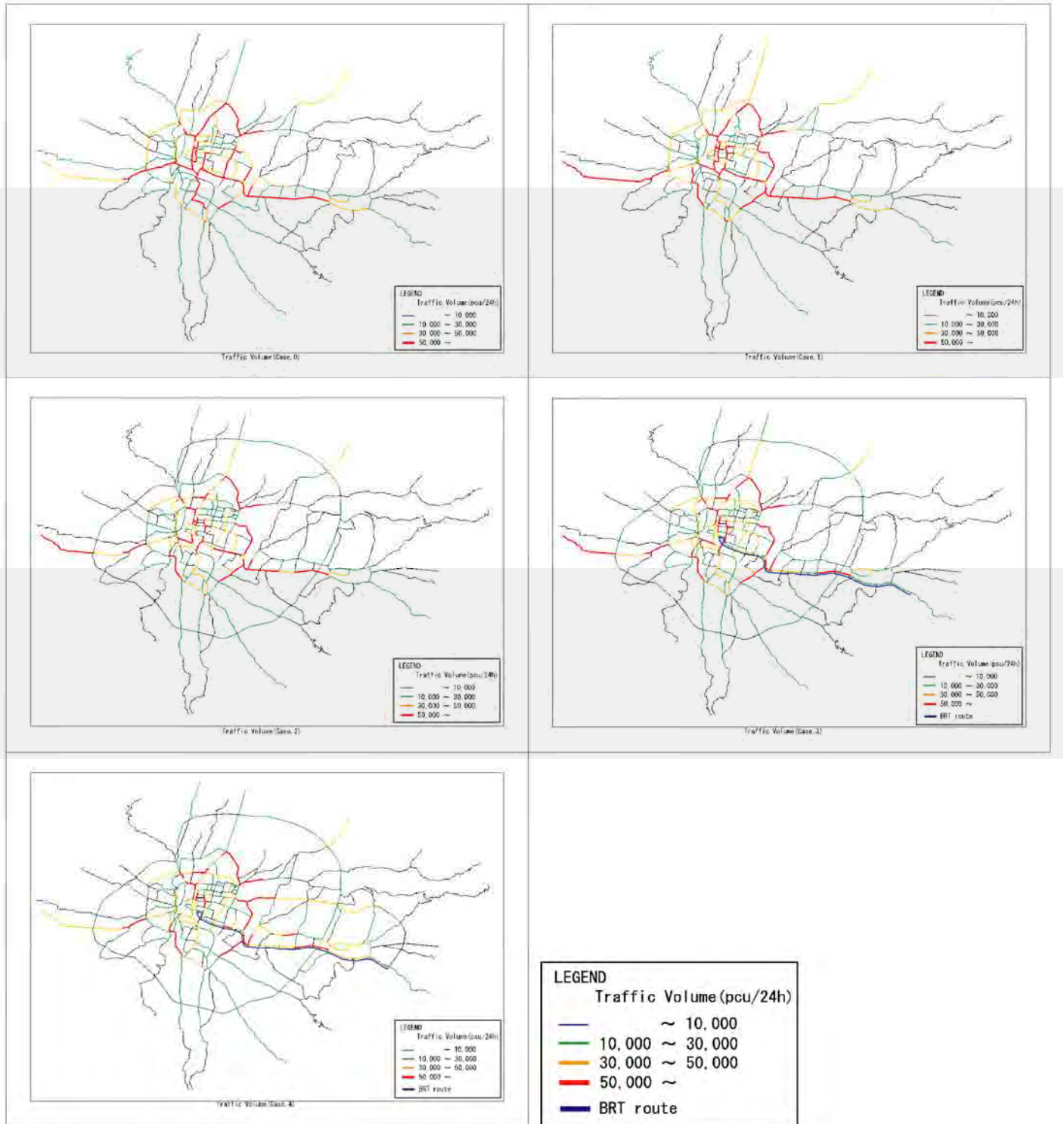
▼VTOD by type of vehicle (Case-4 in 2022)

unit: vehicles/day

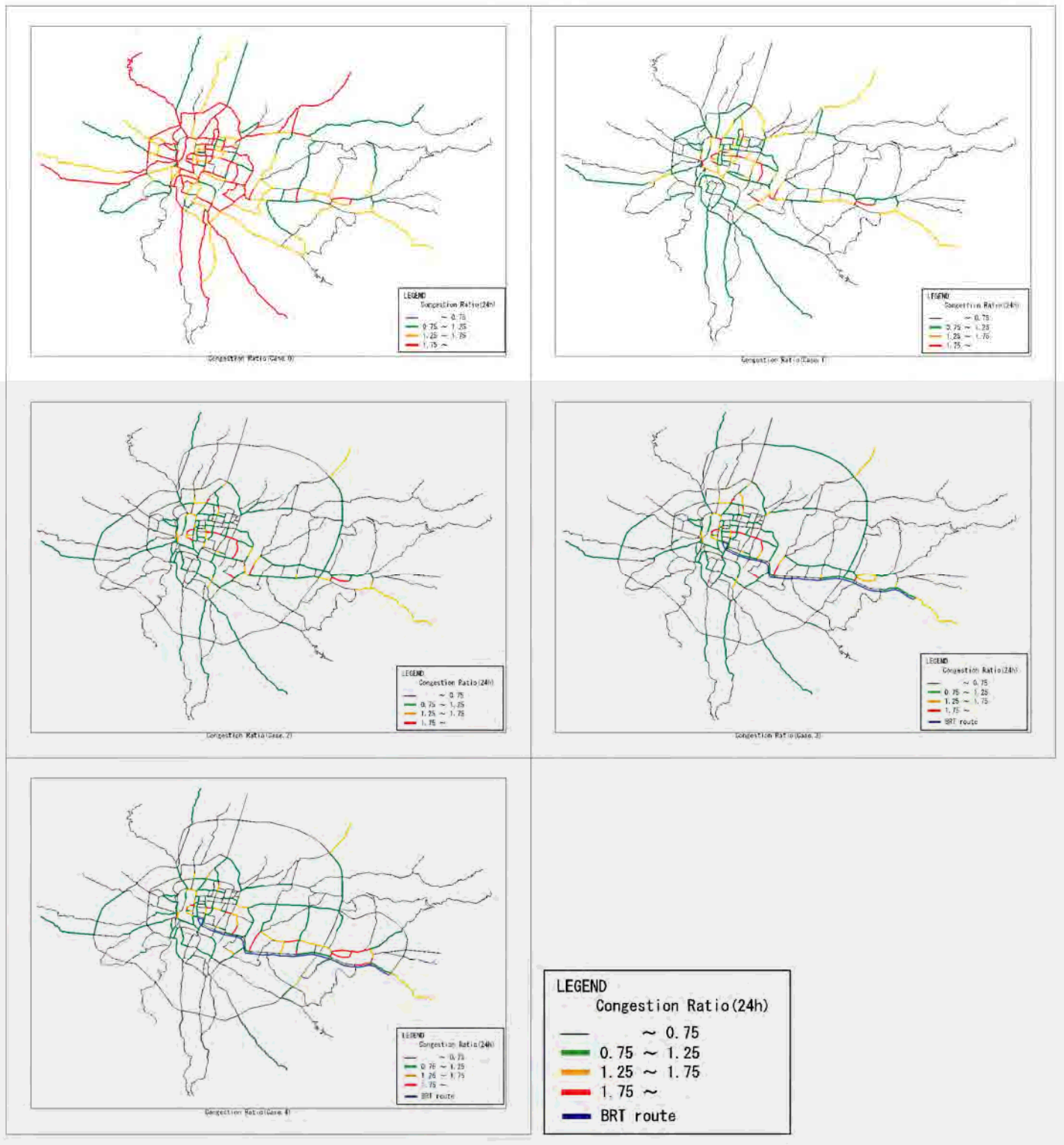
Mode	Large Zone	100	200	300	400	500	600	700	800	900	Total
Motorcycle	100	504,613	2,763	38,182	4,513	18,098	26,850	10,510	4,285	3,795	613,609
	200	2,754	5,099	448	416	1,338	955	772	53	59	11,894
	300	38,000	437	72,356	329	2,230	1,956	6,486	472	501	122,767
	400	4,511	414	327	23,426	14,268	1,561	1,337	15,792	511	62,147
	500	18,095	1,337	2,238	14,264	49,446	5,417	11,459	22,822	600	125,678
	600	26,831	951	1,977	1,553	5,413	18,810	1,251	2,061	691	59,538
	700	10,504	769	6,493	1,335	11,457	1,242	5,807	3,674	1,140	42,421
	800	4,274	53	479	15,789	22,821	2,059	3,672	26,464	270	75,881
	900	3,794	59	507	510	600	688	1,139	270	500	8,067
	Sub Total	613,376	11,882	123,007	62,135	125,671	59,538	42,433	75,893	8,067	1,122,002
Car	100	167,277	1,465	13,272	1,133	9,819	9,912	3,676	4,869	1,754	213,177
	200	1,457	140	299	589	303	121	211	10	19	3,149
	300	13,115	280	17,570	165	1,520	988	1,526	1,541	303	37,008
	400	1,136	584	170	4,693	2,219	1,095	186	3,883	182	14,148
	500	9,812	301	1,527	2,208	3,592	1,089	1,373	2,061	150	22,113
	600	9,891	119	1,005	1,086	1,081	5,258	274	387	315	19,416
	700	3,666	209	1,537	184	1,368	268	2,707	114	64	10,117
	800	4,855	10	1,544	3,873	2,057	385	112	607	56	13,499
	900	1,750	17	306	180	150	310	60	55	82	2,910
	Sub Total	212,959	3,125	37,230	14,111	22,109	19,426	10,125	13,527	2,925	335,537
Truck	100	61,705	320	9,999	1,309	1,151	9,400	2,084	553	2,483	89,004
	200	320	75	71	16	9	70	97	2	80	740
	300	9,994	71	7,714	158	123	972	1,620	56	549	21,257
	400	1,310	16	158	1,322	3,520	779	461	1,469	2,453	11,488
	500	1,151	9	123	3,519	64	126	176	396	496	6,060
	600	9,395	70	970	776	126	6,455	478	241	623	19,134
	700	2,083	97	1,620	461	175	476	1,104	61	93	6,170
	800	553	2	56	1,468	395	240	61	658	276	3,709
	900	2,483	80	550	2,453	495	618	91	276	324	7,370
	Sub Total	88,994	740	21,261	11,482	6,058	19,136	6,172	3,712	7,377	164,932
Bus	100	82,987	1,815	8,341	4,407	5,388	9,915	960	1,157	706	115,676
	200	1,812	202	398	48	51	76	31	38	0	2,656
	300	8,232	397	5,425	569	804	643	1,803	110	206	18,189
	400	4,391	46	583	371	242	489	127	1,120	380	7,749
	500	5,378	49	825	237	445	423	189	380	0	7,926
	600	9,886	70	654	476	411	14,946	51	571	0	27,065
	700	942	31	1,803	125	185	47	645	290	0	4,068
	800	1,145	35	120	1,112	376	565	285	985	0	4,623
	900	702	0	213	380	0	0	0	0	5	1,300
	Sub Total	115,475	2,645	18,362	7,725	7,902	27,104	4,091	4,651	1,297	189,252
Total	100	816,582	6,363	69,794	11,362	34,456	56,077	17,230	10,864	8,738	1,031,466
	200	6,343	5,516	1,216	1,069	1,701	1,222	1,111	103	158	18,439
	300	69,341	1,185	103,065	1,221	4,677	4,559	11,435	2,179	1,559	199,221
	400	11,348	1,060	1,238	29,812	20,249	3,924	2,111	22,264	3,526	95,532
	500	34,436	1,696	4,713	20,228	53,547	7,055	13,197	25,659	1,246	161,777
	600	56,003	1,210	4,606	3,891	7,031	45,469	2,054	3,260	1,629	125,153
	700	17,195	1,106	11,453	2,105	13,185	2,033	10,263	4,139	1,297	62,776
	800	10,827	100	2,199	22,242	25,649	3,249	4,130	28,714	602	97,712
	900	8,729	156	1,576	3,523	1,245	1,616	1,290	601	911	19,647
	Total	1,030,804	18,392	199,860	95,453	161,740	125,204	62,821	97,783	19,666	1,811,723

Source : JICA Survey Team

Appendix2.2.8 Forecasted Future Traffic Volume of Roads for Case 0-4 (in 2022)



Appendix 2.2.9 Forecasted Future Congestion Ratio of Roads for Case 0-4 (in 2022)



APPENDIX3 ROAD INVENTORY SURVEY

Appendix 3.1 Field Survey Sheet for Road Inventory Survey

Road Inventory Survey

Name of Road (Road No.): _____

Surveyor1 :

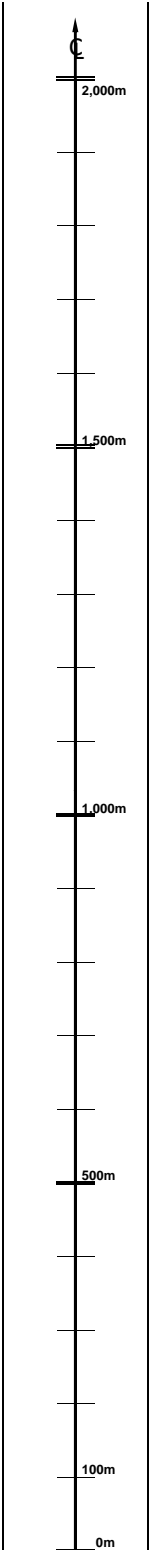
Surveyor2 :

Surveyor3 :

Sheet No. /

Date:

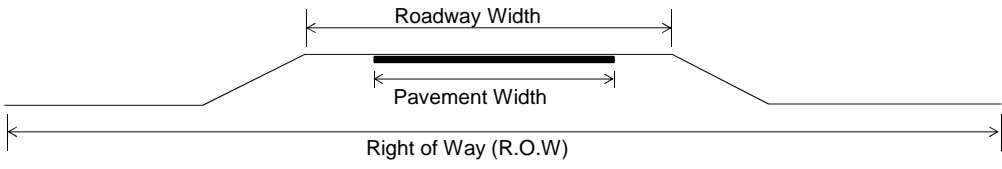
Road Condition



Type of Pavement	Roadway Width	Pavement Width	Median Strip Width	Pavement Condition
Select from following: A : Asphalt G : Gravel E : Earthen	(m)	(m)	(m)	Select from following: G : Good F : Fair B : Bad

- Items of Requirement
1. Type of Pavement
 2. Roadway Width
 3. Pavement Width
 4. Pavement Condition
 5. Link No.
 6. Bridge & Boxculvert
 - Station
 - Type
 - Length
 - Width
 7. Sight Distance
 8. Condition of Traffic Control
 9. Parking Place
 - Bus
 - Taxi
 - Tempo

Start from _____
(Mileage : _____)



Appendix 3.2 Measurement Items

(1) Road Inventory Survey

In this survey, following items were obtained.

(a) Road Width (Roadway Width, Pavement Width)

The measurement work was conducted by using measuring tapes. The road width was obtained at each 100m interval along target roads and the definition of road width is shown in the following figure.

