

**THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA  
MINISTRY OF RAILWAYS AND TRANSPORT  
MINISTRY OF HIGHWAYS  
ROAD DEVELOPMENT AUTHORITY**

**THE STUDY ON  
THE URBAN TRANSPORT DEVELOPMENT  
OF THE COLOMBO METROPOLITAN  
REGION**

**FINAL REPORT**

**APPENDIX**

**October 2006**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**PADECO Co., Ltd.**

**Oriental Consultants Co., Ltd.**

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## APPENDIX

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Exchange Rates Used

1 USD = Rs.102.5

Rs. 1 = 1.124 JPY

(Average Rate during Jan to May 2006)

## Appendix 1 Long List of Projects and Proposals from Previous Studies and Working Groups

The Long List prepared in this study consists of following tables:

**Table A1.1 List of Projects and Proposals from Previous Studies**

- List of proposals/projects and descriptions from the Colombo Metropolitan Regional Structural Plan (CMRSP), Colombo Development Plan (CDP), Colombo Urban Transport Study (CUTS2), and Western Regional Megapolis Plan (WRMP); and
- Current status of each proposal/project.

The legends are as follows:

Source	Year Published
Colombo Metropolitan Regional Structural Plan (CMRSP)	1998
Colombo Development Plan (CDP)	1999
Colombo Urban Transport Study (CUTS2)	1999
Western Regional Megapolis Plan (WRMP)	2004

Project Type	Definition
CIS	Construction/Improvement Scheme
RWS	Road Widening Scheme
TMS	Traffic Management Scheme
IPIS	Institutional/Policy Improvement Scheme

Project Status	Definition
P	Proposed
G	Gazetted (Planned for Implementation)
O	Ongoing
PC	Partially Completed
C	Completed

The study on project status in Chapter 2 reviewed and evaluated this table.

**Table A1.2 List of Projects Proposed in the Working Groups**

- List of proposals/projects and descriptions from the working group members and study team.

The legends are the same in both tables.

**Table A1.1 List of Projects and Proposals from Previous Studies (1/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
1	CMRSP	Road	North South Highway (NSH) within CMR	4-lane, grade separated highway created by combining Southern Highway (Welipenna - Kottawa) and Outer Circular Road (Kottawa - Katunayake)	CIS	O
2	CMRSP	Road	North Eastern Highway (NEH) within CMR	4-lane, grade separated highway from New Kelani Bridge - Mirigama/Ambepussa Connect to Baseline Road	CIS	P
3	CMRSP	Road	South Eastern Highway (SEH)	4-lane, grade separated highway from Ratmalana - Ratnapura via Kottawa	CIS	P
4	CMRSP	Road	Moratuwa-Polgasowita Link	8 km roadway to connect Moratuwa to NSH at Polgasowita	CIS	P
5	CMRSP	Road	Southward Extension to NSH	4-lane, grade separated highway from Welipenna - Matara	CIS	P
6	CMRSP	Road	Northward Extension to NSH	4-lane, grade separated highway from Katunayake - hinterland	CIS	P
7	CMRSP	Road	Trincomalee Extension to NEH	Extension to NEH along Colombo-Trincomalee corridor	CIS	P
8	CMRSP	Road	Kandy Extension from NEH	Connection of NEH to Kandy from Ambepussa	CIS	P
9	CMRSP	Road	Connection to Asian Highway	Link to Anuradhapura from NEH to link the Asian Highway to the national network	CIS	P
10	CMRSP	Rail	Rehabilitation of Rail Track	Rehabilitate right of way and other structures to allow for speeds of 100 km/hr	CIS	P
11	CMRSP/ CDP	Rail	Development of Rail Signaling System	No information given	CIS	G
12	CMRSP/ CDP/ WRMP	Rail	Improvements to Rail Stations	Improve Rail Stations to allow for intermodal access	CIS	G
13	CMRSP/ CDP	Rail	Systematic Replacement of Rail Rolling Stock	Increase and improve quantity of rail rolling stock	CIS	G

**Table A1.1 List of Projects and Proposals from Previous Studies (2/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
14	CMRSP	Road	Progressively Ban All On-Street Parking	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, ban on-street parking and discuss with private sector regarding alternative off-street parking facilities	TMS	O (Kolpetty-Ratmalana Completed)
15	CMRSP	Road	Provide Bus Bays	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, provide limited turn-out areas for pick up/drop off purposes	CIS	PC
16	CMRSP	Road	Signalization of Intersections and Possible Synchronization	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, signalize and synchronize intersections, with a focus on bus flows. Develop Intelligent Transport Systems for these corridors	TMS	PC
17	CMRSP	Road	Investigate and Develop Parallel Roads	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, enable collector-distribution on roads	CIS	P
18	CMRSP	Road	Reduce Abutting Access	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, reduce access of tertiary roads to primary roads	CIS	P
19	CMRSP	Road	Prohibit Right Turns	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, ban right turns except at signalized intersections	TMS	P
20	CMRSP	Road	Signalize Pedestrian Crossings	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, place signals at all pedestrian crossings	TMS	PC

**Table A1.1 List of Projects and Proposals from Previous Studies (3/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
21	CMRSP	Regulation	Develop and Implement Land Use Controls	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, impose land-use controls and building regulations on land adjacent to major corridors at intersections with roads over 10,000 vpd	IPIS	P
22	CMRSP	Road	Widen and Re-Define Road Cross-sections	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, widen to 4-lanes and redefine cross-sections with markings and vehicle segregation	RWS	P
23	CMRSP	Regulation	Restrict Slow Moving Vehicles	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, restrict slow moving vehicles such as carts, tractors, and bicycles. Accommodate on parallel street	TMS	P
24	CMRSP	Regulation	Control Animals and Processions	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, control stray animals and processions	IPIS	O
25	CMRSP	Road	Implement Coordinated System of Construction, Maintenance, and Improvements	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, implement coordinated system for construction, maintenance, and improvements	CIS	PC
26	CMRSP	Road	Improve Paving Quality	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, improve paving quality to facilitate movement and improve drainage	CIS	PC
27	CMRSP	Bus	Convert Parking Lanes to Bus Lanes	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, convert parking lanes to bus lanes	TMS	P
28	CMRSP	Road	Overpasses at Railway Crossings	On A1, A2, A3, A4, Horana Road, Low Level Road, Parliament Road, and Baseline Road, construct overpasses at railway crossings	CIS	P



**Table A1.1 List of Projects and Proposals from Previous Studies (4/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
29	CMRSP	Road	Control Access on CMR's A and B Class Roads	Partially control access on CMR's A and B class roads	TMS	O
30	CMRSP	Road	Develop CMR's C and D Class Roads	Further develop CMR's C and D class roads to sustain bus operations on those roads	CIS	O
31	CMRSP	Road	Introduce Street Line Schemes	Colombo - Biyagama Road and Parliament Drive (160 ft.); All other A and B class roads (100 ft.); Marine Drive from Kollupitty - Moratuwa (130 ft.); Selected Service Roads (80 ft.); Proposed Light Rail and Roads (130 ft.)	RWS	PC
32	CMRSP	Rail	Triple Track on Main Line from Colombo to Ragama	Track capacity has been reached on this line, so it should be triple tracked to increase competitiveness.	CIS	C
33	CMRSP	Rail	Double Track Coastal Line from Colombo to Kalutara	Increase capacity along Galle Road corridor to increase modal share of rail and reduce traffic congestion on Galle Road	CIS	C
34	CMRSP	Rail	Double Track between Ragama and Negombo	Improve speed and compete with road based traffic on Negombo corridor	CIS	C
35	CMRSP/ WRMP	Rail	New Rail Link (Dematagoda-Kotte-Ratmalana)	Development of a rail loop from Dematagoda to Ratmalana to reduce congestion on Sri Jayawardenapura Road, Kotte Road, and Kollonnawa Road. Called the City Line in WRMP	CIS	P
36	CMRSP	Rail	Electrification of Railway	Help to increase speeds and capacity, as well as give a renewed image to SLR. Many proposals proposed including a network of 200+ km extending from Colombo to Kalutara, Kottawa, Kurunegala, and Kochchikade. DMU and carriage purchases would also have to occur.	CIS	P

**Table A1.1 List of Projects and Proposals from Previous Studies (5/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
37	CMRSP	Intermodal	Intermodal Access and Park and Ride (Bus/Rail and Rail/Private Vehicle)	Renew bus routes as feeders to rail stations. Use railway land and underutilized space around stations for Park N' Ride and bicycle parking facilities.	CIS/TMS	P
38	CMRSP	Rail	Demand Responsive Suburban Rail Routing and Scheduling	Implement uniform headway baseline service between Kalutara (Coastal) and Veyangoda (Main) of 10-15 minutes peak and 30 minutes off-peak. Started by University of Moratuwa, but was stopped due to lack of funding.	IPIS	P
39	CMRSP	Land Use/ Development	Development of Negombo/Katunayake Growth Center	Includes airport, connected to NSH and accessibility is available via NEH, Low-Level Road, Kotte Road, High Level Road, Puttalam Line. (double tracked from Ragama - Negombo)	CIS	P
40	CMRSP	Land Use/ Development	Development of Gampaha/Nittambuwa Growth Center	Corridor served NEH and A1 (Kandy Road), as well as Main Line.	CIS	P
41	CMRSP	Land Use/ Development	Development of Biyagama/Sapugaskanda Center	NSH will bisect this area, along with access to Low-Level Road, Kandy Road, and Jayawardanapura Road. Restoration of right-of-way to Biyagama may also occur	CIS	P
42	CMRSP	Land Use/ Development	Development of Homagama/Padukka Growth Center	Connected to NSH via SEH (Ratmalana - Ratnapura Highway) and A4, plus possible LRT along Kelani Valley Line right-of-way	CIS	P
43	CMRSP	Land Use/ Development	Development of Horana/Bandaragama Growth Center	NSH will bisect this area.	CIS	P
44	CMRSP	Land Use/ Development	Development of Matugama Growth Center	Main intersection of NSH Also great impact on Kalutara District development	CIS	P
45	CMRSP	Land Use/ Development	Development of Kalutara Urban Center	Connected to NSH via proposed interchange at Bombuwela, as well as access to Galle Road (A2) and Coastal Line	CIS	P

**Table A1.1 List of Projects and Proposals from Previous Studies (6/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
46	CMRSP	Land Use/ Development	Development of Moratuwa Urban Center	Needs a new road link between Piliyandala and Moratuwa as part of NSH, as connection is poor. Investigate parallel roads to A2	CIS	P
47	CMRSP	Land Use/ Development	Development of Avissawella Urban Center	Connected to Ratmalana-Ratnapura Highway by link road. A4 can be a distributor and A1 connections from Avissawella can be improved.	CIS	P
48	CMRSP	Land Use/ Development	Development of Dehiwela - Mt. Lavinia Agglomeration	Will have good inter-regional access via Baseline Road extension within 2 km from center	CIS	P
49	CMRSP/ CDP	Road	Transport Demand Management (TDM) Measures (City of Colombo)	Areas served well by public transport (Fort, Pettah, Slave Island, Maradana, and Town Hall) should have TDM, including imposing zonal parking areas with maximum spaces/zone; electronic road pricing; auto-restricted areas; staggering hours of schools, offices, etc; bus priority including exclusive lanes, turning movements, and dedicated streets.	TMS	G
50	CMRSP/ CDP	Rail	Develop People Mover System	In central areas (Fort, Pettah, Slave Island, Maradana, and Town Hall), develop high quality PMS - light rail, trams, or low-floor buses	CIS	G
51	CMRSP/ CDP	Rail	Extend People Mover System to Suburbs	Extend PMS (above) to some suburbs, including along the KV Line right-of-way, and along the canal banks from Narahenpita to Wellawatte via Kirulapone	CIS	G

**Table A1.1 List of Projects and Proposals from Previous Studies (7/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
52	CMRSP/ CDP	Intermodal	Develop Intermodal Pettah Transport Center	Develop a high quality, multi-modal transport center using the Manning Market land. It should provide for inter-modal transfer between rail, PMS, inter-city bus, and local buses. A bridge connection, over the rail tracks, between DR Wijewardena Mw. and Olcott Mw. should be considered.	CIS	G
53	CMRSP/ CDP	Road	Bicycle Lanes	Incorporate 2 bicycle lanes on Marine Drive from Wellawatte to Fort and extend to Modera	TMS	G
54	CMRSP/ CDP	Road	Baseline Road Extension	Improvements being made from Kelani Tissa round about to Kirulapone to A4. Extension plans between Attidiya to A2 have been finalized. All designs should reflect limited access and be treated as a high mobility route.	CIS	O
55	CMRSP/ CDP	Road	Develop Marine Drive	Could be designed as a 2-lane distributor road to support Galle Road	CIS	PC
56	CMRSP/ CDP	Road	Extension of Duplication Road	Extension of Duplication Road to Dharmarama Road (Wellawatte) should be connected to an alternative route like Anderson Lane, Hampden Lane, Sri Saranankara Mw., Karagampitiya Road, and a new link to Templers Road. (Mt. Lavinia)	CIS	PC (Up to Wellawatta)
57	CMRSP/ CDP	Road	Mattakkuliya Bridge	3rd bridge over the Kelani River at Mattakkuliya to provide parallel road for Northbound traffic from CBD via Alutmawata Road, along Hekitta Road to Ja-ela and Negombo. Provide an effective alternative to proposed Katunayake Expressway	CIS	C

**Table A1.1 List of Projects and Proposals from Previous Studies (8/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
58	CMRSP/ CDP	Road	Katunayake Expressway	Along seaside of A3 highway to provide access to airport and North Western Region. Perhaps overlap of this expressway and NSH - study needed	CIS	PC
59	CMRSP	Land Use/ Development	Improvement of Schools Outside City	Improve schools outside city as school traffic is a significant contribution to the morning peak and traffic-attracting schools are located within a 2 sq. km area in the city	IPIS	O
60	CMRSP	Road	Pedestrianize the Fort Area	Restrict private vehicle access to Fort area Follow with other pedestrian areas	TMS	P
61	CMRSP	Bus	Restructuring Bus Companies (Public)	Re-structure peoplized bus transport services into 3 large operating units and provide for their financial viability	IPIS	C
62	CMRSP/ WRMP	Bus	Consolidate Single Bus Operators (Private)	Encourage grouping of single bus operators to improve quality of service	IPIS	O (Attempted, but failed)
63	CMRSP	Bus	Update Bus Routes, Schedules, and Fleet based on Demand Patterns; Increase Available Bus Fleet to 12,000 Buses	Update routes, fleet, and scheduling of buses based on demand patterns and road development To meet the modal shares, the operational bus fleet in CMR should be increased from 9,000 vehicles to 12,000 vehicles - about 800 buses/year (with attrition included)	CIS	PC
64	CMRSP/ CDP	Bus	Develop Bus Priority Projects	Give priority in traffic flow to increase bus speeds on main corridors, especially during peak periods	TMS	G
65	CMRSP	Bus	Improve Quality of In- and Out-of Vehicle Bus Travel	Improve Quality of In- and Out-of Vehicle Bus Travel	IPIS	P
66	CMRSP/ CUTS2	Port	Creation of Internal Container Depots (ICD)	Create road-based and rail-based ICDs in Biyagama (road) and Hunupitiya and Ratmalana (rail). Will require 3 additional locomotives and 60 wagons for SLR	CIS	P

**Table A1.1 List of Projects and Proposals from Previous Studies (9/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
67	CMRSP	Land Use/ Development	Relocation of Manning Market and Part of Pettah Dry Goods Wholesale Market	Move both to Orugodawatte, which will be connected to NSH, EWH, and Baseline Road	CIS	P
68	CMRSP	Intermodal	Develop Ragama Intermodal Transport Center	Will serve NSH, NEH, and 2 railway lines	CIS	P
69	CMRSP	Intermodal	Develop Kottawa Intermodal Transport Center	Will serve NSH, SEH, KV Line, and A4	CIS	P
70	CMRSP	Intermodal	Develop Ratmalana Intermodal Transport Center	Serve Coastal Line, Galle Road, Baseline Road extension, and SEH	CIS	P
71	CMRSP	Intermodal	Develop Orugodawatte Intermodal Transport Center	Serve Main Line, Baseline Road, and A1 and A3	CIS	P
72	CMRSP	Intermodal	Intermodal Facilities at Each Railway Station	Develop well-designed and functional intermodal transfer facilities (bus/rail), including drop-off/pick-up bus facilities at each station	CIS	P
73	CMRSP	Regulation	Develop Adequate Safety Regulations for Office and School Van Transport	Develop safety regulations for office and school van transport	IPIS	P
74	CMRSP	Regulation	Develop and Implement a Permit System for Three-Wheelers	Implement three-wheeler permit system to resolve high charges currently levied and oversupply of vehicles	IPIS	P
75	CMRSP	Road	Research Requirements for an Inter-Regional Expressway System	Investigate vehicle ownership, demand patterns, human settlement patterns along with relevant transport modal attributes to determine high speed linkages	IPIS	0
76	CMRSP	Intermodal	Upgrade Traffic/Land Use Model for CMR to a Full Transport Model	Use University of Moratuwa's initial model and upgrade it to incorporate multi-modal transport model	IPIS	P
77	CMRSP	Road	Study Conversion of Roads to High Mobility Corridors	Conduct research program to monitor speeds and delays and identify improvements along other proposed corridors Pilot HMC was along Galle Road - Moratuwa	CIS	P

