

TRANSPORT MASTER PLAN

6. TRANSPORT SECTORIAL PLAN

6.1 ROAD DEVELOPMENT PLAN

(1) Planning Concept

Urbanized Area

- Full utilization of existing facilities to preserve the historical urban environment.
- To properly distribute the local traffic as well as to improve the urban environment pavement improvement is in urgent need.
- Limitation of new construction to missing links of important roads to significantly improve the network efficiency.

Suburban Area

- Formation of functionally hierarchic road network to promote the land development plan of the Municipality of Phnom Penh.
- Congestion National Roads needs to be alleviated.



Future Basic Road Networks

(2) Basic Road Network

Basic functions of the roads included in the proposed future basic road network are as follows. Northern New Trunk Road to provide access to the new international airport and new satellite city.

Support the Planned Development

- Northern New Trunk Road is to provide the access to the northern part of the western suburban area. This road roughly outlines the northern boundary of the area where the future development plans are located. In addition, this road is become the primary access together with Intermediate Ring Road, to the area adjacent to the present urbanized area where urbanization is currently progressing. This road is also expected to provide access to the planned new international airport and new satellite city, by being extended towards west, in the long future (beyond the Target Year of 2015).
- Southern New Trunk Road is to serve the industrial area in the south of the BOT road.
- Intermediate Ring Road is to improve the access to the area adjacent to the present urbanized area where urbanization is currently progressing.
- The section of Outer Ring Road between the Northern New Trunk Road and Southern New Trunk Road is to serve to the planned Export Processing Zone (EPZ). This road also roughly defines the western boundary of the planned development area.

Formation of Network

- Northern New Trunk Road, Southern New Trunk Road and Intermediate Ring Road, combined with Outer Ring Road and the existing Inner Ring Road, are to form the skeleton of the road network and are expected to function as the principal arterial roads in the western suburbs.
- Outer Ring Road is extended to NR 6 in the north and to NR 1 in the south to allow the through traffic between north and south to the urbanized area.

Alleviation of Congestion

- Russey Kaev Bypass is to shoulder the traffic entering the urbanized area from the north and reduce the traffic congestion on National Road (NR) 5.
- Cheng Aek Bypass is to shoulder the traffic entering the urbanized area from the south and reduce the traffic congestion on NR 2.

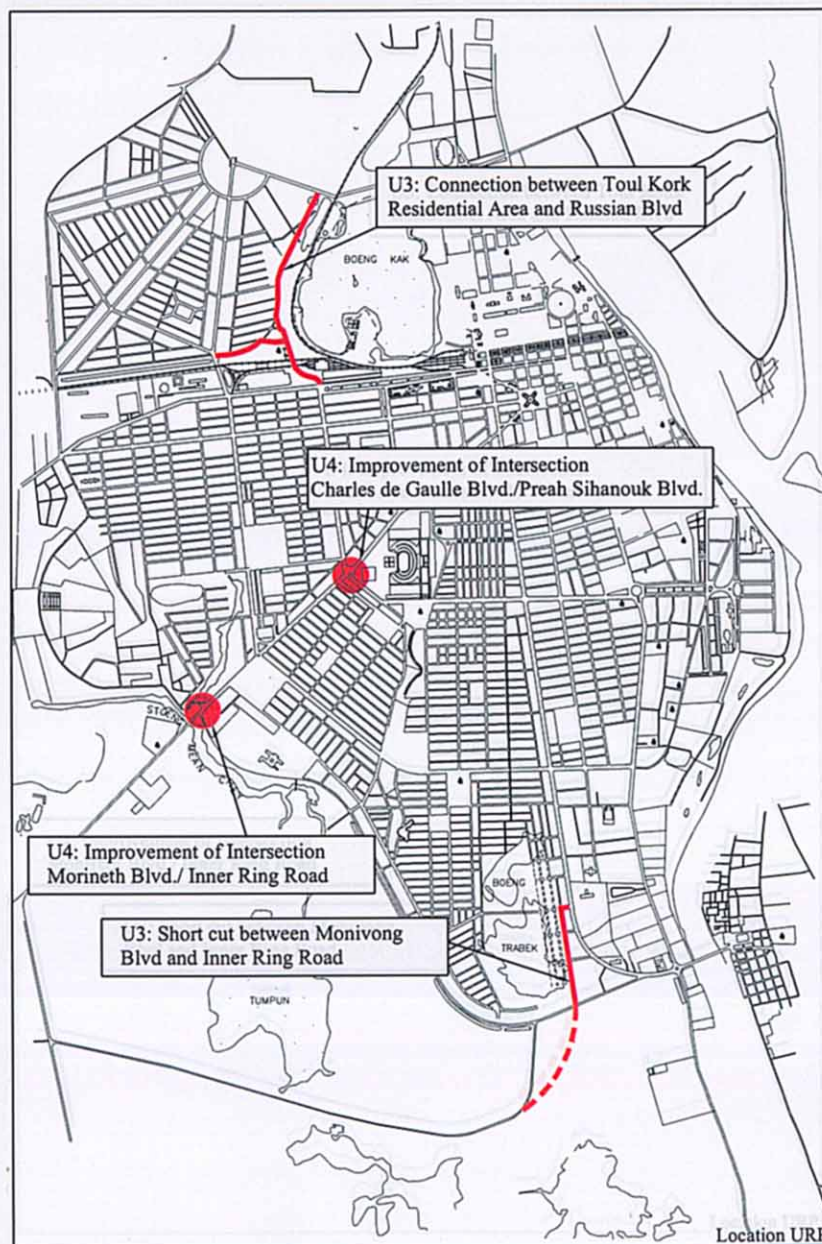
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(3) Road Projects in Urbanized Area