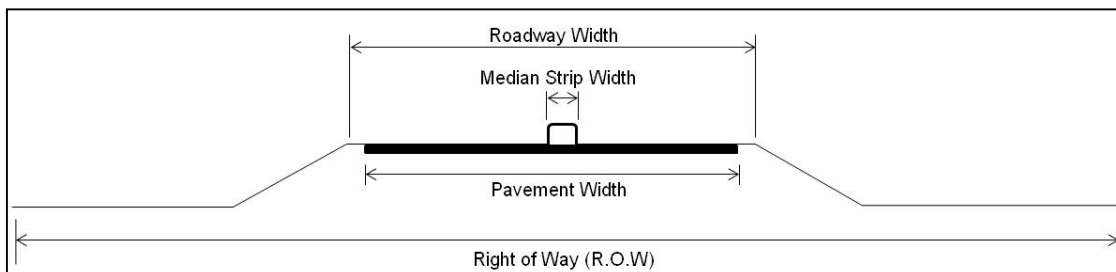


Fig. 3.2.1 Definition of Measurement Items for Road Inventory Survey

(b) Pavement (Pavement Type, Pavement Condition)

Based on visual observation, pavement type and pavement condition were classified into Asphalt, Gravel or Earthen and Good, Fair or Bad respectively at each 100m interval along target roads. The criteria of judgment of pavement condition for Asphalt type of pavements are shown in the table below. The pavement condition for Gravel and Earthen was judged as Bad condition.

Table 3.2.1 Criteria of Judgment of Distress Classification for Asphalt pavement type

Distress Classification	Observed Incidences
Good	When the existing road is smooth and has no potholes visible is recorded as good. The surface does feel comfortable to the vehicles plying over it having good riding quality.
Fair	When existing road is smooth but has few potholes visible is recorded as fair. The surface does feel uncomfortable a bit to the vehicles plying over it.
Bad	When existing road has more potholes and surface undulation visible is recorded as bad. The surface does feel uncomfortable to the vehicles plying over it.

(c) Bridge and Box Culvert (Length, Width)

The location of Bridge and Box Culvert including measurement of Length and Width was recorded with the checking at each 100m interval along target roads.

(d) Sight Distance (Location of Short Sight Distance)

The location where the sight distance is too short, such as a traffic choke point which has sharp curves, was recorded by visual observation at each 100m interval along target roads.

(e) Condition of Traffic Control

The condition of traffic control which is one way system or two ways, was recorded at each 100m interval along target roads.

(f) Parking Place

Parking Place for Bus, Taxi and Tempo which is in roadside of target routes was recorded at each 100m interval.

(2) Roadside Condition Survey

In this survey, Number of Houses encroached inside Right of Way was counted at every 100m intervals of National Highways and Feeder Roads by using Satellite Image Map in Auto CAD Application. The Right of Way Width of National Highway and Feeder Road were defined as 25m and 15m respectively from the road center in accordance with NEPAL ROAD STANDARDS (2027).

Furthermore, River Width, Land Clearance and Number of Houses within 30m from the center of the target river were obtained at every 50m intervals by using Satellite Image Data as same above. The definition of each measurement item is shown in the figure below.

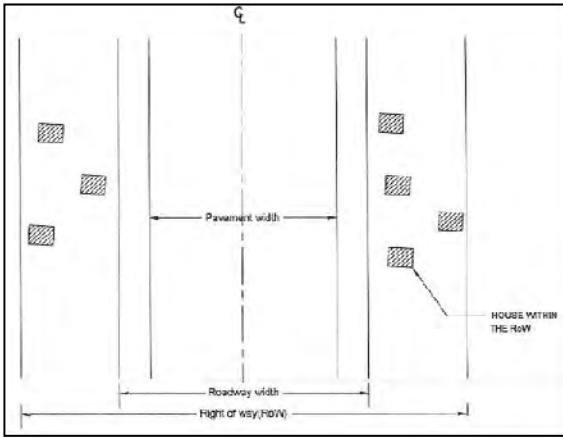
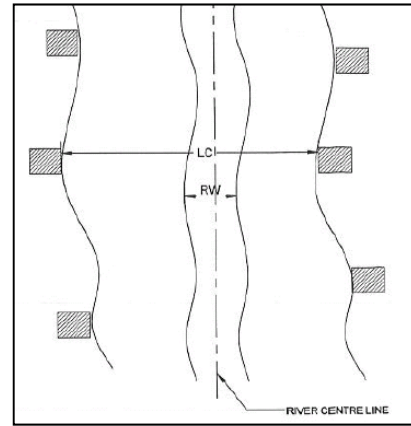
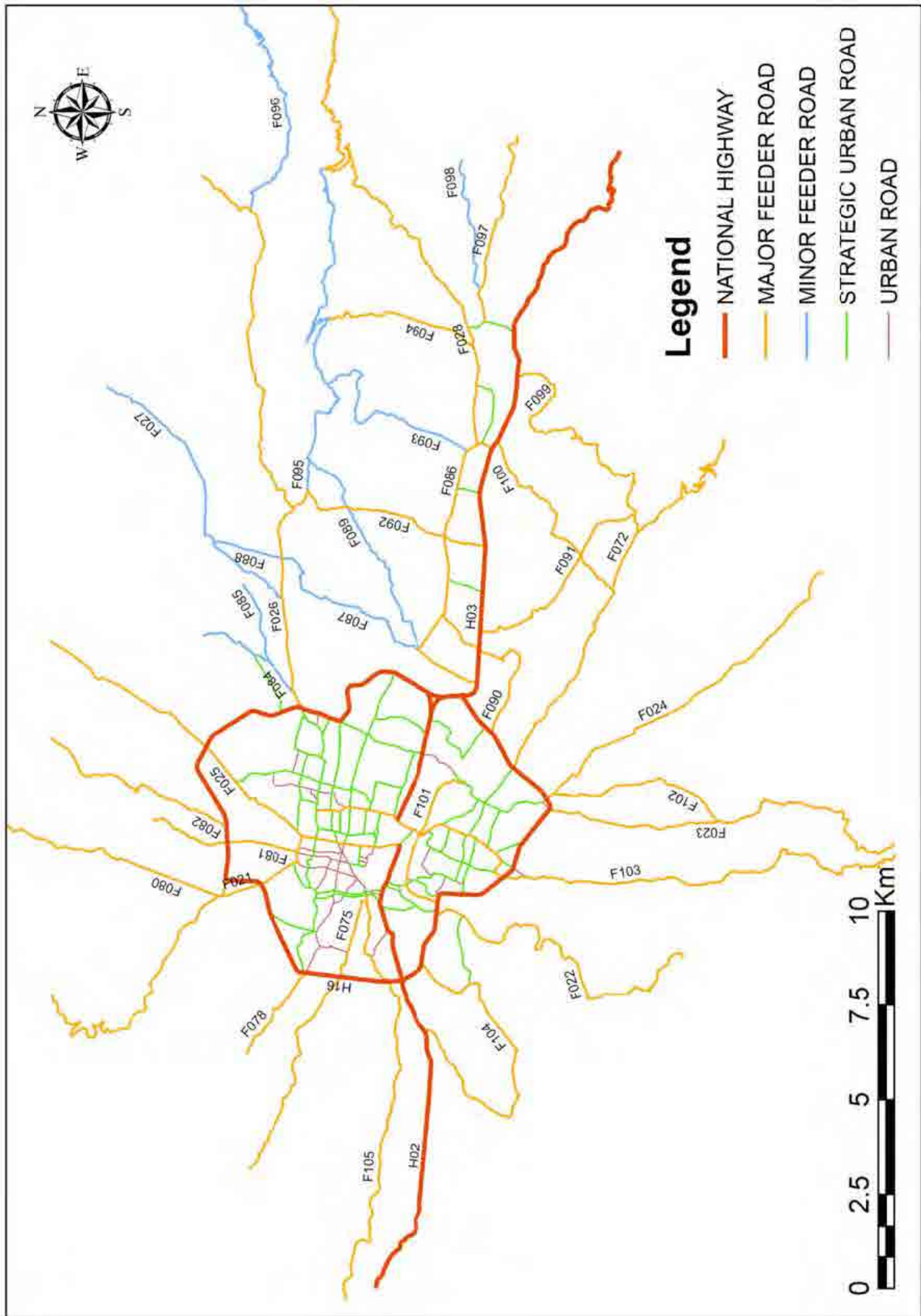


Fig. 3.2.2 Roadside Condition Survey Cross Section

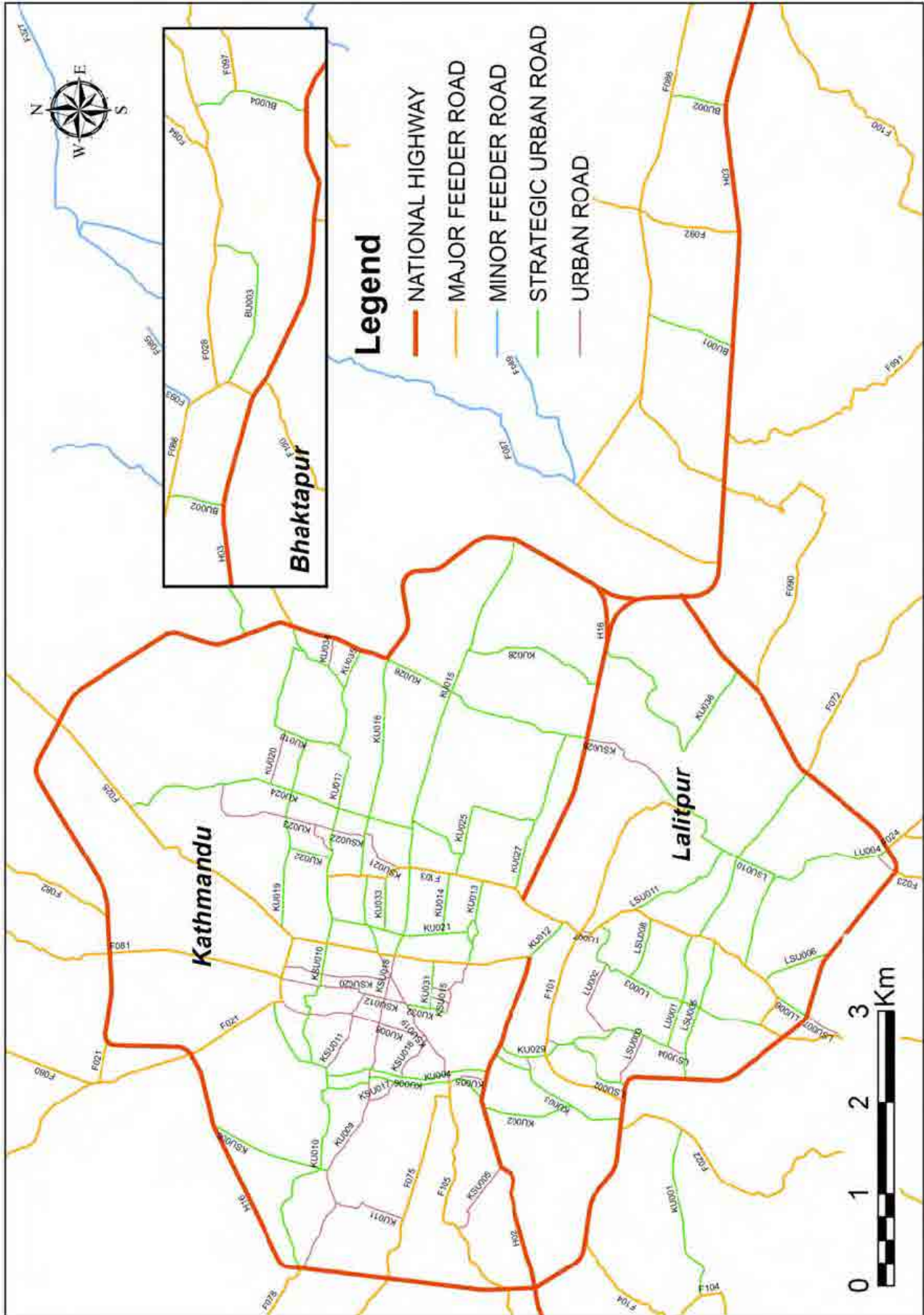


RW=River Width, LC=Land Clearance
Fig. 3.2.3 River Corridor Cross Section

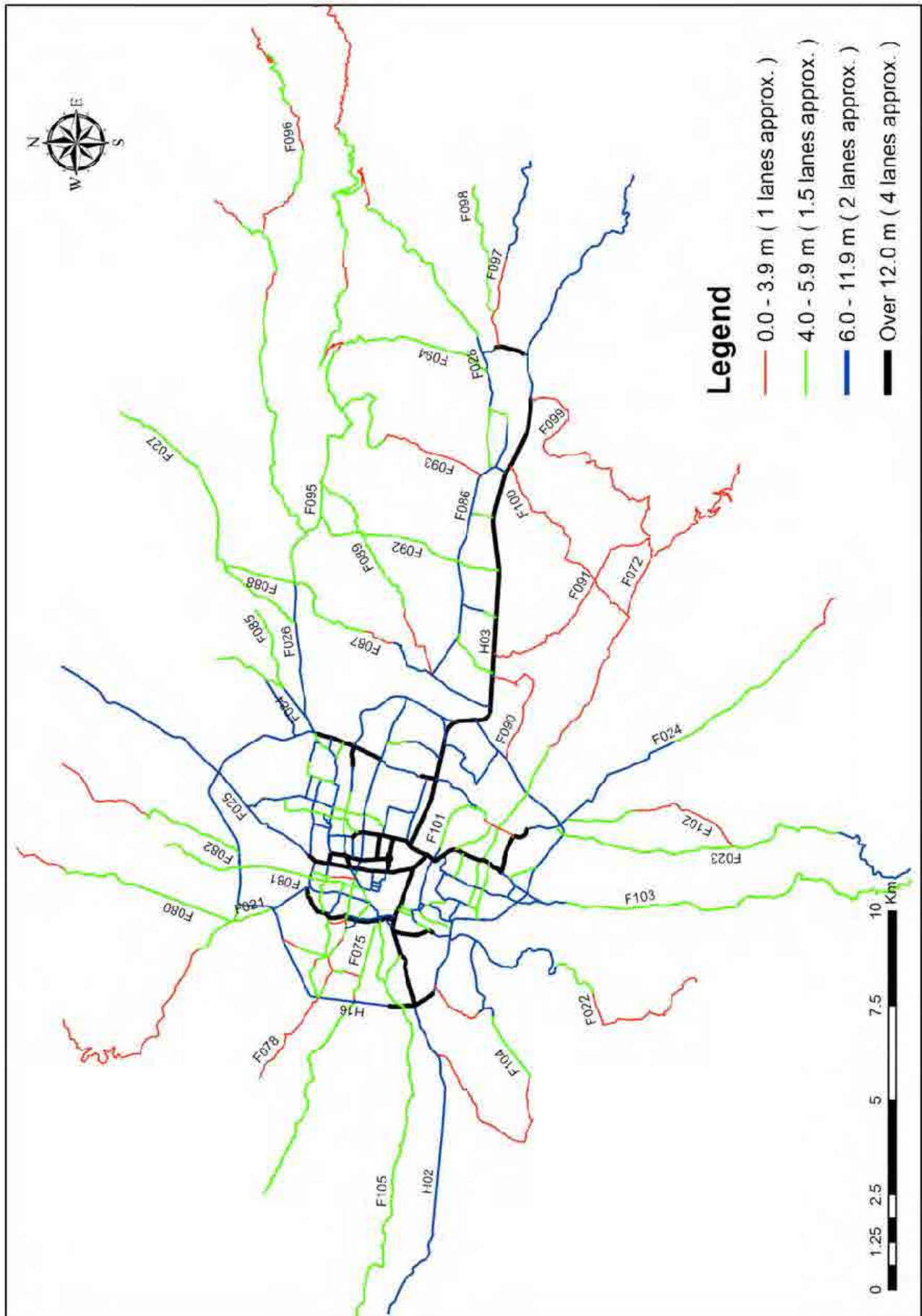
Appendix 3.3 Target road classified by road classification within Kathmandu Valley



