APPENDIX 20

TRAFFIC CAMPAIGN AND PUBLIC EXPERIMENT

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APPENDIX A20-2-1 PREPARATORY WORK FOR BUS OPERATION EXPERIMENT

(1) Background and Purpose

This experiment is intended to not only realize a convenient and safe transportation system for the people living in the city, thus contributing to the betterment of the urban environment in Phnom Penh, but also improve the transport circumstances by introducing an appropriate transport system and traffic management. In this way, a better traffic manner is promoted and popularized. At the same time, during this public experiment, any problem encountered will be duly noted and seriously assessed so that proper adjustments can be made for the actual implementation of city bus operation and other related traffic management schemes, such as intersection improvement, traffic marking and sidewalk improvement.

On the other hand, it is necessary to carefully consider the procedure and coverage of this public experiment because of the following reasons:

- If this city bus operation is implemented in the same manner as before, it is obvious that the city bus operation would be suspended again owing to the operation of the more convenient motodop and the large volume of motorcycle traffic.
- If this public experiment is implemented throughout the public transport network, there is a possibility that taxi-bus and motodop businesses, which provide one of the most important financial sources for the low-income level, would be seriously affected. The possibility of public transport passengers shifting to city buses is a major concern to taxi-bus and motodop operators and drivers.

■**Motodop is the main public transport in the city.**

■**Taxi-bus plays the role of intercity public transport mode**

(2) Procedure and Method of Public Experiment

a. Selection of bus routes

Figure A20.2.1 shows the bus routes, 10 routes in total, which had been submitted by a Malaysian bus company to the Department of Public Works and Transport in the Municipality of Phnom Penh in 1996. Then city bus operation was started initially with 4 routes among the 10 submitted bus routes.

However, the city bus operation was suspended just after a few months owing to its rapidly deteriorating operational conditions brought about by the large number of motorcycle traffic including the convenience afforded by the motodop (cheaper fare, frequency and door-to-door operation).

On the other hand, the estimated existing public transport demand, which is calculated from the share of motodop traffic from total number of motorcycles and occupancy, based on the traffic count survey result, is shown in Figure A20.2.2. The following 4 major public transport corridors can be identified based on this figure.

- North-south radial public transport corridor
  Monivong and Norodom Blvd. comprise this radial public transport corridor. There is a concentration of commercial and institutional facilities along these thoroughfares. This is the largest public transport corridor together with the east-west radial public transport corridor, which is described hereafter.
- East-west radial public transport corridor
  This radial public transport corridor is composed of Russia, Kampuchea Krom and Tep Phan Street. It also includes the residential area in Toul Kouk district and an urbanized area progressing along National Road No. 4.
- Northeast-southwest radial public transport corridor
  This public transport corridor is composed of Monireth and Charles de Gaulle Blvd. Its public transport demand is smaller than those of the other radial public transport corridors due to delayed urbanization in the hinterland of this corridor.
- Circular public transport corridor
  This public transport corridor is composed of Sihanouk, Mao Tse Toung and Tep Phan Street and it forms a circular route.

Based on the history of the previous city bus operation, the existing public transport demand and the following strategies, city bus routes for public experiment have been proposed as shown in Figure A20.2.3.

- Completion of bus routes within the 4 central districts
  This strategy is offered to avoid the recurrence of conflict concerning a previously implemented rerouting of buses and taxi-buses at Prek Leap terminal (this involved the rerouting of buses and taxi-buses along National Road No. 6 and relocating the terminal from Central Market in the CBD to the newly-developed Prek Leap market in the northern suburban area). Then, taxi-buses to/from provinces had to make a stop at Prek Leap to allow passengers to transfer to a shuttle bus, which connects to the city center. This rerouting resulted in taxi-bus drivers calling a strike and blocking traffic along National Road No.6. The taxi-bus drivers thought that the rerouting put them at a disadvantage, as there had been no campaign period to inform them of the route changes; passengers with heavy luggage were also inconvenienced when they had to transfer at the terminal). Thus, city bus routes should not extend to the suburban area. To avoid the conflict with taxi-bus drivers, the proposed bus routes for this public experiment should be completed within the CBD.
- Selection of one radial route and one circular route for bus routes
  To minimize competition with the motodop during the public experiment, the bus routes should not cover all of the public transport corridors. Choosing just one radial route and one circular route will help minimize the effect to the motodop business, which is one of the most important financial sources to the low-income group. In addition, this strategy will enable city bus users to easily understand the bus system during the public experiment. As these two routes intersect each other, there is the possibility of transfer between buses.
- Sihanouk - Nerhu - Kampuchea - Nordom route is selected from among several circular routes.
  This circular bus route is proposed based on the following evaluation:
  - Tep Phan - Tchecoslovaquie route: The length of this route is short.
  - Sihanouk - Nerhu route: This is the largest public transport corridor among the 4 circular routes. The land use along this route is highly developed and has better conditions of road pavement and roadside environment than those of other circular routes. Bus transfer passengers from the radial route are also expected at the transfer points, such as the intersections of Monivong-Sihanouk and Monivong-Kampuchea.
  - Mao Tse Toung route: The public transport demand of this route comes second to that of the Sihanouk – Nerhu route. The land use along this route is not developed. The roadsides are even deteriorated, with the sidewalk between Monireth and Kampuchea on the east side partly occupied by a second-hand car dealer and some small industries.
  - Inner Ring Road route: The road surface of this route is very poor; it is not paved and serves as