**Table A1.1 List of Projects and Proposals from Previous Studies (10/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
78	CMRSP	Road	Research Traffic Restraint/TDM Measures	Conduct international best practice and survey to recommend a scientific and socially acceptable program	TMS	O
79	CMRSP	Bus	Research on Improving Bus Operations	Conduct a research program to systematically build up fleet to increase quality and quantity of operations. Improve routing and bus development	IPIS	O
80	CMRSP	Intermodal	Conduct a Multi-Modal Analysis of Transport Requirements within CMR	Results should be used to determine the optimal locations of intermodal transport centers listed above	IPIS	O
81	CMRSP	Rail	Develop Long-Term Strategic Plan for SLR	Focus on railway improvements, fleet and management	IPIS	P
82	CMRSP/ CDP	Road	Improve Kollupitiya - Belummahara (State Drive)	Widen to 100 ft.	RWS	G
83	CMRSP/ CDP	Road	Improve Parliament Drive	Widen to 100 ft.	RWS	G
84	CMRSP/ CDP	Road	Improve Kollupitiya - Moratuwa (Marine Drive + Railway strip)	Widen to 130 ft.	RWS	G/PC (Up to Wellawatta)
85	CMRSP/ CDP	Road	Improve Road from Colombo - Galle	Widen to 100 ft.	RWS	G
86	CMRSP/ CDP	Road	Improve Road from Colombo - Horana	Widen to 100 ft.	RWS	G
87	CMRSP/ CDP/ WRMP	Road	Improve Road from Colombo - Ratnapura	Widen to 100 ft.	RWS	PC
88	CMRSP/ CDP	Road	Improve Road from Colombo - Kandy	Widen to 80-100 ft.	RWS	PC
89	CMRSP/ CDP	Road	Improve Road from Colombo - Negombo	Widen to 80-100 ft.	RWS	G

**Table A1.1 List of Projects and Proposals from Previous Studies (11/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
90	CMRSP/ CDP	Road	Improve Baseline Road	Widen to 100 ft.	RWS	G
91	CMRSP/ CDP	Road	Improve Road from Fort - Maradana	Widen to 100 ft.	RWS	G
92	CMRSP/ CDP	Road	Improve Road from Fort - Borella	Widen to 100 ft.	RWS	G
93	CMRSP/ CDP	Road	Improve Dharmapala Mawatha	Widen to 100 ft.	RWS	G
94	CMRSP/ CDP	Road	Improve Road from Dehiwala - Maharagama	Widen to 100 ft.	RWS	G
95	CMRSP/ CDP	Road	Improve Road from Rajagiriya - Ratmalana	Widen to 100 ft.	RWS	G
96	CMRSP/ CDP	Road	Improve Road from Pannipitiya - Battaramulla	Widen to 100 ft.	RWS	G
97	CMRSP/ CDP	Road	Improve Road from Malabe - Athurugiriya	Widen to 100 ft.	RWS	G
98	CMRSP/ CDP	Road	Improve Road from Koswatte - Kelanimulla (Dalugama (proposed))	Widen to 100 ft.	RWS	G
99	CMRSP/ CDP	Road	Improve Kirimandala Mawatha	Widen to 100 ft.	RWS	G
100	CMRSP	Road	Improve Road from Nugegoda - Delkanda	Widen to 100 ft.	RWS	P
101	CMRSP	Road	Improve Port Access Road	Extend Port Access Road 9 km to the east to connect with NSH. Widen to 100 ft.	RWS	C
102	CMRSP/ CDP	Road	Improve Duplication Road	Widen to 80 ft. (CDP indicates between Slave Island and Bambalapitiya)	RWS	G
103	CMRSP	Road	Improve Road from Bambalapitiya - Ratmalana	Widen to 80 ft.	RWS	P



**Table A1.1 List of Projects and Proposals from Previous Studies (12/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
104	CMRSP/ CDP	Road	Improve Road from Thimbirigasyaya - Narahenpita	Widen to 80 ft.	RWS	G
105	CMRSP/ CDP	Road	Improve Road from Nugegoda, Jubili Post - Etul Kotte	Widen to 80 ft.	RWS	G
106	CMRSP/ CDP	Road	Improve Road from Gas Paha - Mattakkuliya	Widen to 80 ft.	RWS	G
107	CMRSP	Road	Improve Road from Delkanda - Rattanapitiya	Widen to 80 ft.	RWS	P
108	CMRSP	Road	Improve Road from Koswatte - Etul Kotte (proposed)	Widen to 80 ft.	RWS	P
109	CMRSP	Road	Improve Road from Udahamulla - Polwatte	Widen to 80 ft.	RWS	P
110	CMRSP	Road	Improve Lake Drive State D R Kirimandala Mawatha	Widen to 80 ft.	RWS	P
111	CUTS2	Bus	Develop Transport Provision Contracts (TPC)	This includes: establishing bus service regulator, set bus service levels, developing TPCs, establishing contract monitoring, and establishing minimum fleet operators.	IPIS	P
112	CUTS2	Bus	Establish Service Planning Process	This includes: establishing service planning guidelines and establishing organization to undertake service planning.	IPIS	P
113	CUTS2	Bus	Review Bus Sector Levels of Compensation	This includes: examining potential for fuel duty rebates, and establishing and implementing bus fare policy.	IPIS	PC
114	CUTS2	Land Use/ Development	Improve and Develop Fort and Pettah Areas	Conceptual transport plan with emphasis on improving accessibility, public transport, and traffic circulation. Contains Pettah Transport Center	CIS	O

**Table A1.1 List of Projects and Proposals from Previous Studies (13/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
115	CUTS2	Intermodal	Develop, Approve, and Expand Transport Master Plan for CMR	Based on CMRSP; Recommends managing radial flows; planning for orbital flows; and solving transport issues that result from transport in CMR	IPIS	O
116	CUTS2	Road	Create Traffic Management Policy and Body	This includes: appointing traffic management council and traffic management secretariat.	TMS	P
117	CUTS2	Road	Strengthen RDA Implementation Capabilities	This includes: creating traffic directorate and RDA traffic management unit and appointing staff.	IPIS	P
118	CUTS2	Road	Strengthen CMC Traffic Management Capabilities	This includes: creating a parking unit and establishing a road safety unit.	TMS	O
119	CUTS2	Road	Strengthen Police Traffic Management Capabilities	This includes: reviewing traffic management training, filling vacancies, and reducing transfer of senior staff.	TMS	O
120	CUTS2	Road	Develop Parking Policies and Strategies	This includes: adopting a national parking policy, developing a local parking policy and strategy, and developing CMC parking enforcement capabilities.	TMS	P
121	CUTS2	Road	Undertake Detailed Design of WA Silva Junction Improvements and Extension (Duplication Road)	This includes: detailed design, monitoring improvements, re-evaluating extension options, and implementing extension.	RWS	PC
122	CUTS2	Road	Implement Galle Road Pilot Scheme	This includes: land acquisition and detailed design for Galle Road - Dehiwela Bridge to Kawdana Junction.	CIS	P
123	CUTS2	Road	Implement Lipton Circus Pilot Scheme	This includes: detailed design for Lipton Circus/Eye Hospital Junction.	TMS	PC
124	CUTS2	Road	Prepare Kandy Road and Galle Road Corridor Schemes	These are the high-mobility corridors from CMRSP.	TMS	P
125	CUTS2	Rail	Study Rail's Future Supply and Demand to Increase Modal Share	This includes: demand forecasting and alternative forms of investments.	IPIS	P

**Table A1.1 List of Projects and Proposals from Previous Studies (14/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
126	CUTS2	Rail	Increase Progressive Practices Used at SLR	This includes: refocusing towards a customer-led business; creating a Safety and Operational Standards Department; creating a New Works Department; and integrating traffic control and infrastructure.	IPIS	P
127	CUTS2	Rail	Develop Strategies for Signaling, Rolling Stock, and Asset Management	This includes: developing a traffic control policy, establishing control officer roles; increase cross-Colombo services; research and install train describer equipment and associated systems; prepare rolling stock strategy; and prepare asset management plan.	IPIS	P
128	CUTS2	Rail	Improve SLR Timetabling and Service Delivery	This includes: prepare demand-driven timetable for network; implement efficient rolling stock storage and light maintenance facilities; review rolling stock and crew assignments; and introduce cross-Colombo shuttle services.	IPIS	P
129	CUTS2	Rail	Quantify Structural Integrity of Kelani Rail Bridge	This includes: structural tests and assessment.	CIS	C
130	CUTS2	Rail	Determine Viable Mass Rapid Transit Options for Colombo	This includes: undertaking a feasibility study.	IPIS	P
131	CDP	Land Use/ Development	Introduction of New Building Limits/Lines	Establish building limits/lines for future road widening along Ceremonial Access, Ward Place, Maradana Road, Bullers Road, etc.	IPIS	G
132	CDP	Road	Improve Road from Dehiwala - Hokandara	Widen to 100 ft.	RWS	G
133	CDP	Road	Improve Road from Thimbirigasyaya - Nawela	Widen to 80 ft.	RWS	G
134	CDP	Road	Improve Road from Maharagama - Nugegoda	Widen to 80 ft.	RWS	G

**Table A1.1 List of Projects and Proposals from Previous Studies (15/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
135	CDP	Regulation	Creation of a Colombo Development Authority	Administer the core area; consists of municipalities; able to tax and collect duties	IPIS	G
136	CDP	Port	Port Development (Colombo)	No information given	CIS	G
137	CDP	Land Use/ Development	Improvements in Fort	No information given	CIS	G
138	CDP	Road	Road Construction along Kelani River	No information given	CIS	G
139	CDP	Land Use/ Development	Create Concentrated Development Areas	Areas include: Maradana, Kollupitiya, Mattakkuliya, Orugodawatta, Dematagoda, Borella, Bambalapitiya, Wallawatte, Narahenpita, Kirulapane, Thimbirigasyaya.	CIS	G
140	WRMP	Road	Outer Necklace Semi-Expressway	Connects all proposed new townships/regional centers (Seethawaka, Negombo, Kalutara, Attanagala, Horana) to the peripheral of the Western Region. 2 lanes completed by 2010	CIS	P
141	WRMP	Road	Inner Necklace Expressway	Connects airport/north to industrial zone/south and links Inner Necklace Townships. 2 lanes completed by 2010	CIS	P
142	WRMP	Road	City Semi Expressway	Acts a Colombo bypass and connects to Colombo-Katunayake Expressway (north) and Southern Expressway (south) via A4, B84, A2. 2 lanes completed by 2010	CIS	P
143	WRMP	Road	Kandy Expressway	Links Inner and Outer Necklace Expressway to Kandy. 2 lanes completed by 2010	CIS	P
144	WRMP	Road	Semi Expressways	Other proposed expressways to carry trips to/from CBD	CIS	P

**Table A1.1 List of Projects and Proposals from Previous Studies (16/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
145	WRMP	Road	Traffic Management Proposals	Operate signals 24/7; signalize roundabouts; convert roundabouts to signalized intersections; convert Galle/Duplication to one-way system; road widening and extensions; flyovers and grade separation	TMS	P
146	WRMP	Land Use/ Development	Land Use Controls	Building setbacks, access control, car park provision	IPIS	P
147	WRMP	Road	Pedestrian Facilities	Build overpasses and underpasses where appropriate	TMS	O
148	WRMP	Bus	Develop Bus Stand Facilities	Provide bus bays, shelters, lights, passenger information	CIS	P
149	WRMP	Road	Road Signage	Improve road directional signs, street signs, and traffic sign markings with proper reflective sheeting	TMS	O
150	WRMP	Road	Implement Traffic Calming Measures	Road humps, rumble strips, entrance treatments, roundabouts, narrow pavement widths, barriers, signs, changes in pavement texture/color	TMS	O
151	WRMP	Road	Phase Out Three-Wheelers	Once bus and rail systems are improved, three-wheelers can be phased out with a progressive legislation program.	IPIS	P
152	WRMP	Rail	Remove Coastal Line	Remove section from Ratmalana to city limit near Orugodawatta	CIS	P
153	WRMP	Rail	Develop Circle Line Railway	Elevated medium-capacity rail transit system from Balummahara to Homagama, with expansion for the future	CIS	P
154	WRMP	Rail	Develop Southern Line Railway	Elevated medium-capacity rail transit system from CBD to Horana Regional Center	CIS	P
155	WRMP	Road	Upgrade A1	From Kiribathgoda to Nittabuwa	CIS	PC

**Table A1.1 List of Projects and Proposals from Previous Studies (17/17)**

No	Source	Category	Project Title	Project Description	Project Type	Status
156	WRMP	Road	Upgrade A4	From Kirulapone (Baseline Road) to Kottawa (Southern Expressway)	CIS	P
157	WRMP	Road	Upgrade B84/Colombo Horana Road	From Colombo to Pokunuwita	CIS	P
158	WRMP	Road	Upgrade B214/Kelaniya - Mudungoda Road	From Biyagama to Mudungoda	CIS	P
159	WRMP	Bus	Remove Central Bus Stands and Develop Bus Interchanges at Periphery of City	Locate bus interchanges at Dematagoda, Battaramulla, Maharagama, Ratmalana, Wattala, Wellampitiya, Kottawa, Katubedda. Link these to proposed mass rapid transit lines.	CIS	P
160	WRMP	Intermodal	Integration of Public Transport Fares and Schedules	Integrate inter- and intra-city bus and rail fares to remove transfer penalty. Integrate schedules to reduce travel time	IPIS	P
161	WRMP	Bus	Bus Infrastructure Improvements	Create bus bays, designated bus lanes, interchanges, and depots for all buses	CIS	P

**Table A1.2 List of Projects Proposed by Working Groups (1/5)**

No	Category	Project Title	Project Description	Project Type
1	Regulation	Establish a Coordinating Body for Urban Transportation Development in CMR	Establish a committee responsible for the overall coordination of transportation policy in CMR. It is expected that all transport-related ministries would be members of the committee and they would be actively supported by their agencies. Note that in addition to central government ministries, representatives from the WPC and CMC are also to be a member of the committee.	IPIS
2	Road	Area Traffic Control (ATC) System	Introduction of an area traffic control system to Colombo including the establishment of a Traffic Control Center. A total of 120 signals, which include 102 existing signals, at various locations in Colombo.	TMS
3	Road	Traffic Signal Rehabilitation	Review and update phasing and timing of the existing traffic signals. The project is a temporary measure until introduction of ATC system. 102 existing signals in Colombo and about 10 signals in adjacent areas will be targeted.	TMS
4	Road	CCTV Traffic Monitoring System	Installation of closed circuit television (CCTV) camera at key intersections in and around Colombo for traffic monitoring purposes. The project can be a part of ATC system project or a separate project. Approximately 30 - 40 locations will be covered by the system.	TMS
5	Road	Pedestrian Overpass/underpass	Construction of pedestrian overpasses or underpasses at locations where pedestrian volumes are high. Candidate locations are Lipton Circus, Kollupitiya, Bambalapitiya, Pettah, Baseline Road	TMS
6	Road	Road User Education Program	Campaign, TV programs, contests, and other activities that focus on traffic discipline and manner to increase understanding by all road users of the actions that cause congestion.	TMS/IPIS
7	Road	Traffic Safety Improvement	Conduct traffic safety audit and implement improvement measures. Target roads are A1 (Kandy), A2 (Galle), A3 (Negombo), A4 (High Level Road), A1SP (Sri Jayewardenepura Mawatha), and other accident prone spots and sections.	TMS/IPIS
8	Road	Traffic Safety Awareness Program	Campaign, TV program, contest and other activities directed towards all road users that focus on traffic safety.	TMS/IPIS
9	Road	Fourth Bridge at Kelaniya (Keranisiri Bridge)	New Bridge construction crossing Kelani River connecting Biyagama Road and Ambatale Road. Foundation and Substructure has been completed.	CIS
10	Road	B152 Widening	This project covers Marine Drive Extension after the Mattakkuliya Bridge to Negombo. The most of alignment goes over the existing B152 Road.	RWS