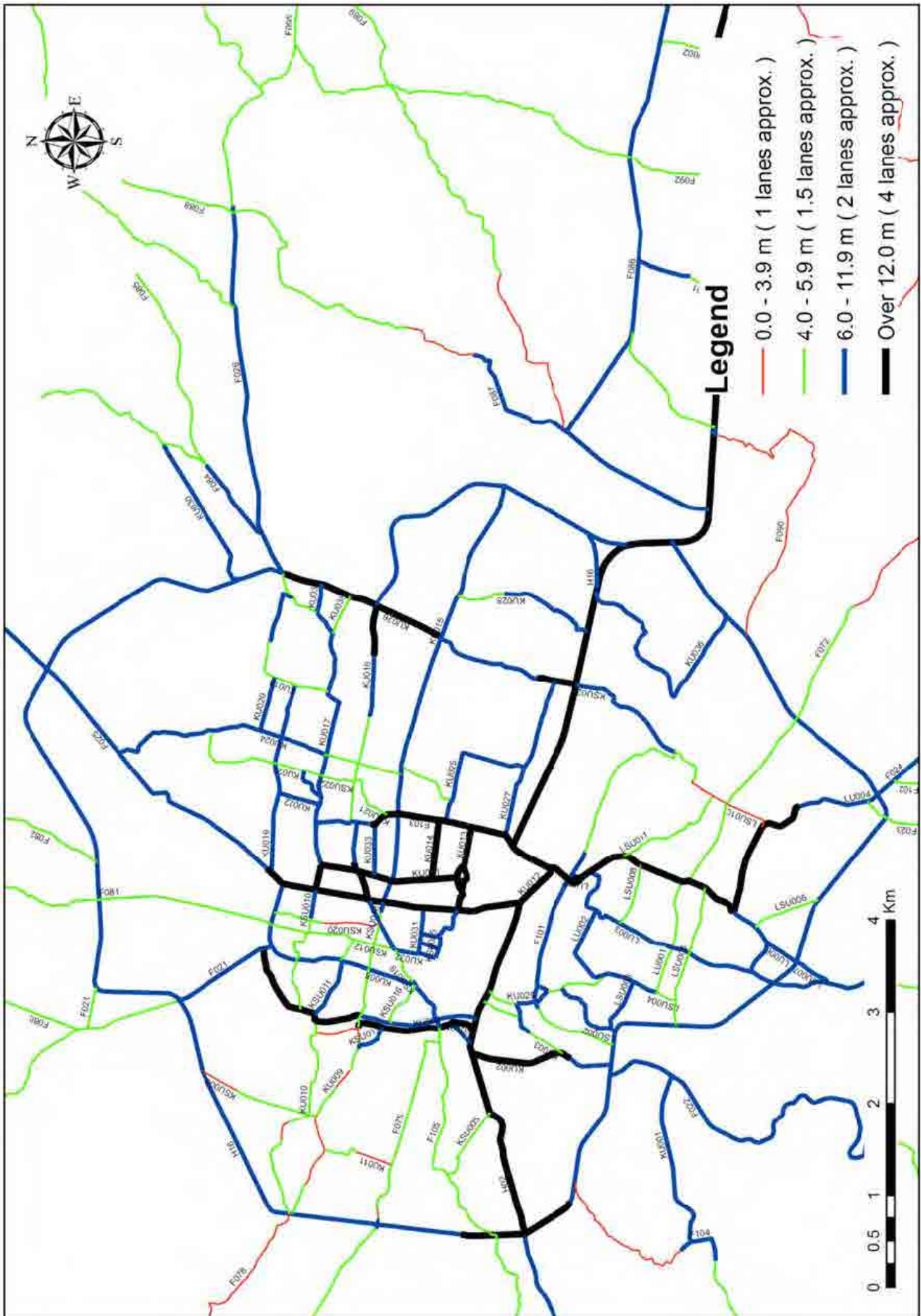
Appendix 3.4 Target road classified by road classification within KMC, LSMC and BMC



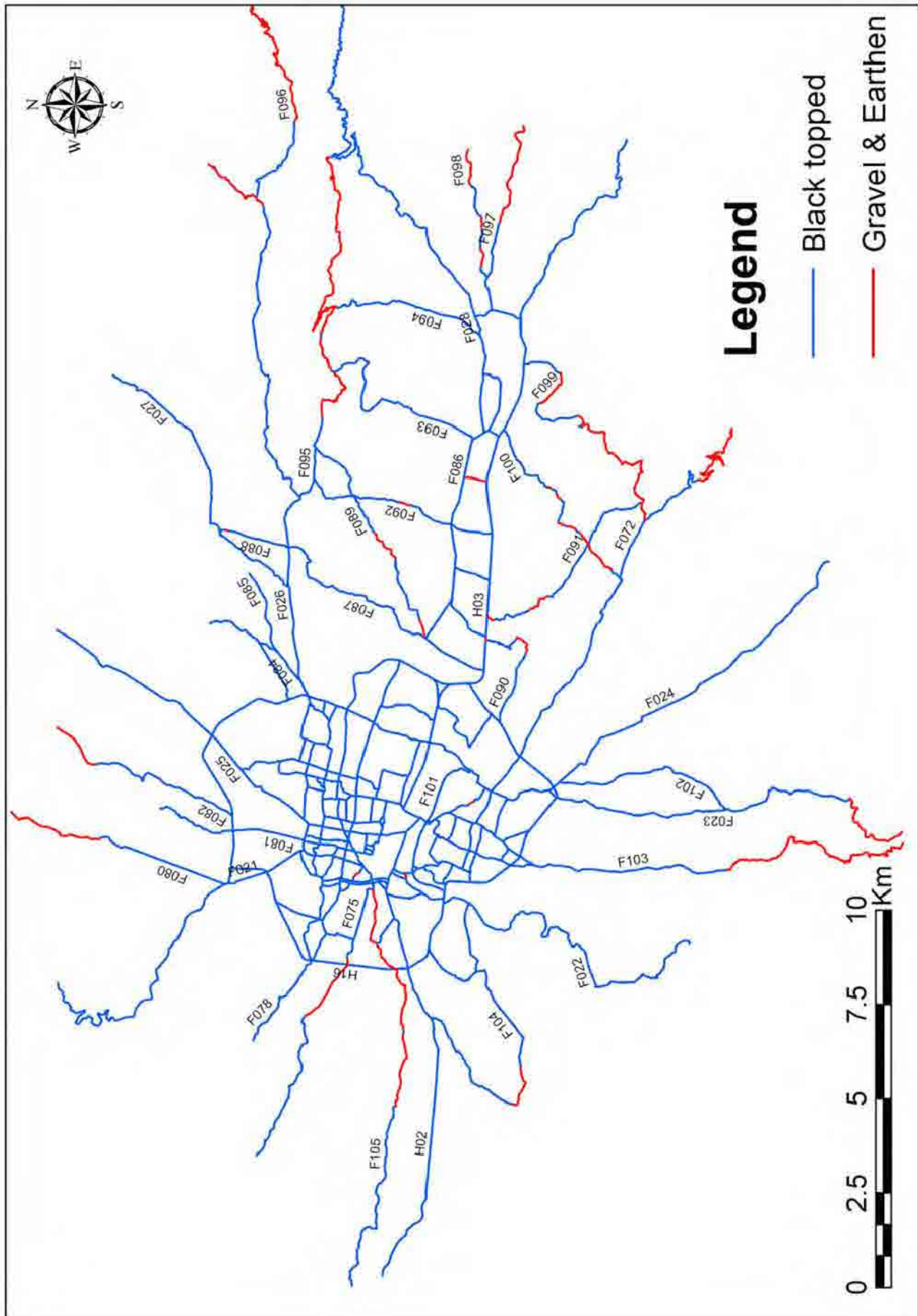
Appendix 3.5 Target road classified by pavement width within Kathmandu Valley



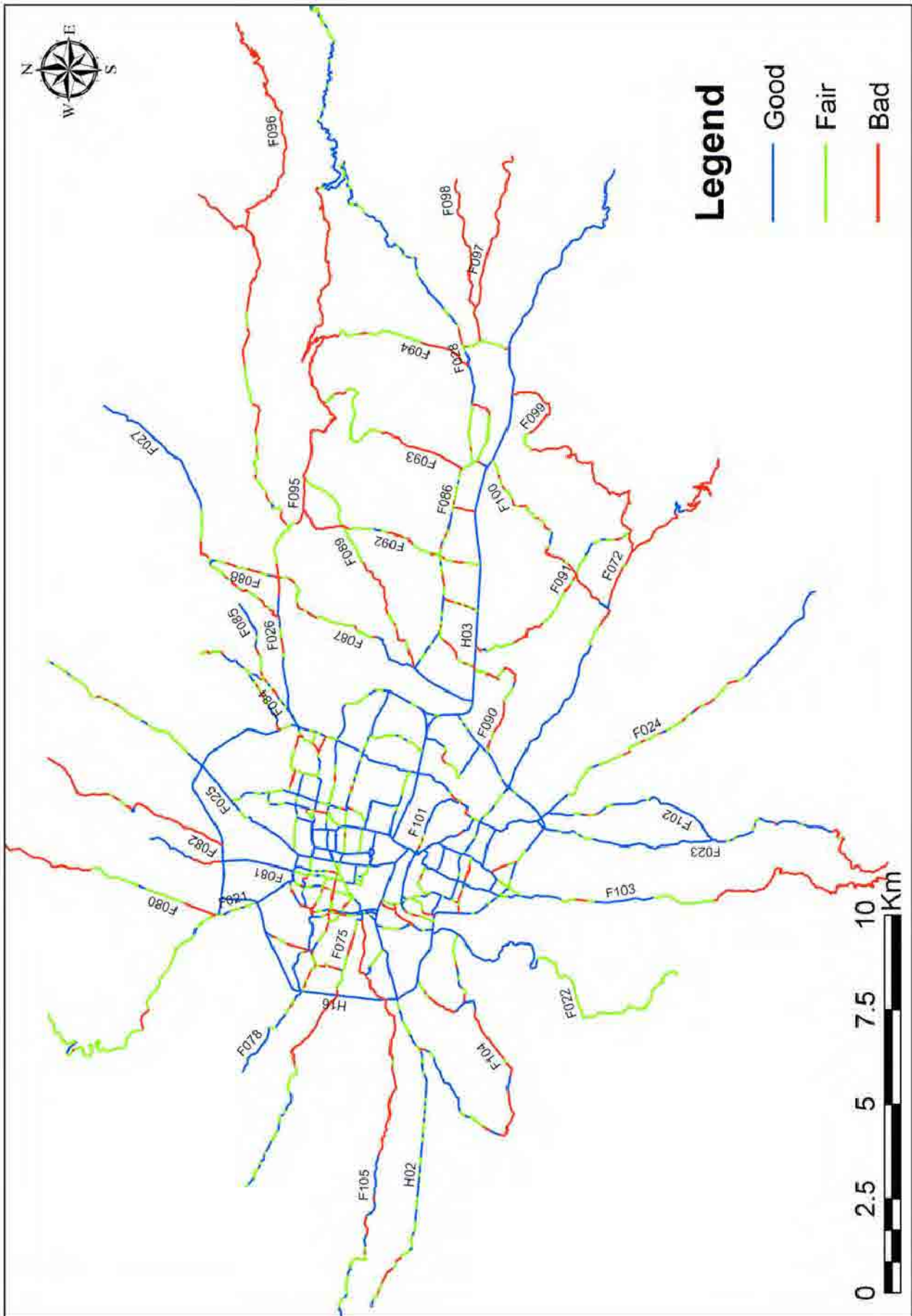
Appendix 3.6 Target road classified by pavement width within KMC and LSMC



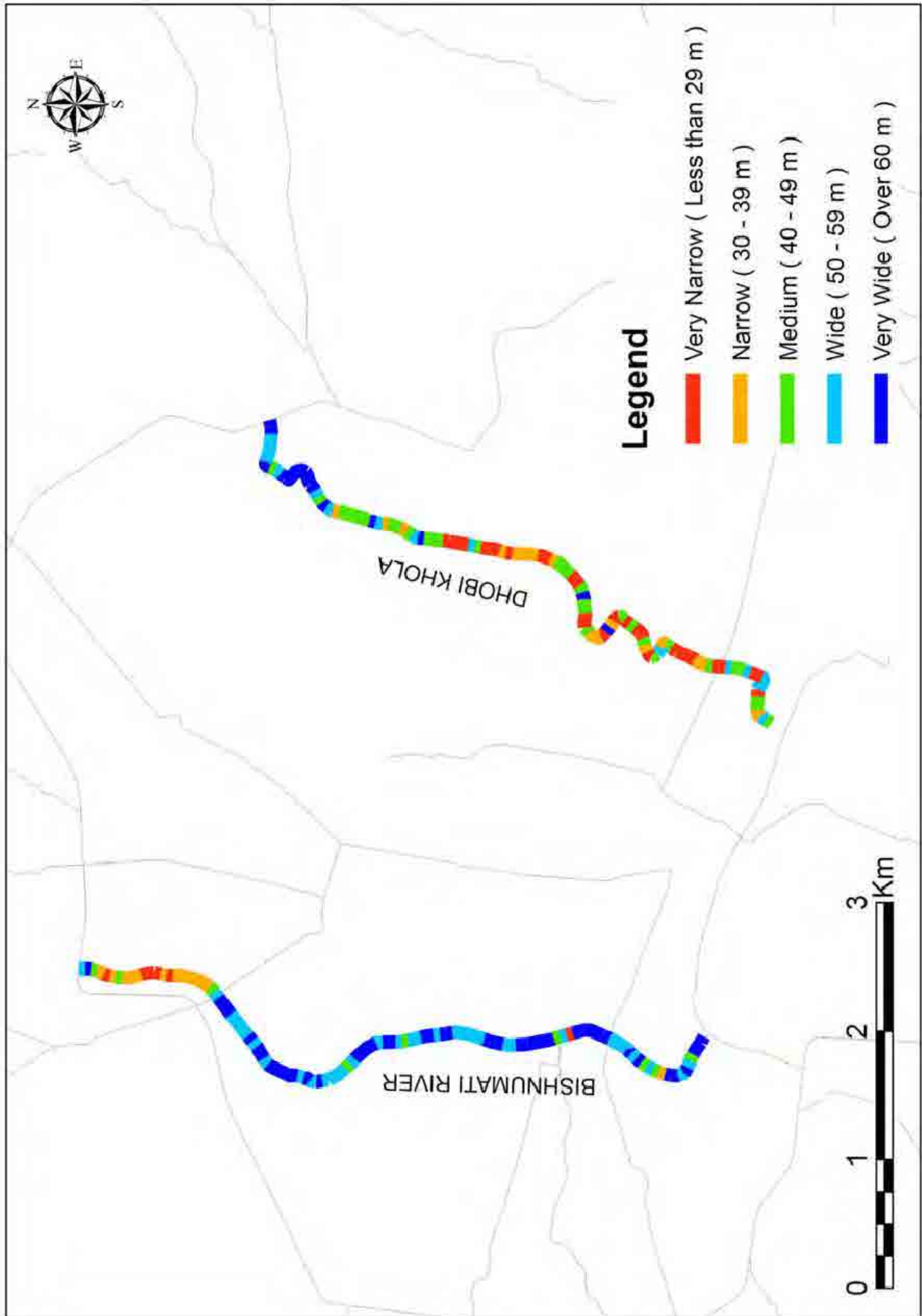
Appendix 3.7 Target road classified by pavement type



