

**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

MAIN TEXT

October 2006

JAPAN INTERNATIONAL COOPERATION AGENCY

PADECO Co., Ltd.

Oriental Consultants Co., Ltd.

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PREFACE

In response to the request from the Government of Democratic Socialist Republic of Sri Lanka, the Government of Japan decided to conduct the Study on the Urban Transport Development of the Colombo Metropolitan Region and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent the study team headed by Dr. Chiaki Kuranami, PADECO Co., Ltd. to Sri Lanka three times during the study period from October, 2005 to October, 2006.

The team held discussions with the officials concerned of the Government of Sri Lanka and conducted field surveys, investigations, and also held seminars. In succession, the team made further study and the present report was prepared.

I hope that this report will contribute to the urban transport development in Colombo Metropolitan Region in Sri Lanka and to the enhancement of the friendly relationship that exists between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Sri Lanka for their close cooperation with the study.

October 2006

Yoshihisa Ueda,
Vice President
Japan International Cooperation Agency

October 2006

Mr. Yoshihisa Ueda
Vice President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Transmittal

Dear Sir,

We are pleased to submit herewith the final report of “The Study on the Urban Transport Development of the Colombo Metropolitan Region”.

This report presents the results of the study, which was undertaken in the Democratic Socialist Republic of Sri Lanka, from October 2005 to October 2006 by the Study Team, organized jointly by PADECO Co., Ltd. and Oriental Consultants Co., Ltd.

This report analyses the present and future demand and conditions of urban transport in the Colombo Metropolitan Region. It comprehensively covers issues of urban transport including road, traffic management, public transport, institution, legislation, socio-environment considerations, and financing. The report proposes an integrated transport development program which can be accomplished by 2015, moreover, recommends establishment of a presidential committee for urban transport to coordinate project implementation. The outcome of the study concludes that proposed projects are technically, economically, environmentally and socially feasible and will contribute greatly to alleviation of traffic congestion in the region.

With regard to a feature of this study, the Study Team organized a total of 36 working group meetings and succeeded in involving officers and stakeholders in the planning process.

In view of the urgency of development of urban transport in the Colombo Metropolitan Region, we recommend that the Government of Sri Lanka implement the projects with top priority.

We owe a great deal to many people for the completion of this report. We are very much thankful to the officials. We would like to express our deep appreciation and sincere gratitude to all those who extended their kind assistance and cooperation to the Study Team, in particular, the concerned personnel of your agency and Embassy of Japan in Sri Lanka, as well as officials of the Ministry of Railways and Transport, Ministry of Highways, and Road Development Authority.

Very truly yours,



Chiaki Kuranami
Team Leader

The Study on the Urban Transport Development of the Colombo Metropolitan Region
in the Democratic Socialist Republic of Sri Lanka

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Exchange Rates Used 1 USD = Rs.102.5 Rs. 1 = 1.124 JPY (Average Rate during Jan to May 2006)

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ABBREVIATION/ACRONMYS (English)

AAGR	Annual Average Growth Rate
ADB	Asian Development Bank
ALS	Area Licensing Scheme (Singapore)
AQMS	Air Quality Monitoring System
ASEAN	Association of South East Asian Countries
ATC	Area Traffic Control
BMTRRS	Bastian Mawatha Three Rodha Rata Sangamaya, a Three-Wheeler Organization
BoI	Board of Investment
BOT	Build Operate Transfer
BRT	Bus Rapid Transit
CBC	Cluster Bus Companies
CBD	Central Business District
CBS	Central Bus Stand
CCTV	Close Circuit Television
CDP	Colombo Development Plan
CEA	Central Environmental Authority
CGR	Ceylon Government Railways
CMC	Colombo Municipal Council
CMR	Colombo Metropolitan Region
CMRSP	Colombo Metropolitan Region Structure Plan
CMT	Commission of Motor Traffic
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CPC	Ceylon Petroleum Corporation
CPI	Consumer Price Index
CTB	Ceylon Transport Board
CTC	Centralized Traffic Control
CUST2	Colombo Urban Transport Study – Phase 2
CUTS	Colombo Urban Transportation Study
CUTS1	Colombo Urban Transport Study – Phase 1
DCS	Digital Control Systems Pvt. Ltd.
Dist.	District
DMRC	Delhi Metro Rail Corporation

DS	Divisional Secretary
DT	Double Tracking
EA	Executing Agency
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EPF	Employee Provident Fund
ERP	Electronic Road Pricing
ETC	Electronic Toll Collection
EU	European Union
FIRR	Financial Internal Rate of Return
FRH	Functional Road Hierarchy
FT	Fixed Time (traffic signal control)
FY	Fiscal Year
GDP	Gross Domestic Product
GIS	Geographic Information System
GOJ	Government of Japan
GOSL	Government of Sri Lanka
GPS	Global Positioning System (American SBLS)
GRC	Grievance Redress Committees
HCM	High Mobility Corridor
HCs	Hydrocarbons
HOV	High Occupancy Vehicle
IandM	Inspection and Maintenance
IC	Internal Combustion
ICB	International Competitive Bidding
IEE	Initial Environmental Examination
IMF	International Monetary Fund
IMO	Infrastructure Management and Operation (payment)
IOL	Inventory of Loss
IRI	International Roughness Index
ISO	International Standard Organization
IT	Information Technology
ITS	Intelligent Transport System
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
LAA	Land Acquisition Act

LED	Light Emitting Diode
LLC	Limited Liability Company
LPBOA	Lanka Private Bus Operators Association
LPG	Liquefied Petroleum Gas
LRT	Light Rail Transit
MAAP	Microprocessor Accident Analysis Package
MFO	Minimum Fleet Operator
MoL	Ministry of Land
MoNRD	Ministry of New Railway Development
MoRT	Ministry of Railways and Transport
MoT	Ministry of Transport
MoTE	Ministry of Transport and Environment
MoTH	Ministry of Transport and Highways
MoUDWS	Ministry of Urban Development and Water Supply
MoWRD	Ministry of Western Region Development
MRT	Mass Rapid Transit
MTA	Motor Traffic Act
MTBF	Mean Time Between Failures
MV	Motor Vehicle
MW	Mawatta
NBRO	National Building Research Organization
NCRC	National Council for Road Safety
NEA	National Environmental Act
NGO	Non Government Organization
NIRP	National Involuntary Resettlement Policy
NMT	Non-Motorized Transport
NMV	Non-Motor Vehicle
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxide
NPV	Net Present Value
NRSS	National Road Safety Secretariat
NTC	National Transport Commission
OandM	Operations and Maintenance
O ₃	Trioxide
OD	Origin Destination
OJT	On-the-Job Training

PAA	Project Approving Agency(s)
PandR	Park and Ride
PCU	Passenger Car Unit
PI	Preliminary Information
PLC	Programmable Logic Controller
PM ₁₀	Particulate Matter up to 10 Micrometers in Size
PNR	Private Non-Residential (parking)
PPI	Private Participation in Infrastructure
PPP	Public Private Partnership
PR	Public Relation
PRC	People's Republic of China
PS	Pradesheeya Sabha (Village Council)
PSO	Public Service Obligation
PSP	Private Sector Participation
PT	Public Transport
PTWG	Public Transport Working Group
RAP	Resettlement Action Plan
RBC	Regional Bus Company
RCDC	Road Construction and Development Company
Rd	Road
RDA	Road Development Authority
RMV	Registration of Motor Vehicles
ROW	Right of Way, Border of a road or the area occupied by a road
Rs.	Sri Lankan Rupees
RTB	Regional Transport Board
RUE	Road User Education
RVP	Reid Vapor Pressure
SBU	Strategic Business Unit
SDandCC	State Development and Construction Corporation
SDH	Synchronous Digital Hierarchy
SEMA	State Enterprise Management Agency
SJK	Sri Jayawardanapura and Kotte
SJP	Sri Jayawardana Pura
SLCTB	Sri Lanka Central Transport Board
SLR	Sri Lanka Railways
SLTB	Sri Lanka Transport Board

SLTRRRSS	Samastha Lanka Three Rodha Rata Riyadurange Subasadaka Sangamaya, a Three-Wheeler Organization
SO ₂	Sulfur Dioxide
SPC	Southern Provincial Council
SPRPTA	Southern Province Road Passenger Transport Authority
STDP	Southern Transport Development Project
TA	Technical Assistance
TCC	Traffic Command Center
TDM	Transport Demand Management
TIA	Traffic Impact Analysis
TIS	Traffic Information System
TM	Traffic Management
TMC	Traffic Management Council
TOD	Transit Oriented Development
TOR	Terms of Reference
TPC	Transport Provision Contract
TRL	Transport Research Laboratory
TSP	Total Suspended Particulate
TTR	Timetable Requirements
UDA	Urban Development Authority
UoM	University of Moratuwa
US	United States of America
USD (US\$)	US Dollar
VAT	Value-Added Tax
VET	Vehicle Emissions Testing
VOC	Vehicle Operating Cost
VPS	Vehicle Positioning System
WB	The World Bank
WG	Working Group
WHO	World Health Organization
WP	Western Province
WPC	Western Provincial Council
WPCMT	Western Province Commission of Motor Traffic
WPRDA	Western Province Road Development Authority
WRMP	Western Regional Megapolis Plan
WPRPTA	Western Province Road Passenger Transport Authority

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Chapter 1 Introduction

1.1 Background

As the capital of Sri Lanka, Colombo is the largest city with a metropolitan area of 5.4 million inhabitants (2004), which is expected to grow to 8.4 million by 2030.¹ Traffic congestion is on the rise due in part to urban development and sprawl, but also because of increased private vehicle use, a wide mix of vehicles on the road, inefficient use of road capacity, and undisciplined drivers and pedestrians. The increase in private vehicles originates in increased incomes, as well as minimal investments in public transport - both railways and road-based public transport. Buses and trains are overcrowded, and while capacity has increased somewhat, quality has remained the same or deteriorated. This has led to a modal shift from public to private vehicles, with the typical results of increased congestion, pollution, and accidents.²

Several major studies have been conducted, and plans and proposals have been put forward in the past to try and improve the situation. These include: (i) the Colombo Metropolitan Regional Structural Plan (CMRSP); (ii) the Colombo Development Plan (CDP); (iii) the Colombo Urban Transport Study Stages 1 and 2 (CUTS1 and CUTS2); and (iv) the Western Regional Megapolis Plan (WRMP). Even with the substantial planning efforts undertaken previously to improve urban transport in the Colombo Metropolitan Region (CMR), few of the recommendations have been implemented. This initial part of this Study is to conduct a detailed review past plans and studies to analyze the reasons that have prevented a smooth implementation of recommended measures.