**Table A1.2 List of Projects Proposed by Working Groups (2/5)**

No	Category	Project Title	Project Description	Project Type
11	Road	Improve Road from Yakkala - Biyagama - Malabe	Widen road from 2 lanes to 4 lanes from Yakkala-Biyagama-Malabe connecting Kandy Road to Kotte Road. Redefine cross-sections with markings and incorporate vehicle segregation.	RWS
12	Road	Improve Road from Panadura - Bandaragama (A8)	Widen road from 2 lanes to 4 lanes along A8 from Panaduwa-Bandaragama connecting Galle Road to NSH. Redefine cross-sections with markings and incorporate vehicle segregation.	RWS
13	Road	Improve Road from Waskaduwa - Bandaragama (B454-455)	Widen road from 2 lanes to 4 lanes from Waskaduwa-Bandaragama connecting Galle Road to NSH. Redefine cross-sections with markings and incorporate vehicle segregation.	RWS
14	Road	Maradana - Galle Face Link	UDA has plans to develop a 4-lane road crossing Beira Lake to connect DR Wijewardana Mawatta to Galle Face, with a 200m bridge across the lake.	CIS
15	Road	Independence Square pedestrian footpath development	Facilitate a series of pedestrian footpaths around Independence Square.	CIS
16	Road	Beira Lake pedestrian footpath development	Facilitate a series of pedestrian footpaths around Beira Lake.	CIS
17	Road/Bus	Develop BRT between Dematagoda and Battaramulla	Develop bus rapid transit line connecting Dematagoda station to Sethsiripaya Administrative Complex to serve administrative staff and alleviate congestion	CIS
18	Road	Pelawatta - Malabe - Kahantota Road (7 Km)	Widen to 2 lanes from Pelawatta (B-47) to Pittugala (B-263). Intersects B-240 at Malabe. An alternate route from Battaramulla to Kaduwela that bypasses Malabe could be undertaken.	RWS
19	Road	Pittakotte -Thalawatugoda - Hokandara - Koskadawila Road (8.4.Km)	Widen to 2 lanes from Pitakotte (B-120) to Koskadawila (B-263). Intersects B-47 at Thalawatugoda. An alternate route from Nugegoda to Kaduwela that bypasses Malabe and Battaramulla could be undertaken.	RWS
20	Road	Thalangama - Aggona - Angoda -Kelaniya - Kiribathgoda Road	Widen to 4 lanes from Koswatta Junction (B-240) to A1 at Dalugama Junction. Intersects AB10 at Kelanimulla Junction and B214 at Kelaniya.	RWS
21	Road	Pannipitiya - Moralatiya - Tuumbowila - Wewala - Suwarapola Road (7.4 km)	Widen to 2 lanes from Pannipitiya railway station (B-047) to Suwarapola (B-295). Intersects A-4 at Moraketiya and B-84 at Bokundara.	RWS



**Table A1.2 List of Projects Proposed by Working Groups (3/5)**

No	Category	Project Title	Project Description	Project Type
22	Road	Piliyandala - Henemulla (5.65 Km) + Bridge 150m span	Widen to 2 lanes from Panadura (A2) to Piliyandala (B-84). Require a bridge of 150m across Weras Ganga. Important link between Piliyandala and Panadura.	RWS
23	Road	Biyagama - Malwana - Walgama - Malwana - Walgama - Ulhitiwala - Pananwala -Keragala -Henegama -Wanaluwawa Road	Widen to 2 lanes from Biyagama (B214) to Biyagama EPZ to Kirindiwela. Links to A1 and B214 from Pasyala to Kaduwela	RWS
24	Road	Kottawa - Pitipana Road (5.1 Km)	Widen to 2 lanes from Kottawa (A4) to Pitipana (A4). Bypasses Homagama.	RWS
25	Road	Homagama -Thalagala - Olaboduwa - Palanoruwa - Kahatapitiya - Kedalpitiya sections	Widen to 4 lanes from Homagama (A4) to Bandaragama connecting four B class roads.	RWS
26	Road	Flyover Construction for Railway crossing at Kelaniya on Kandy road	Flyover for railway crossing at Kelaniya on Kandy Road. East-west traffic at this intersection exceeds 80,000 per day. The railway traffic is so high that the road closes frequently in peak time. Design of the flyover has been prepared by RDA.	CIS
27	Road	Flyover Construction for Kohuwala Intersection	Flyover at Kohuwala Intersection. Total engineering cost is estimated as Rs. 600 million. Preparation of detailed engineering designs is in progress. Acquisition of land to be commenced after finalization of detailed engineering design.	CIS
28	Road	Flyover Construction for Kirulapone Intersection	Flyover at Kirulapone Intersection. Total engineering cost is estimated as Rs. 300 million Concept paper has been prepared, and submitted for JICA grant aid program for feasibility study.	CIS
29	Road	Flyover Construction for Nugegoda Intersection on High Level Road	Design drawing is available, for an alternative proposal international PQ completed and bidding document is available. Proposals have been already submitted to GoSL, JICA and China.	CIS
30	Road	Flyover Construction for Dehiwala Junction on Galle Road	Flyover at Dehiwela Junction on Galle Road. Detailed design for a four lane flyover structure on the Galle Road has already been completed. This project requires demolition of buildings and acquisition of lands on either end of the junction along the Galle Road. Hence another option needs to be looked in to ascertain whether a flyover along Hill Street direction would be more feasible.	CIS

**Table A1.2 List of Projects Proposed by Working Groups (4/5)**

No	Category	Project Title	Project Description	Project Type
31	Road	Flyover Construction for Railway crossing at Duplication Road across the Coastal Railway Line at Slave Island	Flyover for Railway Crossing at Duplication Road across the Coastal Railway Line at Slave Island. The railway traffic is so high that the road closes frequently in peak time. Traffic data are not available.	CIS
32	Road	Flyover Construction for Boralesgamuwa Roundabout	Flyover at Boralesgamuwa Roundabout. Total engineering cost is estimated as 300 million Rs. Concept paper has been prepared, and submitted for JICA grant aid program for feasibility study.	CIS
33	Road	Flyover Construction for Orugodawatta Railway Crossing	Flyover for Orugodawatte Railway Crossing. Total engineering cost is estimated as 600 million Rs. Concept paper has been prepared, and submitted for JICA grant aid program for feasibility study.	CIS
34	Road	Grade separated interchange construction for Rajagiriya Intersection	East-west traffic at this intersection exceeds 80,000 per day. Intermingling of the north-south traffic due to the intersection design increases congestion. Total engineering cost is estimated as Rs. 800 million. Concept paper has been prepared, and submitted for JICA grant aid program for feasibility study and China grant. Traffic data is available.	CIS
35	Road	Grade separated interchange construction for Panchikawatte Roundabout	Total engineering cost is estimated as Rs. 1000 million. Concept paper has been prepared, and submitted for JICA grant aid program for feasibility study. Acquisition of land to be commenced after finalization of detailed engineering design. Traffic data is not available.	CIS
36	Road	Grade separated interchange construction for Orugodawatte Intersection	Flyover across Main Line on Orugodawatte - Ambatale Road. Total engineering cost was estimated as Rs. 500 Million and acquisition is in progress.	CIS
37	Road	Lipton Circle extending over the roundabout at Alexandra Place on the State Drive to Parliament	Concept paper has been prepared, and submitted for JICA grant aid program for feasibility study.	CIS
38	Road	Liberty Roundabout at Dharmapala Mawatta and Duplication Road	Concept paper has been prepared, and submitted for JICA grant aid program for feasibility study.	CIS
39	Road	Capacity Development for Drainage maintenance for Colombo Municipality	Overflow storm water make congestion worsen in CMC area. The drainage system along highways are well equipped, however, ignorance of maintenance is the major reason of the capacity decreasing. This project provides technical assistance services and equipment for maintenance ability improvement of CMC.	IPIS

**Table A1.2 List of Projects Proposed by Working Groups (5/5)**

No	Category	Project Title	Project Description	Project Type
40	Bus	Project to Improve School Transport Services	Quick and inexpensive approach to beginning to regulate school transport services. Continued support of NTC large bus school services	IPIS
41	Bus	Strengthening of NTC on Transport Planning and Operations/Management	The training would include regulations, surveying, data analysis, database design and analysis, GIS training, transport economics, pricing, timetabling, cost-benefit analysis, tendering, route network design. This training should also include information on franchising – methodology, legal framework, benefits, risks, concepts, etc.	IPIS
42	Bus	Strengthening of SLTB on Operations/Management	The training would include data analysis, marketing, intermodalism, crew assignment, vehicle assignment, maintenance scheduling, costing. It would also include information on franchising – methodology, benefits, risks, concepts, costing, etc.	IPIS
43	Bus	Develop a Training Center at Western Province Road Passenger Transport Authority and Undertake Strengthening of WPRPTA	Strengthen WPRPTA staff, Private Owners/Operators, and Bus Crews	IPIS
44	Rail	Strengthening of Sri Lank Railways on Planning and Operations/Management	Training at SLR would focus on developing pricing and fare policies, costing, commercially-oriented measures (including freight development, marketing, passenger information, etc.), general management knowledge, regulations, progressive policies (public private partnerships, value capturing, development of railway land), demand surveys, data analysis, timetabling, and intermodalism (reasons why it is necessary, how to work with the bus sector). Training should also focus on Human Resources Management.	IPIS
45	Three Wheelers	Strengthen WPRPTA to Implement and Strengthen the Three-Wheeler Services Bureau and Outline Three-Wheeler Regulations	Focus on assisting WPRPTA in forming a task force to implement and strengthen the Three-Wheeler Services Bureau under WPRPTA	IPIS
46	Social/ Environment	Capacity Building for equipment and training of personnel	Capacity building is necessary to expedite the existing vehicle inspection program, conduct roadside inspections of fuel, increase the emission and noise testing capabilities, and improve transport operational monitoring.	IPIS
47	Social/ Environment	Landscaping and Road Design	Focused on pedestrian facilities and identifying existing roads that can be improved with regards to landscaping and design.	IPIS

## Appendix 2 Socio-Economic Activities of Western Province

### A2.1 Economic Growth of Western Province

#### (1) Secondary and Tertiary Sectors

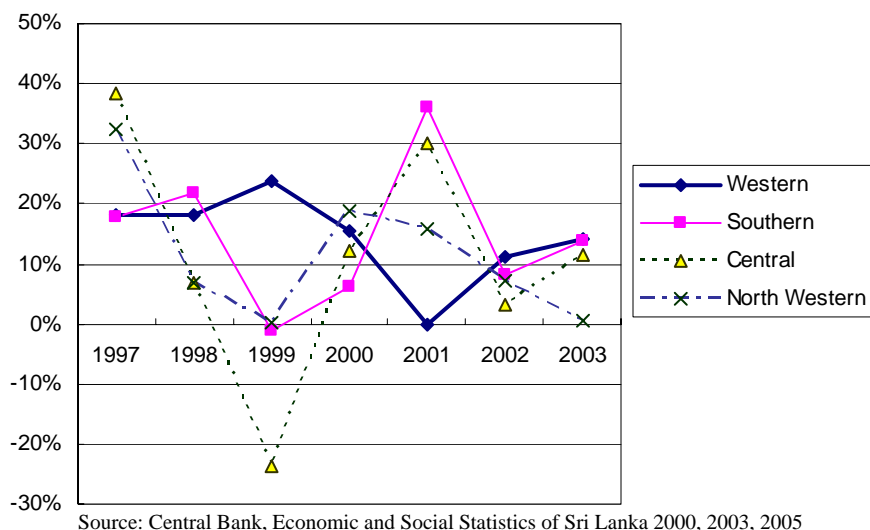


Figure A2.1 Annual Growth Rate of Secondary Sector in Major Provinces

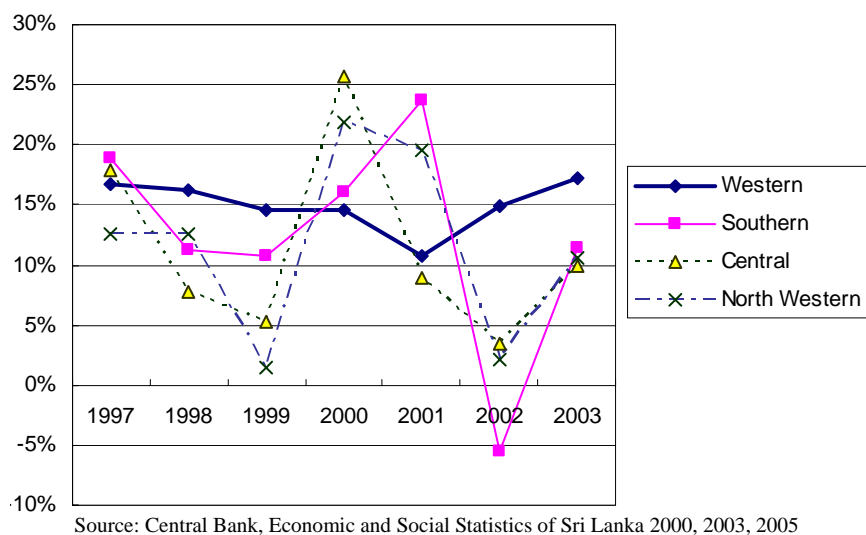
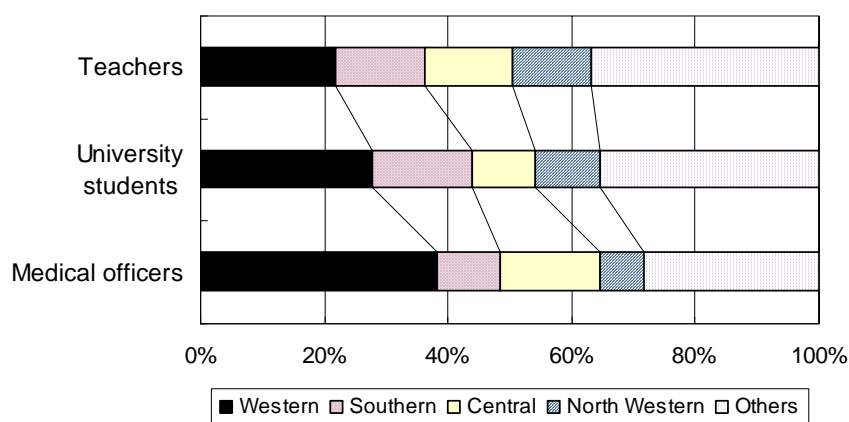


Figure A2.2 Annual Growth Rate of Tertiary Sector in Major Provinces

## A2.2 Social Service and Employment Concentration



Source: Central Bank, Economic and Social Statistics of Sri Lanka 2000, 2003, 2005

**Figure A2.3 Share of Western Province in Social Services**

**Table A2.1 Share of Employees in WP in Major Industries (2001)**

Area	All Industries	Three Major Industrial Categories		
		Manufacturing	Construction	Wholesale and Retail
Sri Lanka	6,236,000	1,057,000	324,000	388,000
Total WP	1,968,165	534,297	99,145	296,773
Colombo District	855,142	197,350	41,682	142,473
Gampaha District	756,186	260,565	39,096	106,385
Kalutara District	356,837	76,382	18,367	47,915

Source: Census of population and housing – 2001, Sri Lanka, Department of Census and Statistics

## A2.3 Migration Statistics

**Table A2.2 CMR Migrant Population Characteristics**

District	Sex	Number of Persons by What Year They Migrated into									
		After 2000		1996-2000		1991-1995		Before 1991		Not Stated	
		Total	%	Total	%	Total	%	Total	%	Total	%
Colombo	M	51,778	13.8	82,222	22.0	53,301	14.3	152,822	40.9	33,501	9.0
	F	40,092	11.9	75,476	22.4	53,273	15.8	149,422	44.2	19,148	5.7
	T	91,870	13.0	157,698	22.2	106,574	15.0	302,244	42.5	52,919	7.4
Gampaha	M	42,131	14.9	68,111	24.1	44,300	15.7	107,983	38.2	20,440	7.2
	F	40,333	12.5	85,025	26.3	56,495	17.5	124,538	38.5	17,105	5.3
	T	82,464	13.6	153,136	25.3	100,795	16.6	232,521	38.3	37,545	6.2
Kalutara	M	10,951	13.1	18,550	22.2	13,784	16.5	33,307	39.9	6,959	8.3
	F	10,332	10.5	20,537	21.0	17,086	17.4	44,103	44.9	6,284	6.4
	T	21,183	11.7	39,087	21.5	30,870	17.0	77,410	42.6	13,243	7.3

Source: Department of Census and Statistics "Census of Population and Housing - 2001

Analyzing the gender patterns of migration, Colombo has a higher percentage of in-migration of men (52.5%), whereas Gampaha and Kalutara have a higher in-migration of females, 53.3% and 54.0% respectively.