Appendix 3.8 Target road classified by pavement condition



Appendix 3.10 Target river corridor classified by width of land clearance



Appendix 3.11 Characteristics for All Target Road

Route No.	Name of Road	Lane No. Based on Pavement Width Approx.	Ave. Pavement Width (m)	Pavement Type				Pavement Condition			House within R.O.W		Bridge (No.)	Box Culvert (No.)	Pavement Slab Edge Damage (No.)	Condition of Traffic Control*			Parking Place			Location of Start	Location of End	
				BT (km)	GR (km)	ER (km)	Total (km)	Good (km)	Fair (km)	Bad (km)	Total No.	No. per km				↓ (km)	↑ (km)	↑ ↓ (km)	Bus (No.)	Taxi (No.)	Tempo (No.)			
National Highway	H02	Tribuvan Highway	4	9.87	12.1	0.0	0.0	12.1	7.5	3.8	0.8	935	77	2	0	0	0.0	0.0	12.1	10	1	3	Tripureswor Kalanki	Kalanki
	H03	Amiko Highway	4	14.74	18.7	0.0	0.0	18.7	18.7	0.0	0.0	230	12	5	3	1	0.0	0.0	18.7	20	0	0	Maitighar Suryabinayak	Suryabinayak Sanga
	H16	Ring Road	2 ~ 4	11.28	27.6	0.0	0.0	27.6	24.1	3.5	0.0	210	8	9	0	0	0.0	0.0	27.6	15	3	7	Kalanki	Kalanki
Major Feeder Road	F021	Trisuli Road	1 ~ 2	4.86	11.6	0.0	0.0	11.6	2.7	8.1	0.8	336	29	1	2	18	0.0	0.0	11.6	10	3	3	Lainchaur	Tinpple Bus Stop
	F022	Dakshinkali Road	2	5.33	10.1	0.0	0.0	10.1	4.3	5.8	0.0	341	34	0	2	18	0.0	0.0	10.1	9	9	0	Balkhu Chobhar	Chobhar Bansbari
	F023	Chapagaun Road	1 ~ 2	5.65	8.6	2.6	0.0	11.2	7.3	1.1	2.8	707	63	0	0	6	0.0	0.0	11.2	2	1	2	Satdobato	Tkabhairav
	F024	Godawari Road	1 ~ 2	4.98	9.5	0.0	0.0	9.5	4.2	4.0	1.3	698	73	1	1	0	0.0	0.0	9.5	2	0	0	Satdobato	Godawari
	F025	Budhanilkantha Road	2 ~ 4	8.98	10.8	0.0	0.0	10.8	6.5	4.0	0.3	726	67	0	0	0	0.0	1.0	9.8	34	5	23	Tripureswor Lainchaur	Lainchaur Budanilkantha
	F026	Sankhu Road	1.5 ~ 2	5.98	13.4	2.1	0.0	15.5	2.7	4.7	8.1	1028	66	4	8	17	0.0	0.0	15.5	7	8	0	Chabahil Bagmati River	Bagmati River Lapsephedi
	F028	Nagarkot Road	1 ~ 2	4.28	18.0	0.0	0.0	18.0	12.3	5.2	0.5	507	28	0	1	0	0.0	0.0	18.0	4	0	0	Salaghari	Nagarkot
	F072	Lubhu Road	1 ~ 1.5	3.96	9.3	0.0	3.9	13.2	5.2	0.7	7.3	617	47	2	0	0	0.0	0.0	13.2	2	0	0	Gwarko	Lakuri Bhanjyang
	F075	Bhimdhunga Road	1 ~ 2	5.11	6.1	1.9	0.0	8.0	1.9	3.1	3.0	522	65	0	3	12	0.0	0.0	8.0	2	1	0	Tankeswor	Bhimdhungga
	F078	Hal Chok - Narayanthan Road	1	3.94	2.7	0.0	0.0	2.7	2.1	0.5	0.1	142	53	0	1	8	0.0	0.0	2.7	2	2	0	Swayambhu	Narayanthan
	F080	Phutung Road	1 ~ 2	5.24	3.6	2.6	0.0	6.2	0.2	2.5	3.5	557	90	1	0	0	0.0	0.0	6.2	5	1	0	Balaju	Chunigaon
	F081	Lainchaur - Samakhushi Chok - Baniyatar Road	1.5 ~ 2	5.51	4.1	0.0	0.0	4.1	3.3	0.0	0.8	596	145	2	0	4	0.0	0.2	3.9	2	2	0	Lainchaur	Baniyatar
	F082	Tokha Road	1 ~ 1.5	4.83	4.1	1.5	0.0	5.6	0.2	0.3	5.1	414	74	1	0	3	0.0	0.0	5.6	2	2	0	Samakhushi Chowk	Chandesh warigaon
	F086	Thimi Road	2	6.95	7.5	0.0	0.0	7.5	3.9	2.7	0.9	738	98	2	2	0	0.0	0.0	7.5	4	0	0	Jadibuti	Salaghari
	F090	Dharmeshwar - Tikathali - Manohara - Lokanthali - Thimi Road	1 ~ 1.5	4.01	4.2	0.6	0.1	4.9	0.1	1.9	2.9	354	72	2	0	3	0.0	0.0	4.9	0	0	0	Balkumari	Sano Thimi
	F091	Kausaltar - Balkot - Sirutar - Chamelidada Road	1	3.55	4.0	0.2	0.6	4.8	0.5	2.7	1.6	354	74	1	1	0	0.0	0.0	4.8	0	0	0	Kausaltar	Chamelidada
	F092	Thimi - Mulpani Road	1 ~ 1.5	4.43	5.2	0.3	0.0	5.5	0.2	2.4	2.9	342	62	1	0	0	0.0	0.0	5.5	0	0	0	Thimi	Mulpani
	F094	Byasi - Changunarayan Road	1.5	4.64	6.0	0.0	0.0	6.0	0.0	3.1	2.9	171	29	0	0	0	0.0	0.0	6.0	0	0	0	Chocckhen	Sangdaha
	F097	Bhaktapur - Nala - Banepa Road	1 ~ 2	4.86	2.6	3.3	0.0	5.9	0.0	0.0	5.9	279	47	0	1	0	0.0	0.0	5.9	0	0	0	Kamalbinayak	Amaldol
	F099	Suryabinayak - Chamelidada - Bhujunge Road	1	3.76	2.8	5.7	0.0	8.5	0.0	0.5	8.0	508	60	2	0	0	0.0	0.0	8.5	0	0	0	Suryabinayak	Bhujunge
	F100	Salaghari - Katunje - Sumlingtar Road	1	2.83	3.3	0.0	2.1	5.4	0.6	1.9	2.9	292	54	1	3	0	0.0	0.0	5.4	0	0	0	Salaghari	Lubhu
F101	Balkhu - UN Park Lane - Shankhamul	1.5 ~ 2	6.14	4.1	0.0	0.0	4.1	2.9	0.7	0.5	128	31	0	0	0	0.0	0.0	4.1	0	0	0	Balkhu	Shankhamul	
F102	Satdobato - Dhapakhel - Thecho Road	1 ~ 1.5	4.24	4.9	0.0	0.0	4.9	4.0	0.7	0.2	307	63	0	1	0	0.0	0.0	4.9	0	0	0	Satdobato	Thecho	
F103	Bungmati Road	2 ~ 4	7.39	12.0	6.2	0.0	18.2	9.2	2.5	6.5	899	49	2	0	31	0.0	0.0	18.2	7	6	4	Hattisar Bungamati	Bhaisepati Bungamati	
F104	Kashibazar - Kirtipur - Machhegaun - Tinthana Road	1 ~ 2	4.36	8.3	1.2	0.0	9.5	3.4	1.4	4.7	705	74	2	0	14	0.0	0.0	9.5	5	5	1	Nariwalphamt	Tinthana	
F105	Nagdhunga - Tankeswor Road	1 ~ 2	5.11	5.3	5.9	0.0	11.2	2.4	1.7	7.1	590	53	0	4	0	0.0	0.0	11.2	0	0	0	Tankeswor	Nagdhunga	
Minor Feeder Road	F027	Sundarijal Road	1 ~ 1.5	4.67	7.0	0.0	0.0	7.0	3.5	1.9	1.6	579	83	3	3	0	0.0	0.0	7.0	17	2	0	Jorpati	Sundarijal
	F084	Chuchepati - Mahankal - Kapan - Dandagaun Road	2	6.37	3.1	0.0	0.0	3.1	1.3	1.3	0.5	281	91	0	0	2	0.0	0.0	3.1	2	1	0	Chuche Pati Mahankal	Mahankal Kapan
	F085	Mahankal - Atterkhel Road	1.5 ~ 2	5.97	2.1	0.0	0.0	2.1	1.1	0.6	0.4	185	88	0	0	0	0.0	0.0	2.1	1	1	0	Mahankal	Tinchuli
	F087	Pepsikola - Gothatar Road	1 ~ 2	5.64	2.7	0.0	0.0	2.7	1.2	1.3	0.2	31	11	0	0	0	0.0	0.0	2.7	3	2	2	Sinamangal	Gothatar
	F088	Gokarna - Jorpati - Gothatar	1.5 ~ 2	5.89	3.7	0.1	0.0	3.8	0.3	1.6	1.9	165	43	0	0	0	0.0	0.0	3.8	2	0	0	Gokarna	Gothatar
	F089	Pepsikola - Karkigaun Road	1 ~ 2	5.24	5.2	1.6	0.0	6.8	0.0	3.9	2.9	396	58	0	2	0	0.0	0.0	6.8	8	0	0	Sinamangal	Phuyalgaon
	F093	Salaghari - Duwakot-Changunarayan Road	1 ~ 1.5	4.17	4.7	0.0	0.0	4.7	0.0	2.4	2.3	384	82	0	0	0	0.0	0.0	4.7	0	0	0	Nekosera	Changu
	F095	Mulpani - Sangdaha - Changunarayan - Tikot Road	1 ~ 1.5	4.39	1.7	9.8	0.0	11.5	0.0	0.0	11.5	283	25	0	0	0	0.0	0.0	11.5	0	0	0	Mulpani	Tikot
F096	Sankhu - Kattike	1 ~ 1.5	4.27	2.5	5.0	0.0	7.5	0.0	0.0	7.5	234	31	2	1	0	0.0	0.0	7.5	0	0	0	Sankhu	Kattike	
F098	Kamalbinayak - Sudal - Adikarigaun Road	1 ~ 2	5.24	2.6	2.8	0.0	5.4	0.0	0.0	5.4	185	34	1	0	0	0.0	0.0	5.4	0	0	0	Kamalbinayak	Sudal	
KMU	KMU001	TU Gate - Naya Bazar (TU Road)	2	7.39	1.7	0.0	0.0	1.7	0.4	1.0	0.3	No Data	0	0	0	0.0	0.0	1.7	0	0	0	TU Gate	Naya Bazar	
	KMU002	Kalimati - Balkhu (TU Road)	2 ~ 4	12.33	1.7	0.0	0.0	1.7	1.0	0.7	0.0	No Data	0	0	0	0.0	0.0	1.7	0	0	0	Kalimati	Balkhu	
	KMU003	Teku - Kuleshwar	1.5	5.92	1.0	0.0	0.0	1.0	0.0	0.0	1.0	No Data	1	0	0	0.0	0.0	1.0	0	0	0	Teku	Kuleshwar	
	KMU004	Kalimati - Bijeshwari - Sorhakutte	2 ~ 4	11.99	3.5	0.0	0.0	3.5	1.2	1.0	1.3	No Data	0	0	0	0.0	0.0	3.5	0	0	0	Kalimati	Sorhakutte	
	KMU006	Kalimati Bridge - Puspapal Path	1 ~ 4	9.50	1.8	0.0	0.0	1.8	1.3	0.2	0.3	No Data	0	0	0	0.0	0.0	1.8	0	0	0	Kalimati Bridge	Indrani Temple	
	KMU007	Naya Bazar - Puspapal Path Junction	1.5 ~ 2	6.56	1.5	0.2	0.0	1.7	0.7	0.4	0.6	No Data	0	0	0	0.0	0.0	1.7	0	0	0	Naya Bazar	Puspapal Path Junction	
	KMU010	Swoyambhu Nath - Swoyambhu Marg	1.5	5.03	2.1	0.0	0.0	2.1	1.8	0.1	0.2	No Data	0	0	0	0.0	0.0	2.1	0	0	0	Swoyambhu Nath	Bijeshwari	
	KMU012	Tipura Marga	4	17.52	0.5	0.0	0.0	0.5	0.5	0.0	0.0	No Data	0	0	0	0.0	0.0	0.5	1	0	0	Tripureswor	Thapathali	
	KMU013	Prithvi Path	4	17.78	0.9	0.0	0.0	0.9	0.9	0.0	0.0	No Data	0	0	0	0.0	0.0	0.5	0.4	0	0	0	Singha Durbar	Sundhara
	KMU014	Exhibition Road	4	12.00	0.5	0.0	0.0	0.5	0.5	0.0	0.0	No Data	1	0	0	0.0	0.0	0.5	0	0	0	Padmodaya Junction	Durbar Murg Junction	
	KMU015	Sinamangal Road - Dilli Bazar Road - Bag Bazar Road - Ratnapark Road	2	7.93	4.2	0.0	0.0	4.2	2.5	1.5	0.2	No Data	2	0	0	0.0	0.0	4.2	0	0	0	Sinamangal	Bhotahiti	
	KMU016	Gyaneshwor Road	1.5 ~ 4	9.91	3.0	0.0	0.0	3.0	1.9	0.9	0.2	No Data	1	0	0	0.0	0.0	3.0	0	0	0	Gaushala	Jamal	
	KMU017	Chabahil - Narayanhiti Path	1.5 ~ 2	7.75	3.5	0.0	0.0	3.5	2.3	0.8	0.4	No Data	1	0	0	0.0	0.0	3.5	0	0	0	Chabahil	Kanti Path Junction	
	KMU018	Chabahil - Handigaun Marg - Gyaneshwor	1.5 ~ 2	5.55	2.2	0.0	0.0	2.2	0.0	1.6	0.6	No Data	1	0	0	0.0	0.0	2.2	0	0	0	Chabahil	Gyaneshwor	
	KMU019	Gairidhara Road - Uttar Dhoka Road	2	7.72	1.3	0.0	0.0	1.3	0.6	0.7	0.0	No Data	1	0	0	0.0	0.0	1.3	0	0	0	Maligaon	Budhanilkantha Road Junction	
	KMU021	Durbar Marg	4	15.37	1.6	0.0	0.0	1.6	1.6	0.0	0.0	No Data	0	0	0									