In response to the request of the Government of the Democratic Socialist Republic of Sri Lanka (GoSL), the Government of Japan (GoJ) dispatched this Study Team to undertake *the Study on the Urban Transport Development of the Colombo Metropolitan in the Democratic Socialist Republic of Sri Lanka* (the Study). Counterpart agencies of this Study are the Ministry of Railways and Transport (MoRT), the Ministry of Highways (MoH), and the Road Development Authority (RDA). They will act together as the coordinating body with other relevant organizations for the smooth implementation of the Study.

1.2 Study Objectives

According to the minutes of the meeting held on 18 May 2005 to discuss the Study's Scope of Work, the following basic focus and outline were agreed by both parties. The Study is to be carried out over a short duration with greater importance placed on quickly implementable high-priority measures to improve CMR urban transport. The solutions should consist of impacts that will be instantly beneficial and will cover such soft measures as capacity building, policy improvements, and institutional coordination, as well as more technical measures such as infrastructure and facility development. The high priority measures proposed will move beyond plans/recommendations to actual implementable projects (i.e. practical projects with institutional support). Where possible, these projects will be designed to be financially self-sustainable. This will be accomplished by making the most of the recommendations proposed in the Colombo Urban Transport Studies (CUTS) developed by the World Bank, as well as other reports and plans generated by Sri Lankan organizations such as the counterpart organizations,

¹ Board of Investment, Sri Lanka. *Western Region Megapolis Regional Structure Plan*, Final Report Volume 1. July 2004

² It is worth noting that some officials indicated that the levels of congestion are causing some people to return to public transport.

Urban Development Authority (UDA) and National Physical Planning Department (NPPD). The traffic surveys and transport demand forecast undertaken by CUTS will be used to the maximum extent possible along with data from the counterparts themselves, although some traffic surveys will be implemented under this Study to reflect recent changes.

To achieve these objectives, the Study has been placing particular importance on a participatory approach covering such stakeholders as central, provincial, and local governments, NGOs, the private sector, and community leaders to identify possible solutions to the urbanization and urban transport issues. A candid exchange of views and opinions to attain common understanding among stakeholders is vital for moving a proposed urban transport improvement plan into action.

The objectives of the Study are to:

1. Identify CMR's urbanization and urban transport issues and formulate a strategic urban transport framework for CMR;
2. Clarify the high priority urban transport issues in order to formulate a high priority improvement measures/projects for CMR; and
3. Propose implementation methodologies to ensure realization of the proposed high priority measures, including institutional, financial, regulatory, and legal aspects.

1.3 Study Area and Methodology

(1) Study Area

In terms of the strategic framework, the study area will be broad, to cover all aspects of transport including road development, intersection improvement, traffic management, public transport, and environmental measures. Its purpose is mainly for recommending a plan for CMR's current urban transport environment, but the study will also put forth a framework for the future CMR and provide guidance for the probable urbanization of areas that may now be considered outside the CMR. The study area covers an extended area as development along the major corridors, as well as other areas are likely to increase in the next 20 years. That said, the study area would incorporate much of the Western Province, including a radius of 40-50 km from Colombo's city center. This area incorporates Colombo Municipality, Gampaha District, and Kalutara District.

As the purpose of the project is to reduce traffic congestion in the CMR, the outer boundary proposed will be the Outer Circular Highway (OCH). RDA has essentially agreed to the location of the alignment to be the outer limit of the CMR and it will link some of the major growth centers such as Kaduwella, Kadawata, and Kottawa, which were defined by UDA in the Colombo Metropolitan Regional Structural Plan. This will thereby incorporate the congestion found along the major corridors and future circumferential corridors between the growth centers.

(2) Methodology

The Study has been conducted in two phases. Phase I was implemented from November 2005 – March 2006 and incorporated the development of a strategic framework, as well as the identification of priority issues and priority improvement measures that fit within the plan. The characterization of the issues also addressed the root causes of the issues. The final step to Phase I was agreement among the relevant decision-makers and stakeholders as to the list of high priority issues and potential improvement measures.

Phase II started in May 2006 and was completed in September 2006. Phase II has been tasked with further developing the priority issues and improvement measures into implementable (practical) projects, with corresponding preliminary feasibility studies, which can be executed and made operational by 2015. The high priority projects will cover non-infrastructure measures such as institutions, capacity building, and policy coordination, as well as more technical solutions such as infrastructure and facility development. It is anticipated that the first half of the short-term time frame will focus on transport demand management (TDM) measures, capacity building, and highly urgent infrastructure projects that could possibly be eligible for grants or local funding, and the second half of the planning time frame will focus on larger infrastructure projects and more complicated measures that may require loans or a longer implementation period. The proposed criteria that will be applied to the priority projects consist of both a quantifiable assessment of the projects' urgency and their constraints. Examples of urgency would be (i) reduce traffic congestion by expanding traffic capacity; (ii) reduce traffic congestion by reducing traffic demand; (iii) promote public transport and usage by increasing quality of service; and (iv) increase coordination. Constraints would be (i) completion or at least significantly under development by 2015; (ii) manageable land acquisition and resettlement; and (iii) adverse environmental impacts - that is, only projects that can be completed by 2015, have manageable land acquisition and resettlement costs, and do not have adverse environmental impacts will be considered. Once the list of priority projects was identified, then funding possibilities were considered.

Phase I also included counterpart training sessions, both in Sri Lanka and Japan. The University of Moratuwa (UoM) conducted training that mainly focused on basic concepts of transport planning and traffic management, as well as international best practice case studies.³ The classroom training occurred in March and consisted of a two-day training course with assistance from Moratuwa University. This course could be held for about 20-25 people per session and it is planned to have a one-day training course for high-level participants and two two-day training courses for mid-level participants.

Counterpart training in Japan took place at the end of Phase I. This training session brought three transport officials to Japan for about two weeks to engage in site visits of national and local transport authorities as well as private sector transport companies. A summary of the training can be found in Appendix 35.

A videoconference was held on 6 September 2006 between Sri Lankan officials and Thailand's Office of Transport and Traffic Policy and Planning (OTP). The purpose was to provide Sri Lankan attendees with information on institutional coordination in an international context. Dr. Chalermtrak, the Deputy Director of OTP, gave a presentation on how OTP was established and provided case studies of the formulation of specific projects under inter-ministerial coordination. Details of the videoconference can be found in Appendix 28.

STRADA training and tutorial was provided by the Study Team on 22 September 2006. The topics included demand forecasting basics and the relationship between traffic demand and economic analysis. The counterparts mentioned that they would like to apply STRADA as part of a system to manage their traffic and planning database and execute forecasts.

The First Seminar was conducted on 10 March 2006 and presented the findings of the Progress Report (Chapters 2-10 of this report). It was a ½ day seminar. The purpose was to elicit feedback from the various stakeholders, including the Steering Committee members. The Second Seminar was held on 15 June 2006 and presented the findings of the Interim Report

³ See *Report on Training Program* by Uni-Consultancy Services, Moratuwa, March 2006.

(Chapters 11-17 of this report). It also was a ½ day seminar and the Study Team obtained feedback on the list of high priority projects and approaches for the pre-feasibility projects. A Third Seminar is planned for 27 September 2006 to present the outcomes of the pre-feasibility studies.

Throughout the study there were benchmarks, in the form of reports, seminars, Steering Committee Meetings, and Working Group Meetings that the Study Team will meet. Additionally, the Study Team members who are assigned to each Working Group met with the Secretary of the Ministry of Transport monthly to brief him on the progress of the Working Groups and study in general.

Steering Committee

In order to obtain the necessary approval and ownership of the issues, recommendations, and methodologies for implementation, a Steering Committee that consists of high-level decision makers has been established. Because Steering Committees are inherently formal in nature and their purpose as a forum to present the team's findings, they have been held in parallel with the preparation of the project's reports. A more informal forum of Working Groups was held monthly.

The following organizations are in the Steering Committee:

- Ministry of Railways and Transport;
- Ministry of Highways;
- Road Development Authority;
- Urban Development Authority;
- Traffic Police, Sri Lanka Police;
- Colombo Municipal Council;
- National Transport Commission;
- Department of External Resources, Ministry of Finance;
- Department of National Planning, Ministry of Finance;
- Sri Lanka Railways;
- Central Environmental Authority;
- Western Provincial Council;
- Western Provincial Council Road Passenger Transport Authority; and
- Sri Lanka Transport Board.

The Steering Committee Meetings have been organized and chaired by MoRT and/or MoH. The Study Team was responsible for assisting in the facilitation and organization of the Steering Committee meetings and operated as the Secretariat.⁴ The dates and agendas of the Steering Committee meetings are as follows:

⁴ Secretariat tasks involve preparing the discussion notes in advance of each meeting and taking the minutes of each meeting.