Since major problems of the road network in the urbanized area are the poor pavement conditions and the presence of 2 missing links, road projects are identified to specifically solve these problems. In addition, there are several irregular-shaped intersections making the traffic management complicated and difficult and thus causing the congestion. Example of such irregular-shaped intersections are the eccentric roundabout island (Charles de Gaulle/Sihanouk) and staggered intersections (Monireth/Inner Ring Road). The geometric improvement of such intersections is therefore included in the projects.

List of the Projects (Urbanized Area)

Project	Length (km)	Cost (M.US\$)
U1: Pavement improvement of arterials and collectors		
- Reconstruction	48.5	20.82
- Overlay	9.4	2.63
U2: Pavement improvement of local streets		
- Reconstruction	227.2	49.98
U3: Construction of missing links		
- Toul Kouk-Russian Blvd.	2.4	1.20
- Monivong Blvd.-Inner Ring Rd.	1.0	0.50
U4: Geometric improvement of intersections		
- Charles de Gaulle/Preach Sihanouk	-	0.05
- Monireth /Inner Ring Rd.	-	0.15
Total	288.5	75.33



Road Projects in Urbanized Area

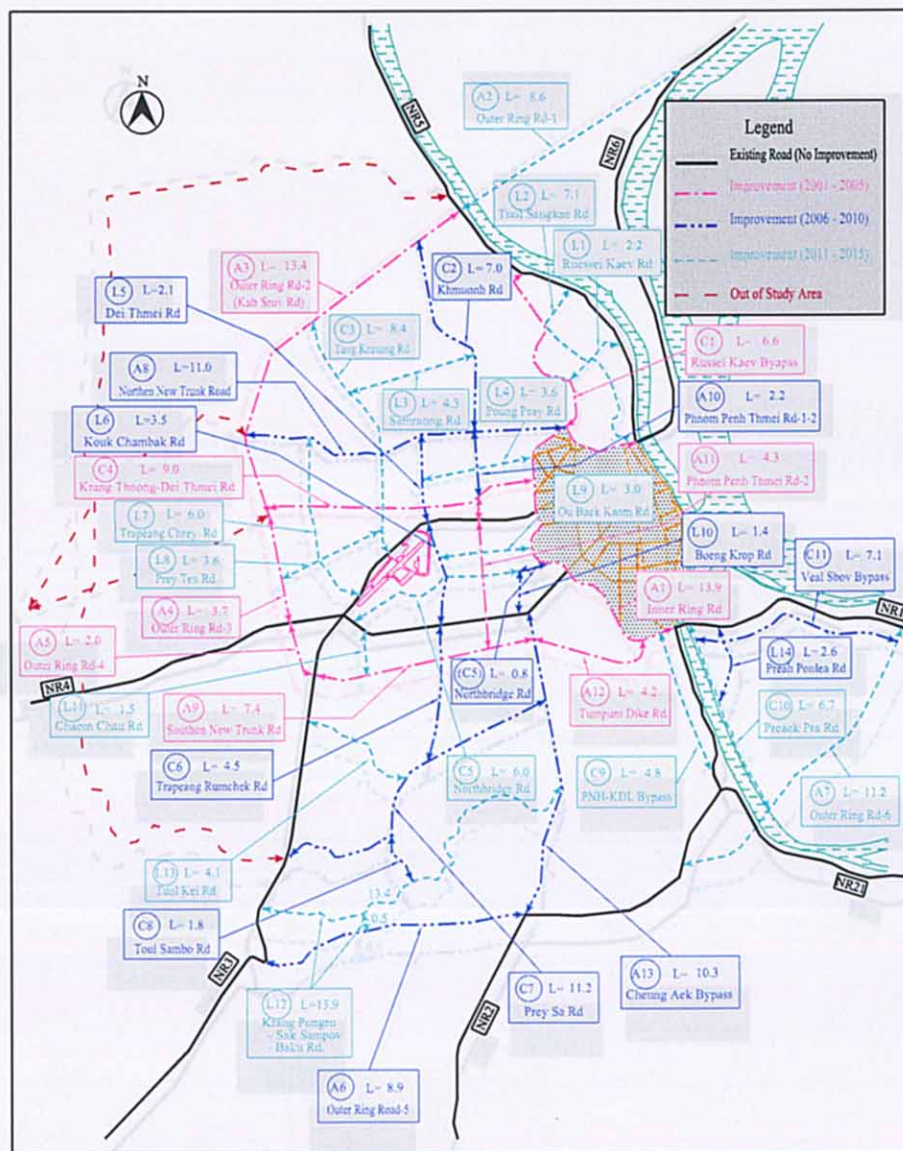
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(4) Identification of Road Project in Suburban Area

Since the major problems of the road network in the suburban area are incompleteness of road network, traffic congestion on the arterials due to lack of alternative roads and lack of access to strategic development areas, projects are identified focusing on the improvement of the road network by increasing the length of road. In total projects are proposed including the new construction of 11 roads and improvement of 27 existing roads. Major components of the improvement of existing roads are widening and new construction of pavement.

List of the Projects (Suburban Area)

Project	Length (km)	Cost (M.US\$)
Arterials (A1-A13)		
- New Construction (4)	29.2	29.2
- Improvement of Existing Roads (9)	72.6	55.3
Collectors (C1- C11)		
- New Construction (3)	18.8	15.0
- Improvement of Existing Roads (8)	51.3	24.2
Local Roads (L1- L14)		
- New Construction (4)	17.5	8.8
- Improvement of Existing Roads (10)	41.6	19.9
Total	231.1	152.4