Appendix 3.11 Characteristics for All Target Road

Route No.	Name of Road	Lane No. Based on Pavement Width Approx.	Ave. Pavement Width (m)	Pavement Type				Pavement Condition			House within R.O.W		Bridge (No.)	Box Culvert (No.)	Pillar (per Span) Distance (No.)	Condition of Traffic Control*			Parking Place			Location of Start	Location of End
				BT (km)	GR (km)	ER (km)	Total (km)	Good (km)	Fair (km)	Bad (km)	Total No.	No. per km				↓ (km)	↑ (km)	↑↓ (km)	Bus (No.)	Taxi (No.)	Tempo (No.)		
Strategic-Urban Road	KMU026	Pattisputali Road - Old Baneshwor Road	2 ~ 4	10.35	2.2	0.0	0.0	2.2	2.1	0.1	0.0	No Data	0	0	0	0.0	0.0	2.2	0	0	0	Gaushala	New Baneshwor
	KMU027	Bijulbazar Road - Bhaktithapa Road	2	7.78	1.6	0.0	0.0	1.6	0.9	0.7	0.0	No Data	1	0	0	0.0	0.0	1.6	0	0	0	Maitighar	New Baneshwor
	KMU028	Min Bhawan - Shantinagar - Bhimsengola	1.5 ~ 2	6.11	1.8	0.0	0.0	1.8	0.2	1.6	0.0	No Data	0	0	0	0.0	0.0	1.8	0	0	0	Min Bhawan	Bhimsengola
	KMU029	Teku - Kalo Pul Road	1.5 ~ 2	5.68	0.5	0.0	0.0	0.5	0.0	0.5	0.0	No Data	1	0	0	0.0	0.0	0.5	0	0	0	Teku	Kalo Pul
	KMU030	Chabahil - Tenzing Chowk Road	2	7.61	1.6	0.0	0.0	1.6	0.7	0.4	0.5	No Data	0	0	0	0.0	0.0	1.6	0	0	0	Chabahil (Dhobi Khola)	Tenzing Chowk
	KMU031	New Road	2	11.68	0.5	0.0	0.0	0.5	0.5	0.0	0.0	No Data	0	0	0	0.0	0.0	0.5	0	0	0	Kantipath Road Junction	Ganga Path Junction
	KMU032	Sukra Path - Dharma Path	2	11.00	0.5	0.0	0.0	0.5	0.3	0.2	0.0	No Data	0	0	0	0.0	0.0	0.5	0	0	0	Indra Chowk	Purano Dafer Junction
	KMU033	Kamaladi Road	2	7.58	0.6	0.0	0.0	0.6	0.6	0.0	0.0	No Data	0	0	0	0.0	0.0	0.6	0	0	0	Bungmati Road Junction	Durbar Murg Junction
	KMU035	Jayabageshwori - Siphil Road	1.5 ~ 2	7.93	0.3	0.0	0.0	0.3	0.0	0.0	0.3	No Data	0	0	0	0.0	0.0	0.3	0	0	0	Jayabageshwori	Siphil
	KMU036	Subidhanagar - Sahayoginagar Road	2	6.58	2.1	0.0	0.0	2.1	1.2	0.6	0.3	No Data	0	0	0	0.0	0.0	2.1	0	0	0	Subidhanagar (Bagmati River)	Sahayoginagar (Manahara Khola)
	KSU001	Dhobi Khola Corridor West Bank Road	1.5	6.82	0.0	0.0	4.8	4.8	0.0	0.0	4.8	No Data	0	0	0	0.0	0.0	4.8	0	0	0	Kuriya Gaon	Ring Road Junction
	KSU002	Dhobi Khola Corridor East Bank Road	1.5	7.09	1.1	0.0	4.2	5.3	0.4	0.0	4.9	No Data	0	0	0	0.0	0.0	5.3	0	0	0	Kuriya Gaon	Ring Road Junction
	KSU006	Banasthali - Swayambu Road	1 ~ 1.5	5.84	1.2	0.0	0.0	1.2	0.3	0.3	0.6	No Data	0	0	1	0.0	0.0	1.2	0	0	0	Banasthali	Swayambu
	KSU010	Tredevi Marg	2	7.91	1.5	0.0	0.0	1.5	0.7	0.6	0.2	No Data	0	0	0	0.0	0.0	1.5	0	0	0	Kuslechaur	Kanti Path Junction
	BMU001	Gathaghar - Sano Thimi	1.5 ~ 2	6.12	1.0	0.0	0.0	1.0	0.0	0.4	0.6	No Data	0	0	0	0.0	0.0	1.0	0	0	0	Gathaghar	Sano Thimi
	BMU002	Hanumante Bridge - Thimi Road	1.5	5.55	0.6	0.0	0.0	0.6	0.0	0.0	0.6	No Data	0	0	0	0.0	0.0	0.6	0	0	0	Hanumante Bridge	Thimi Road Junction
	BMU003	Sallaghari - Tekhacho - Nagarkot Road	1.5 ~ 2	6.27	1.8	0.0	0.0	1.8	0.0	1.2	0.6	No Data	0	0	0	0.0	0.0	1.8	0	0	0	Sallaghari	Nagarkot Road Junction
	BMU004	Ganud Kundal Road	2 ~ 4	10.89	1.3	0.0	0.0	1.3	0.0	1.1	0.2	No Data	2	0	0	0.0	0.0	1.3	0	0	0	Jagati	Kamalbinayak
	LMU001	Gwarko - Pulchowk - Sanepa - Kalo Pul Road	1.5 ~ 2	6.45	4.8	0.0	0.0	4.8	3.2	1.6	0.0	No Data	0	0	0	0.0	0.0	4.8	0	0	0	Gwarko	Kalo Pul
	LMU003	Bhani Mandal - Kupondole	2 ~ 4	12.40	2.9	0.0	0.0	2.9	2.9	0.0	0.0	No Data	0	0	0	0.0	0.0	2.9	0	0	0	Bhani Mandal	Kupondole
	LMU004	Lagankhel Road	2 ~ 4	12.52	2.3	0.0	0.0	2.3	2.3	0.0	0.0	No Data	0	0	0	0.0	0.0	2.3	0	0	0	Satdobato	Jawalakhel
	LMU006	Ekantakuna Road	1.5 ~ 2	6.94	0.5	0.0	0.0	0.5	0.0	0.5	0.0	No Data	0	0	0	0.0	0.0	0.5	0	0	0	Ekantakuna	Bungmati Road Junction
	LSU001	Balkumari - Shankhamul Road	1.5 ~ 2	7.02	0.6	1.1	0.2	1.9	0.5	0.1	1.3	No Data	0	0	0	0.0	0.0	1.9	0	0	0	Balkumari	Shankhamul
	LSU002	Balkhu - Sanchal Road	2	8.00	0.7	0.0	0.0	0.7	0.0	0.4	0.3	No Data	0	0	0	0.0	0.0	0.7	0	0	0	Balkhu	Sanchal
	LSU005	Bagmati River (Ring Road) - Youlakhel - Pulchowk Road	1.5	5.03	1.5	0.0	0.0	1.5	0.2	0.4	0.9	No Data	0	0	0	0.0	0.0	1.5	0	0	0	Bagmati River (Ring Road)	Pulchowk
	LSU006	Thasikhel - Jawalakhel Road	1.5	4.68	0.8	0.0	0.0	0.8	0.0	0.2	0.6	No Data	0	0	0	0.0	0.0	0.8	0	0	0	Thasikhel	Jawalakhel
	LSU008	Pulchowk - Bakundol Road	1.5	5.33	0.6	0.0	0.0	0.6	0.6	0.0	0.0	No Data	0	0	0	0.0	0.0	0.6	0	0	0	Pulchowk	Bakundol
	LSU010	Shankhamul - Mangal Bazar - Lagankhel Road	1 ~ 2	4.64	2.0	0.0	0.0	2.0	0.9	0.5	0.6	No Data	1	0	0	0.0	0.0	2.0	0	0	0	Shankhamul	Lagankhel
	LSU011	Patandhoka Road	1	4.25	0.7	0.1	0.0	0.8	0.7	0.0	0.1	No Data	0	0	0	0.0	0.0	0.8	0	0	0	Pulchowk	Sasto Bazar
	Urban Road	KMU005	Kalimati Bridge - Tankeswor	4	12.00	0.3	0.0	0.0	0.3	0.3	0.0	No Data	0	0	0	0.0	0.0	0.3	0	0	0	Kalimati Bridge	Tankeswor
		KMU008	Tankeswor - Paropakar Marga - Paknjol Road	2	8.00	2.0	0.0	0.0	2.0	0.6	1.1	0.3	No Data	0	0	0	0.0	0.0	2.0	0	0	0	Tankeswor Bridge
KMU009		Swoyambhu Nath - Puspapal Path Junction Road	1 ~ 1.5	4.13	2.0	0.0	0.0	2.0	0.2	0.8	1.0	No Data	0	0	0	0.0	0.0	2.0	0	0	0	Swoyambhu Nath	Bhurungkhel
KMU011		Chhauni Hospital Road	1 ~ 1.5	5.64	0.8	0.0	0.0	0.8	0.1	0.2	0.5	No Data	0	0	0	0.0	0.0	0.8	0	0	0	Chhauni	Swoyambhu
KMU020		Bishal Nagar Marg	2	6.60	0.5	0.0	0.0	0.5	0.0	0.1	0.4	No Data	0	0	0	0.0	0.0	0.5	0	0	0	Handigaon	Bhatbateri
KMU023		Naxal - Sann - Baluwatar	1.5 ~ 2	6.11	1.5	0.0	0.0	1.5	1.1	0.4	0.0	No Data	0	0	0	0.0	0.0	1.5	0	0	0	Naxal	Baluwatar
KMU034		Mitla Park - Lama Pokhari Road	2	8.00	0.3	0.0	0.0	0.3	0.0	0.3	0.0	No Data	0	0	0	0.0	0.0	0.3	0	0	0	Mitla Park	Lama Pokhari
KSU003		Tripureswor - Teku Road (Bagmati River Side)	1.5 ~ 4	8.73	0.2	0.1	0.0	0.3	0.2	0.0	0.1	No Data	0	0	0	0.0	0.0	0.3	0	0	0	Tripureswor	Teku
KSU004		Kalimati - Teku Road (Bagmati River Side)	1.5 ~ 2	6.56	0.7	0.0	0.0	0.7	0.3	0.0	0.4	No Data	0	0	0	0.0	0.0	0.7	0	0	0	Kalimati	Teku
KSU005		Red Cross Road	1.5	5.05	0.8	0.0	0.0	0.8	0.3	0.5	0.0	No Data	0	0	0	0.0	0.0	0.8	0	0	0	Soltimod	Chhinalata Chowk
KSU007		Balaju - Bijeshwari Road	1.5 ~ 2	8.43	0.3	0.9	0.4	1.6	0.0	0.2	1.4	No Data	0	0	1	0.0	0.0	1.6	0	0	0	Balaju	Bijeshwari
KSU008		Gongabu - Nayabazar Road	2	7.35	0.2	0.6	0.0	0.8	0.2	0.0	0.6	No Data	0	0	0	0.0	0.0	0.8	0	0	0	Gongabu (South Side)	Nayabazar
KSU009		Lazimpat - Kapur Dhara Road	1.5	5.11	0.9	0.0	0.0	0.9	0.4	0.5	0.0	No Data	0	0	0	0.0	0.0	0.9	0	0	0	Lazimpat	Kapur Dhara
KSU011		Bijeshwari - Chhetrapati - Thahiti Road	2	5.96	0.9	0.0	0.0	0.9	0.0	0.6	0.3	No Data	0	0	0	0.0	0.0	0.9	0	0	0	Bijeshwari	Thahiti
KSU012		Thamel Marg	1.5	5.45	1.4	0.0	0.0	1.4	0.1	1.3	0.0	No Data	0	0	0	0.0	0.0	1.4	0	0	0	Galkopakha	Indra Chowk
KSU013		Pako Road	2	8.35	0.2	0.0	0.0	0.2	0.0	0.2	0.0	No Data	0	0	0	0.0	0.0	0.2	0	0	0	New Road Junction	Te Bahal
KSU014		New Road Junction - Khichapokhari Road	2	10.00	0.2	0.0	0.0	0.2	0.1	0.1	0.0	No Data	0	0	0	0.0	0.0	0.2	0	0	0	New Road Junction	Khichapokhari
KSU015		Dharma Path Junction - Kantipath Junction Road	2	8.90	0.5	0.0	0.0	0.5	0.0	0.5	0.0	No Data	0	0	0	0.0	0.0	0.5	0	0	0	Dharma Path Junction	Kanti Path Junction
KSU016		Maru Ganesh Sthan Road	1.5 ~ 2	6.12	0.3	0.2	0.0	0.5	0.0	0.3	0.2	No Data	0	0	0	0.0	0.0	0.5	0	0	0	Basantapur	Kankeswori (Bishnumati River)
KSU017		Bishnumati - Dalu Road	2	7.50	0.4	0.0	0.0	0.4	0.0	0.4	0.0	No Data	0	0	0	0.0	0.0	0.4	0	0	0	Bishnumati River West Bank	Dalu
KSU018		Chittadhar Marg	1.5	5.55	1.1	0.0	0.0	1.1	0.0	0.5	0.6	No Data	0	0	0	0.0	0.0	1.1	0	0	0	Kantipath Road Junction	Bishnumati River East Bank
KSU019		Hanuman Dhoka Road	1.5 ~ 2	6.86	0.5	0.0	0.0	0.5	0.5	0.0	0.0	No Data	0	0	0	0.0	0.0	0.5	0	0	0	Kantipath Road Junction	Suraji Arcade
KSU020		Teuda Road - Tarachhi Marg - Amrit Marg	1.5	5.26	1.3	0.0	0.0	1.3	0.7	0.4	0.2	No Data	0	0	0	0.0	0.0	1.3	0	0	0	Asan Tole	ASCOL Bus Stop
KSU021		Hattisar Road Junction - Kamal Pokhari Road	2	8.00	0.3	0.0	0.0	0.3	0.0	0.3	0.0	No Data	0	0	0	0.0	0.0	0.3	0	0	0	Hattisar Road Junction	Kamal Pokhari
KSU022		Kamal Pokhari - Nandi Ratri Road	1.5 ~ 2	5.88	0.4	0.0	0.0	0.4	0.0	0.4	0.0	No Data	0	0	0	0.0	0.0	0.4	0	0	0	Kamal Pokhari	Nandi Ratri
KSU023		Nag Pokhari - Naxal Road	2	7.50	0.4	0.0	0.0	0.4	0.0	0.3	0.1	No Data	0	0	0	0.0	0.0	0.4	0	0	0	Nag Pokhari	Naxal (Nepal Police Head Quarters)
KSU024		Sorhakutte - Gongabu Road	1.5 ~ 2	6.44	1.9	0.0	0.0	1.9	1.2	0.5	0.2	No Data	1	0	0	0.0	0.0	1.9	0	0	0	Sorhakutte	Gongabu
KSU025		Nawa Prabhat Marga	1.5 ~ 2	5.65	0.3	1.0	0.0	1.3	0.0	0.3	1.0	No Data	0	0	1	0.0	0.0	1.3	0	0			