**Table A2.3 Migration to Colombo District by Origin (2001)**

Major Districts Migrated From	Number of Migrated Persons					
	Male	%	Female	%	Total	% of Total
Gampaha	19,206	45.8	22,651	54.2	41,857	8.9
Kalutara	29,819	46.2	34,619	53.8	64,438	9.1
Kandy	35,459	55.6	28,135	44.4	63,594	9.0
Nuwara Eliya	19,595	54.8	16,171	45.2	35,766	5.0
Galle	37,492	52.8	33,548	47.2	71,040	10.0
Matara	40,965	54.4	34,502	45.6	75,267	10.6
Jaffna	25,598	47.4	28,402	52.6	54,000	7.6
Kurunegala	15,796	56.1	12,341	43.9	28,137	4.0
Badulla	19,562	55.0	16,016	45.0	35,578	5.0
Rathnapura	22,191	48.6	23,475	51.6	45,666	6.4
Kegalle	19,552	52.4	17,777	47.6	37,329	5.2
Sub Total	285,235	51.6	267,637	48.4	552,672	77.7
All the other districts	88,389	55.7	70,044	44.3	158,633	22.3
Total	373,624	52.5	337,681	47.5	711,305	100.0

Source: Department of Census and Statistics "Census of Population and Housing - 2001"

**Table A2.4 Migration to Gampaha District by Origin (2001)**

Major Districts Migrated From	Number of Migrated Persons					
	Male	%	Female	%	Total	% of total
Colombo	83,871	48.7	88,501	51.3	172,372	28.4
Kurunegala	25,122	40.2	37,317	59.8	62,439	10.3
Kandy	20,322	48.7	21,429	51.3	41,751	6.9
Galle	15,623	51.5	14,707	49.5	30,330	5.0
Matara	15,374	51.0	14,808	49.0	30,182	5.0
Kegalle	16,450	42.4	22,347	57.6	38,797	6.4
Anuradhapura	9,638	39.8	14,583	60.2	24,221	4.0
Puttalam	11,137	44.8	13,716	55.2	24,853	4.1
Rathnapura	9,869	29.0	13,799	71.0	23,668	4.0
Badulla	9,634	49.5	9,843	50.5	19,477	3.2
Nuwara Eliya	9,884	49.7	10,002	50.3	19,886	3.3
Sub Total	226,924	46.5	261,052	53.5	487,976	80.5
All the other districts	56,041	47.3	62,444	52.7	118,485	19.5
Total	282,965	46.7	323,493	53.3	606,461	100.0

Source: Department of Census and Statistics "Census of Population and Housing - 2001"

**Table A2.5 Migration to Kalutara District by Origin (2001)**

Major Districts Migrated From	No. of Migrated Persons					
	Male	%	Female	%	Total	% of total
Colombo	29,197	45.8	34,526	44.2	63,723	35.1
Galle	11,507	43.0	15,262	57.0	26,769	14.7
Matara	5,038	48.0	5,439	52.0	10,477	5.7
Rathnapura	6,173	40.8	8,943	59.2	15,116	8.3
Sub Total	51,915	44.7	64,170	55.3	116,085	64.0
All the other districts	31,636	48.1	34,072	51.9	65,708	36.0
Total	83,551	46.0	98,242	54.0	181,793	100.0

Source: Department of Census and Statistics "Census of Population and Housing - 2001"

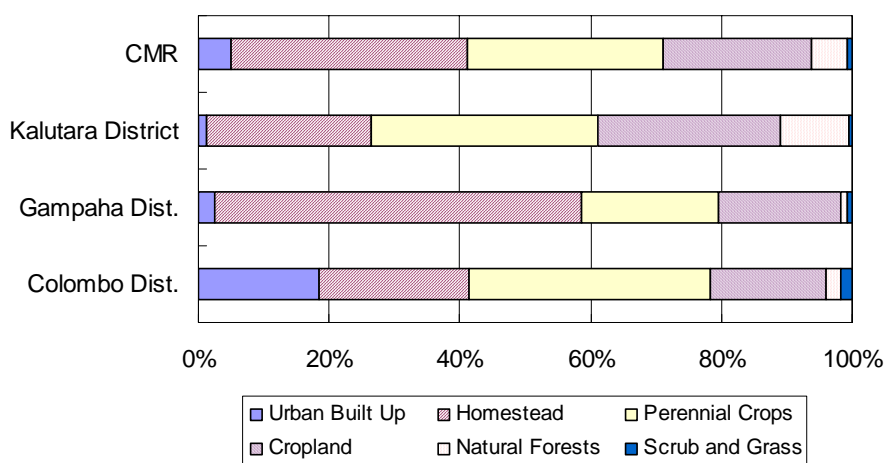
## Appendix 3 Land Use Data

### A3.1 Current Land Use

#### (1) Land Use Characteristics

##### Land Use Patterns

The first figure below shows the land use pattern of the Colombo Metropolitan Region in 1996, while the CMR in 1996, while the second figure shows the changes patterns between 1981 and 1996.



Source: Colombo Metropolitan Regional Structural Plan, Volume III

**Figure A3.1 CMR Land Use Patterns (1996)**

Although Western Province is the most urbanized region of the country and Colombo District the most urbanized of the region, the character of the region varies tremendously and many parts of the region are still qualified as rural, due to the large concentration of perennial crops (rubber and coconut) and cropland (paddy fields). Homesteads account for another 30-55% of the land.<sup>1</sup>

##### Changes in Land Use

**Table A3.1 Land Use Changes (1981-96)**

Land Use Category	Change of Percentage between 1981 and 1996			
	Colombo Dist.	Gampaha Dist.	Kalutara Dist.	CMR
Urban Built Up	5.4	0.7	0.3	1.4
Homestead	0.8	3.1	2.8	2.5
Perennial Crops	-6.1	-3.5	-3.8	-3.9
Cropland	0.5	0.0	0.7	0.2
Natural Forests	0.0	-0.1	-0.1	0.1
Scrub and Grass	-0.2	0.0	0.1	0.0
Wetlands, Water, Others	-0.4	-0.2	0.0	-0.3

Source: Colombo Metropolitan Regional Structural Plan, Volume III

<sup>1</sup> Homesteads are large plots with residential and agricultural activities. Most of these plots are greater than one acre. In Gampaha, the large amount of homesteads is due to the good soil quality of that area where coconut, pineapple and beetles are harvested.

An analysis of the major land use changes in the past 15 years shows the following:

- Colombo District has shown an increase in its urban built up area of 5.4% as a result of rural land conversion;
- Conversion of agricultural lands to residential uses in Gampaha and Kalutara Districts is increasing, although they still have a large proportion of homesteads, which indicates very low density development; and
- Rubber and coconut land has been targeted for urban development as rubber plantations occupied 21% of the region's land in 1981 and 18.2% in 1996.

## (2) Housing Density

The Census for Population and Housing (2001) provides details on housing density at the Division Level, but with the following limitations:

- A chronological data review was not undertaken; and
- Approval for development already granted by local authorities is not included, including that for numerous high rise residential buildings in Colombo.

Table A3.2 shows the residential building density from 2001 for DS divisions in the region. The majority of the region is considered low density.

**Table A3.2 Residential Building Density (2001)**

Colombo DS Division	Residential Building Density	Gampaha DS Division	Residential Building Density	Kalutara DS Division	Residential Building Density
Dehiwala Mt. Lav.	58.69	Kelaniya	13.61	Panadura	8.44
Colombo	37.08	Ja-Ela	7.20	Kalutara	4.49
Thimbirigasyaya	24.33	Negombo	7.14	Beruwala	4.30
Moratuwa	21.24	Wattala	6.69	Bandaragama	3.75
Sri Jaya Kotte	16.36	Biyagama	5.96	Horana	2.14
Padukka	14.30	Gampaha	4.90	Millaniya	1.45
Kolonnawa	13.87	Mahara	4.74	Mathugama	1.42
Maharagama	11.46	Katana	4.21	Dodangoda	1.34
Kesbewa	8.33	Minuwangoda	2.98	Ingiriya	1.33
Kaduwela	6.02	Divulapitiya	2.72	Madurawala	1.30
Homagama	3.95	Attanagalla	2.57	Agalawatta	1.02
Hanwella	1.60	Mirigama	2.06	Bulathsinghala	0.83

Source: Census of Population and Housing, Department of Census and Statistics and GIS Division, UDA (2001)



### A3.2 Land Values

Table A3.3 and A3.4 show the land values along major arterials and in residential areas for different distances from Colombo. North Colombo, which has received a large inflow of migrants in recent years, shows lower land values.

**Table A3.3 Land Values by Distance from Colombo (2006)**

Land Value (Rs. 000) per 25 sq. m	City Center, Major Arterial	Residential Area	Example
Colombo	1,500-5,000	3,000-5,000	Colombo 3, 4, 5, 6, 7
North Colombo	300-500	100-300	Dematagoda, Kotahena
5 to 10 km	600-2,000	200-300	Kotte, Kelaniya, Nugegoda
OCH area (10 to 20km)	300-800	75-250	Kottawa, Kaduwela, Kesbewa, Ja-ela
Over 20km Major City	500-900	75-500	Kalutara, Gampaha
Over 20km	500	50-150	Homagama, Horana

Source: This Study

**Table A3.4 Land Values in CMR (2006)**

District	City / DS Divisions	Land Value (Rs. 000) per 25 Sq. m	
		Sub Area	Land Value
Colombo	City of Colombo	• Colombo 3,4	
		- Commercial	4,000 - 5,000
		- Residential	3,000 - 5,000
		• Colombo 5,6	
		- Commercial	1,000 - 5,000
		- Residential	3,000 - 4,000
		• Colombo 7	
		- Commercial	-
		- Residential	3,000 - 3,500
		• Colombo 8,9,10	
		- Commercial	1,500 - 2,000
		- Residential	800 - 1,000
		• Fort & Pettah	
		• Security Zone	0 Value
	- Commercial	3,500 - 4,000	
	- Residential	-	
	• Colombo North		
	- Commercial	300 - 500	
	- Residential	100 - 300	
	SJ Kotte MC	• Nugegoda town	1,000 - 1,500
	• Adjacent to main roads	800 - 1,000	
	• Good residential areas	250 - 350	
Dehiwala MC	• Along Main roads	800- 1,500	
	• Good residential areas	250 - 500	
Moratuwa MC	• Along Main roads	800 - 1,500	
	• Good residential areas	200 - 300	
Kaduwela PS	• Battaramulla	200 - 450	
	• Malambe	250 - 450	
	• Kaduwela	150 - 400	
	• Athurugiriy	100 - 300	
Maharagama PS	• Town Center	1,000 - 1,500	
	• Along major roads	500 - 800	
	• Other residential	150 - 250	
Kotikawatta PS	• Town Center	400 - 500	
	• Other Residential	75 - 150	
Kolonnawa UC	• Town Center	500 - 800	
	• Other Residential	75 - 150	

District	City / DS Divisions	Land Value (Rs. 000) per 25 Sq. m	
		Sub Area	Land Value
Gampaha	Kesbewa PS	• Borelesgamuwa	400 - 700
		• Piliyandala	300 - 600
		• Kesbewa	100 - 300
	Hanwella PS	• Town Center	400 - 600
		• Other Residential	75 - 200
	Awissawella UC	• Town Center	500 - 800
		• Other Residential	50 - 150
	Gampaha MC	• CBD	600 - 900
		• Other town Centers	150 - 200
		• Along Kandy Road	100 - 150
• Adjacent to main roads		60 - 100	
• Interior from the main roads		40 - 60	
Negombo	• Town Center	800 - 1,500	
	• Adjoining Main roads	500 - 800	
Gampaha	Katana	• Other residential	200 - 600
		• Town Center	60 - 75
	Divulapitiya	Town Center	125 - 140
	Mirigama	Town Center	125 - 140
	Minuwangoda	Town Center	200 - 250
	Wattala	Town Center	400 - 425
	Ja-Ela	Town Center	300 - 350
	Attanagalla	Town Center	150 - 175
	Dompe	Town Center	60 - 75
	Mahara	Town Center	200 - 250
Kelaniya	• City limits	1,000 - 2,000	
	• Immediate vicinity	200 - 300	
	• Interior	150 - 250	
Biyagama	• Adjoining main roads	200 - 500	
	• Other residential	100 - 200	
Kalutara	Panadura	• City limits - Center	600
		• - Remainder	100
		• Adjoining main roads	600 - 275
	Bandaragama	• Other residential	100
		• Close to main roads	375 - 75
	Horana	• Other residential	50
		• Town Center	500
		• Close to main roads	500 - 175
	Ingiriya	• Other residential	50
		• Close to main roads	200
Bulathsinghala	• Other residential	40	
	• Close to main roads	100	
	• - Center	75	
Madurawala	• - Remainder	30	
	• Other residential	50	
	• Close to main roads	15	
Millaniya	• Other residential	75	
	• Close to main roads	25	
Kalutara	• Town Center	500	
	• Close to main roads	500 - 200	
	• Other residential	75	
Beruwala	• Town Center	300	
	• Close to main roads	300 - 100	
	• Other residential	75	
Dodangoda	• Abutting Town Center	100	
	• Other Residential	40	
Mathugama	• Town Center	200	
	• Close to main roads	200 - 100	
	• Other residential	75	

District	City / DS Divisions	Land Value (Rs. 000) per 25 Sq. m	
		Sub Area	Land Value
Agalawatta		• Town Center	100
		• Close to main roads	100 - 75
		• Other residential	40
Palindanuwara		• Town Center	100
		• Close to main roads	100 - 75
		• Other residential	30
Walallavita		• Town Center	100
		• Close to main roads	100 - 75
		• Other residential	15

Source: JICA Study Team

### A3.3 Urbanization Plans

There were three major plans undertaken that pertained to land use:

#### (1) Colombo Metropolitan Regional Structural Plan (CMRSP) (1998)

The high level summary of the plan was gazetted by the Cabinet, although the entire plan was only approved by the subject ministers. The important elements of the plan are summarized below.

##### *Development of Six Growth Centers*

The plan estimated that the region would have 6.5 million people in 2010 and 7.0 million by 2030. Due to the high growth, the plan proposed restructuring the land use system by promoting high density development in selected growth centers while preserving environmentally sensitive areas such as wetlands and agricultural lands. The following provides a brief summary:

- Six growth centers are expected to be urban agglomerations and include (i) Negombo – Katunayake; (ii) Gampaha – Nittambuwa; (iii) Homagama – Padukka; (iv) Horana – Bandaragama; (v) Biyagama – Supugaskanda; and (vi) Mathugma – Agalawatta;
- Several transport development proposals were made including the development of the (i) North-South Expressway; (ii) North-Eastern Highway; (iii) Rathmalana - Rathnapura Highway; and (iv) a link between Moratuwa and Piliyandala. The purpose of these expressways is to link the growth centers, as well as to link the growth centers with Colombo. Railway proposals were made as well, which includes a new rail link from Dematagoda to Rathmalana via Kotte and circular light rail transit system; and
- Thirteen major urban centers were ranked to promote high density urban development.

Proposed land use development of the six growth centers includes a heavy concentration of urban activities to handle the expected population growth. Between 30-50% of each area, except Gampaha, will be used for industrial purposes, as Gampaha is expected to be mainly residential.

**Table A3.5 Proposed Land Use Development of the Growth Centers (2010)**

Use	Growth Centers											
	Negombo		Gampaha		Biyagama		Homagama		Horana		Matugama	
	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%	Ha.	%
Residential	663	17.0	1,364	40.0	1,125	25.0	552	25.0	1,316	30.0	250	27.0
Industrial	1,950	50.0	511	15.0	1,800	40.0	774	35.0	1,316	30.0	316	34.0
Commercial	117	4.0	170	5.0	225	5.0	110	5.0	219	5.0	45	5.0
Institutional	195	5.0	511	15.0	225	5.0	221	10.0	438	10.0	92	10.0
Recreational	390	10.0	341	10.0	450	10.0	221	10.0	438	10.0	92	10.0
Circulation	585	15.0	512	15.0	675	15.0	332	15.0	658	15.0	135	14.0
Total	3,900	100.0	3,409	100.0	4,500	100.0	2,210	100.0	4,385	100.0	930	100.0
Estimated Pop	0.5m		0.3m		0.3m		0.3m		0.2m		0.04m	

Source: Colombo Metropolitan Region Structure Plan, Volume III

The core area consists of Colombo city and its suburbs, including Sri Jayawrdanepura Kotte. This core area is expected to have high density residential, commercial, and administrative functions, while preserving environmentally sensitive land uses.