Road Projects in Suburban Area

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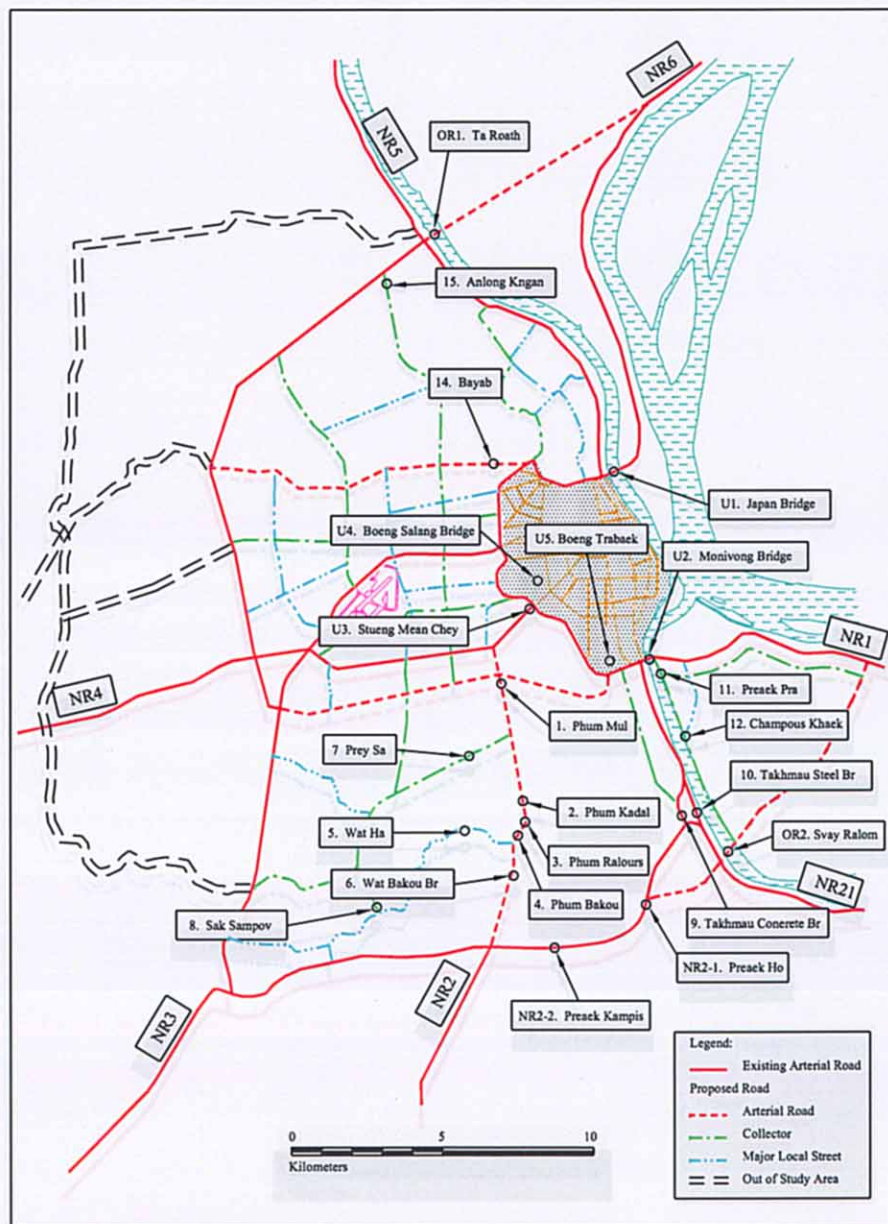
(5) Identification of Bridge Project

The bridge projects are composed of;

- Reconstruction of the severely damaged bridges endangering the passing vehicles or forcing the vehicles to slow down,
- Replacement of the temporary bridges on National Roads on which heavy vehicles have difficulty to pass,
- Widening of the bridges on heavily trafficked roads where traffic demand is approaching the capacity, and
- Construction of new bridges on the proposed roads.

List of the Projects (Bridges)

Project	Length (m)	Cost (M.US\$)
Reconstruction of Damaged Bridges		
- 14 bridges (1-8, 11-15, U4, U5)	397	3.83
Reconstruction of Temporary Bridges on National Roads		
- 4 bridges (9, 10, NR2-1, NR2-2)	317	3.53
Widening of Bridges		
- 3 Bridges (U1, U2, U3)	1,080	33.81
Construction of New Bridges along the Outer Ring Road		
- 2 bridges (OR1, OR2)	1,480	32.39
Total	3,274	73.56