Appendix 3.11 Characteristics for All Target Road

Route No.	Name of Road	Lane No. Based on Pavement Width Approx.	Ave. Pavement Width (m)	Pavement Type				Pavement Condition			House within R.O.W		Bridge (No.)	Box Culvert (No.)	Pavement Surface Distress (No.)	Condition of Traffic Control*			Parking Place			Location of Start	Location of End
				BT (km)	GR (km)	ER (km)	Total (km)	Good (km)	Fair (km)	Bad (km)	Total No.	No. per km				↓ (km)	↑ (km)	↑ ↓ (km)	Bus (No.)	Taxi (No.)	Tempo (No.)		
KSU027	Thapathali - Shankhamul Road	1.5 - 2	6.17	2.0	0.0	0.0	2.0	1.0	0.6	0.4	No Data	1	0	0	0.0	0.0	2.0	0	0	0	Thapathali	Shankhamul	
KSU028	Shankhamul - Bagmati River Road	1.5	4.47	0.5	0.2	0.0	0.7	0.0	0.5	0.2	No Data	0	0	0	0.0	0.0	0.7	0	0	0	Shankhamul	Bagmati River	
BSU001	Manahra Khola - Arniko Highway Junction Road	2	6.95	0.0	1.1	0.0	1.1	0.0	0.0	1.1	No Data	0	0	0	0.0	0.0	1.1	0	0	0	Manahara Khola East Bank	Arniko Highway Junction	
BSU002	Lohakanthali - Phidol	2	7.00	0.1	0.0	0.0	0.1	0.0	0.0	0.1	No Data	0	0	0	0.0	0.0	0.1	0	0	0	Manahara Khola North Bank	Manahara Khola South Bank	
LMU002	Sanepa - Kupondole	2	6.95	1.3	0.0	0.0	1.3	0.0	1.1	0.2	No Data	0	0	0	0.0	0.0	1.3	0	0	0	Sanepa	Kupondole	
LMU005	Gusingal - Bagmati River Side	2	8.00	0.1	0.0	0.0	0.1	0.1	0.0	0.0	No Data	0	0	0	0.0	0.0	0.1	0	0	0	Gusingal	Bagmati River Side	
LMU007	Park Lane - Kopundol Road	2	8.00	0.1	0.0	0.0	0.1	0.1	0.0	0.0	No Data	0	0	0	0.0	0.0	0.1	0	0	0	Park Lane Junction	Kopundol Junction	
LSU003	Balkhu - Sanepa	2	8.00	0.5	0.0	0.0	0.5	0.5	0.0	0.0	No Data	0	0	0	0.0	0.0	0.5	0	0	0	Balkhu	Sanepa	
LSU004	Milap Road Junction - Youlakhel Road	1.5	5.00	0.2	0.0	0.0	0.2	0.0	0.1	0.1	No Data	0	0	0	0.0	0.0	0.2	0	0	0	Milap Road Junction	Youlakhel	
LSU007	Ekantakuna - Nakhu Bazar Road	2	8.52	0.5	0.0	0.0	0.5	0.0	0.5	0.0	No Data	0	0	0	0.0	0.0	0.5	0	0	0	Ekantakuna	Nakhu Bazar	
LSU009	Satdobato - Talchikhel Chowk Road	1.5	4.00	0.2	0.0	0.0	0.2	0.2	0.0	0.0	No Data	0	0	0	0.0	0.0	0.2	0	0	0	Satdobato	Talchikhel Chowk	
National Highway			12.10	58.4	0.0	0.0	58.4	50.3	7.3	0.8	1,375	24	16	3	1	0.0	0.0	58.4	45	4	10		
Major Feeder Road			5.25	182.1	34.1	6.7	222.9	80.1	62.2	80.6	12,858	58	25	30	134	0.0	1.2	221.7	99	45	33		
Minor Feeder Road			4.92	35.3	19.3	0.0	54.6	7.4	13.0	34.2	2,723	50	6	6	2	0.0	0.0	54.6	33	6	2		
Strategic Urban Road			8.13	74.6	1.4	9.2	85.2	40.3	22.2	22.7	No Data	13	0	1	0.0	0.5	84.7	1	0	0			
Urban Road			6.51	27.2	4.1	0.4	31.7	9.3	12.6	9.8	No Data	2	0	2	0.0	0.0	31.7	0	0	0			
Name of River Corridor			Target Length		River Width (Avg.)		Land Clearance (Avg.)		No. of Houses within 30 m from the center of river		Location of Start	Location of End											
Dhobi Khola			5.50		9.4		42.1		658		Thapathali (Junction of Bagmati River)	Chabahil (Junction of Ring Road)											
Bishnumati River			5.45		20.1		52.8		508		Teku (Junction of Bagmati River)	Bus Park (Junction of Ring Road)											

Note: Route No.

H__F__ = Reference Number of National Highway and Feeder Road defined in SSRN 2009/10

KMU__ or KSU__ = Urban Road within Kathmandu District which was selected and numbered by JICA Survey Team

BMU__ or BSU__ = Urban Road within Bhaktapur District which was selected and numbered by JICA Survey Team

LMU__ or LSU__ = Urban Road within Lalitpur District which was selected and numbered by JICA Survey Team

Note: Condition of Traffic Control

↓ = One-Way System from location of start to location of end

↑ = One-Way System from location of end to location of start


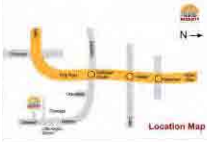














↑ ↓ = Two-Way System (Vehicles from both direction can pass the surveyed road)













**APPENDIX4 LAND-USE SURVEY AND URBAN
DEVELOPMENT STUDY**

Appendix 4.1 Private Sector Development Projects

Private Sector Development Projects



Developer	Project name	Location	Outline of Project	Images
Imperial Developer Tel: 5538255, 5538377 Fax: N/A info@imperialcourt.co m.np Shangrila Housing Pvt. Ltd Tel: 4227446 Fax: 4216134 Oriental Builders & Developers (P) Ltd Tel: 977-1-4107523, 4107819 Fax: 4107587 info@orientalbuilder.c om	IMPERIAL COURT Project_11	2 Santa Bhawan Sanepa Lalitpur	104 Units 5,860 m2 (11-8-1-1) 145 – 166 m2 NRs. 13.1 to 17.5 million Construction Date: Mar, 2010 Handover Date: Aug, 2012 on-going	
	Sun City Project_14	1 Pepsicola Gothatar Kathmandu	1000 Units 33,068 m2 (65-0-0-0) 80 – 124 m2 NRs.3.2 to 5.4 million Construction Date: Sep, 2009 Handover Date: Apr, 2012 on-going	
	Chakrapath Heights Project_16	2 Mitra Colony Marg Basundhara Kathmandu	370 Units 14,245 m2 (28-0-0-0) 34 – 115 m2 NRs.2.2 to 6.1 million Construction Date: Mar, 2010 Handover Date: Mar, 2013 on-going	
	Dhumbarahi Apartment Phase II Project_22	Dhumbarahi Kathmandu	100 Units N/A NRs.3.7 million Construction Date: Dec, 2010 Handover Date: N/A on-going	
	Vegas City Project_23	2 Imadole Lalitpur	573 Units 21,795 m2 (43-0-0-0) 79 – 124 m2 NRs.6.3 to 21.3 million Construction Date: Oct, 2010 Handover Date: N/A on-going	
	Imperial Apartment Project_24	0 Naxal Kathmandu	63 Units N/A 70 – 186 m2 NRs.6.3 to 21.3 million Construction Date: Nov, 2010 Handover Date: N/A on-going	
	Bagmati Apartment Project_25	Sankhamul Kathmandu	80 Units N/A 75 – 115 m2 NRs. 4.05 to 6.82 million Construction Date: Sep, 2010 Handover Date: Aug, 2011 on-going	
	Sanepa Height Apartment Project_26	1 Sanepa Chowk Sanepa Lalitpur	46 Units N/A NRs. 2.76 to 9.48 million Construction Date: Aug, 2010 Handover Date: N/A on-going	
	Grand Apartment Project_27	1 Dhumbarahi Kathmandu	45 Units N/A NRs. 2.64 to 9.7 million Construction Date: Aug, 2010 Handover Date: N/A on-going	
	Oriental Individual Homes Project_29	2 Bafal Kathmandu	120 Units N/A NRs. 12.5 to 16.7 million Construction Date: Aug, 2004 Handover Date: N/A on-going	
	Oriental Individual Homes Project_30	0 Belkumari Kathmandu	300 Units N/A NRs. N/A Construction Date: Nov, 2010 Handover Date: N/A on-going	
	Eastern Apartments Project_32	2 Kaushaltar Bhaktapur	700 Units 14,753 m2 (29-0-0-0) NRs. 1.38 to 3.59 million Construction Date: May, 2011 Handover Date: N/A on-going	

Royal Orchid Developers Pvt. Ltd Tel: 55250560, 55250465 merocity2010@gmail.com Downtown Housing Company Pvt. Ltd. Tel: 5000223, 5000224 Fax: 5000223 marketing@downtow n.com.np	METRO CITY Project_37	1 Hattiban Lalitpur	575 Units 7,631 m2 (15-0-0-0) 35 – 94 m2 NRs. 1.5 to 4.8 million Construction Date: Nov, 2010 Handover Date: Nov, 2013 on-going	 
	DOWN TOWN APARTMENTS Project_41	Dhapakhel Lalitpur	207 Units 6,105 m2 (12-0-0-0) 40 – 241 m2 NRs. 5.5 to 6.5 million Construction Date: Feb, 2010 Handover Date: Jul, 2013 on-going	 
	CITY VIEW APARTMENTS Project_52	Bakundole Sanepa Lalitpur	38 Units 1,521 m2 (3-0-0-0) 81 – 295 m2 NRs. Construction Date: Nov, 2010 Handover Date: Jul, 2013 on-going	 
Guna Developers Tel: 01-4223399, 01-4224522 Fax: 977-01-4621083	Guna Colony Project_16	9 Sinamangal Kathmandu	160 Units 3,921 m2 (7-11-1-1) 79 – 85 m2 NRs. 3.2 to 3.7 million Construction Date: Jan, 2008 Handover Date: N/A Completed	
	LLP Apartment Project_17	2 Panipokhari Kathmandu	48 Units 1,852 m2 (3-10-1-0) 140 m2 NRs. 10.0 to 16.5 million Construction Date: Jan, 2008 Handover Date: Completed	
	LP Apartment Project_18	2 Lazimpat Kathmandu	100 Units N/A 190 m2 NRs. 10.0 to 16.5 million Construction Date: Jan, 2008 Handover Date: Completed	 
	Bhainsepati Apartment Project_19	5 Bhainsepati Lalitpur	500 Units N/A NRs. 1.5 to 2.5 million Construction Date: Oct, 2009 Handover Date: N/A on-going	
	Lazpa Apartment Project_20	2 Lazimpat Kathmandu	120 Units 1,508 m2 (2-15-1-3) 70 – 72.5 m2 NRs. 5.7 to 6.5 million Construction Date: Jan, 2008 Handover Date: N/A Completed	 <p style="text-align: center;">LAZPA APARTMENT</p>
	Reliable Colony Project_21	5 Bhainsepati Lalitpur	110 Units N/A 93 – 96.3 m2 NRs. 7.5 to 8.0 million Construction Date: Jan, 2008 Handover Date: N/A Completed	
	BN Apartment Project_45	Babarmahal Kathmandu	310 Units 59,202 m2 (10-13-0-0) NRs. 5.5 to 6.5 million Construction Date: Jan, 2010 Handover Date: N/A on-going	
	GN Apartment Project_46	Gwarko Lalitpur	650 Units N/A NRs. 2.7 to 4.5 million Construction Date: Jan, 2010 Handover Date: N/A on-going	
Bagmati Homes Tel: 977-01-6205764, 9851093072 Fax: Not Available bagmatihomes@wlin k.com.np	Rose Village Project_43	3 Sundar Nagr Marg Balkot Bhaktapur	60 Units 12,672 m2 (25-0-0-0) 122 – 195 m2 NRs. Construction Date: Nov, 2007 Handover Date: Feb, 2010 Completed	

	TCH Tower IV Sitapaila Project_1	Sitapaila	67 Units 2,460 m2 (4-13-1-1.89) 76 – 232 m2 NRs. 5.8 to 8.9 million (NRs.8.9mil.) Construction Date: Nov, 2007 Handover Date: Jan, 2011 Completed	
	TCH Community Living – Thaiba Phase I Project_4	7 Kha Thaiba Lalitpur	58 Units 9,733 m2 (19-2-0-2) 129 - 224 m2 NRs. 7.0 to 15.0 million (NRs.7.9mil.) Construction Date: Nov, 2007 Handover Date: Dec, 2009 Completed	
	TCH Community Living – Thaiba Phase II	7 Kha Thaiba Lalitpur	37 Units 9,733 m2 (15-4-2-2) m2 NRs. to million Construction Date: Handover Date:	
	TCH Community Living – Sitapaila – I	Sitapaila	76 Units 21,876 m2 (43-0-0-0) NRs. 3.3 to 5.4 million (NRs.18.5mil.) Construction Date: Nov, 2001 Handover Date: Oct, 2003 Completed	
	TCH Community Living – Budhanilkantha	Budhanilkantha	42 Units 14,753 m2 (29-0-0-0) NRs. 4.1 to 6.7 million (NRs.14mil.) Construction Date: Apr, 2003 Handover Date: May, 2005 Completed	
	TCH Community Living - Sitapaila – II	Sitapaila (Ichhangu)	76 Units 18,823 m2 (37-0-0-0) NRs. 3.5 to 9.0 million (NRs.14.7mil.) Construction Date: Nov, 2004 Handover Date: Mar, 2007 Completed	
	TCH Community Living – Dharan	Dharan	15 Units 4,261 m2 (8-6-0-2) NRs. 3.4 to 5.6 million Construction Date: May, 2005 Handover Date: on-going	
	Brihat Community Living - Ramkot		On-going	
CD Developers Pvt. Ltd. Cell: 9802055500, 9741151488, 9841555405 Fax: 4231043 CE Construction Toll Free: 1660-01-00333, Cell: 9802055500, 9741151488, 9841555405 Fax: 4231043 cecon@mail.com.np	Grande Towers Dhapasi Project_53	Ring road- Tokha Road Dhapasi Kathmandu	548 Units 27,472 m2 (54-0-0-0) 107-454 m2 Construction Date: January, 2008 Handover Date: April, 2011 on-going	
	Vaena's Residency Project_58	Ringroad - Tokha Dhapasi Kathmandu	74 Units 17,805 m2 >(35-0-0-0) 177 - 245 m2 NRs.8.9 to NRs.12.6 million Construction Date: September, 2009 Handover Date: Nov, 2012 on-going	
	Harmony Housing Project_55	Ringroad -Tokha Tokha Kathmandu	99 Units 22,809 m2 (45-0-0-0) 97 - 174 m2 NRs.4.5 to NRs.11.1 million Construction Date: June, 2009 Handover Date: June, 2012 on-going	 
	Retreat Apartment Project_57	Sitapaila Kathmandu	30 Units 3,042 m2 88 - 100 m2 NRs.7.5 to NRs.17.5 million Construction Date: April, 2009 Handover Date: April, 2010 Completed	