Table 1.1 Steering Committee Meeting Summary

Number	Date	Agenda
1	19 December 2005	Obtain feedback on Inception Report, Identify Working Groups
2	28 February 2006	Present and obtain feedback on Progress Report, Discuss training classes and seminar
3	13 June 2006	Present and obtain feedback on Interim Report, High Priority Projects, and scope of Pre-Feasibility Studies
4	25 September 2006	Present and obtain feedback on Draft Final Report

Working Group Meetings

Involvement of stakeholders is one of the critical components of this Study as it is necessary to obtain feedback and opinions of all involved organizations. Because there are numerous urban transport stakeholders, five Working Groups (WGs) have been established as shown in Table 1.1. These WGs have been organized to elicit opinions on and prioritization of issues, constraints, and possible solutions, as well as detailed feedback and documentation from all stakeholders, both Steering Committee members, as well as other relevant stakeholders.

Table 1.2 Established Study Working Groups

Topic (Sector)	Counterpart Agency	Participating Agencies
Institutional and Policy Coordination	MoRT and MoH	NTC, UDA, WPRTA, WPC, CMC, Police, other local MC
Road Development Planning	RDA	MoH, MoRT, RDA, UDA, CMC, other local MC, freight operators, Chamber of Commerce
Public Transport	NTC	NTC, SLTB, SLR, CMC, WPRPTA, Bus/three wheeler operators/associations, NGOs representing poor, women, minorities
Traffic Management and Safety	CMC	CMC, Traffic Police, MoH, RDA, NGOs, WPC, MoRT, UDA, Ambulance Companies, Chamber of Commerce
Social and Natural Environment	UDA	UDA, CEA, MoRT, MoH, RDA, NGOs, Chamber of Commerce
Area Traffic Control Institutions ⁵	MoRT	WPC, CMC, Police, RDA

Several meetings were held for each of the above WGs between December 2005 and May 2006. Appendix 35 provides the date and agenda for each WG meeting that was held.

1.4 Report Structure

The remaining chapters in this Final Report consist of the following chapters:

- Chapter 2 presents a review of the existing studies, plans, and projects in CMR. As many of the projects proposed have not been implemented, the chapter seeks to outline the main reasons for the lack of implementation, as well as to identify, for those that have been or are in the process of being implemented, what has allowed those projects to move forward;

⁵ This Working Group was established in August 2006 to discuss the institutional issues of implementing the proposed ATC project.

- Chapter 3 examines urban development trends and its impacts on transport and traffic. Socio-economic characteristics and land use patterns are examined over time, as well as by differentiating by districts within the Study area. Important transport corridors in the region are identified in the context of the dynamic nature of urbanization;
- Chapter 4 aims to establish a strategic framework for transport systems in CMR. It first examines a future vision for the kind of city it could be and only then can the type of structure and development needed to achieve this goal be prepared. It also describes potential issues in stages of implementation;
- Chapter 5 reviews the urban road network and traffic conditions. It examines network issues in relation to the past planning exercises and studies, as well as policy directions for improvement;
- Chapter 6 discusses existing traffic conditions in terms of traffic operations, traffic management facilities, and traffic control practices followed by a review of previously recommended, planned, and ongoing traffic management projects. It also examines parking management measures in detail as a potential traffic management measure to reduce congestions in the CMR. Institutional and regulatory aspects of traffic management are also addressed;
- Chapter 7 reviews public transport systems in Colombo and its surrounding metropolitan area. It strives not to repeat what has been done previously, but will update some of the major data points, and identify the current issues and the causal relationships. It also identifies and prioritizes the major public transport issues, which are reflected in the analysis that follows;
- Chapter 8 addresses the link between sustainability and transport systems to reduce traffic congestion and environmental impacts while ensuring mobility for all, including the disabled and poor. Involuntary resettlement issues and causes of air pollutions from mobile sources are examined in detail;
- Chapter 9 presents an overview of the institutional structures and coordination mechanisms of transport in the Western Province (WP). In addition, the chapter examines the issues as to why there has not been effective and efficient implementation of transportation policy; and
- Chapter 10 summarizes priority issues and policy directions for improvements.
- Chapter 11 elaborates on the selection process and results of short-list measures/projects. The selection was undertaken based on the discussions and evaluations performed by each working group.
- Chapter 12 describes short-list projects for urban road systems including flyover construction projects. Project sheets have been prepared for all of the recommended projects and are located in Appendices 20 and 21. This chapter provides an additional explanation of each project, as well as implementation benefits and risk mitigation measures.
- Chapter 13 presents short-list projects for traffic management and safety. Project locations, contents, benefits, and mitigation measures are explained in detail.

- Chapter 14 introduces the short-list projects for public transport improvements. Practical measures for improving public transport systems in Colombo will be presented and include buses, rail, three-wheeler, and school vans.
- Chapter 15 describes the proposed institutional and policy coordination project, which is a central high-level body that represents the main political decision makers in urban transport, including the Western Provincial Council (WPC). Its organizational structure, legal framework, benefits, and risk mitigation measures are analyzed.
- Chapter 16 addresses natural and social environmental concerns. In addition to the projects in this sector, an overall framework for the environmental evaluation of transport projects that will be used in the future is presented.
- Chapter 17 presents the selection procedure of High Priority Projects from the Short List project/measures. The final list of High Priority Projects is presented with an explanation for their urgency. Potential projects for pre feasibility studies are presented.
- Chapter 18 outlines the methodology for the pre-feasibility projects including (i) road extension and widening projects; (ii) grade separation projects; and (iii) an area traffic control (ATC) system and corridor improvements.
- Chapter 19 undertakes the traffic demand analysis and projects traffic growth and the future road network for 2015 and 2030. This chapter also presents the results of impact analysis on traffic by implementing each or group of the pre-feasibility projects.
- Chapter 20 presents designs for the road widening and extension pre-FS projects that will either increase capacity via road widening or will produce a more rational network by constructing missing road links. Cost estimates are also provided.
- Chapter 21 analyzes pre-FS projects to identify which intersections need grade separation projects. For those needing such a structure, the road and flyover designs are provided, along with cost estimates and the bill of quantity.
- Chapter 22 presents the results for the ATC System and the corridor improvement project. ATC system design, configuration, costs, and organizational components were outlined. As part of the ATC system, geometric improvements of intersections will be necessary and two sample designs were created. Corridor improvements were designed for A2 (Galle Road) and A0 (Sri Jayawardenapura) and based on these designs, costs are provided.
- Chapter 23 presents the economic analysis for different packages of pre-FS projects (i.e. a package for each of the following: road widening projects, intersection improvement projects, new road construction projects, corridor improvement projects, and all projects). In this, costs and benefits, an economic internal rate of return, and net present value for each of the packages are calculated.
- Chapter 24 identifies negative impacts and potential mitigation measures for the pre-FS projects proposed in Chapters 20 and 21.
- Chapter 25 presents the financing options for the high priority and pre-FS projects. Included in this chapter is an analysis of recent trends in both the domestic budget with

regards to transport, as well as external funding sources. A discussion of alternative funding mechanisms is also included.

- Chapter 26 provides conclusions and recommendations for future steps.

Chapter 2 Review of Urban Transport Projects in Previous Studies and Plans

2.1 Introduction

This chapter reviews the urban development plans that have been prepared by various domestic and international organizations over the past 8 years. The studies and plans have focused on either the entirety of Western Province or a subset of areas within that province, considered to be the Colombo Metropolitan Region (CMR). The purpose of this chapter is to identify the previous projects, along with a brief explanation, categorization, project type, and status. As many of the projects proposed have not been implemented, the chapter seeks to outline the main reasons for lack of implementation, as well as to identify, for those that have been or are in the process of being implemented, what has allowed those projects to move forward. It is expected that these projects will be used as a basis for future Working Group discussions to see if the projects are still valid or if new approaches should be considered. A full list of all 161 previously proposed projects can be found in Appendix 1.

2.2 Review of Past Urban Studies and Plans

Colombo Metropolitan Region (CMR) physical (or master) plans have been undertaken since British colonial times. The review here however will only consider those plans that have been deemed to have an impact on current planning, which are as shown in Table 2.1.

Table 2.1 Recent Urban Plans/Studies for CMR

Name of Plan/Study	Prepared by	Year Published
Colombo Metropolitan Regional Structural Plan (CMRSP)	Urban Development Authority (UDA)	1998
Colombo Development Plan (CDP)	UDA	1999
Colombo Urban Transport Study 1 and 2 (CUTS1 and CUTS2)	World Bank Consultant	1999
Western Regional Megapolis Plan (WRMP)	Board of Investment	2004

Source: This Study, 2006

Below, a brief review of each of these plans/studies is given.

(1) Colombo Metropolitan Regional Structural Plan (CMRSP)

The Colombo Metropolitan Regional Structural Plan (CMRSP) is a very comprehensive master plan that examined all sectors of urban development and transport infrastructure and for the first time went through a reasonably acceptable level of stakeholder consultation by undertaking five workshops. The basic objectives/goals of the CMRSP are described in Table 2.2.

Table 2.2 Basic Objectives and Goals of CMRSP

Objective	Goal
Provide opportunities for increased economic development, employment generation and improved living standards.	The region is to play a leadership role in the national economy, via growth centers for new investment in industrial and infrastructure development.
Improve accessibility and mobility.	Introduce new transport facilities and land-use plan to improve accessibility and mobility.
Promote environmentally sustainable urban growth.	Introduce growth centers and conserve environmentally sensitive areas.
Reinforce core functions of metropolitan area.	Extend functions to new core areas and improve accessibility within the region.
Increase the housing supply.	Provide infrastructure to new areas of expansion to facilitate the housing supply.
Formulate an investment program for funding.	Increase opportunities for private sector participation in urban investment.

Source: CMRSP

The strategy for development can be summarized as follows:

- Expand the boundaries of Colombo city (core area) to include strategically selected adjacent urbanized areas;
- Establish six growth centers (Negombo, Horana, Homagama, Biyagama, Ragama, Gampaha and Negombo) with transport links to provide high-speed travel; and
- Construct a north-south highway to connect all the growth centers, a circular light railway system near the core area, electrification of railways, and the realization of high mobility roads.

CMRSP was taken up at the highest levels of Government, but was not approved due to a change in government and to the fact that the plan was prepared by UDA, which does not have the authority to prepare regional plans.