Bridge Projects

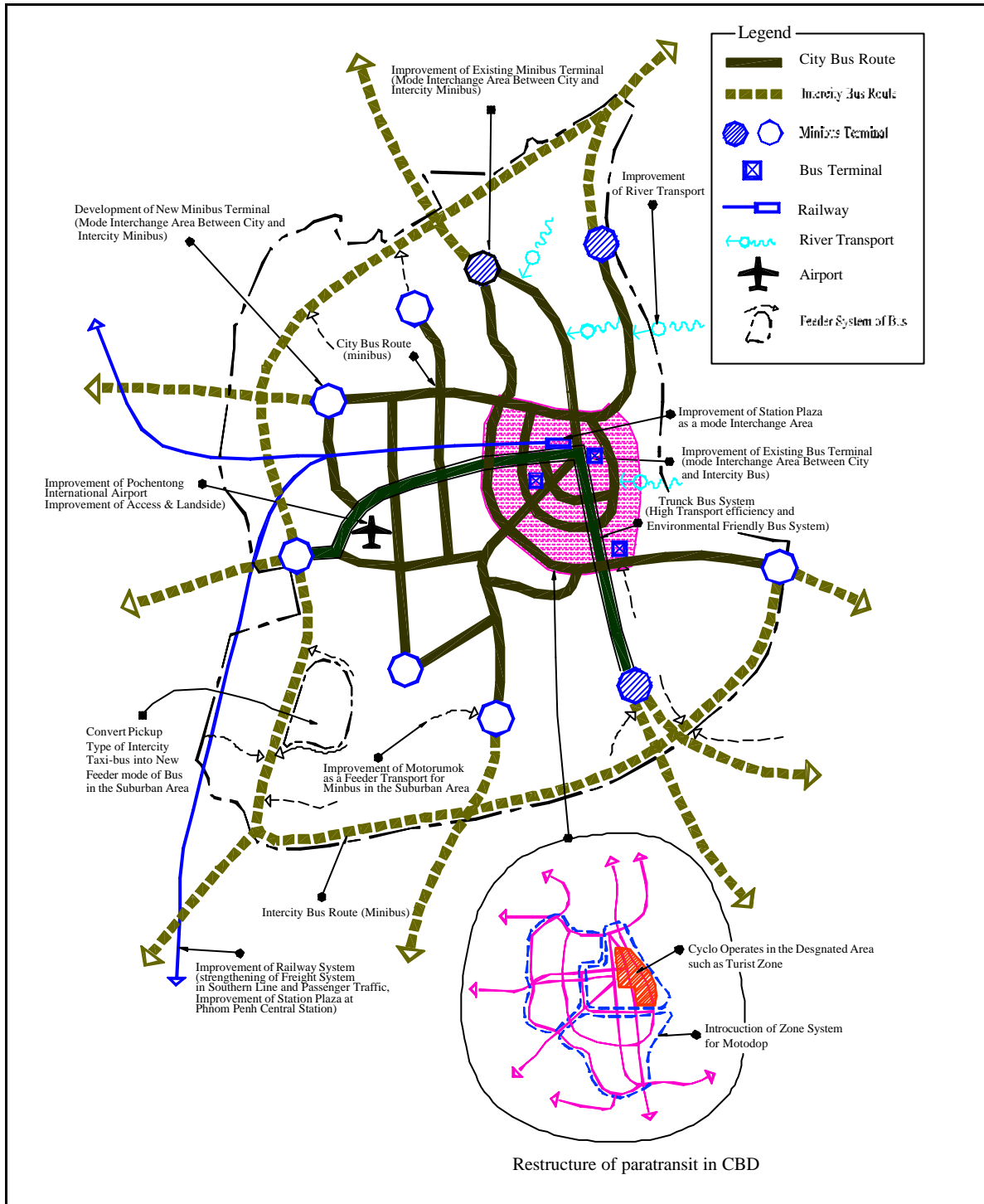
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6.2 PUBLIC TRANSPORT PLAN

(1) Planning Concept

Based on the existing public transport issues, future urban development direction toward the west, future population (1.82 million in Year 2015), traffic demand and basic concept of the urban trans-

port master plan, the comprehensive public transport system in Phnom Penh Metropolitan area in the target year 2015 is illustrated below.