**Table A3.6 Proposed Land Use Distribution of the Core Area (2010)**

Zone	City of Colombo		Greater Kotte		Core Area (Total)	
	Extent (Ha)	%	Extent (Ha)	%	Extent (Ha)	%
Concentrated Development Zone	391.0	10.49	00.0	00.0	391.0	2.44
Port Related Activity Zone	506.0	13.57	00.0	00.0	506.0	3.16
Commercial Zone	453.0	12.15	174.0	1.42	627.0	3.92
Mixed Commercial Zone	186.0	4.99	50.0	0.41	236.0	1.48
Tourism Allied Zone	00.0	00.0	148.0	1.21	148.0	0.93
Administrative Zone	00.0	00.0	1,100.0	8.96	1,100.0	6.88
Mixed Residential Zone	491.0	13.17	1,599.0	13.03	2,090.0	13.06
Special Primary Residential Zone	290.0	7.78	560.0	4.56	850.0	5.31
General Residential Zone	00.0	00.00	4,948.0	40.32	4,948.0	30.93
Security Zone	00.0	00.00	245.0	2.00	245.0	1.53
Transport Zone	700.0	18.77	1,429.0	11.65	2,129.0	13.31
Environmental Zone	40.0	1.07	1,332.0	10.85	1,372.0	8.58
Recreation Zone	315.0	8.45	200.0	1.63	515.0	3.22
Designated Zone	259.0	6.95	00.0	00.0	259.0	1.62
Water Bodies	98.0	2.63	486.0	3.96	584.0	3.65
Total	3,729.0	100.0	12,271.0	100.0	16,000.0	100.0

Source: Based on Colombo Metropolitan Regional Structural Plan - Volume III

## (2) Western Regional Megapolis Plan (WRMP) (2002)

This plan is similar to CMRSP as it follows the concept of decentralizing activities to selected growth centers and linking them with highways. The main features of the plan are summarized as follows:

- Two north-south ring roads (Inner Necklace and Outer Necklace) and a radial highway network to connect the city, growth centers, and other residential townships;
- High density development in the core, medium density development in the Inner Necklace townships, and low density development in the Outer Necklace townships;
- The Central Business District (CBD) will be the country's finance hub;

- Five regional centers are proposed in Negombo, Attanagalle, Avissawella, Horana, and Kalutara and each center will develop as a mini CBD;
- Five subregional centers are proposed along the Inner Necklace expressway;
- Baseline Road is proposed as a business corridor;
- Core areas within the Inner Necklace expressway are proposed to form a technology corridor for biotech and other research-based industries; and
- Lands along the Outer Necklace expressway are proposed to be used to develop an industrial corridor.

### **(3) Colombo Development Plan (1999)**

The Colombo Development Plan (CDP) was a subset of CMRSP's Core Area Plan. As it is the only plan that has been gazetted as a whole, it remains the legal document for planning and development in Colombo. It replaced the Colombo Development Plan from 1985. It includes zoning and planning guidelines as well as planning and building regulations. Objectives of the plan include:

- Develop Colombo to be the financial and commercial hub of South Asia;
- Improve the transport system to increase efficiency and reduce congestion and travel time;
- Conserve and revitalize architectural and historical areas/buildings;
- Increase infrastructure capacity to meet the demand;
- Ensure environmental conservation to enhance the Garden City image; and
- Increase the amount of urban land to prevent speculative land prices and undesirable land subdivisions.

The strategy proposed developing the core area along the waterfront with high, medium, and low density development scattered in selected areas throughout the core linked by a modern transport system. This plan as resulted in higher density development in some areas and improvements in the control of environmentally sensitive areas.

### **(4) Other Plans**

Based on CMRSP, UDA prepared several detailed plans for specific urban areas as listed below:

#### **(i) Gazetted Plans:**

- Seethawakpura Pradesheeya Sabha (Colombo District);
- Moratuwa Municipal Council (Colombo District); and
- Kalutara Urban Council (Kalutara District).

#### **(ii) Plans under consideration by the UDA Planning Committee:**

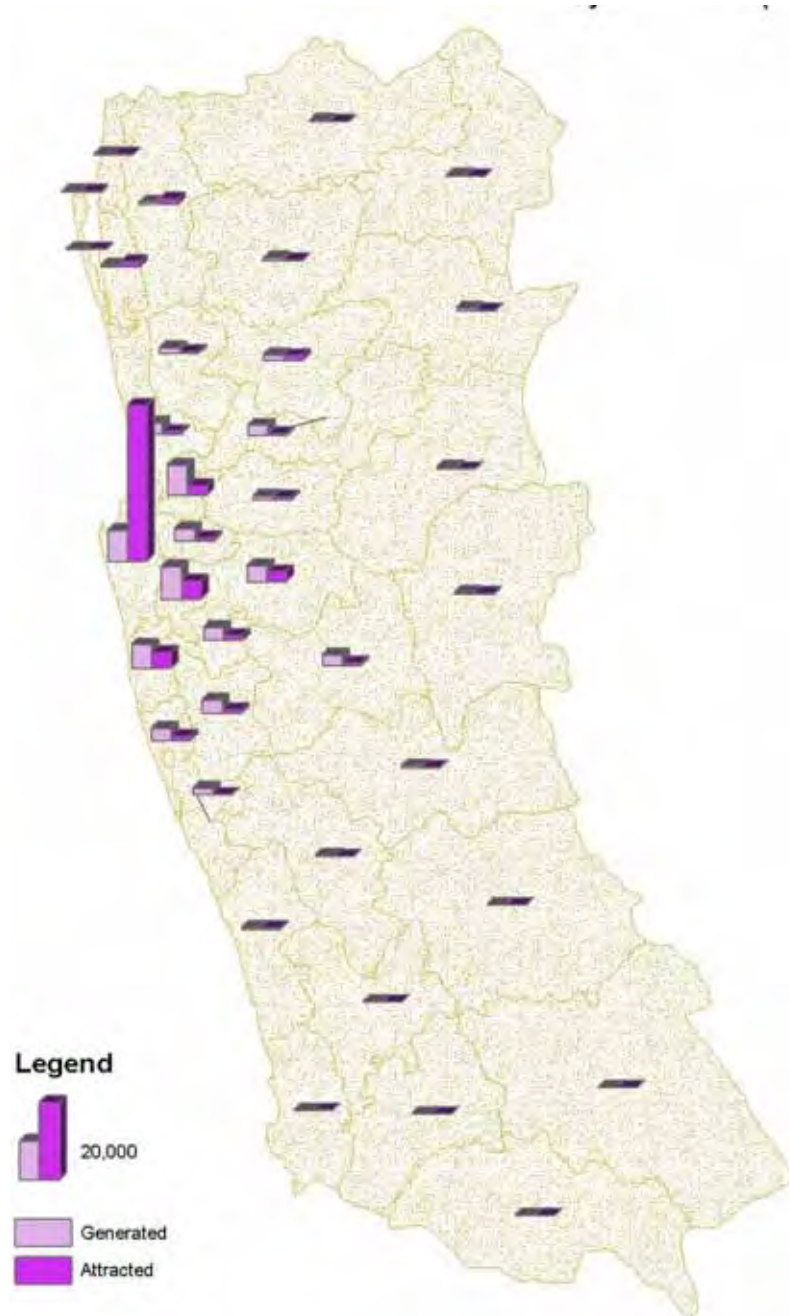
- Homagama Pradesheeya Sabha (Colombo District);
- Sri Jayawardanepura Kotte Municipal Council (Colombo District); and
- Maharagama Urban Council (Colombo District).

### **A3.4 Zoning System**

The Colombo Municipal Council is divided into 45 wards for administrative purposes. For planning purposes, the Urban Development Authority grouped similar wards to create fourteen planning areas. These areas were used in CMRSP. However, the 15 postal zones are much more popular for discussing CMC, but there is no compatibility between the systems. The University of Moratuwa's TRANSPLAN software reduced the 45 wards to 33 zones based on traffic assignment data. WRMP, proposed twelve zones, the definitions of which are not compatible with earlier plans, although the zonal characteristics were used to define the new zones.

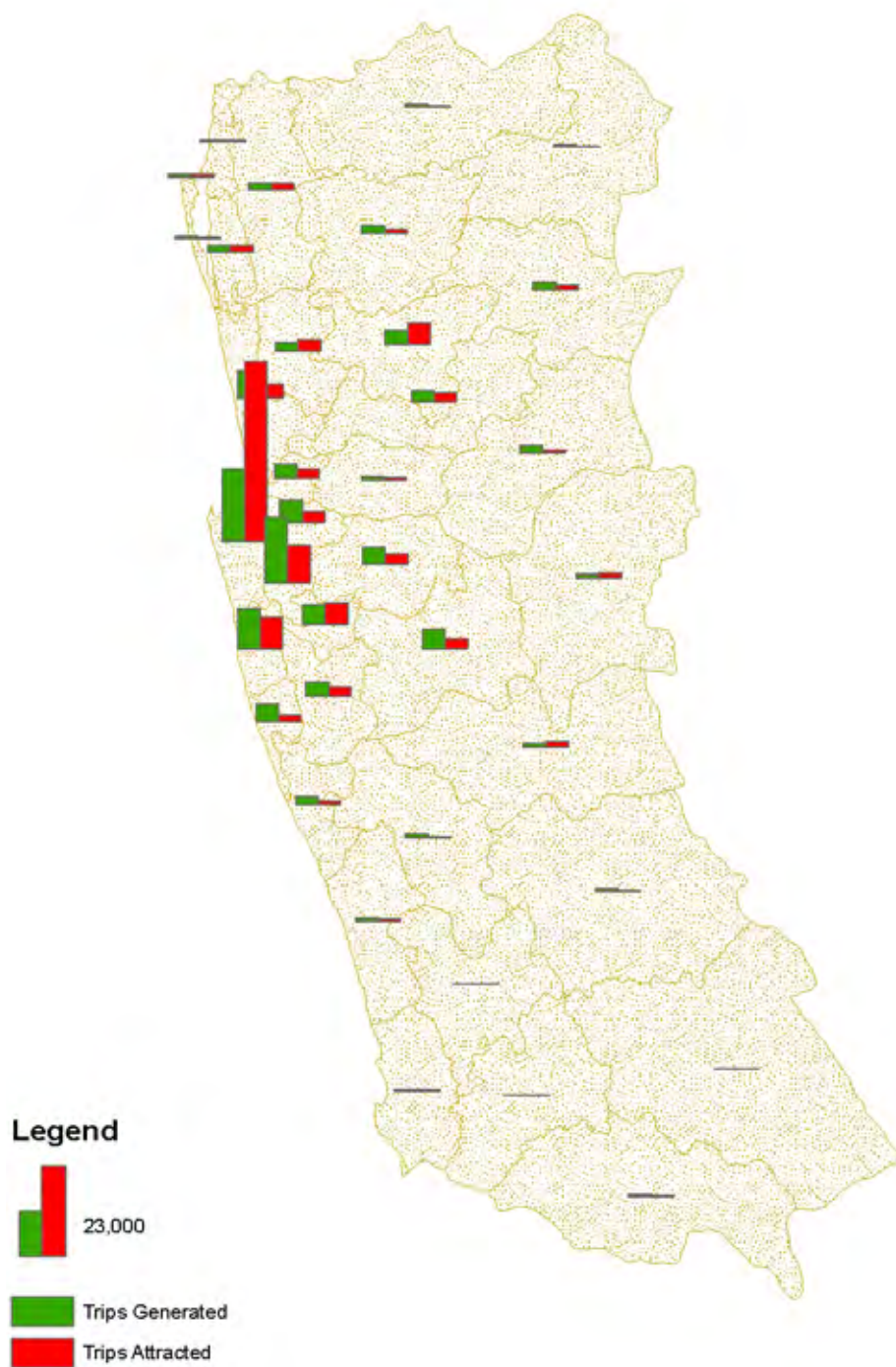
## Appendix 4 Trip Demand Distribution in CMR

### A4.1 Trip Generation and Attraction Distribution



Source: UoM

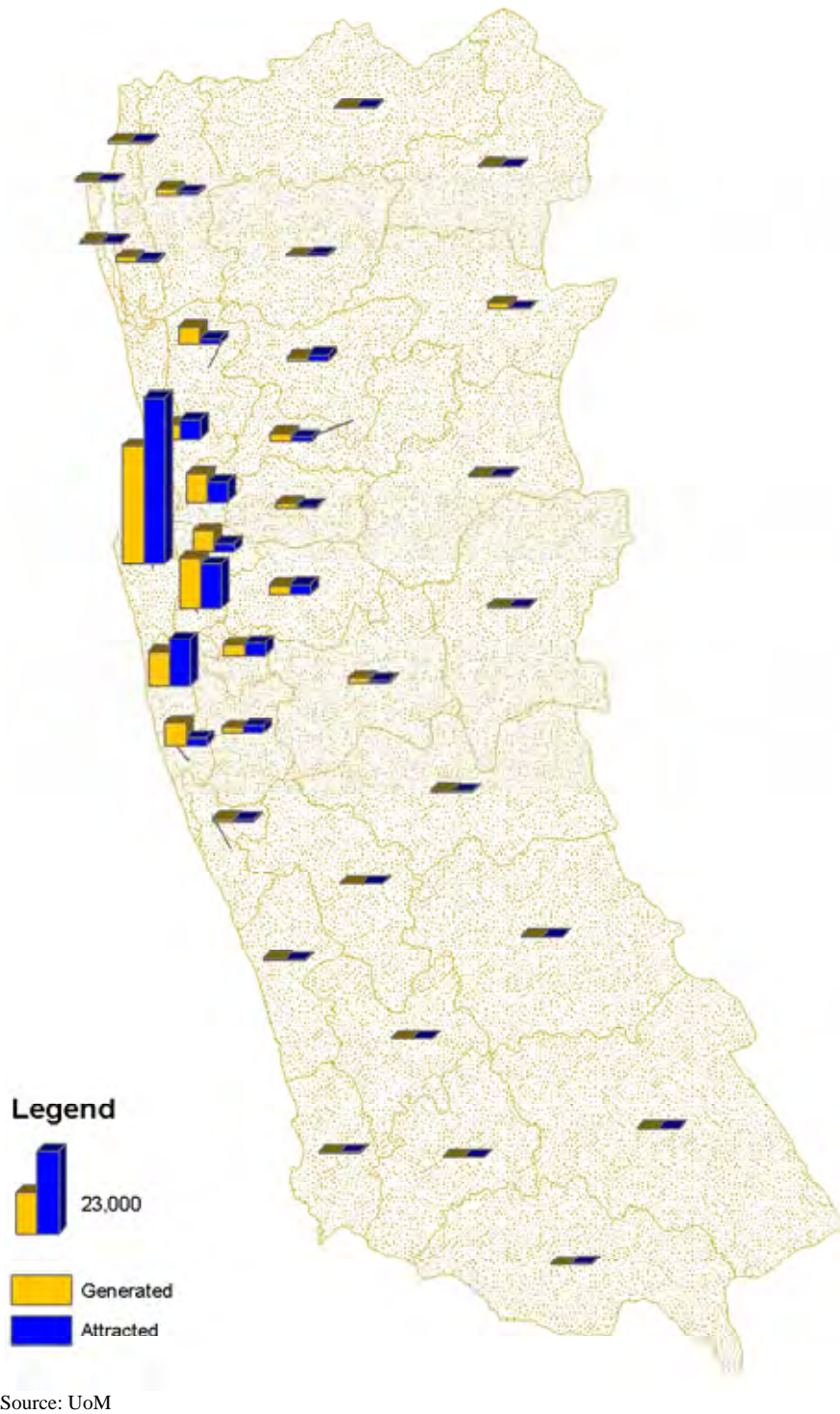
Figure A4.1 Home Based Work Trips by Private Vehicle (1995)