(2) Colombo Development Plan (CDP)

The Colombo Development Plan (CDP) was a direct outcome of the CMRSP. As mentioned above, one of the reasons for the CMRSP not obtaining approval was the inability of the UDA to have regional plans gazetted. This is because the UDA only has a mandate to do this for locations designated as “urban areas”. Given this, the UDA extracted the “Core Area Plan” from the CMRSP and had it gazetted as the Colombo Development Plan (or CDP). Note that the CDP is the only plan at this time to have a legal basis and replaces the previous CDP of 1985. The plan consists of two volumes that are as follows:

- Volume I: Development Plan with Zoning and Other Related Planning Guidelines; and
- Volume II: Planning and Building Regulations.

The CDP’s vision for the core area, which is the area represented by the Municipal Councils for Colombo, Dehiwela-Mt. Lavinia, and Sri Jayawardenapura Kotte, is to create a gracious city functionally efficient, economically viable, environmentally sustainable and socially integrated to address the challenges associated with improving quality of life, as well as to act as the engine of national economic growth for Sri Lanka in the 21st century. The objectives for the core area are summarized below:

- To become the financial and commercial hub of the South Asian Region;
- To improve the transport system and thereby reduce congestion and travel times;
- To conserve, revitalize and cautiously replace architectural and historical masterpieces;
- To increase the capacity of infrastructure to meet demand;
- To ensure environmental conservation so as to enhance the garden city image of Colombo. This would include the provision for new public open and recreational spaces of about 320 hectares;
- To increase the amount of land for urban use in order to prevent speculative land prices and undesirable land subdivisions;
- To encourage more development in the core area along the waterfront and to link all of it with modern transport links;
- To establish an authority (i.e., the Colombo Development Authority) to implement development projects; and
- To shift public administrative and government institutions to Greater Kotte in order to release urban land for more productive uses.

To assist in the realization of the above objectives, the CDP provided a list of transportation and traffic management projects that included a more efficient parking system, the introduction of vehicle entry fees, the staggering of school and/or office hours, exclusive bus lanes, the improvement and extension of Baseline Road, the extension of Marine Drive, the extension of Duplication Road, the construction of the Colombo-Katunayake Expressway, etc.

(3) Colombo Urban Transport Study Stages 1 and 2 (CUTS1 and CUTS2)

The Colombo Urban Transport Study 2 (CUTS2), which was a continuation and refinement of the Colombo Urban Transport Study 1 (CUTS1) and the culmination of seven years of work, had the objective of preparing packages of capital schemes together with institutional strengthening and feasibility schemes, and recommended associated policy reforms to assist in improving the urban transport system. Note that one of the goals of the study was to make the best use of existing system components through the promotion of short-term measures that would increase capacity, in addition to identifying medium- and long-term measures to satisfy transport needs due to urban growth. CUTS2 proposed 12 categories of project to achieve this and their goals are briefly described below:

- **Bus Services Action Plan:** (i) The quality of bus transport should take precedence over financial viability and include a reduction in overloading; (ii) both private and public bus operation should continue in allotted roles under appropriate regulation to ensure both higher quality and lower cost; (iii) public sector buses should provide basic bus services at affordable prices while the private sector should focus on providing higher quality service at unregulated fares; (iv) public sector buses should increase their share from 50% to 60%; and (v) private bus owners should be encouraged to form groups with a minimum bus fleet of 50 vehicles;
- **Rail Services Action Plan:** (i) Establish a new Safety and Operational Standards Department; (ii) establish a new Works Department separate from infrastructure; (iii) rename the “Operations Department” to “Commercial Department” and make it responsibilities for all customer service and service delivery; (iv) create a separate Freight Department with responsibility for marketing and planning freight; and (v) create a separate Strategic Planning Unit responsible for overall business planning that would set targets and assess performance;
- **City Center Conceptual Transport Plan:** Develop a long-term transportation plan for the city center that would: (i) have a one-way ring around Fort; (ii) restrict car traffic

entering Fort and provide priority to buses and pedestrians; (iii) use Bodhiraja Mawatha as a bus link to facilitate the coordination of public transport facilities; (iv) redevelop and upgrade Pettah with the recognition that it is the transport center; (v) develop Manning Market as a bus terminal; and (vi) develop Pettah as a market for pedestrians and restore the bazaar-type atmosphere;

- **Rail/Road Coordination:** (i) Provide better coordination via the improved design of bus stations and terminal layouts at Gampaha; (ii) improve pedestrian crossings between bus and train stations; and (iii) improve vehicular access to public transport;
- **Transportation Master Plan:** (i) Adopt a transportation master plan as quickly as possible; (ii) achieve traffic restraint via a combination of measures that includes a restrictive parking policy, park-and-ride, demand spreading, ride sharing, etc; (iii) introduce a LRT on Galle Road, Sri Jayawardenapura/Kotte Road, High Level Road, and Negombo Road corridors; (iv) widen all major radial corridors to four or six lanes and minor corridors to two lanes; (v) improve operations of suburban rail so it can carry 20% of corridor flows by 2004 and gradually develop the Main Line as a dual two line rail track and double track the Coast and Negombo Lines; (vi) implement electrification of these railways lines; and (vii) implement bus priority measures (including bus lanes) for major corridors having at least six lanes;
- **Traffic Management Policy:** Establish a traffic management council and develop parking policy and strategy guidelines;
- **Pre-feasibility Study for Kelani River Rail Bridge:** Determine whether or not the bridge can serve traffic demand and if it is structurally sound (Capacity was determined not to be an issue while the structural integrity of the bridge, especially in the mid- to long-term was deemed as questionable.);
- **Feasibility Study for Duplication Road Extension:** Given the high-density settlement, keep land acquisition to a minimum and focus on improved traffic flows via traffic management measures;
- **Mass Rapid Transit:** Develop an MRT concept paper including examining the potential costs of MRT and identifying the revenue and viable fare levels of such a system for highly traveled corridors such as Galle Road and Duplication Road;
- **Pre-feasibility Study for Inland Container Depot (ICD):** (i) Establish an ICD to remedy the lack of port capacity; (ii) use existing rail infrastructure to keep costs down and upgrade them to improve capacity; (iii) establish the ICD at Hunupitiya as it is near major roads and there are existing sidings; and (iv) encourage private sector investment;
- **Design of Pilot Schemes:** Implement two pilot schemes, which consist of improving Lipton Circus Eye Hospital Junction and Galle Road (Dehiwela Bridge to Kawdana Junction) and implement traffic management schemes, for the purposes of demonstration and transferring traffic management techniques to local agencies; and
- **Corridor Improvement Programs:** Develop eight radial arterials leading into Colombo into High Mobility Corridors via the implementation of traffic management schemes and improved road design that would substantially increase running speeds.

(4) Western Region Megapolis Plan (WRMP)

In 2003, a new government, which wanted to place a high priority on urban development, engaged the Singaporean consultancy CESMA to prepare a new plan for CMR under the direction of Sri Lanka's Board of Investment. The goal of the Western Region Megapolis Plan (WRMP) was to transform the Western Province (or CMR) into a modern megapolis that would accommodate a total population of about 8.4 million with the city of Colombo as the nucleus. Its major planning concepts are as follows:

- **Decentralization Concept:** While promoting high and efficient concentration in the city of Colombo, new growth areas are to be introduced in the northern, eastern and southern parts of CMR;
- **Garden City Concept:** The extensive wetlands in Colombo are to be utilized to realize the concept of Colombo being a garden city; and
- **Live-Work-Play Concept:** Encouragement of jobs to locate near residential areas and the provision of easy access to recreational facilities.

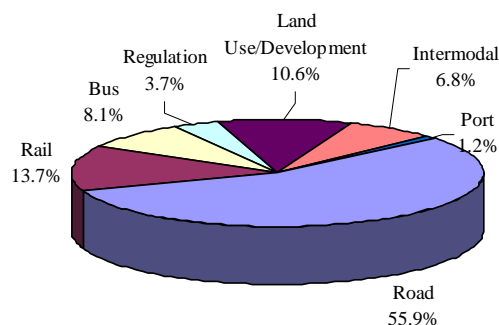
To realize the above concepts, the WRMP proposed the following structure for the CMR:

- The construction of two north-south ring roads known as an Inner Necklace and Outer Necklace to connect the CMR's radial highway network. This infrastructure would hold the nodes, growth centers, and residential townships of the area and ensure good connectivity;
- A core area consisting of high-density development, while the areas between the core and the Inner Necklace and the Outer Necklace and the Inner Necklace would consist respectively of self-contained medium-density and low-density developments;
- The core area is to consist of the city of Colombo and the adjacent urbanized areas of Dehiwela-Mount Lavinia, Sri Jayawardenapura Kotte, Kollonnawa, Kaduwela, Maharagama, Ratmalana and Kesbewa, which cover an area of 17,000 hectares. The core would serve as the economic engine of the country and would improve its economic competitiveness;
- A Central Business District (CBD) capable of serving as the financial hub for the entire country as well as for the surrounding South Asia region;
- The establishment of Colombo as a transportation and distribution hub (transshipment and air cargo gateway to Sri Lanka and South Asia), which would include the construction of a new port;
- Continued decentralization of administrative functions to Sri Jayawardenapura Kotte;
- Five regional centers are to be located at Negombo, Attanagalle, Avissawella, Horana and Kalutara, with each regional center to act as a mini CBD;
- Five sub-regional centers are to be located along the Inner Necklace;
- The area along the Base Line Road is to be a business corridor;
- The area along the Inner Necklace is to contain a technology corridor with biotechnical parks and other research based industries; and
- The area along the Outer Necklace will contain an industrial corridor.