the diversion route for heavy vehicles such as cargo trucks during daytime. There is also no hinterland on the south and west side of this route because it is formulated as the edge of the urbanized area in Phnom Penh.

- Monivong route is selected from among several radial routes
  This radial bus route is proposed based on the following evaluation:
  - Russia/Kampuchea route (east – west corridor): The hinterland of this route is only the west side due to the topographical limitation on the east side (the rivers Sap, Basac and Mekong are on the east side of this route). There are old bus stops remaining along this route because this route was one of the city bus routes implemented in 1996. Kampuchea Krom has been recently improved.
  - Monireth – Charles de Gaulle route (northeast – southwest corridor): This route has the smallest public transport demand among the 3 radial routes evaluated. Moreover, a deteriorated road section can be seen along Charles de Gaulle.
  - Monivong route (north – south corridor): This route has the largest public transport demand in Phnom Penh and the land use along this corridor is highly developed. Transfer passengers to/from inter-city taxi-buses can be expected at the south end of this route because the existing Chav Ampav taxi-bus terminal is located at this point.

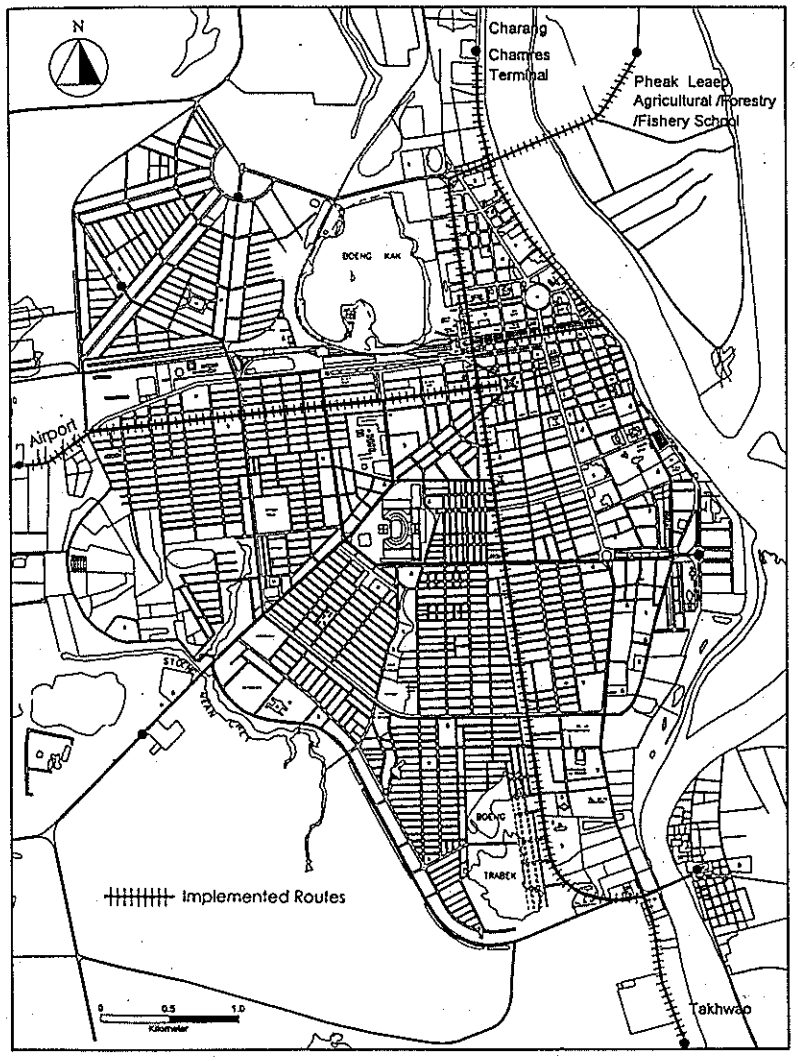


Figure A20.2.1 Proposed City Bus Routes for City Bus Operation in 1996