Source: UoM

**Figure A4.2 Home Based Education Trips by Private Vehicle (1995)**



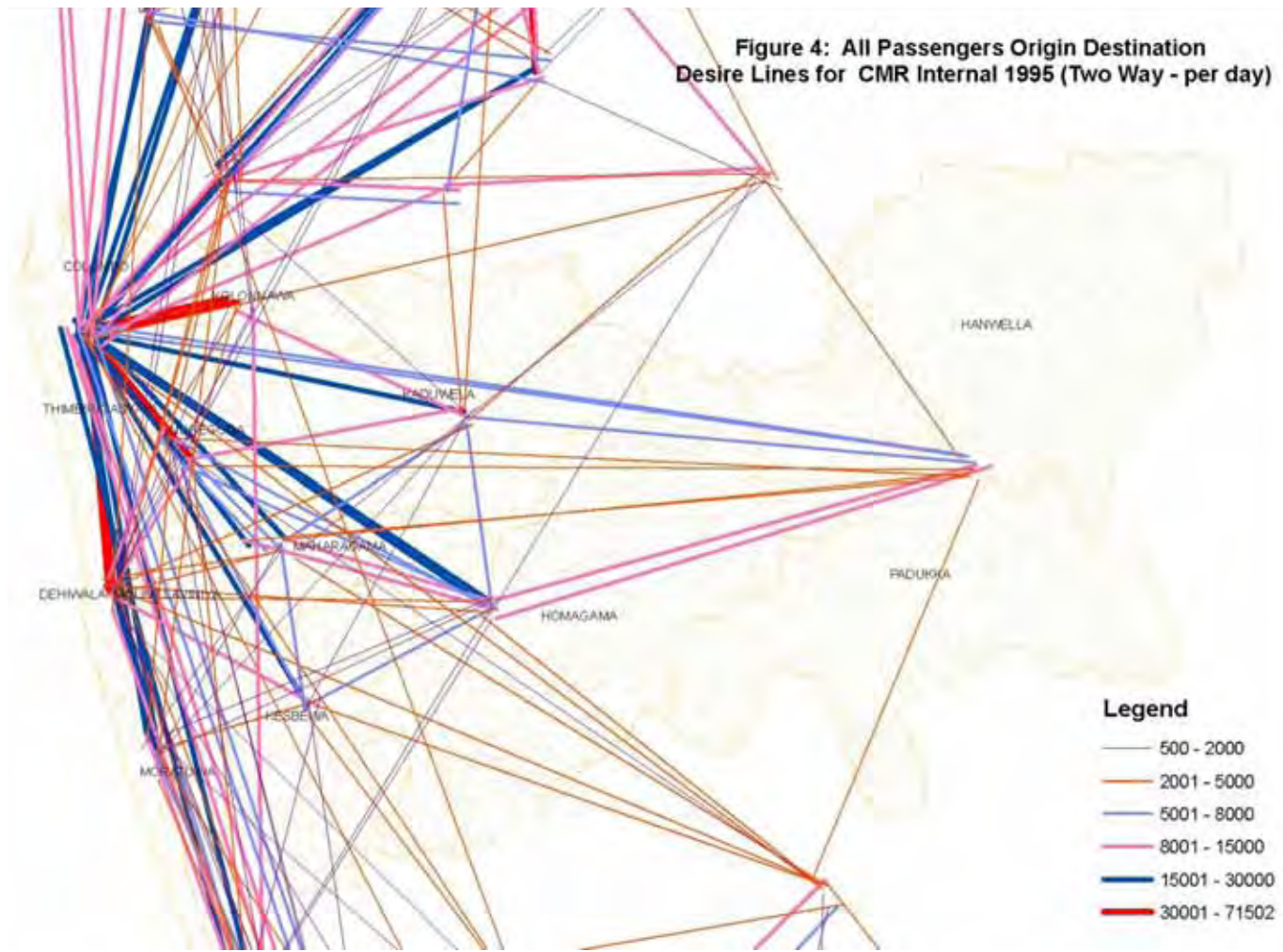


**Figure A4.3 Non-Home Based Trips by Private Vehicle (1995)**

## **A4.2 Desire Lines**

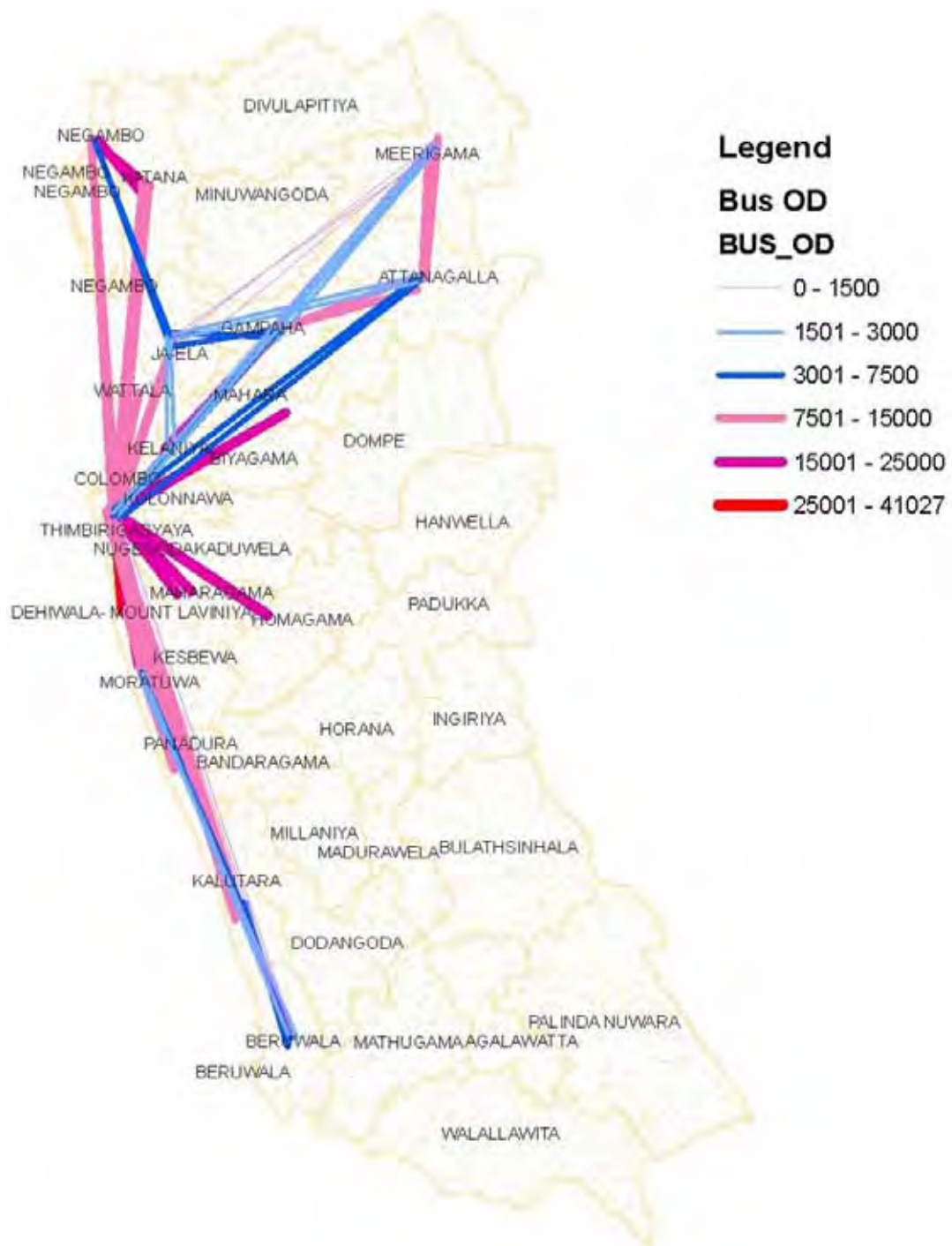
Modal trip characteristics are identified as follows:

- **Bus:**
  - The desire lines do not cross each other. Instead, the desire lines show a radial pattern connecting suburb to city center without any suburb-suburb connections; and
  - Negombo and Galle Roads have the highest demand.
- **Rail:**
  - The distribution of lines show a wider range of access than buses, due to the rail's speed and capacity; and
  - Traffic is smaller on the rail as frequency and capacity are smaller than the roadway. The Main Line, Puttalam Line, and Coastal Line are the largest, with the Kelani Valley Line showing low demand.
- **Private Vehicles:**
  - At the CMR level, the demand distribution is relatively linear; although differentiation can be seen in the southeastern area of Colombo; and
  - Galle Road and the southern areas exhibit the highest demand.



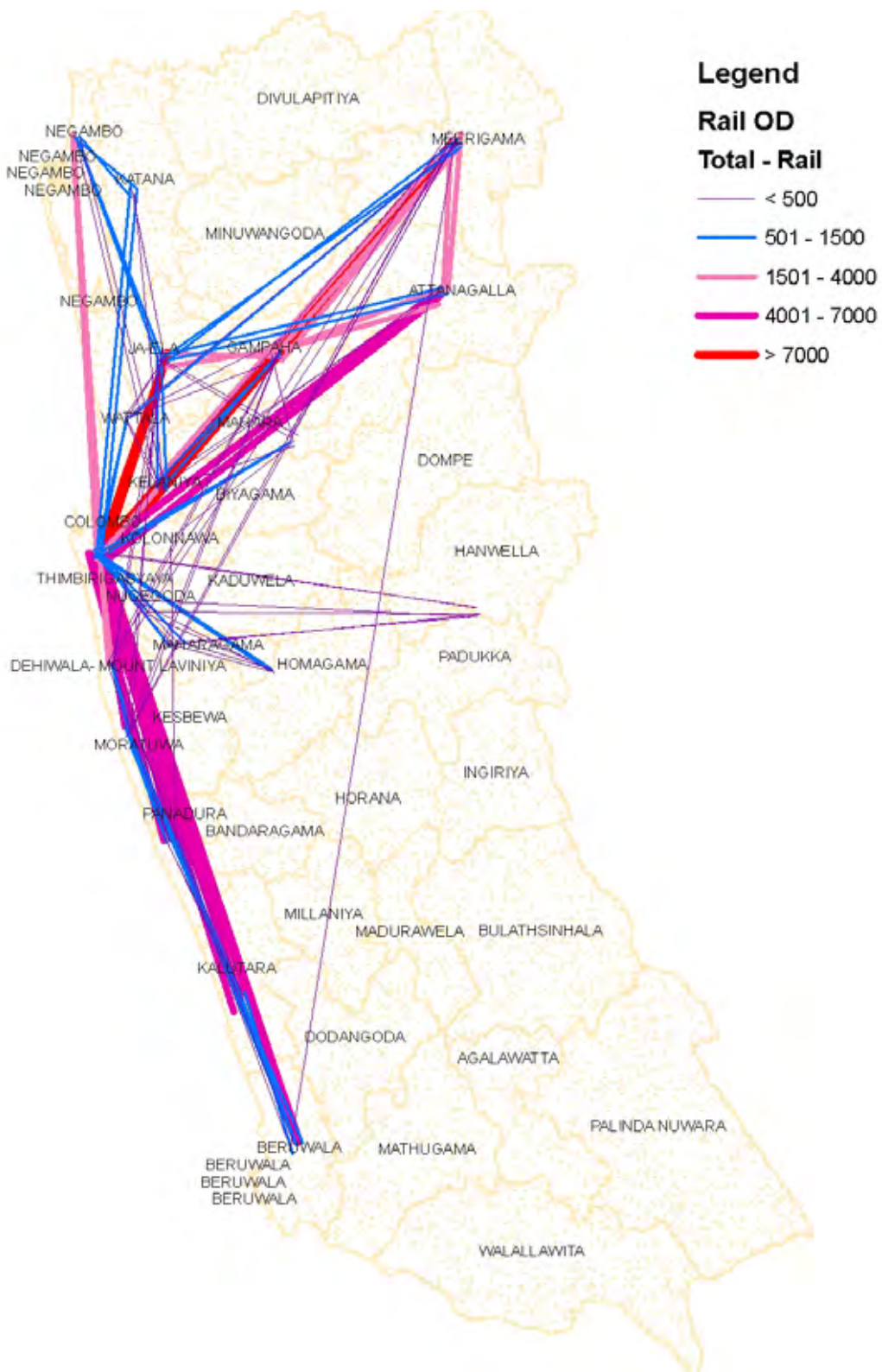
Source: UoM

**Figure A4.4 Passenger Trip Desire Line, All Modes (1995)**



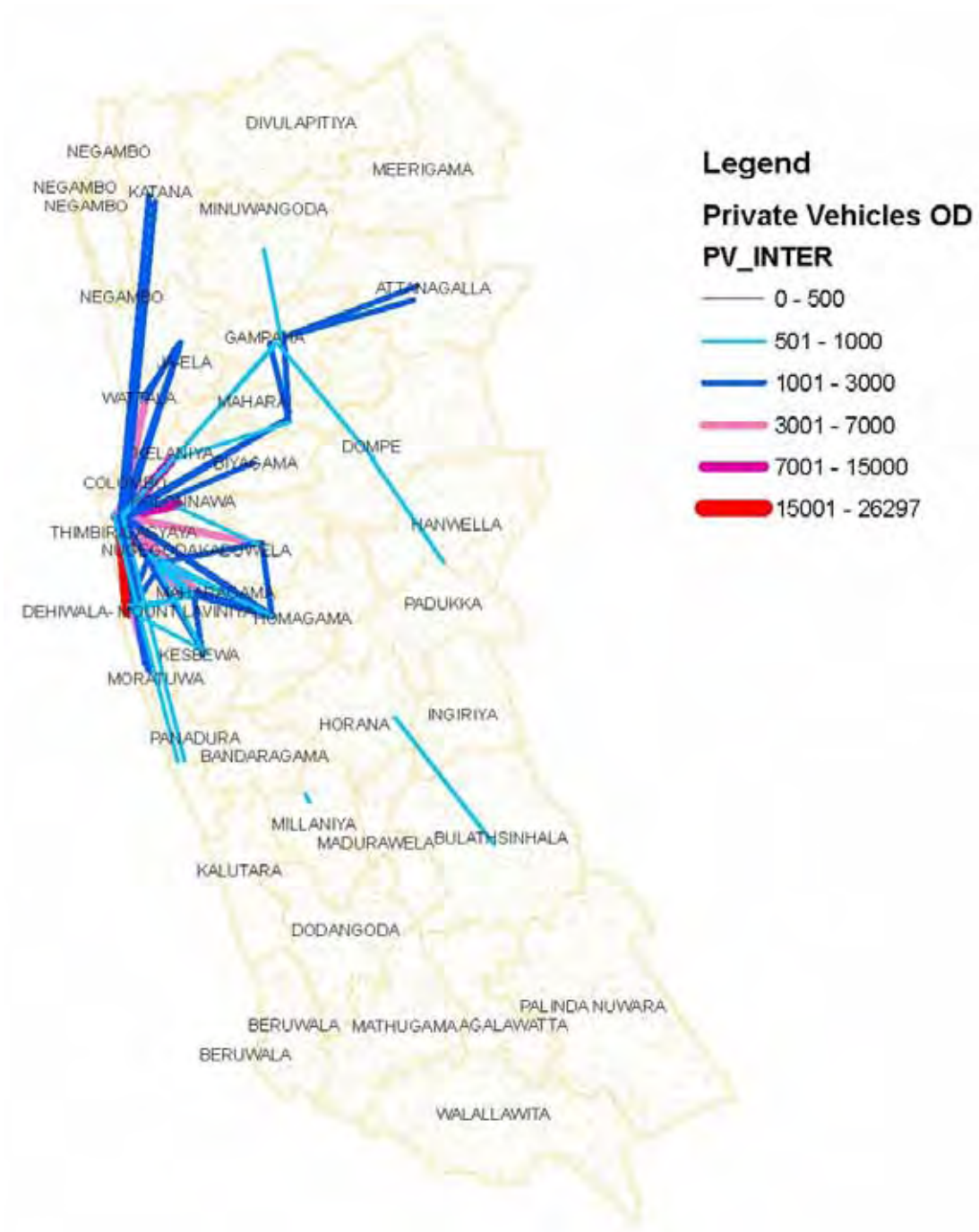
Source: UoM

**Figure 4.5 Bus Passenger Desire Lines (1995)**



Source: UoM

**Figure A4.6 Rail Passenger Desire Lines (1998)**



Source: UoM

**Figure A4.7 Private Vehicle Passenger Desire Lines (1995)**

### A4.3 Modal Share

**Table A4.1 Daily Passengers in Both Directions along the CMC Boundary (1965-2005)**

Corridor	Pax 1965 (000s)	AAGR (65-85) %	Pax 1985 (000s)	AAGR (85-95) %	Pax 1995 (000s)	AAGR (95-05) %	Pax 2005 (000s)
Negombo- Kandy	118	6.2	400	3.6	607	-0.9	553
Ambatale Rd			32	12.0	63	-0.8	58
Low Level Rd	38	2.0	56	0.1	59	-0.3	57
Kotte Rd/SJP Rd	45	3.5	89	10.8	249	1.1	278
Narahenpita Rd	12	6.2	40	0.1	35	2.8	46
High Level Rd.	62	4.2	141	3.9	206	-0.5	196
Horana Rd	21	5.2	58	8.1	126	-1.3	111
Galle Rd.	91	5.8	279	1.7	331	1.0	365
Total	387	5.3	1095	4.4	1676	-0.6	1,572

Source: UoM

**Table A4.2 CMC Cordon Traffic Data by Mode and Corridor (2way, per day)-1995**

Corridor (Location)	Passengers per day				Road Vehicles per day		
	Bus	Private	Rail	Total	Bus	Private	Total
Negombo Rd (Victoria Bridge)/ Puttalam Line	146,019	82,597	8,000	236,616	3,816	37,461	41,277
	62%	35%	3%		9%	91%	
Kandy Rd (New kelani Bridge) /Main Line	205,534	77,785	88,000	371,319	5,251	35,203	40,454
	55%	21%	24%		13%	87%	
Low Level Rd (Rail Crossing)	40,628	23,271		63,899	1,106	10,214	11,320
	64%	36%			10%	90%	
Kolonnawa Rd (Rail Crossing)	45,651	13,845		59,496	1,022	7,262	8,284
	77%	23%			12%	88%	
Kotte Rd/SJ pura Rd (Rajagiriya)	115,341	133,659		249,000	4,095	12,826	16,921
	46%	54%			24%	76%	
Narahenpita Rd (Canal Rd)	7,764	27,143		34,907	282	13,033	13,315
	22%	78%			2%	98%	
High Level Rd (Kirullapone Bridge) /KV Line	142,830	54,981	8,000	205,811	3,994	24,280	28,274
	69%	27%	4%		14%	86%	
Horana Rd (Pamankada Bridge)	61,826	64,742		126,568	1,684	28,324	30,008
	49%	51%			6%	94%	
Galle Rd (Dehiwala Bridge)/ Coast Line	187,881	82,154	61,000	331,035	5,834	34,612	40,446
	57%	25%	18%		14%	86%	
Total	953,474	560,177	165,000	1,678,651	27,084	203,215	230,299
	57%	33%	10%		12%	88%	

Source: CUTS2 study and UoM

#### Traffic and Modal Share along CMR Boundary

The following table shows bidirectional traffic at the CMR Boundary. The private vehicle passenger flows have been calculated by multiplying the traffic flows by average vehicle

occupancy. The bus passenger flows are calculated using 2001 vehicle occupancy estimates. The rail calculations are derived from 2005 railway passenger origin/destination ticket sales data.