2.3 Composition and Status of Projects Proposed by Past Urban Studies and Plans

The 161 projects that were proposed in the above-mentioned urban studies/plans are listed in Appendix 1. Each study was reviewed and all transport and land use/development projects were added to the list with a brief summary of each project's details, when available. Some studies/plans included duplicate projects, although the project is only listed once with multiple sources. They were then given a category to better qualify their focus, which included Road, Rail, Bus, Port, Intermodal, Land Use/Development, and Regulation. Each project was given a project type, such as Construction Improvement Scheme, Road Widening Scheme, Traffic Management Scheme, and Institutional/Policy Improvement Scheme. Lastly the each project's status was identified through discussions with project counterparts. Status is identified as proposed, gazetted (i.e. planned for implementation), ongoing, partially completed, and completed.

A breakdown of the projects by project category is shown below in Figure 2.1.

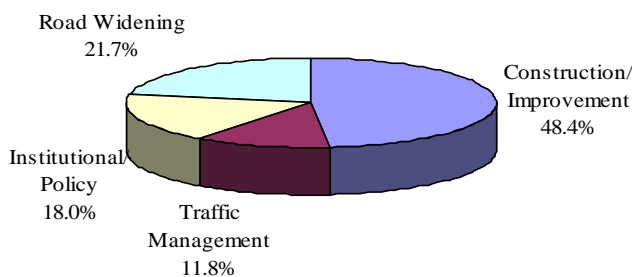


Source: This Study

Figure 2.1 Categorization of Previously Proposed Projects

As the above figure indicates, the majority of projects that have been considered are road projects (55.9%). After that, the next most numerous category of project put forward has been rail projects at 13.7%. Except for land use/development projects with a share of 10.6%, all other project categories accounted for less than 10% of the total.

In Figure 2.2, the types of projects that were prepared and their share of the total are shown. Note that the majority of project types consist of new construction or improvement work (48.4%), while another 21.7% consist of road widening. The remaining two other types of projects, or institutional and policy improvement and traffic management, accounted for 18.0% and 11.8%, respectively, of the total. This indicates that the vast majority of projects (70.1%) are physical (or hard) in nature, while only 29.8% are non-physical (or soft) in nature, perhaps signifying a lack of the latter project type.



Source: This Study

Figure 2.2 Types of Previously Proposed Projects

In Figure 2.3, the status of past projects is shown using five different designation types.

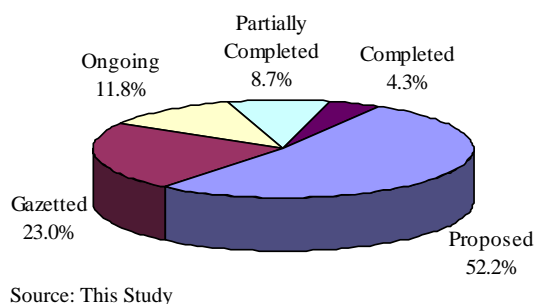


Figure 2.3 Status of Previously Proposed Projects

As the above figure shows, only 4.3% of past projects have been completed, while 52.2% have yet to be taken up in any way (i.e., they have been proposed, but not acted upon). As the CDP was gazetted by the Cabinet, 23% have a legal claim to implementation. The majority of these are gazetted as they were recommended in the CDP, which as an entity was gazetted by the Cabinet. Presently, 20.5% are either ongoing or partially completed.

Of those that are ongoing, partially completed, or completed, Figures 2.4 and 2.5 provide a summary of their category and type. Roads make up 67.5% of the projects, while bus is an additional 12.5% and rail accounts for 10.0%. No Port or Regulations have been implemented and so are not included in this figure. In comparison to the harder and physical infrastructure projects account for only 57.5% of projects that are ongoing, partially completed, or completed, a decrease over the proportion that were proposed, whereas softer and non-infrastructure projects accounted for 42.5%, an increase over the proportion what was proposed. This demonstrates an interest or willingness to implement softer projects, which presents good prospects for future development.

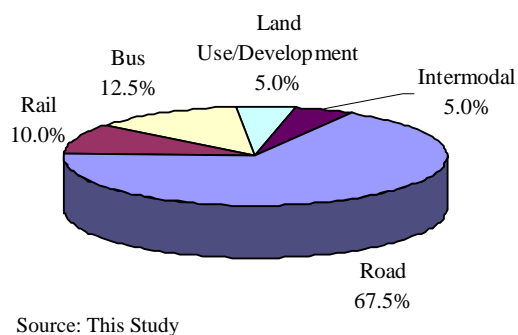


Figure 2.4 Categories of Projects that are Ongoing, Partially Completed, or Completed

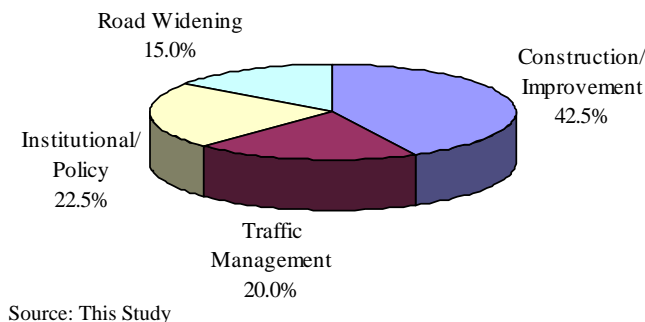


Figure 2.5 Types of Projects that are Ongoing, Partially Completed, or Completed

2.4 Implementation Issues

From Section 2.3, it can be said that there seems to be serious difficulty in realizing projects that have been proposed by past plans/studies. Note also that the vast majority of these projects were scheduled for completion by 2010, which seems highly unlikely now due to time constraints. The possible major reasons for this, although not comprehensive, are given below in Table 2.3.

Table 2.3 Possible Reasons for Lack of Implementation of Previously Proposed Projects

Type of Reason	Description
Physical	<ul style="list-style-type: none"> • Inability to Acquire Right of Way • Natural or Man-made Physical Constraints
Technical	<ul style="list-style-type: none"> • Lack of Detailed Design • Insufficient Technical Capability • Lack of Technical Assistance
Institutional	<ul style="list-style-type: none"> • Lack of Political Will/Motivation • Unclear Delineation of Powers Between Organizations • Lack of Coordination • Lack of Capacity • Political Interference and External Interests
Financial/Economic	<ul style="list-style-type: none"> • Lack of funding • Inability to raise funds • Low financial/economic IRR
Social/ Environmental	<ul style="list-style-type: none"> • Large social environmental impacts • Impacts on cultural sites • Impacts on historical sites • Large natural environmental impacts
Regulatory	<ul style="list-style-type: none"> • Frequent policy changes • Unclear policy or criteria • Lack of legal basis • Lack of master plan or clear strategy for CMR • Lack of project prioritization

Source: This Study

After discussions in Working Groups as well as individual meetings with relevant agencies and organizations, it appears that the two major reasons for lack of implementation are *institutional and financial/economic*. The agencies involved have requested the Study Team to make note of this for future recommendations.

There were projects that have been implemented, as can be seen in Appendix 1 and Figure 2.3. For the most part, those projects can be qualified as those requiring (i) little coordination among agencies (traffic management schemes in CMC); (ii) significant resources obtained from multi- or bi-lateral donors (Southern Highway, 3rd Kelani River Rail Bridge, and the Baseline Road Extension); and (iii) few or no changes to the institutional and regulatory framework. However, other projects, such as triple tracking of the Main Line, financed internally, and restructuring the public bus companies have occurred, counter to these reasons, which demonstrate that with resources and political will changes can be made.

Chapter 3 Urban Development Trends and Travel Patterns

3.1 Introduction

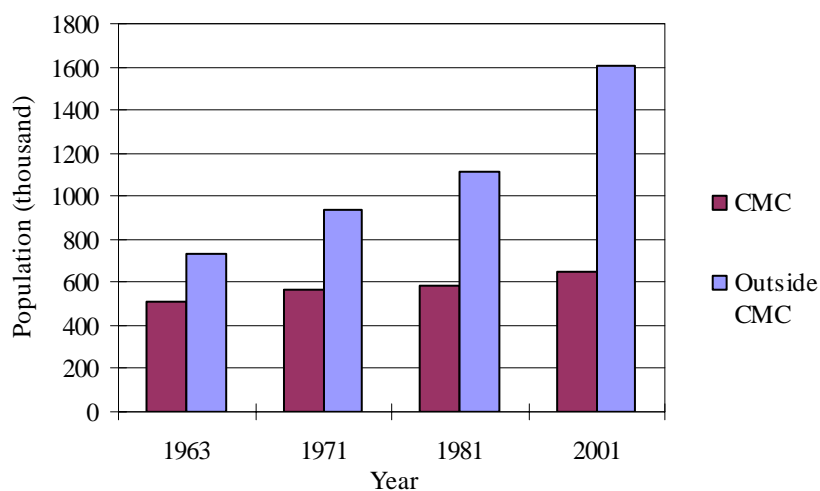
This chapter presents the current urbanization status of the Colombo Metropolitan Region (CMR) and analyzes the travel patterns within the current urbanization perspective. First, recent population growth and the concentration of socio-economic activities in Western Province (WP) and its three districts will be explained. Then trends of population growth are discussed. Travel pattern characteristics are reviewed and the interaction between land use and travel patterns is discussed.

3.2 Socio-economic Characteristics of the Study Area

(1) Population Growth

Colombo District

Figure 3.1 shows population growth in Colombo District and in the Colombo Municipal Council (CMC) area. The population has remained around 600,000 with a gradual increase from 1963 onwards. The population in the remainder of Colombo District, on the other hand, has grown rapidly in the past decades and is now more than twice what it was in 1963.