Proposed Public Transport System in Phnom Penh Metropolitan Area in Year 2015

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(2) Bus Transport

Necessity of City Bus System

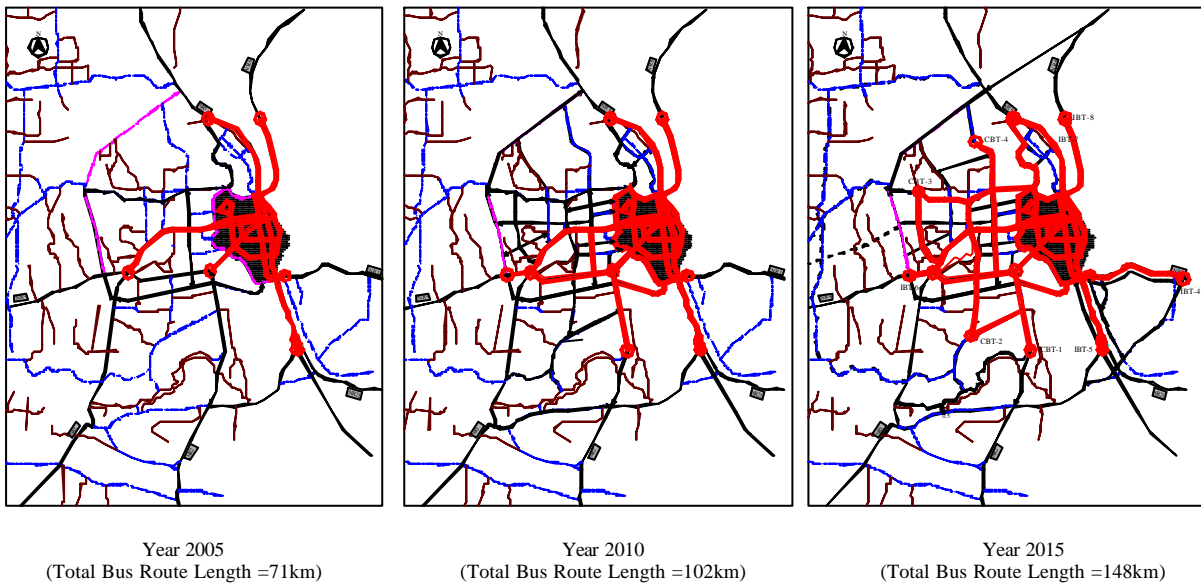
Considering the size of the metropolitan area and road conditions, a bus system should be introduced as the trunk public transport system given the following reasons.

- The bus system is one of the most flexible and easiest transport systems and it can be introduced into a small-scale urbanized area.
- The bus system can be easily introduced without any drastic change to the existing transport facilities, such as road system.
- Considering the population size, level of economic activity and other Asian experience of urban transport systems, a public transport system belonging to the bus oriented system should be introduced.

Development of Bus Route Network

The proposed bus route network is summarized below.

- Proposed bus route network in 2005 should cover the urbanized area, except for both sides of Inner Ring Road and extend to the suburban area along existing National Roads, such as NR2, NR3/4, NR5 and NR6 up to the existing bus terminals. This network is to meet the demand for public transport in the urbanized area and to connect major public facilities such as markets, schools and government offices.
- Bus route networks in 2010 and 2015 are to cover the urbanized and the western suburban area, where newly urbanized area will be developed in the future. The network shall be extended in accordance with the progress of development. The bus route along NR1 will extend to the proposed new bus terminal, located at intersection of NR1 with Outer Ring Road.



Proposed Bus Rout Network in 2005, 2010 and 2015

Bus Passenger Demand Forecast

Bus demand forecast is based on the analysis of opinion survey of bus operation conducted as a part of person trip survey and on proposed transport policies, such as para-transit zone system. The forecast bus demand was verified using the data obtained through the Public Experiment. The bus passenger demand in year 2005 and 2015 will be 111,000 trip (3.9% out of total trip excluding trips) and 333,000 trip (8.4%), respectively.

(3) Taxi Transport

It is necessary to introduce a city taxi service for the convenience of businessmen and those with heavy luggage, and/or tourists in the future. The required number of taxis in the year 2015 is estimated at approximately 2,600 units. Considering the restructuring of inter-city taxi-bus, one alternative is to convert the sedan type taxi-bus into city taxis over the next few years, and subsequently air-conditioned meter taxis will be introduced in the future.

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(4) Para-transit Transport

Motodop

The operational zone system (the urbanized area is divided into 3 zones) for motodop should be introduced to reduce traffic in the urbanized area and to pave the way for a smooth city bus service operation. However, the completion of this zone system should be introduced after the year 2010 when the improvement of local streets in the urbanized area will be completed.