	Shristi Colony –Sitapalla Project_60	Sitapalla Kathmandu	45 Units 5,296 m2 (10-6-2-0.96) NRs.6.8 million Construction Date: Jul, 2011 Handover Date: Sep, 2012 Planning	
	Dhapasi Cluster II Project_62	Dhapasi Kathmandu	6 Units m2 235 - 289 m2 NRs. 13.9 to NRs.16.0 million Construction Date: Sep, 2009 Handover Date: Nov, 2012	
CM Developers Pvt. Ltd. Toll Free: 1660-01-00333, Cell: 9741151487, 9741151488,	Vinayak Colony Project_54	Nakhu Road Bhainsepati Kathmandu	170 Units 54,433 m2 (107-0-0-0) 172 - 276 m2 NRs.11.8 to NRs.23.5 million Construction Date: January, 2008 Handover Date: Apr, 2011	 
	Rlo Apartment Project_61	Kupondole Lalitpur	28 Units 1,272 m2 (2.5-0-0-0) 112 - 168 m2 NRs.8.2 to NRs.12.1 million Construction Date: September, 2008 Handover Date: Mar, 2011 Completed	 
Civil Homes Pvt. Ltd. Civil Complex, Soalteeemode, Kathmandu Tel : 4030623, 4030624 Fax : 4030613	Civil Homes Phase I	Bainsipati		
	Civil Homes Phase II	Tinthana, Kalank	122 Units Completed	 
	Civil Homes Phase III Project_10	5 Sunakothe Lalitpur	196 Units 68,677 m2 (135-0-0-0) 159 - 236 m2 NRs.10.9 to NRs.27.3 million Construction Date: Dec, 2003 Handover Date: on-going	 
	Civil Homes Phase IV Project_42	1 Dhapakhel Lalitpur	394 Units 58,504 m2 (115-0-0-0) 119 - 259 m2 NRs.18.9 to NRs.26.9 million Construction Date: Feb, 2008 Handover Date: on-going	 
	Civil Apartments Project_65	1 Dhapakhel Lalitpur	154 Units 3,734 m2 (7-5-1-3) 71 - 119 m2 NRs.2.9 to NRs.6.0 million Construction Date: Feb, 2008 Handover Date: on-going	
	Civil Colony I Project_66	9ka, VDC , Thecho Sunakothe Lalitpu	69 Units 10,174 m2 (20-0-0-0) 90 m2 NRs.6.6 to NRs.11.4 million Construction Date: May, 2011 Handover Date: on-going	 
Sunrise Developers Pvt. Ltd. untower@wink.com.np www.sunrisetower.com	Sunrise Towers	Dhobighat (Ring Road), Lalitpur	On-going	
	Sunrise Appartments	Nakhkhu, Lalitpur-13	On-going	
	Sunrise Cityhomes	Bijuli Bazar, Anamnagar, Kathmandu	On-going	

<p>Euro Real Estate Pvt. Ltd Tel: 016208851 Fax: Not Available euro.nepal@hotmail.com</p> <p>United Builders and Engineers (P) Ltd. Tel: 01-4771360, 01-4771285 Fax: Not Available ube@ntc.net.np</p>	<p>Himalayan Colony II Project_48</p>	<p>8 Balkumari Lalitpur</p>	<p>32 Units 59,202 m2 (10-13-0-0) 149 – 177 m2 NRs. 15.0 to 18.0 million Construction Date: Dec, 2010 Handover Date: Aug, 2012 Planning</p>	 
	<p>United Avenue Project_49</p>	<p>Sanepa Height Lalitpur</p>	<p>26 Units 1,208 m2 (2-6-0-0) 146 – 182 m2 NRs. 12.6 to 15.7 million Construction Date: November, 2010 Handover Date: May, 2013 on-going</p>	
	<p>United Society Project_50</p>	<p>Sano Bharyang Kathmandu</p>	<p>280 Units 5,405 m2 (10-10-0-0) NRs. 4.0 to 4.2 million Construction Date: November, 2010 Handover Date: May, 2013 on-going</p>	
<p>Mercury Apartments Pvt. Ltd. Tel: 9851031746, 4100552 Fax: 4249723 dksharma.nepal@gmail.com</p>	<p>Sterling Patan Project_51</p>	<p>3 Thado Dhunga Lalitpur</p>	<p>34 Units 2,027 m2 (4-0-0-0) NRs. 16.0 to 36.5 million Construction Date: October, 2009 Handover Date: December, 2010</p>	 
<p>Chaudhary Group (CG) Properties Tel: +977-1-5250699 Fax: +977-1-5250493 info@chaudharygroup.com</p>	<p>Cityscape Apartment Homes Project_47</p>	<p>1 Gha Hattiban Dhapakhel Lalitpur</p>	<p>428 Units 23,720 m2 (46-10-0-0) 54 – 256 m2 NRs. 2.9 to 14.5 million Construction Date: October, 2009 Handover Date: April, 2012</p>	 
	<p>CG Hills Project_64</p>	<p>Hattigauda Kathmandu</p>	<p>53 Units 10,175 m2 (20-0-0-0) 177 – 240 m2 NRs. 13.2 to 27.3 million Construction Date: Nov, 2011 Handover Date: Dec, 2012 Planning</p>	 
<p>CG Developers Tel: 9851086761, 977-1-5548156, 5548164 Fax: 977-1-5549792 keshar.man@chaudharygroup.com</p>	<p>Mount View Residency Project_28</p>	<p>2 Hattiban Lalitpur</p>	<p>Units N/A N/A NRs. N/A Construction Date: May, 2000 Handover Date: N/A Completed</p>	
	<p>Kathmandu Residency Project_31</p>	<p>2 Bagdole Lalitpur</p>	<p>180 Units N/A NRs. N/A Construction Date: April, 2001 Handover Date: N/A Completed</p>	
	<p>Mount View Residency Revisited Project_56</p>	<p>1 Ka Harisiddhi Harisiddhi Lalitpur</p>	<p>9 Units 2,782 m2 (5-7-2-0) 76 – 232 m2 NRs. 7.9 to 20.5 million Construction Date: March, 2011 Handover Date: July, 2012 on-going</p>	
<p>Brihat Investments Pvt. Ltd. Tel: 9802020051 Cell: 4282086 /4282861 Fax: 1-4288820</p>	<p>Brihat Community Living-Sitapaila Project_59</p>	<p>7 Sitapaila Kathmandu</p>	<p>70 Units NRs. 7.3 to 16.2 million Construction Date: May, 2010 Handover Date: October, 2012</p>	
<p>The Comfort Housing Pvt. Ltd. Telephone 977-1-4440250/ 4439960, Fax: 977-1-4439973</p>	<p>TCH Tower II – Lazimpat</p>	<p>Lazimpat</p>	<p>36 Units 1,781 m2 (3-8-0-0) NRs. 4.9 to 7.5 million (NRs.12.9mil.) Construction Date: Oct, 2004 Handover Date: Jan, 2007 Completed</p>	
	<p>TCH Tower III – Panipokhari</p>	<p>Panipokhari</p>	<p>51 Units 2,197 m2 (4-5-0-2) NRs. 5.9 to 9.3 million (NRs.14.5mil.) Construction Date: Nov, 2006 Handover Date: Mar, 2009 Completed</p>	

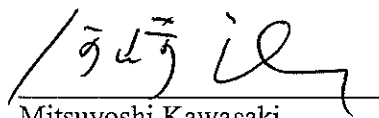
Silver Valley Developers P. Ltd. P.O. Box No. 1223, Kathmandu Tel: 977-1-6922141 www.silvervalley.com.np	Silver City	Kalikasthan, Kathmandu 113 - 261 m2 On-going	
Westar Properties	Westar Residency	Balkumari Lalitpur Units N/A 7,631 m2 (15-0-0-0) NRs. N/A Construction Date: Handover Date: on-going	
Star Homes	Chhauni housing	Chhauni Kathmandu 60 Units 11,701 m2 (23-0-0-0) NRs. N/A Construction Date: Handover Date: Completed	
	Sitapaila Housing	Sitapaila Kathmandu 70 Units N/A NRs. N/A Construction Date: Handover Date: Completed	
Varun Developers Pvt. Ltd	Park View Horizon	Dhapasi Kathmandu 212 Units 15,262 m2 (30-0-0-0) NRs. N/A Construction Date: Handover Date: on-going	
	Sunshine Apartments	1 Ring Road Sukedhara Kathmandu 95 Units 2,233 m2 (4-6-0-3.43) NRs. N/A Construction Date: Handover Date: on-going	

APPENDIX5 MINUTE OF MEETING

MINUTES OF MEETING
ON
DATA COLLECTION SURVEY
ON
TRAFFIC IMPROVEMENT IN KATHMANDU VALLEY
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL PLANNING AND WORKS

Japan International Cooperation Agency (hereinafter referred to as “JICA”) Nepal Office, on behalf of JICA Headquarters, had a series of discussions on the Outline for JICA Data Collection Survey on Traffic Improvement in Kathmandu Valley (hereinafter referred to as “the Survey”) with officials of Ministry of Physical Planning and Works (hereinafter referred to as “MoPPW”) and Department of Roads (hereinafter referred to as “DOR”). As a result of the discussion, JICA, DOR/MoPPW hereby agreed upon the draft Implementation Program of the Survey as per Annex-1.

Kathmandu, 22nd August 2011



Mitsuyoshi Kawasaki
Chief Representative
JICA Nepal Office



Indu Sharma Dhakal
Director General
Department of Roads
Ministry of Physical Planning and Works

Outline for Data Collection Survey on Traffic Improvement in Kathmandu Valley

1. Background

The increase in the number of vehicles has caused severe traffic congestions in Kathmandu Valley. Vehicles are caught up in the traffic congestion all day long. Traffic congestion is currently one of the most serious issues in the Valley.

In 1993, Japan International Cooperation Agency (hereinafter referred to as "JICA") formulated "Master Plan for Kathmandu Valley Urban Development Plan". Some of the proposed projects have been implemented and helped to improve traffic condition in Kathmandu Valley. On the other hand, almost 20 years has been passed since the Master Plan was formulated and thus it should be updated.

Therefore, the Government of Nepal (hereinafter referred to as "GON") requested the Government of Japan (hereinafter referred to as "GOJ") for the study of "Kathmandu Valley Traffic Management and Road Development Master Plan" in August 2009 and "Traffic Improvement Master Plan Study for Kathmandu Valley FY2011-21012" in July 2010. Based on the requests, JICA dispatched the preparatory survey mission to Nepal in September 2010 and had a series of discussions with relevant organization and institutions.

After the above-mentioned survey, JICA has decided to implement Data Collection Survey within the framework of the previous Master Plan to identify main traffic issues/problems in Kathmandu Valley. It is expected that the data will be utilized by GON as well as related organizations and donors to cope with the traffic issues/problems in Kathmandu Valley.

2. Outline of the Survey

(1) Objectives

The objectives of the Survey are to collect traffic data in Kathmandu Valley and to identify main transport problems and issues in the Valley.

(2) Cooperating Agencies

The Cooperating Agencies are expected to be Ministry of Physical Planning & Works (hereinafter referred to as "MoPPW"), Department of Roads (hereinafter referred to as "DOR") and other relevant organizations.

3. Target Area

Kathmandu Valley

4. Terms of Reference of the Data Collection Survey

(1) Review of the Existing Information, Studies, Plans and Projects

1-1. Review the exiting traffic plan of Kathmandu Valley

1-2. Review the socio-economic characteristics in Kathmandu Valley



- 1-3. Review and analyze existing laws, regulations, policies, and institutional arrangements related to urban transport
 - 1-4. Review the urban transport related organizations (tasks, organizational structure, staff number, and annual budget amount)
 - 1-5. Review urban transport projects done by other donors and the related organizations and institutions.
- (2) Basic Data Collection of Urban Plan
- 2-1. Review the exiting urban plans within Kathmandu Valley
 - 2-2. Review and analyze the existing land use characteristics and urban development characteristics
 - 2-3. Review the business operations of private enterprises (Developers)
 - 2-4. Review urban planning related projects done by other donors and the related organizations and institutions
- (3) Traffic Survey and Road Inventory Survey
- 3-1. Conduct following traffic surveys
 - Household Interview Surveys
 - Identification of Cordon and Screen lines for traffic surveys
 - Traffic count survey at Cordon and Screen Lines and major road sections
 - Roadside Interview (Origin-Destination) Surveys
 - Travel Speed Surveys
 - Traffic Count Survey at Major Intersections
 - Bus Transport Surveys
 - Parking Surveys
 - 3-2. Conduct road inventory survey and other transport facilities survey
 - 3-3. Formulate present OD matrix
- (4) Future Traffic Demand Forecast (Target Year: 2022)
- 4-1. Formulate urban development scenario
 - 4-2. Estimate future socio-economic frame
 - 4-3. Identify future transport network
 - 4-4. Formulate future OD matrix
 - 4-5. Identify bottleneck areas
- (5) Identification of Major Traffic Related Issues/Problems in Kathmandu Valley
- 5-1. Identify major traffic related issues/problems in Kathmandu Valley
 - 5-2. Propose major important issues related to urban planning
- (6) Counterpart Training in Japan
- 6-1. Counterpart personnel can participate in the related training course in Japan.

5. Implementation Framework of the Survey

(1) Structure of the Survey Team

JICA will dispatch the Survey team to carry out the Data Collection Survey on Traffic Improvement in Kathmandu Valley (hereinafter referred to as “the Survey Team”)

The Survey Team will consist of the following experts.

- Team Leader / Traffic Survey 1/ Future Demand Forecasting
- Urban Planning
- Land Use Planning
- Road Planning /Traffic Planning
- Traffic Survey 2

The Survey Team might employ local consultants, NGOs, and/or other staffs to support carrying out the above-mentioned traffic surveys.

(2) Survey Implementation Schedule

November 2011	-Submission of the Inception Report
April 2012	-Submission of the Interim Report
July 2012	-Submission of the Draft Final Report
September 2012	-Submission of the Final Report

(3) Reports

- The Survey Team will prepare and present the reports mentioned in 5. (2) in English.

(4) Monitoring

JICA will review the Survey Team's work periodically. The JICA staffs may attend meetings between the Survey Team, MoPPW, DOR and/or other organizations concerned during the implementation of the Survey to monitor the progress of the works.

6. Undertakings by MoPPW and DOR and other organizations concerned

The Cooperating Agencies and other relevant organizations will undertake to provide the followings in order to assist the implementation of the Survey services on schedule, through close co-operation with the authorities concerned with GON:

- (1) To furnish the Survey team with all available and relevant data, information and documents requested by the Survey team
- (2) To assign counterpart personnel
- (3) To provide meeting space during the stay of the Survey team.
- (4) To ensure issuance of entry permits necessary for the Survey team members to conduct field survey.
- (5) To ensure safety of the team members, if and when required
- (6) To assist the team in making transportation arrangements
- (7) To assist the team in medical services when needed
- (8) To assist the team to obtain other privileges and benefits if necessary

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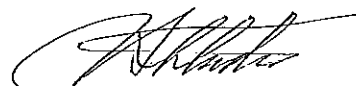
**MINUTES OF MEETING
FOR
INCEPTION REPORT
OF
DATA COLLECTION SURVEY
ON
TRAFFIC IMPROVEMENT
IN
KATHMANDU VALLEY, NEPAL**

**BETWEEN
DEPARTMENT OF ROADS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY**

15 November, 2011



Mr. Indu S. Dhakal
Director General
Department of Roads
Ministry of Physical Planning and Works,
Government of Nepal



Mr. Hiroki SHINKAI
Team Leader
JICA Study Team
Japan

Minutes of Meeting

In response to the request of the Government of Nepal (hereinafter referred to as "GON") Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a JICA Survey Team, headed by Mr. H. Shinkai, to Katmandu on November 6, 2011, to initiate "Data Collection Survey on Traffic Improvement in Kathmandu Valley" (hereinafter referred to as the "Survey").