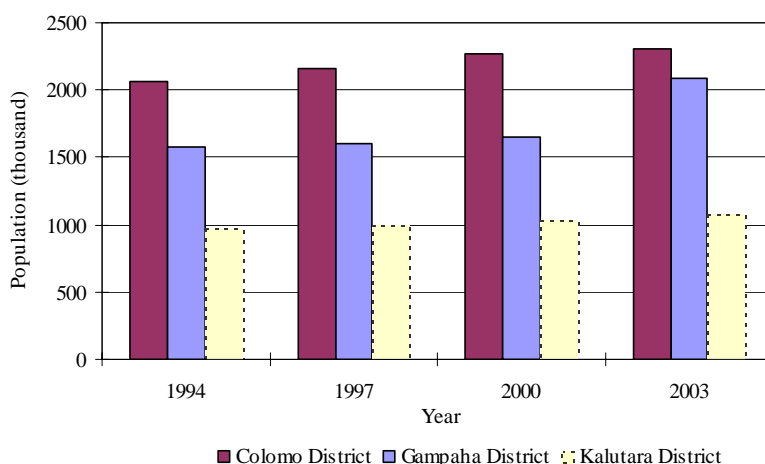


Source: Department of Census, Census Data for Population and Housing, 2001

Figure 3.1 Population Growth in Colombo District

Gampaha District

Figure 3.2 shows the increase in population of three districts in WP, Colombo, Gampaha, and Kalutara. Gampaha's growth rate between 2000 and 2003 is much higher than that of the other two districts.



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

Figure 3.2 Population Growth in Western Province Districts

Population Density of CMR

Distribution of population densities at the Divisional Secretariat (DS) level are illustrated in Figure 3.3, which shows relatively higher density in the CMC area. The surrounding DS divisions including Kelaniya, Kolonnawa, Sri Jayawardanapura Kotte, Dehiwela, and Moratuwa show slightly lower density levels. The three divisions to Colombo's southeast, Kesbewa, Maharagama, and Panadura, also have relatively higher density in comparison to other areas at a similar distance from Colombo. Gampaha and Kalutara still show density levels that could be considered rural. In Japan, urbanized areas have a density of 40 or more inhabitants per Ha.¹ Applying this definition to CMR, half of the area would not be considered urbanized²

Population Density of CMC

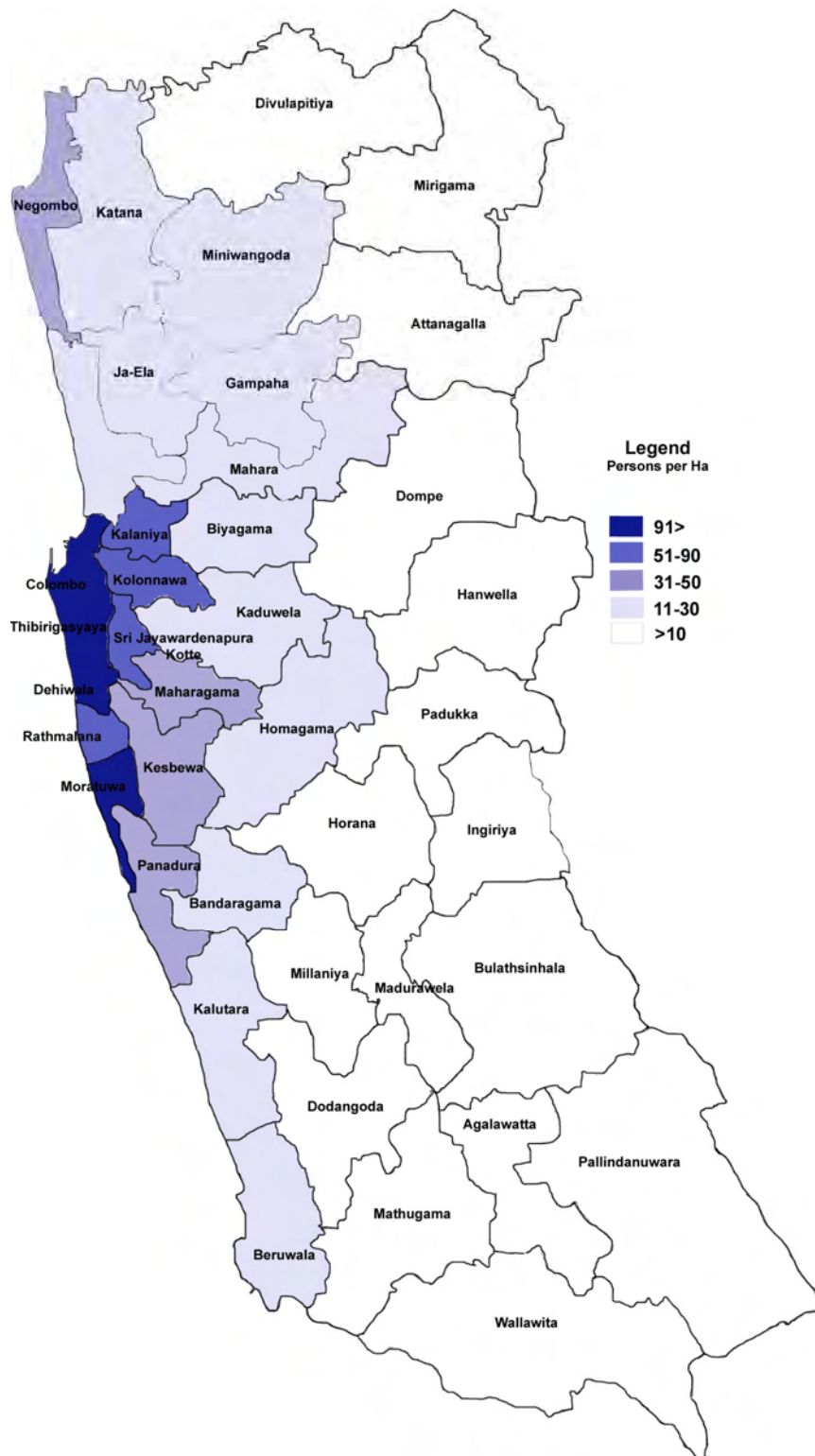
Figure 3.4 shows the population density in CMC at the Planning Unit level.³ The highest density was 472 persons per Ha in Kochchikade, mainly due to its location of Colombo's old downtown area and inclination of the Tamil community to settle there. The planning units in the northern area have a density above 150 per Ha, but those in southern areas are less than 150 persons per Ha.

The change in population density between 1981 and 2001 is also shown in Figure 3.4 in *italics*. The major changes can be seen in northern areas, where a higher concentration of low income settlements is observed. Those areas attracted the Tamil migration from Sri Lanka's north and east during the civil strife. Central Colombo experienced a decrease in density due to commercialization and an increase in land price. Zones in the south increased in density, but at a somewhat lower rate than the north.

¹ This refers to a Densely Inhabited District (DID) as defined in the 1950s by the Statistics Bureau of Japan (Ministry of Internal Affairs, GoJ).

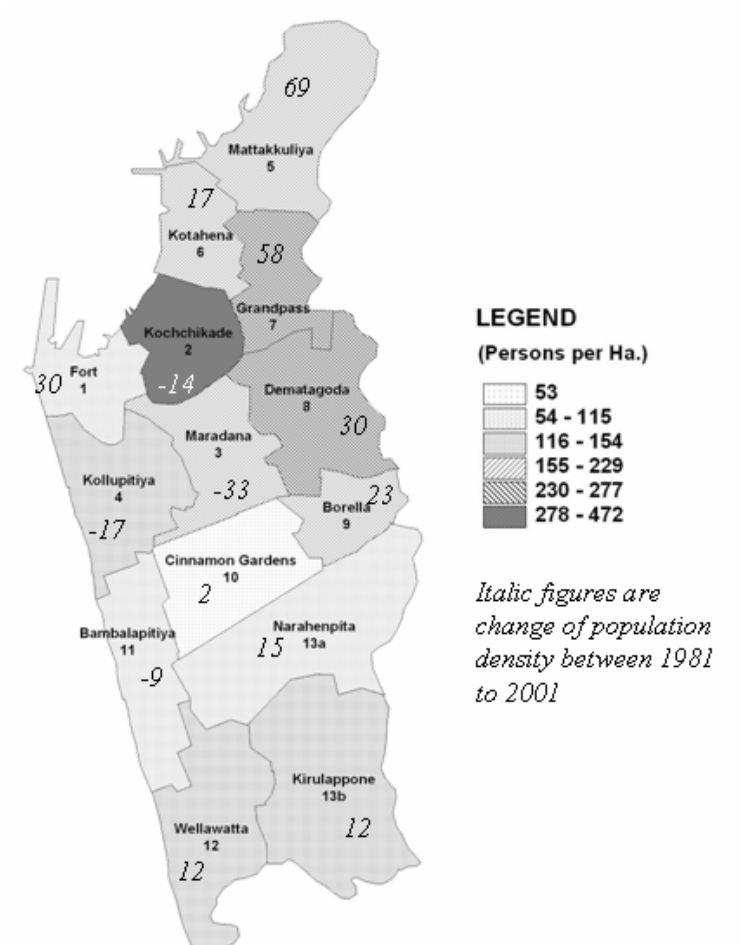
² Definitions of what is "urban" in Sri Lanka are difficult. Between the three types of local authorities (Municipal Council (MC), Urban Council (UC), and Pradesheeya Sabha (PS)), MCs and UCs are defined as urbanized areas and PSs are rural. However, in the CMR, many PS have experienced high growth and exhibit many urban characteristics.

³ CMC is divided into 45 wards for administrative purposes. UDA divided the city into 14 planning units for planning purposes based on wards with similar characteristics. CMRSP has also followed the same system. On the other hand, postal zones are used more prevalently, with 15 zones in the CMC area. There is no compatibility between the systems. WRMMP proposed 12 zones for the Colombo Core Area.