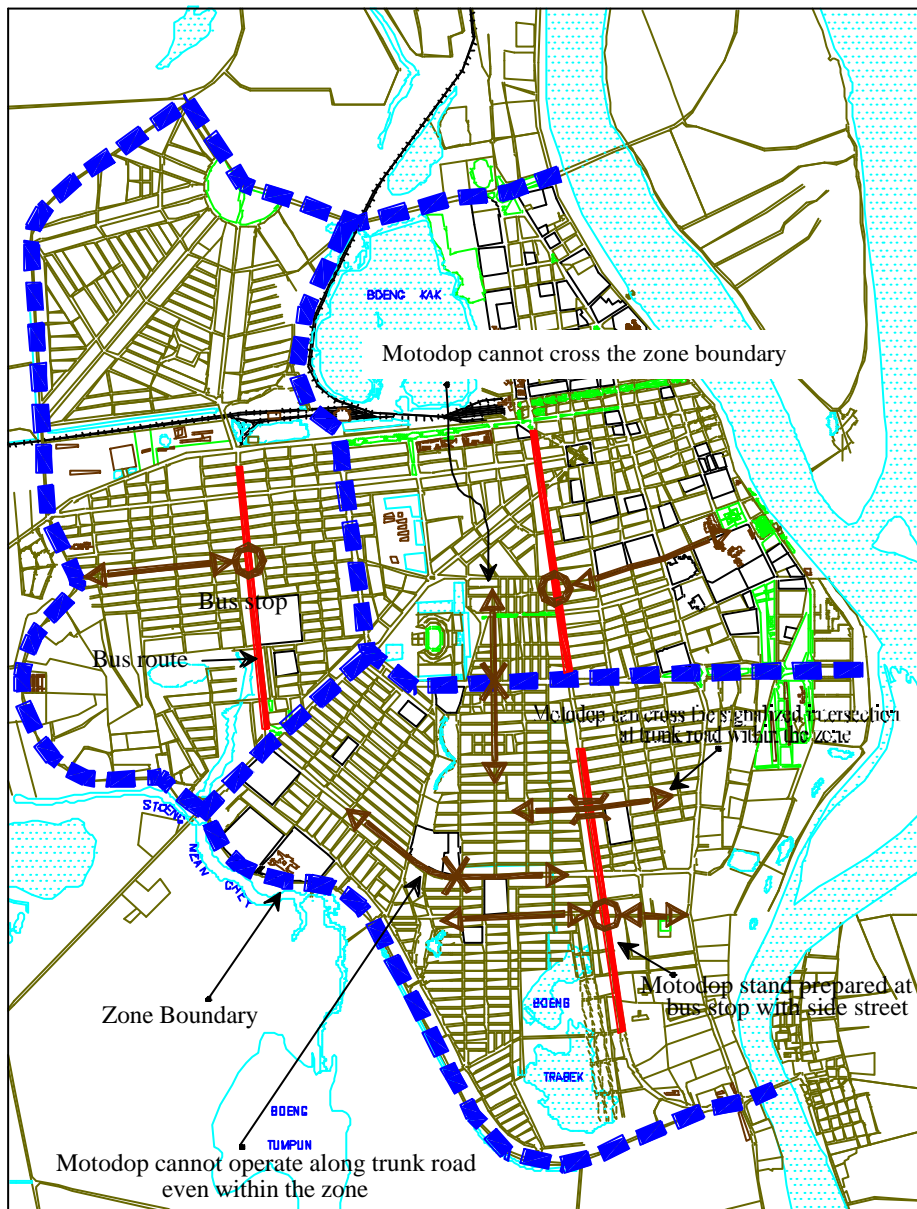
Cyclo

Cyclo should be preserved as a unique historic transportation mode that can operate only in designated areas, such as tourist zone.

Motorumok

Motorumok should play the role of feeder transport means of bus in the suburban area. Operation of motorumok along suburban trunk roads, such as National Roads should be banned in view of its obstruction to other vehicles with low maneuverability and low speed.

The new feeder system, which is the mode between bus and motorumok in the future, is proposed considering the characteristics of road network (long distance between bus routes and villages) and efficient usage of (available) transport modes in the suburban area. This mode can be converted from pickup type of taxi-bus.



Concept of Motodop Operational Zone in the Urbanized Area in 2015

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(5) Accessibility of Other Transport Modes

Railway Transport

The existing railway is not used as a mode of urban transport.

One of the possible measures to encourage usage of railway may be to improve the area around Central Station and promote this area as the mode interchange area.