The JICA Survey Team submitted the Inception Report of the Survey to Department of Roads (hereinafter referred to as "DOR") on November 06, 2011. Explanation and discussion concerning the Inception Report was held on November 09, 2011 to clarify the purposes, contents and organizational set-up of the Survey. Annex 1 shows the participants of the meeting. The main points of the discussions are summarized below:

1. Inception Report

The scope of work, contents and survey methods described in the Inception Report, with modifications resulting from discussions, was agreed upon by the both sides.

2. Technical Committee and Coordination with Other Authorities Concerned

DOR agreed to set up Technical Committee for effective and efficient implementation of the Survey under the chair of the Director General of DOR. The Committee comprises representatives from the following agencies and organizations:

- (1) Department of Roads (DOR)
- (2) Department of Urban Development and Building Construction (DUDBC)
- (3) Department of Transport Management (DOTM)
- (4) Municipality Traffic Police (MTP)
- (5) Kathmandu Municipality (KMC)
- (6) Lalitpur Municipality (LMC)
- (7) Bakhtapur Municipality (BMC)

DOR agreed to call for ADB and other donors to participating in the technical committee as required to exchange the view and deepen the understanding of projects being implemented by each donor.

Representative of each agency and organization is shown in Annex 2.

Shinkai

(S)

3. Technical Working Group

Department of Roads agreed to establish a Technical Working Group for the smooth operation and technology transfer under the Survey. Technical Working Group is comprised of DOR, DUDBC, DOTM, KMC, LMC, BMC and other related government agencies agreed by both DOR and the Survey Team.

The member of Technical Working Group is shown in Annex 3 and they will act as the counterpart personnel of the Survey.

4. Expansion of Survey Area

DOR agreed to the proposal made by the Survey team regarding the expansion of survey area up to Banepa area taking into consideration the development potential of Banepa area, because it may enter the influence zone of Kathmandu Valley when the Bakhtapur – Dhulikhel Road is improved to a high standard road with 4 lanes in the future.

5. Workshops

Workshops shall be conducted twice as follows:

- (1) 1st workshop: at the end of April, 2012 after finishing traffic survey and data processing
- (2) 2nd workshop: at the end of June, 2012 after preparation of the draft final report which includes future traffic demand forecast and proposal on important issues related to transport/urban planning that will be performed at the next stage

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ANNEX 1: PARTICIPANTS OF THE MEETING

NEPALESE SIDE

1. Mr. Indu S. Dhalkal - Director General, DOR
2. Mr. Bishnu Om Bade - Deputy Director General of Maintenance Branch, DOR
3. Mr. Devendra Karki - Regional Director of Central Region, DOR
4. Mr. Bindu Shamsheer Rana - (former) Project Manager of Sindhuli Road, DOR
5. Mr. Chandra Subedi - Chief of Road & Traffic Unit, DOR
6. Mr. Saroj K. Pradhan - Senior Divisional Engineer, DOR

JICA STUDY TEAM

7. Mr. Hiroki SHINKAI - Team Leader/Road Planning (1)
8. Mr. Yasushi OHWAKI - Traffic Survey (1)
9. Mr. Akio ODAKE - Urban Planning/Land Use Planning
10. Mr. Hiroaki TAKAHASHI - Traffic Survey (2)
11. Mr. Masahiro TORIU - Road Planning (2)

JICA NEPAL OFFICE

12. Mr. Kenichi IIZUKA - Representative of JICA Nepal
13. Mr. Saurab Rana - Program Officer, JICA Nepal
14. Mr. Santosh Chhetri - Relation Officer, JICA Nepal

Self

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ANNEX 2: REPRESENTATIVE OF TECHNICAL COMMITTEE

1. Mr. Indu S. Dhalkal - Director General, Department of Roads (DOR), MPPW
2. Mr. Hari Bhakta Shresthta - Deputy Director General of Foreign Cooperation Branch, DOR
3. Mr. Bishnu Om Bade - Deputy Director General, DOR
4. Mr. Devendra Karki - Director of Central Regional Directorate, DOR
5. Mr. Chandra Subedi - Chief of Road & Traffic Unit, DOR
6. To be named. - Representative of Department of Urban Development and Building Construction (DUDBC), DOR
- (1) 7. To be named - Representative of Department of Transport Management (DOTM), Ministry of Labour and Transport Management
8. To be named - Representative of Kathmandu Metropolitan Council (KMC)
9. To be named - Representative of Lalitpur Metropolitan Council (LMC)
10. To be named - Representative of Bhaktapur Metropolitan Council (BMC)
11. To be named - Representative of Metropolitan Traffic Police (MTP)

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ANNEX 3: MEMBERS OF TECHNICAL WORKING GROUP

COUNTERPART FOR THE STUDY TEAM


(1) Chief Counterpart (DOR)	Mr. Saroj K Pradhan
(2) Counterpart (Road & Traffic Unit, DOR)	To be named
(3) Counterpart (DUDBC)	To be named
(4) Counterpart (DUDBC)	To be named
(5) Counterpart (DOTM)	To be named
(6) Counterpart (KMC)	To be named
(7) Counterpart (LMC)	To be named
(8) Counterpart (BMC)	To be named

(13)

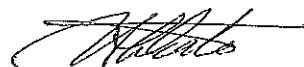
**MINUTES OF MEETING
FOR
INTERIM REPORT
OF
DATA COLLECTION SURVEY
ON
TRAFFIC IMPROVEMENT
IN
KATHMANDU VALLEY, NEPAL**

**BETWEEN
DEPARTMENT OF ROADS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY**

25 April, 2012



Mr. Yogendra Kumar Rai
Deputy Director General
Department of Roads
Ministry of Physical Planning and Works,
Government of Nepal



Mr. Hiroki SHINKAI
Team Leader
JICA Study Team
Japan

Minutes of Meeting

In response to the request of the Government of Nepal (hereinafter referred to as "GON") Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a JICA Survey Team, headed by Mr. H. Shinkai, to Katmandu on November 6, 2011, to initiate "Data Collection Survey on Traffic Improvement in Kathmandu Valley" (hereinafter referred to as the "Survey").

The JICA Survey Team submitted the Interim Report of the Survey to Department of Roads (hereinafter referred to as "DOR") on April 22, 2012. 2nd Technical Committee Meeting was held on April 25, 2012 to explain the finding of all of the survey works which compiled in the Interim Report. **Annex 1** shows the participants of the meeting.

Mr. Shinkai, Team Leader, summarized the overview of surveys works that the survey team conducted and after that, members of survey team explained their finding using the power point.

The main points of the discussions are summarized below:

1. Interim Report

The survey team explained the findings of all the survey works described in the Interim Report as follows:

- Chapter 1: Introduction
- Chapter 2: Overview of the Katmandu valley
- Chapter 3: Road Development Policy and Existing Plans
- Chapter 4: Traffic Survey Method
- Chapter 5: Preliminary Results of Traffic Survey
- Chapter 6: Road Inventory Survey
- Chapter 7: Land-use and Urban Plan

2. Discussion

After the presentation, participants exchanged the opinions regarding the following subjects:

- (1) Population of Kathmandu Valley will be 5 to 6 million by the year of 2030, therefore, strengthening of public transport is indispensable for future Kathmandu valley in the long term. The study on introduction of mass transit system might be necessary.



- (2) The Inner Ring Road become more valid today than it was the JICA MP in 1993 therefore, it should be strengthened and upgraded to the road with a high design standard and capacity. Utilization of river bed of Dhobi Khola, Bishnumati River, and Bagmati River is one of the options for construction the Inner Ring Road.
- (3) Feeder roads, in particular primary feeder roads in north-south direction, play an important role for urbanization of Kathmandu Valley, therefore, those must be upgraded to 2 lanes or 4 lanes depending on the future traffic demand.
- (4) Greater Kathmandu Valley Framework including Banepa area shall be considered in a full scale Master Plan taking into consideration a rapid urban expansion of Kathmandu Valley
- (5) Updating of land-use plan in Kathmandu Valley is under progressing and the output will be presented in the Final Report
- (6) Increase of motor cycle will interfere to the traffic flow of city roads seriously in the near future therefore a fundamental solution shall be studied in a full scale Master Plan.
- (7) Provision of sidewalk and an exclusive lane of ^{bi-}cycle are indispensable for the safety of drivers and pedestrian so that proper measures must be considered in a full scale Master Plan.

After the discussion, the result of survey works compiled in the Interim Report, with modifications resulting from discussions, was agreed upon by the both sides.



ANNEX 1: PARTICIPANTS OF THE 2ND TECHNICAL COMMITTEE MEETING

NEPALESE SIDE

1. Mr. Yondera Kumar Rai - DDG, Department of Roads (Chairman)
2. Mr. Madhav Karki - DDG, Department of Roads
3. Mr. Bishnu Om Bade - DDG, Department of Roads
4. Mr. Devendra Karki - Regional Director, Department of Roads
5. Mr. Chandra K Subedi - Unit Chief, RTU
6. Ms Mira Gyawali - Senior DE, DUDBC
7. Mr. Karuna Ratna Shakya - Kathmandu Valley Town Development Committee
8. Mr. Kapir Dangol - Department of Transport and Management
9. Mr. Saroj K. Pradhan - Chief Counterpart, Senior Divisional Engineer. DOR
10. Mr. Krishna Thapa - Road & Traffic Unit, DOR

JICA SURVEY TEAM

6. Mr. Hiroki SHINKAI - Team Leader/Road Planning (1)
7. Mr. Yasushi OHWAKI - Traffic Survey (1)
8. Mr. Akio ODAKE - Urban Planning/Land Use Planning

JICA NEPAL OFFICE

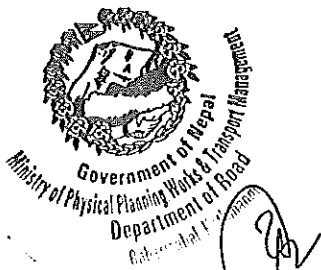
9. Mr. Kenichi IIZUKA - Representative of JICA Nepal
10. Mr. Nobuyuki KOBE - Urban and Regional Dev. Division 1, JICA Tokyo
11. Mr. Nobuyuki TSUNUOKA - Senior Advisor, JICA Tokyo
12. Mr. Saurab Rana - Program Officer, JICA Nepal
13. Mr. Santosh Chhetri - Relation Officer, JICA Nepal



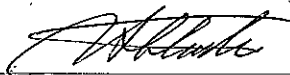
DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL PLANNING AND WORKS
THE FEDERAL DEMOCRATIC REPUBLIC OF NEPAL

**MINUTES OF MEETING
FOR
DRAFT FINAL REPORT
OF
DATA COLLECTION SURVEY
ON
TRAFFIC IMPROVEMENT IN KATHMAND VALLEY**

24 July, 2012



Mr. Dinker Sharma
Director General
Department of Roads
Ministry of Physical Planning and Works,
Government of Nepal



Mr. Hiroki Shinkai
Team Leader
JICA Survey Team
Japan

DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL PLANNING AND WORKS
THE FEDERAL DEMOCRATIC REPUBLIC OF NEPAL

Date & Time : 22nd July 2012, 14:00 – 16:00
Place of Meeting : Conference Room of DOR
Participants : See attached participants list (**Annex 1**)
Agenda: 1) Opening Address by Chair Person (DG of DOR)
2) Outline of the Draft Final Report (JICA Survey team)
3) Explanation of DFR (Member of survey team)
4) Exchange of Opinion on Draft Final Report

Minutes of Meeting

In response to the request of the Government of Nepal (hereinafter referred to as “GON”) Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched a Survey team, headed by Mr. H. Shinkai, to Katmandu on November 6, 2011, to initiate "Data Collection Survey on Traffic Improvement in Kathmandu Valley" (hereinafter referred to as the "Survey"). The Survey team conducted the survey in accordance with the scope of works and completed all the duties by the end of July, 2012 as scheduled.

Survey team prepared the Draft Final Report and submitted 15 copies of Draft Final Report to Department of Roads (hereinafter referred to as “DOR”) on 22 July, 2012. The briefing of Draft Final Report was conducted by JICA Survey Team at 3rd Technical Committee Meeting held on 22 July at the conference room of DOR.

Mr. Shinkai, Team Leader, expressed his appreciation to the member of Technical Committee on their support and cooperation which have extended to the survey team during the field survey. After that, the team members explained the results of the Draft Final Report focusing the output of the work done during May - July, 2012 after the Interim Report.

The main points of the discussions are summarized below:

1. Explanation of the Draft Final Report

The survey team explained the findings described in the Draft Final Report as follows:



- (1) Road Development Plan & Present Road Condition (Mr. Toriu)
- (2) Traffic Movement and Issues (Mt. Ohwaki)
- (3) Future Traffic Demand Forecast (Mr. Nakaseko)
- (4) Present Land-use Development and Issues (Mr. Odake)
- (5) Road Network and Issues & Recommendations to the future M/P (Mr. Shinkai)

2. Discussion

After the presentation, participants exchanged the opinions regarding the environmental issues on proposed eastern link of Inner Ring Road, preservation of historic remains in Bhakutapur area, difficulty of adjustment with many stakeholders regarding the bus public transport, NMT for Kathmandu Valley, complementation of transport mode, etc.

3. After discussion, DOR agreed to the contents of Draft Final Report in principle, and promised JICA Survey team to send the final comments on the Draft Final Report if any by the middle of August, 2012 after checking by DOR and other agencies concerned.

JICA Survey Team informed DOR that the report will be finalized after receiving the final comments from the Nepalese side and submitted to JICA at the end of September 2012 in accordance with the contract.

4. Finally, the Chairman, Mr. Dinker Sharma, Director General of DOR, closed the 3rd Technical Committee Meeting with thanks to JICA Survey Team and Japanese government agencies concerned.



The end

ANNEX 1: PARTICIPANTS OF THE MEETING

NEPALESE SIDE

1. Mr. Dinker Sharma - Director General, DOR
2. Mr. Bishunu Om Bade. - Deputy DG, DOR
3. Mr. Devendra Karki - RG/CRRD
4. Mr. Chandra K Subedi - SDE/DOR
5. Mr. Karuna Ratna Shakya - SDE/KVTDC
6. Mr. Saroj K. Pradhan - Coordinator, SDE/DOR
7. Mr. Bimal Rijal - Technical Advisor, Kathmandu Metropolitan City
8. Mr. Suresh Poudel - Engineer, DOR

JICA SURVEY TEAM

9. Mr. Hiroki Shinkai - Team Leader/Road Planning
10. Mr. Yasushi Ohwaki - Traffic Engineer
11. Mr. Atsuyuki Nakaseko - Traffic Demand Forecast
12. Mr. Akio Odake - Land Use Planner
13. Mr. Masahiro Toriu - Road Engineer

JAPANESE SIDE

14. Mr. Hisashi Hoshino - Representative of Embassy of Japan
15. Mr. Kailash M Pradhan - Program Officer, Embassy of Japan
16. Mr. Kenichiro Iizuka - Representative of JICA Nepal Office
17. Mr. Sourab Rana - Program Officer, JICA Nepal Office