Source: Urban Development Authority (UDA) and Department of Census, Census Data for Population and Housing, 2001

Figure 3.3 CMR Population Density (2001)



Source: UDA and Department of Census, Census Data for Population and Housing, 2001

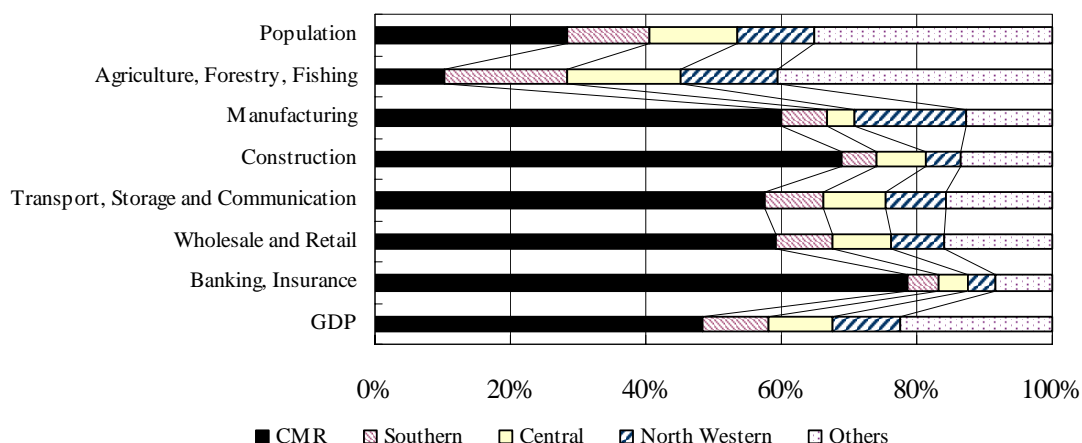
Figure 3.4 2001 CMC Population Density and Changes (1981-2001)

(2) Socio-Economic Characteristics

Concentration of Industrial Activities

Figure 3.5 shows that most of the economic activities are concentrated in the CMR.⁴ Although the population of CMR comprises only 30% of the country, industrial activities exceed 50% of the country in every sub-sector. The total productivity of other economically important provinces (Southern, Central and North Western) is far below that of the CMR.

⁴ CMR = Western Province



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

Figure 3.5 Share of Industrial Output by Province (2003)

A comparison of the growth of the secondary and tertiary industries is shown in Appendix 2. CMR's growth is more stable than that of other major provinces.

Other Activities

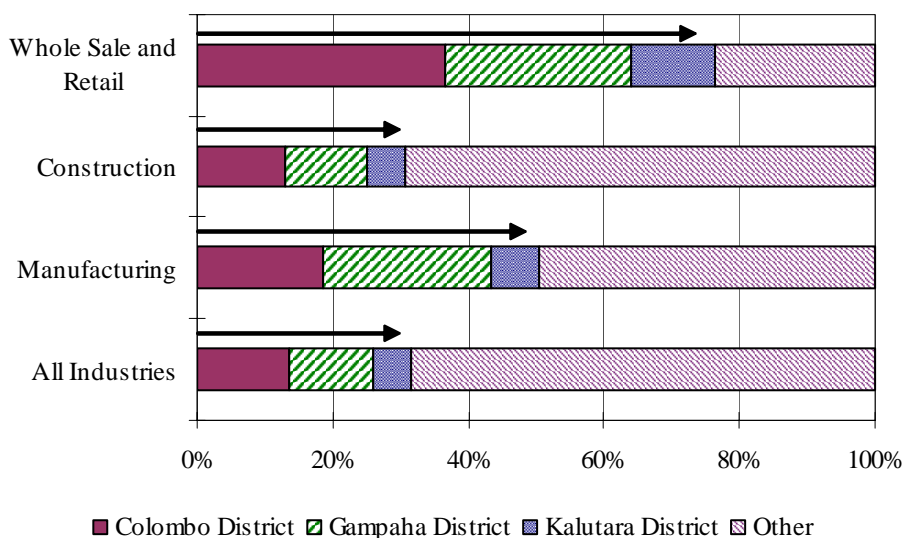
CMR also has a higher concentration of social services, including healthcare, educational, and recreational facilities. Major national level private and public educational and healthcare institutions are located in the CMR, particularly in and around CMC. In the CMR, the number of medical professionals and teachers is about 40% and 20%, respectively, of the national total.⁵

Employment Concentration

Figure 3.6 indicates a heavy concentration of employment in the CMR, with 1/3 of all employment in CMR. Also, half the manufacturing and over 70% of wholesale and retail enterprises are in the CMR. This illustrates the dominance of CMR in Sri Lanka's economy. Within CMR, 43.5% of people were employed in Colombo District and 38.4% were employed in Gampaha District, as the latter has two free trade zones and several other private and public industrial estates.⁶

⁵ More information can be found in Appendix 2.

⁶ More information can be found in Appendix 2.



Source: 2001 Population and Housing Census, Department of Census and Statistics

Figure 3.6 Share of Employees in WP in Major Industries (2001)

Migration in Western Province

Domestic migration began in earnest when the economy was liberalized in 1977. The following table summarizes cumulative migration from other provinces to CMR’s three districts since 1977.⁷ It is noteworthy that the ratio of in-migration to the whole population of Colombo and Gampaha Districts is 30 %.

Table 3.1 CMR In-Migration by District (1977-2001)

Districts	Population	Migration (share in pop)	From Colombo	From Gampaha	From Kalutara
Colombo	2,305,000	711,305 (30.9%)	-	41,857	64,438
Gampaha	2,089,000	606,461 (29.0%)	172,372	-	NA
Kalutara	1,077,000	181,793 (16.9%)	63,723	NA	-

Source: 2001 Population and Housing Census, Department of Census and Statistics

The Districts of Galle, Matara, Kalutara, Kandy, Gampaha, and Jaffna are the main areas where migrants are coming from. Migrants from Galle and Matara typically have a high level of education and are coming to Colombo for the employment opportunities and the migration from Jaffna has been as a result of the security situation.

There has also been a relatively large out-migration from Colombo District to Gampaha and Kalutara Districts, which can be attributed to the following factors:

- High land values in Colombo District;
- High job growth in garment industry in Gampaha and Kalutara;
- Conversion of residential buildings to commercial uses; and
- Increase in home ownership outside Colombo by those who have worked abroad.

⁷ Detail migration data are summarized in Appendix 2.

Another significant factor of migration patterns is that over 50% of migration occurred between 1991 and 2001, with 50% in Colombo District, 55.5% in Gampaha District, and 50.1% in Kalutara District.⁸

(3) Discussion

The review of CMR's socio-economic characteristics reveals the following points:

- The recent population growth in CMR is concentrated in Gampaha District and the suburban areas of Colombo District. Half of CMR is not urbanized based on population density calculations;
- In-migration from other provinces can be attributed to the high concentration of economic activities, social services, and employment opportunities; and
- Although Colombo District has attracted migration from other parts of the country, its population has also migrated out to Gampaha and Kalutara Districts, mainly due to housing costs.

3.3 Trends of Land Use Activities

(1) Market Trends

Recent Building Boom in Colombo

With the liberalization of the economy, there was significant growth in the CMR's construction industry and a subsequent building boom occurred during the 1980s. It has expanded to other areas in the region, particularly the fast urbanizing DS divisions in Colombo and Gampaha Districts. Since 2000, high rise building boom has occurred in CMC. From 2003-05, 359 applications for buildings over four floors were approved in CMC.⁹ The development in Colombo 4, 5 and 6 (Bambalapitiya, Havelock Town, and Wellawatta) has become the most attractive areas for development of high rise residential apartments. Additionally, in-migration of the Tamil community further accelerated development.

Conversion of Residential Buildings for Commercial Purposes

In Colombo city, there was significant conversion of residential buildings for commercial purposes, which occurred mainly in Colombo 7 (Cinnamon Garden) and resulted in a significant impact on traffic. This is on a downward decline, however, due to the introduction of new restrictions, but previously large residential buildings with large plots were in greater demand for such activities. Most tenants are small- and medium-sized businesses and the office space used is cheaper than a fully commercial building.¹⁰ Home owners were then able to have a new source of income from their converted properties.

Land Values

Increases in land values appear to be high, which can be attributed to investments by private property development companies.¹¹ Property development companies are actively developing large plots of agricultural land into small building plots.¹² Most of the companies arrange a

⁸ More information can be found in Appendix 2.

⁹ CMC, 6 buildings out of 359 buildings were over 20 floors.

¹⁰ High rise commercial office buildings in Colombo 3 and 4 (Kolpitty and Bambalapitiya) are expensive.

¹¹ Even when the country had slow economic growth, land values continued increasing at a high rate.

¹² Usually coconut and rubber land into residential plots.

long-term payment system for their clients through their finance institutions.¹³ These developments became so unmanageable that government environmental institutions created a policy that bans the subdivision of coconut lands over 2.0 Ha into residential plots, although there are loopholes.

Biased Land Values

Land value is one of the determining factors in the settlement patterns of growing cities. Table 3.2 shows land values along major arterials.¹⁴ Table 3.2 shows differences in land values between the southern areas as well as a difference in values of 5-10 times between Colombo city and those along the Outer Circular Highway (OCH).¹⁵

Table 3.2 Land Values along Major Arterials

Land Value (Rs. 000) per 25 sq. m in Town Center	North (Kandy and Negombo Roads)	Eastern (Kotte and Low Level Roads)	Southern (High Level and Galle Roads)
Colombo	(100 - 500)	1,500 - 2,000	3,000 - 5,000
5 to 10 km	1,000 - 2,000	800 - 1,000	800 - 1,500
OCH area (10 to 20km)	200 - 450	500 - 800	500 - 800
Over 20km	125 - 150	100 - 300	200 - 500

Source: This Study

Security Issues in Colombo City and Baseline Road Development

It has been reported that the Central Bank bombing in 1996 affected settlement preferences. Since the bombing, people have shied away from concentrating residential and commercial activities in Fort and Pettah areas. During this period, Baseline Road opened, which assisted in attracting people to the eastern and southern areas of Colombo.