**Table A4.3 Daily Bidirectional CMR Cordon Traffic Data by Mode**

Year		Buses	Private Vehicles	Rail	Total
Total (5 locations) 2004/5	Pax	231,005	75,166	66,082	372,254
	Pax %	62%	20%	18%	100%
Total (4 locations) 1995	Pax	284,287	60,793	45,256	390,636
	Pax %	72.9%	15.7%	11.6%	100%
Total (4 locations) 1985	Pax	193,150	20,000	34,500	247,650
	Pax %	78.0%	8.1%	13.9%	100%

Source: UoM

There total daily passengers entering and exiting CMR was 400,000, which is a marginal decrease from ten years ago. 50,000 vehicles crossed the cordon lines, which is an 18% increase in the past decade, most of which can be attributed to an increase in private vehicles and lorries. Passengers using private vehicles have increased by 25%. The number of buses has decreased marginally, although bus capacity has increased. Bus passengers have decreased by 19% while the railway has shown a significant increase in ridership of nearly 50%, although most of this increase can be found on the Main Line. Therefore, the following can be identified:

- Long trips from beyond CMR has slightly decreased due to recent household migration into the area (Section 3.2); and
- Long bus trips are decreasing due to a declining quality of service and a shift to private vehicles and rail.

#### *Modal Share by Corridor on CMR Boundary*

The 1995 CMR bidirectional cordon traffic data collected by the University of Moratuwa and used in the Greater Colombo Traffic Model (1996), CUTS2, and CMRSP studies is shown in Table A4.4.



**Table A4.4 CMR Cordon Traffic Data by Mode and Corridor (2way, per day)-1995**

Road	Road Name	Location			Buses	Private Vehicles	Rail	Goods Vehicles	Total
			Veh	Pax					
North A3	Colombo-Negombo	Kochchikade 39.4 km	Veh		2,047	8,950	-	3,199	14,196
			Pax		90,922	20,943	4,258	-	116,123
			Pax %		78.3%	18.0%	3.7%	-	100%
North-east A1	Colombo-Kandy	Yakkala 34.4 km	Veh		2,446	8,770	-	3,134	14,350
			Pax		111,110	21,777	9,768	-	164,081
			Pax %		67.7%	13.3%	19.0%	-	100%
South-east A4	Colombo-Ratnapura	Meepe* 39.6 km	Veh		720	4,075	-	1,694	6,489
			Pax		35,957	9,984	-	-	45,941
			Pax %		78.3%	21.7%	-	-	100%
South A2	Colombo-Galle	Aluthgama 61.0km	Veh		1,042	6,562	-	1,416	9,020
			Pax		46,598	15,749	9,768	-	72,115
			Pax %		64.6%	21.8%	13.6%	-	100%
Total (4 locations) 1995			Veh		6,255	28,357		9443	44,055
			Pax		284,287	60,793	45,256	-	390,636
			Pax %		72.9%	15.7%	11.6%	-	100%
Total (4 locations) 1985			Veh		5,700	9,725	-	6,750	22,175
			Pax		193,150	20,000	34,500	-	247,650
			Pax %		78.0%	8.1%	13.9%	-	100%
Rate of Change(1985-1995)			Veh		0.93	11.30	-	3.41	7.11%
			Pax		+4.0	+11.8	+2.8	-	+4.7
			Pax %		-5.1%	7.5%	-2.6%	-	

Source: UoM, \*) About 30 kms inside the CMR boundary

Kandy Road (A1) and Negombo Road exceeded 100,000 passengers/day and the demand on Kandy Road is three times as great as that on A4. In comparison with 1985, the number of vehicles increased by 100% and passengers increased by 150%. Buses continue to carry the majority of passengers, with a modal share between 67 and 78%, depending on the corridor. A3 and A4 have higher bus modal shares because rail is either not an option or is not widely used. Private vehicles make up 15.7% of the modal share for total and exceed 20% along A2 and A4, showing a heavy use of private vehicles in the southern and southeastern areas. Freight traffic accounts for more than 20% of all vehicles.

#### A4.4 Vehicle Occupancy

There are no detailed vehicle occupancy counts at the provincial boundary for 1995. Table A4.5 provides average occupancy for the entire CUTS1 study area, including vehicle occupants who are driving or assisting the vehicle as a means of employment.

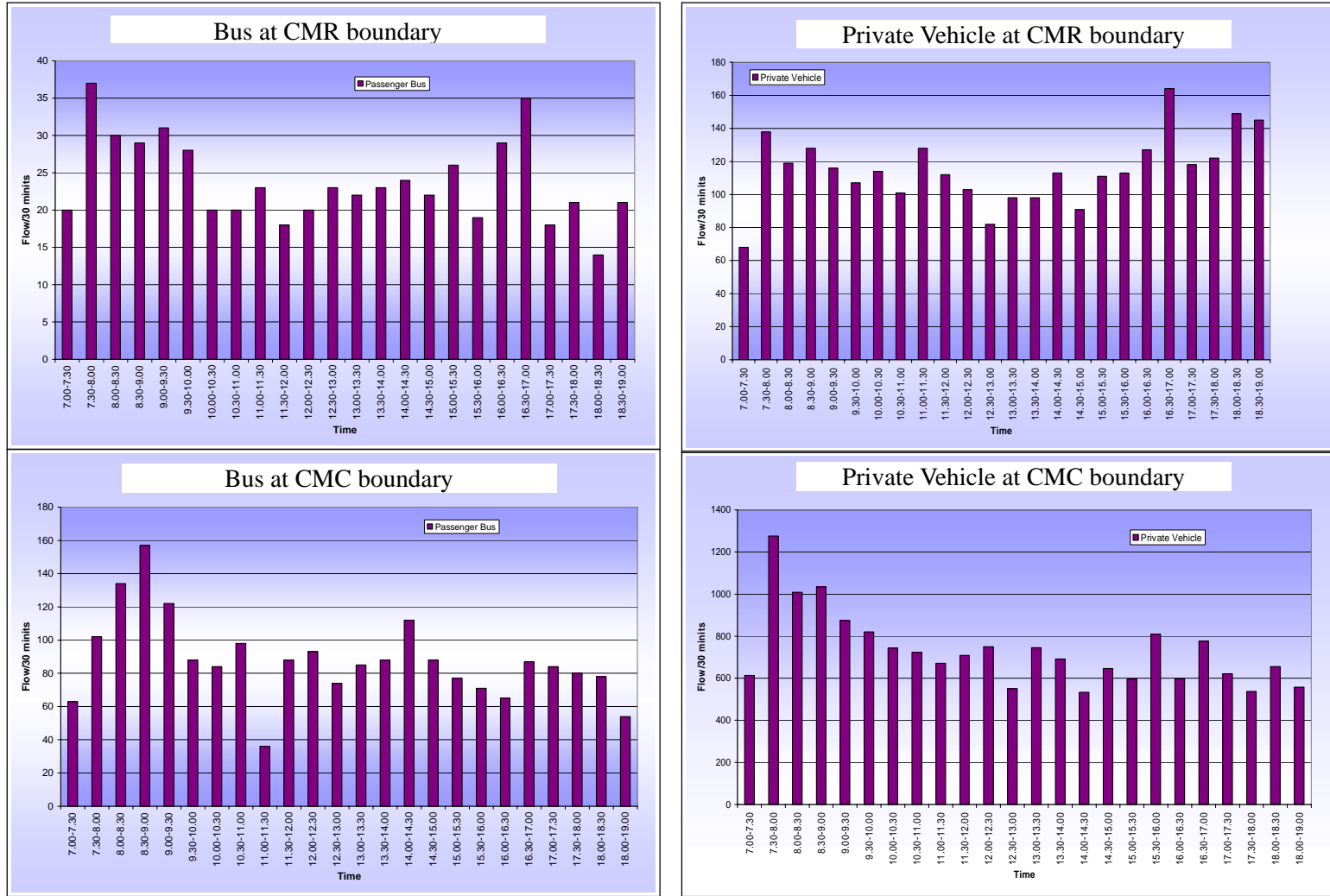
**Table A4.5 CMR Average Vehicle Occupancy Rate**

Vehicle Type	Occupancy	
	Morning Peak Period	24 hour period
Motor Cycle	Home based	1.28
	Non-Home based	2.21
Cars and Private van	Home based	1.20
	Non-Home based	2.28
3-Wheelers and Taxis		1.92
School and Office Vans		6.33
Buses	Inbound	38.8
	Outbound	24.9
		n/a

Source: UoM

## **Appendix 5 Daily Traffic Distribution**

The figures below depict a typical daily traffic situation from observations of the flows of private vehicles and buses at Warakapola (52 km northeast of Colombo on the Kandy Road, observed on 25 May 2005) and at Wellawatta (5 km south of Colombo on Galle Road, observed on 29 January 2004). All figures are for the direction towards Colombo and observations occurred between 7 am and 7 pm.



Source: UoM

Figure A5.1 Daily Demand Distribution at CMR and CMC Boundaries

## Appendix 6 Freight Traffic



Source: UoM

Figure A6.1 Major Truck Routes

**Table A6.1 Distribution of Freight Traffic (Selected Locations)**

Road	Location	Percentage freight traffic
A1_7km	Kelaniya	11.9%
A2_WLTBRg	Wellawatta	1.6%
A3_2km	Paliyagoda	13.4%
A3_36km	Kochcikade	23.8%
A4_9km	Kirulapona	3.5%
B62	Aurvedha hospital	5.3%
B84	Kohuwala	7.3%
B96	Kolonnawa	7.6%
B307	Nawala Y.M.B.A	7.0%
A110	Kaduwela	24.5%
B435	Orugodawatta	16.3%

Source: UoM

*Container Traffic Volumes*

In 2004, the total trailer equivalent units (TEU) handled by the Colombo port was 661,000, which resulted in 472,000 container movements on the roadway. In 2005, it is expected to grow to 727,000 and 519,000, respectively.

**Table A6.2 Container Movements**

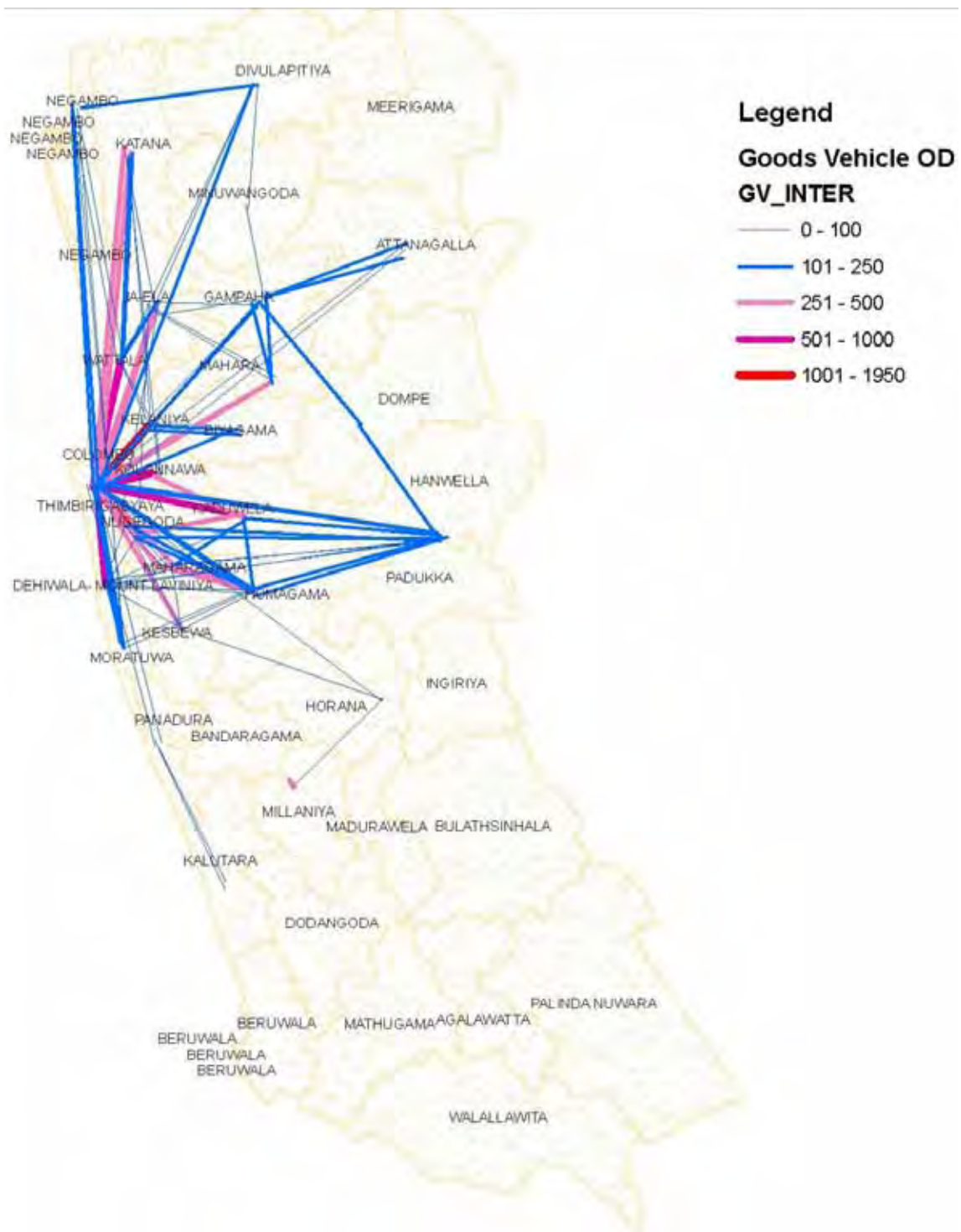
Year	2002		2003		2004		2005 Est.	
	TEU	BOX (/1.4)	TEU	BOX (/1.4)	TEU	BOX (/1.4)	TEU	BOX (/1.4)
Sri Lanka imports and exports	546	390	601	429	661	472	727	519
Imports	273	195	301	215	331	236	364	260
Exports	273	195	301	215	331	236	364	260
Transshipments at Colombo	1,147	819	1,275	911	1,412	1,009	1,560	1,114
Prestos	71		75		78		82	
Total	1,764	1,209	1,951	1,340	2,151	1,481	2,369	1,634

Source: UoM



Source: Port Authority

**Figure A6.2 Locations of Inland Container Terminals (2005)**



Source: UoM

**Figure A6.3 Freight Traffic Desire Line (1995)**

## Appendix 7 Road Design Standards

### A7.1 Typical Cross Sections

**Table A7.1 Typical Cross Section Design Specifications**

Type	Berm	Drainage	Shoulder	Carriageway	Median	R.O.W
R0	-	0.9 x 2	3.0 x 2	10.5 x 2 (6 lanes)	1.2	30.0
R1	1.0 x 2 (0.0min)	1.5 x 2 (0.9min)	3.0 x 2 (2.4min)	7.4 x 2 (4 lanes)	1.2	27.0
R2	0.6 x 2 (0.0min)	0.9 x 2	3.0 x 2 (2.4min)	7.4 x 2 (7.0min)	1.2	25.0
R3	-	0.9 x 2	3.0 x 2	3.7 x 2	-	15.2
R4	1.2 x 2	0.9 x 2	2.4 x 2	3.1 x 2	-	15.2
R5	-	0.9 x 2	2.4 x 2	3.5	-	10.1

Source: RDA, Geometric Road Design Standards (1998)

### A7.2 Quality Standards

Levels of service for roads are specified in design speed, flow, and volume/capacity ratio.