In the case of increase of population along railway line in Phnom Penh, a urban public transport system using existing railway track, such as rail bus or dual mode bus may possibly be introduced.

River Transport

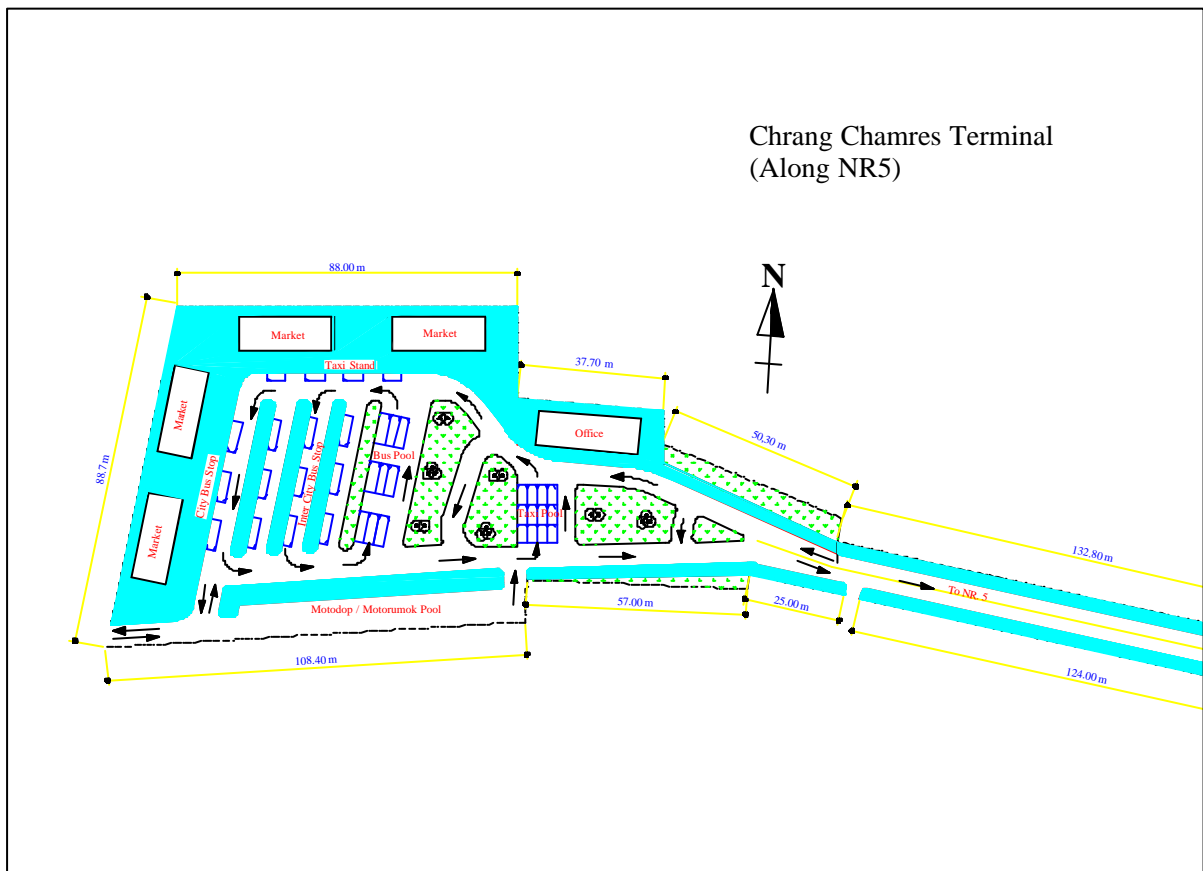
It is important to improve jetty facilities as well as the feeder transport system between the ferry and trunk public transport for the convenient access to/from the riverside area and for the improvement of urban environment in Phnom Penh.

Air Transport

Considering the future increase of air passengers at Pochentong International Airport, it is necessary to improve the landside access to/from the airport by introducing a public transport system, such as bus service.

(6) Development of Mode Interchange Area

One of the most important issues to improve the public transport system is to develop smooth transfer at the mode interchange area, such as bus terminals and railway station. Therefore, it is recommended to designate the location and to develop an efficient and convenient mode interchange area.



Development of Mode Interchange Area