(2) Public Sector Actions

Housing Development for Low- and Middle-Income Residents

There is a serious housing shortage for low- and middle-income residents. Over 50% of CMC's population lives in settlements without appropriate utilities such as water and drainage services.¹⁶ Lower middle-income households in the suburbs are facing high land values and high construction costs, as well as an excessively long period of time to complete construction (often 5-10 years). Hence, the national government is attempting to establish the National Urban Housing Development Authority (NUHDA) to address the following issues:

- Lack of affordable housing in Colombo;
- Lack of affordable housing in the other urbanized/urbanizing areas; and
- Shortage of housing for public servants.

At present, discussions are underway to finalize the NUHDA. A draft Act is under preparation by the Ministry of Urban Development and Water Supply.

¹³ At a glance this looks attractive to buyers, but results in increasing land values as these companies maintain high profits margins.

¹⁴ The study team conducted a questionnaire survey of land owners and private companies to find average market prices of land.

¹⁵ Details of CMR land values can be found in Appendix 3.

¹⁶ UDA

Land Use Control

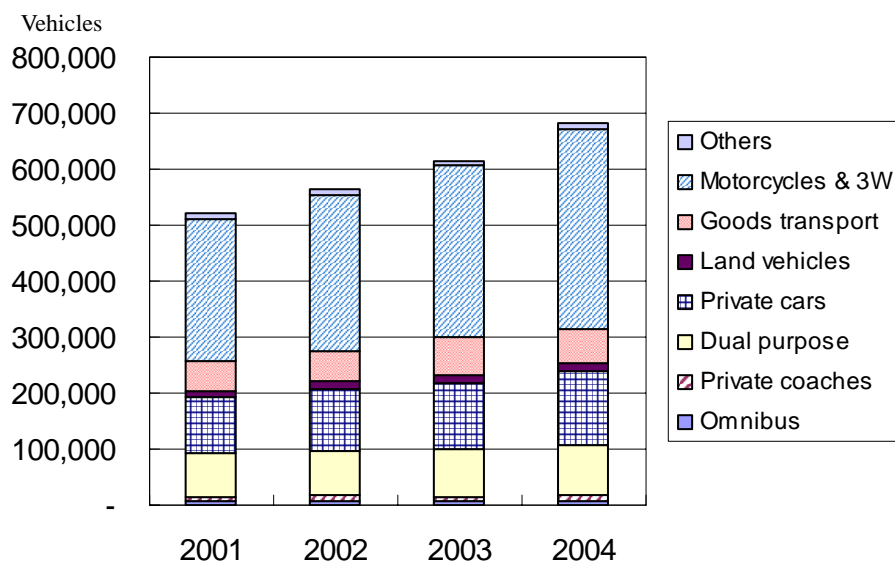
Control of CMC development activities are governed by the Colombo Development Plan (CDP) (1999), which was gazetted. In order to achieve an orderly development, the plan regulates building development. As a result, a large number of construction applications for multi-story buildings have been rejected. UDA has prepared development plans for other urban areas in CMR. Even though most of those plans were not gazetted, the draft plans are being implemented.

Planning regulations on land subdivision has also impacted land values. Under current regulations, if land over 1.0 hectare is subdivided for residential purposes, 10% of the land is to be reserved for community facilities, as well as additional land for roads and basic infrastructure. In total, approximately 20-30% of the land is withheld from residential development; hence the value of developable land increases.

3.4 Vehicle Ownership and Travel Patterns

(1) Vehicle Ownership

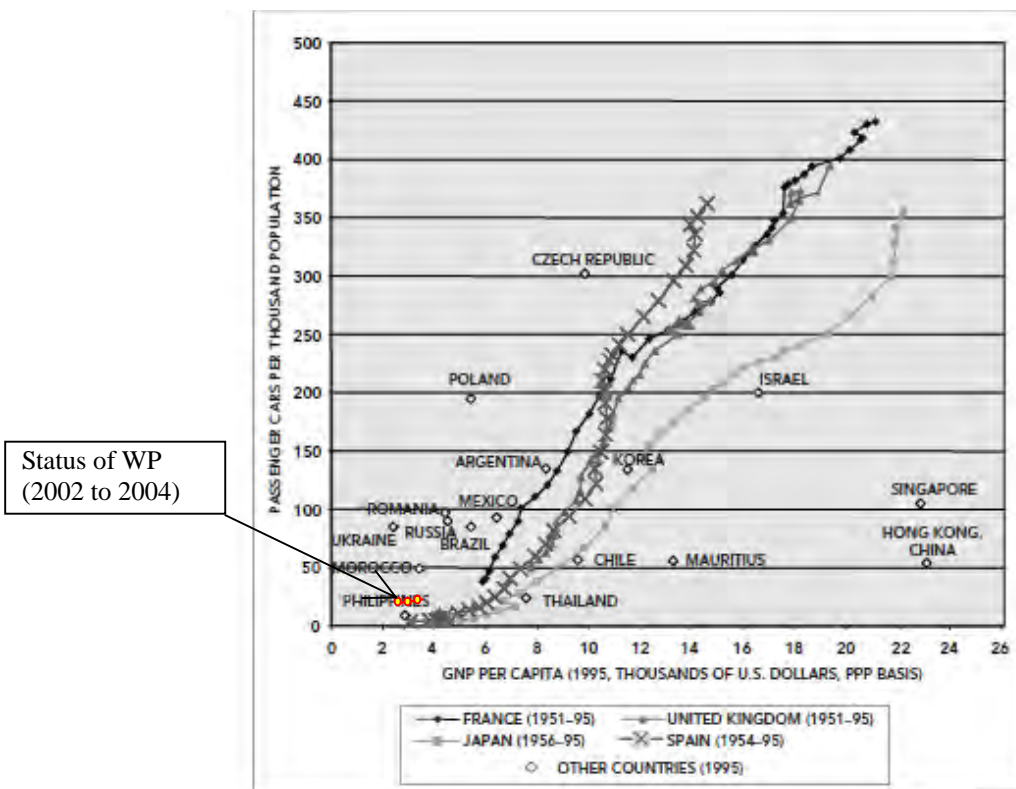
Figure 3.7 shows recent growth of vehicle ownership in Western Province. The share of motorcycles and three-wheelers exceeds 50% of the total and the annual growth rate has been between 10-15%. Private cars make up about 20% of the total vehicles with a growth rate of 10-12%. Overall, the annual growth of all vehicles has been between 8-12%.



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

Figure 3.7 Motor Vehicles in Western Province

Figure 3.8 provides an international comparison of Western Province (WP) and other countries based on the gross domestic product (GDP) per capita and their number of vehicles per thousand population. The figures demonstrate that WP is at the early stages of motorization.



Source: This Study,¹⁷ RMV, and the World Bank

Figure 3.8 Motorization and Incomes: Status of Western Province

(2) Origin and Destination Distributions

Figure 3.9 shows the distribution of CMR's desire lines for all trips and the following characteristics can be observed:¹⁸

- High demand exists in Colombo's surroundings.
- The dark blue and pink lines in Figure 3.9 indicate large commuting demand (8,000-15,000 trips per day), which start in minor suburban cities; and
- Cities on the proposed OCH alignment (CMRSP's six growth centers) are the hubs of the suburban area.

Traffic Volumes on CMC Boundary

The combined road and rail daily passenger flows on each corridor for 1965, 1985, 1995, 2004, and 2005 are listed in Table 3.3.¹⁹ The corresponding average annual growth rates (AAGR) for the periods 1965-85; 1985-95; 1995-05 have also been shown. It shows that 2005 incoming and outgoing daily passenger trips at the CMC boundary were around 1.6 million trips.

¹⁷ The study team converted GDP per capita into 1995 levels using deflation rates.

¹⁸ Further details of desire lines for Colombo city and lines by mode can be found in Appendix 4.

¹⁹ These have been measured at the CMC boundary by UoM.

Table 3.3 Daily Passengers in Both Directions on 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 Road			32	12.0	63	-0.8	58
Low Level Road	38	2.0	56	0.1	59	-0.3	57
Kotte Road/ SJP Road	45	3.5	89	10.8	249	1.1	278
Narahenpita Road	12	6.2	40	0.1	35	2.8	46
High Level Road.	62	4.2	141	3.9	206	-0.5	196
Horana Road	21	5.2	58	8.1	126	-1.3	111
Galle Road.	91	5.8	279	1.7	331	1.0	365
Total	387	5.3	1,095	4.4	1,676	-0.6	1,572

Source: UoM

Overall passenger growth along the CMC boundary has been steady during the period of 1965-95. AAGR appears to be declining gradually from 5.3%, between 1965 and 1985, to 4.4% during the period from 1985-95. Since 1995, there has been a negative AAGR.²⁰

With respect to the differential growth rates between corridors, it can be seen that some corridors have experienced exceptionally high growth rates during specific periods and some have had negative growth. For example, the development of the Sri Jayawardanapura Kotte area and Parliament Road has resulted in the rapid development of that corridor between 1985 and 1995. But this seems to have stabilized in the last decade. Horana Road's rehabilitation in the late 1980s resulted in high growth on that corridor immediately following, but its current poor condition appears to have shifted some traffic to Galle Road. On the other hand, relatively neglected corridors such as the Narahenpita Rd. and Kolonnawa Rd. (a branch of Low Level Road) had almost no growth in the early decades, but have shown recent growth.

Relationship to Recent Land Use Trends

As explained in Section 3.3, the decreased trips along the CMC boundary can likely be attributed to the security situation and Baseline Road's development. The corridors lying near Baseline Road have seen volumes increase.²¹ Recent settlement of high-income households in the southeastern areas is also related, as private vehicle ownership is quite common there. It was expected that the population growth in Gampaha District would result in an increase of traffic on Kandy and Negombo Roads, but that is not reflected in Table 3.3. It is believed that the industrial development within Gampaha District has absorbed traffic that used to go to Colombo, although that would need to be further studied.

²⁰ 2005 data excluded employed drivers from the trip counts, which is estimated to be between 100,000 and 200,000 trips. However even after adjusting only a marginal growth could be recorded of around 100,000 over 10 years which amounts to 5% over the decade.

²¹ Like Kotte Road and Narahenpita Road