**Table A7.2 Level of Service Standards**

Road Class	Design Speed (km/h)	Volume Capacity Ratio
A	>70	0.6 - 0.8
B	>60	0.8 - 0.9
C, D, E	>50	> 0.9

Source: RDA, Geometric Road Design Standards (1998)

Additionally, details of design speeds re specified related to terrain and desired traffic.

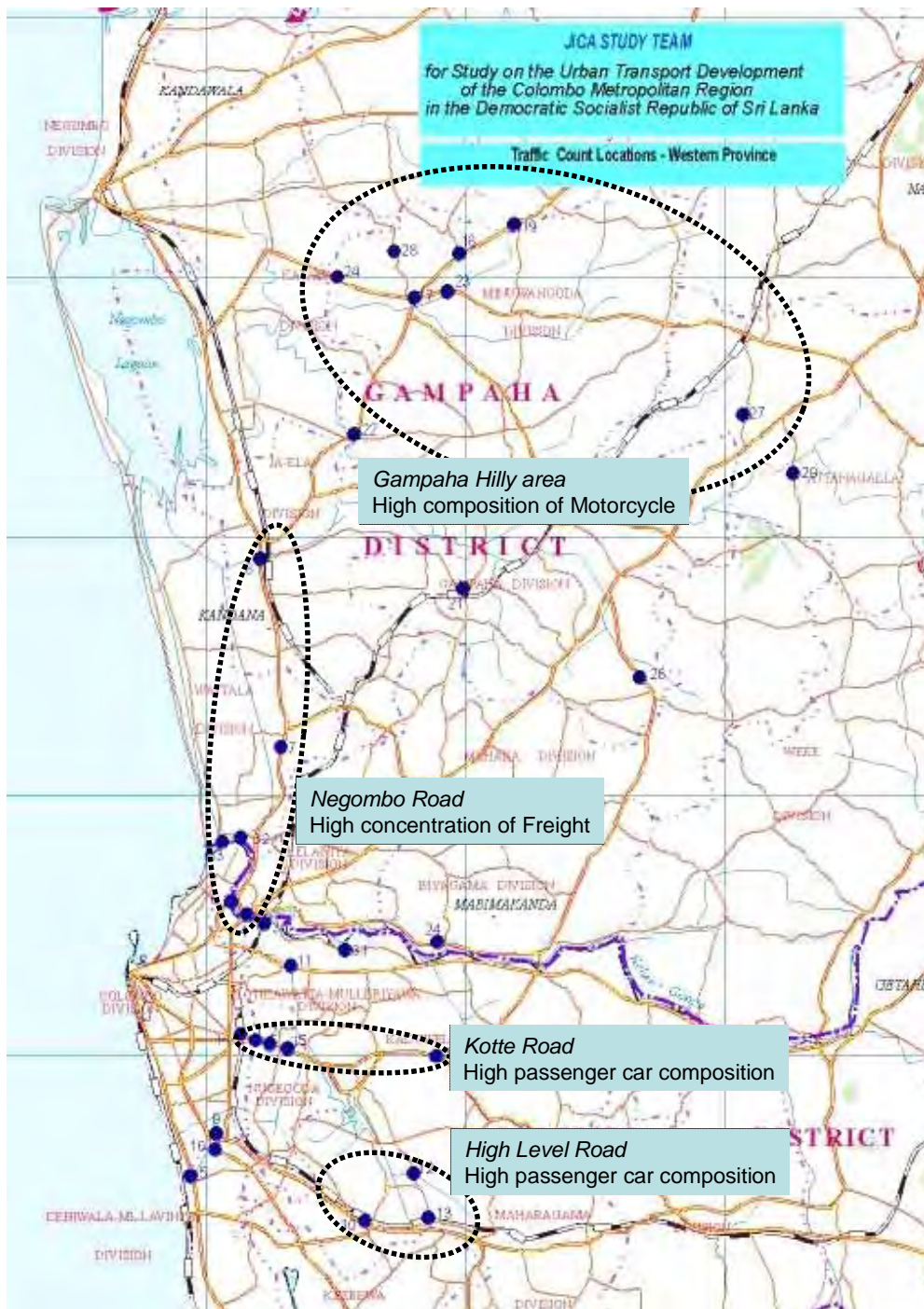
**Table A7.3 Relationship of Design Speed Related to Terrain and Design**

Type of Road	Terrain	Design Volume (PCU/day)	Design Speed (km/h)	
			Rural	Urban
R0	F	72,000 - 108,000	80	70
R1	F	40,000 - 72,000	80	70
	R		70	60
R2	F	25,000 - 40,000	80	70
	R		70	70
	M		60	60
R3	F	18,000 - 25,000	70	60
	R		60	60
	M		50	50
R4	F	300 - 18,000	60	50
	R		50	50
	M		40	40
R5	F	<300	50	40
	R		40	40
	M		30	30

Source: RDA, Geometric Road Design Standards (1998)



## Appendix 8 Traffic Composition and Characteristics



Source: This Study

Figure A8.1 Traffic Characteristics by Direction

Table A8.1 Detail of Manual Classified Counting Data in CMR

Area	Location # in Figure 5.8 and area name	Cars	Three Wheeler	Tractors	Vans	Light Goods	Med. Goods	Heavy Goods	Buses	Medium Buses	Motor Cycles	Volume
High Level	10 Maharagama	26.76	16.52	0.04	16.58	3.76	5.72	0.18	9.29	1.97	19.18	26,604
High Level	12 Welekanda	28.91	13.14	0.01	18.88	4.46	5.32	0.69	3.16	0.96	24.47	9,583
High Level	13 Level Crossing	33.14	17.27	0.09	16.16	4.08	3.01	0.13	2.42	1.36	21.90	11,395
Kotte	1 Opposite Prima	31.48	20.13	0.07	19.93	5.07	1.31	0.11	8.85	2.45	10.62	49,418
Kotte	3 Polduwa	54.64	9.18	0.03	17.45	2.55	1.73	0.12	0.46	0.42	13.42	30,951
Kotte	14 Near Impala	15.11	20.37	0.21	14.05	7.31	5.56	0.55	14.68	4.73	17.43	19,416
Kotte	15 Pamankada Br.	36.07	16.76	0.10	16.43	6.29	2.66	0.33	7.27	1.10	12.99	39,345
Negombo	4 New Kelani Bridge	38.59	16.80	0.13	15.44	4.85	2.69	0.32	7.16	1.08	12.97	40,032
Negombo	6 SLJFB(Sirimawo Bandaranayako)	18.51	12.53	0.12	21.30	10.87	14.23	2.05	4.10	3.32	13.00	48,665
Negombo	7 Kerangapokuna(Mattumage)	19.79	14.70	0.06	20.55	10.85	12.87	1.92	3.99	3.22	12.05	51,482
Negombo	8 Weligampitiya	17.23	10.36	0.17	22.04	10.88	15.58	2.17	4.21	3.42	13.94	45,847
Negombo	11 New Bridge	11.06	37.38	0.09	11.93	4.77	11.26	0.66	0.32	0.37	22.16	6,562
Negombo	30	5.84	20.14	1.22	11.86	6.98	5.32	1.13	1.39	3.31	42.81	1,147
Negombo	32	13.03	23.06	0.19	15.58	0.66	10.39	1.05	7.25	1.32	22.47	12,498
Negombo	33 Hekitta	26.24	32.71	0.04	7.71	1.67	5.48	0.57	2.52	1.00	22.06	8,814
South	5 Dehiwala Br	9.15	10.57	0.76	13.72	9.12	14.28	0.46	3.97	2.86	35.15	9,576
South	9 Kirulapana Park	14.28	19.04	0.47	15.84	8.65	10.25	1.00	3.12	1.81	25.56	8,307
South	16	7.78	12.55	0.49	13.67	8.25	17.16	0.49	5.88	3.17	30.56	7,214
Sub-Colombo	24	8.93	10.54	0.62	19.95	7.79	6.73	0.05	5.84	1.60	37.85	4,366
Sub-Colombo	26 Moragasmulla	20.77	25.52	0.45	18.01	9.04	3.34	1.51	0.35	0.45	20.56	9,400
Sub-Colombo	27	16.74	22.61	0.23	14.72	3.76	3.54	0.10	3.01	3.73	31.56	7,900
Sub-Colombo	29 Near Kotugoda Bridge	8.04	12.31	1.40	13.99	7.44	19.12	0.04	3.03	1.20	33.43	4,653
Sub-Gampaha	18 Polwatta	9.12	20.24	0.58	10.71	7.58	9.84	0.07	0.52	2.25	39.12	2,456
Sub-Gampaha	21 Gampaha	7.68	19.24	0.37	9.75	8.27	13.09	0.00	0.58	4.30	36.72	1,887
Sub-Gampaha	22	10.55	21.23	0.79	11.67	6.88	6.58	0.13	0.46	0.20	41.51	3,024
Sub-Gampaha	23	9.93	9.71	0.50	22.91	8.11	7.65	0.20	5.60	1.74	33.65	11,233

Source: RDA (all data are collected during April 2004 to April 2005)

## Appendix 9 Traffic Signals in the CMR

**Table 9.1 Traffic Signals Managed by CMC**

Signal No.	Name
1	Galle Road-Dharmapala Mawatha
2	Galle Road-Bullers Road
3	Galle Road-Dickmons Road
4	Galle Road-Bambalapitiya Flats-PED
5	Galle Road-Opposite: Savoy-PED
6	Galle Road-W A De Silva Mawatha
7	R A De Mel Mawatha-Dharmapala Mawatha
8	R A De Mel Mawatha-St. Anthony's Mawatha
9	Bullers Road-R A De Mel Mawatha
10	R A De Mel Mawatha-Vajira Road
11	R A De Mel Mawatha-Dickmons Road
12	Malay Street-Justice Akbar Mawatha
13	Slave Island Junction
14	Union Place-Dawson Street
15	Union Place-Darly Road
16	Lipton Circus
17	Dharmapala Mawatha-Park Street
18	Sir Earnest De Silva Mawatha-Dharmapala Mawatha
19	Sir Earnest De Silva Mawatha-Dharmapala Mawatha
20	C W W Kannangara Mawatha-Indipendence Avenue
21	Horton Place-Ananda Kumaraswamy Mawatha
22	C W W Kannangara Mawatha-FR Senanayaka Mawatha
23	Horton Place-Wijerama Mawatha
24	Bullers Road-Kynsy Road
25	Bullers Road-D S Senanayake Mawatha
26	Dudley Senanayaka Mawatha-D S Senanayeka Mawatha
27	Horton Place-Kynsy Road
28	Ward Place-Kynsy Road
29	Kynsey Road-Norris Canal Road
30	Maradana Road-Ananda Rajakaruna Mawatha
31	Maradana Road-Borella Cross Road
32	Borella Junction
33	Ananda Rajakaruna Mawatha-Danister De Silva Mawatha
34	Danister De Silva Mawatha-Dematagoda Road
35	Danister De Silva Mawatha-Sri Dhammarama Road
36	Danister De Silva Mawatha-Sri Saddamma Mawatha
37	Sri Sangaraja Mawatha-Jayantha Weerasekera Mawatha
38	Maradana Road-T B Jayah Mawatha
39	Maradana Road-Symonds Road
40	Maradana Road-Ananda Mawatha
41	Reid Avenue-Stanley Wijesundara Mawatha
42	Bauddhaloka Mawatha-Maitland Place
43	Bauddhaloka Mawatha-Jawatta Road

Signal No.	Name
44	Bauddhaloka Mawatha-Stanley Wijesundera Mawatha
45	Havelock Road-Vajira Road
46	Havelock Road-Thimbitigasyaya Road
47	Dickmons Road-Havelock Road
48	Kirillopone Avenue-Highlevel Road
49	Polhengoda Road-Vijeya Kumaratunge Mawatha
50	Park Road-Polhengoda Road
51	Elvitigala Mawatha-Narahenpita Road
52	Elvitigala Mawatha-Kirimandala Mawatha
53	Elvitigala Mawatha-Thimbirigasyaya Road
54	Olcott Mawatha-Saunders Place
55	Olcott Mawatha-Mihindu Mawatha
56	Olcott Mawatha-E W Bastian Mawatha
57	Maradana Road-Sri Sangaraja Mawatha
58	Sri Sangaraja Mawatha-Grandpass Road
59	Jethawana Junction
60	Sirimawo Bandaranayake Mawatha-near the stadium
61	Ingurukade Junction
62	Danister De Silva Mawatha-New Kelani Bridge Road
63	Sirimawo Bandaranayake Mawatha-Madampitiya Road
64	Aluthmawatha Road-St.James Street
65	George R De Silva Mawatha-Srimath Ramanathan Mawatha
66	Danister De Silva Mawatha-Stace Road
67	T B Jayah Mawatha-Arnold Ratnayaka Mawatha
68	Deans Road-Norris Canal Road
69	Bullers Road-Torrianton Avenue
70	Opp Castle Street Hospital-Parliament Road
71	Opp CEB-Chittampalam A Gardiner Mawatha
72	Thurstan Road-Indian High Commission Residence
73	York Street-Laksala
74	Galle Road-St. Peters Road
75	St. Pauls School-Bambalapitiya
76	York Street-Opp Gringlays Bank
77	Galle Road-St.Lawrance Road

**Table 9.2 Traffic Signals Managed by RDA**

<b>Signal No.</b>	<b>Name</b>	
1	Kalanithissa- (BLP-1)	001-BL
2	Orugodawatte	002-BL
3	Rajasingha-Ped Cross.	003-BL
4	Ingram- (BLP-1)	004-BL
5	Dematagoda-B (BLP-1)	005-BL
6	Dematagoda-B (BLP-1)	006-BL
7	Wesley College Ped. Cross (BLP-1)	007-BL
8	Chamble Part (BLP-1)	008-BL
9	Cycle Baxar Ped. Cross (BLP-1)	009-BL
10	Borella (BLP-1)	010-BL
11	Castle Street (BLP-1)	011-BL
12	Kanatte (BLP-1)	011-BL
13	RMV.Ped. Cross (BLP-11)	013-BL
14	Thimbirigasyaya (BLP-11)	014-BL
15	Kirimandala Mawatha (BLP-11)	015-BL
16	Narahenpita (BLP-11)	016-BL
17	Park Road (BLP-11)	017-BL
18	Polhengoda (BLP-11)	018-BL
19	Highlevel Road (BLP-11)	019-BL
20	Technical-Olcott Mawatha	019-BL
21	Bastian-Olcott Mawatha	001-OM
22	Bust Station-Olcot Mawatha	002-OM
23	Sounders-Olcott Mawatha	003-OM
24	Bodhiraja-Olcott Mawatha	004-OM
25	2nd Cross Street-Olcott Mawatha	006-OM
26	Maradana	001-MA
27	Kirulapone	001-A4
28	Nugegoda	002-A4
29	Seeduwa Ped. Cross	001-A3
30	Telwatte-Negombo	002-A3
31	Coppra-Negombo	003-A3
32	Periyamulla-Negombo	004-A3
33	Williamam Junction	001-A2
34	Dehiwela	002-A2
35	Katubedda	003-A2
36	Moratuwa Cross	004-A2
37	Moratuwa Railway	005-A2
38	Kelaniya Ped. Cross	001-A1
39	Thotalanga	001-MP
40	Gamsaba	
41	Delkanda	
42	Bellantota	
43	Kottawa	
44	Malabe	

Signals No. 1 through No. 25 are located within Colombo Municipality