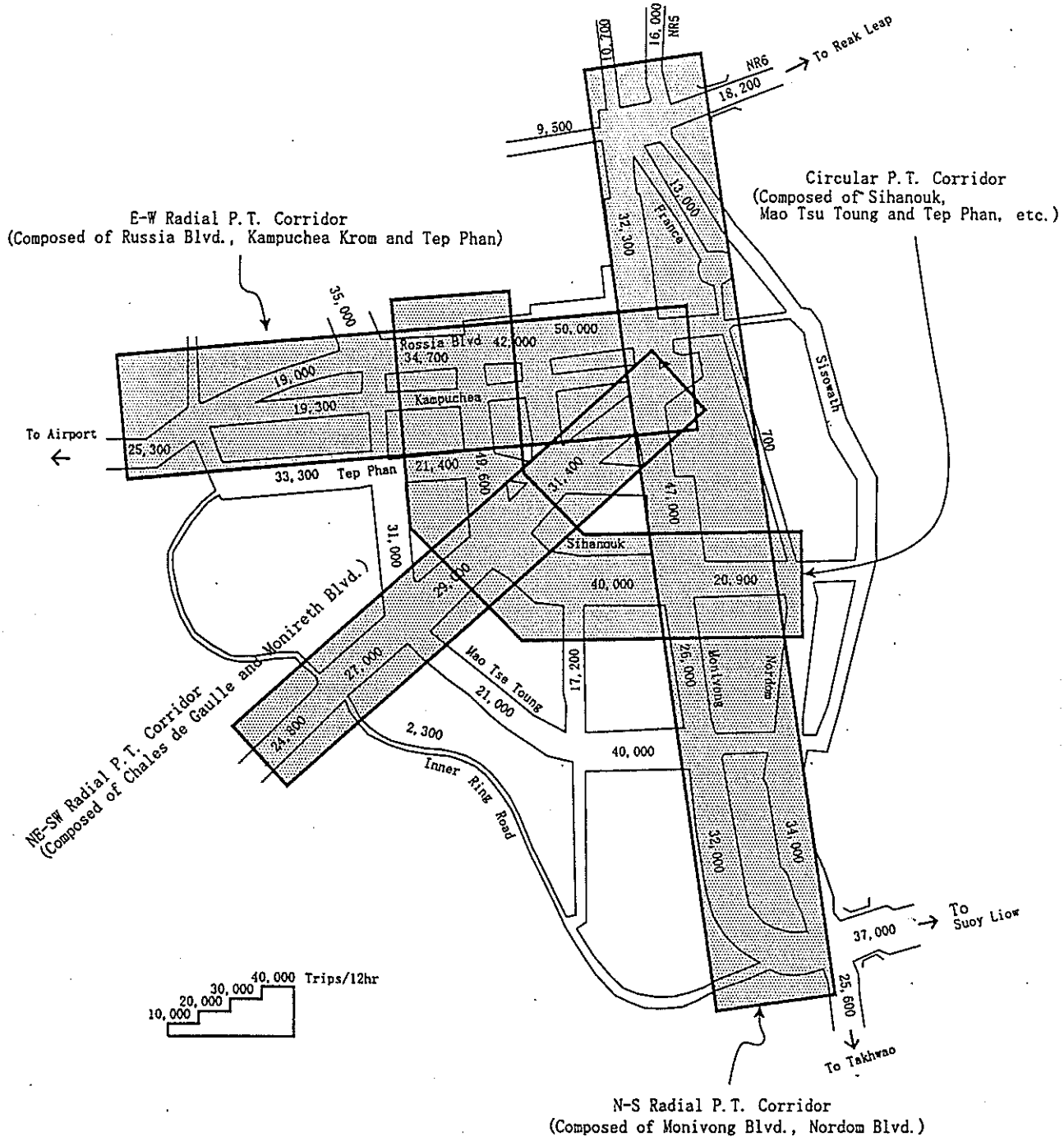


Figure A20.2.2 Major Public Transport Corridors in Central Phnom Penh

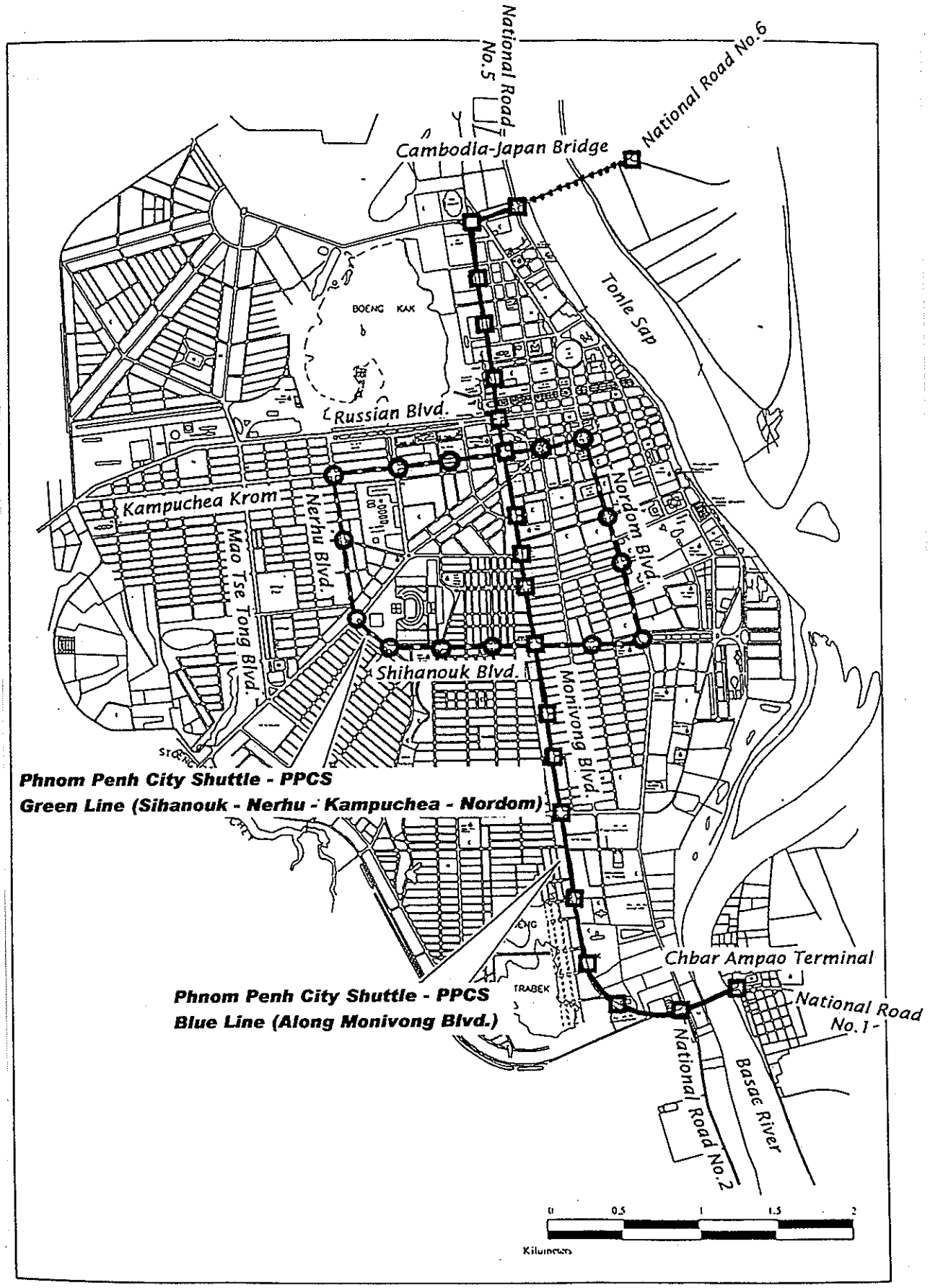


Figure A20.2.3 Proposed City Bus Routes for the Public Experiment

b. Preliminary Bus Passenger Demand Forecast

Based on the analysis of opinion survey of bus operation from the person trip survey, which covered more than 30,000 samples, proposed bus routes of experiment and population by zone, preliminary bus passenger demand forecast is estimated as follows:

i) Assuming that the bus service area is within 150m from the proposed bus routes, the population within the bus service area, which has a possibility of bus use by fare level and by waiting time, is estimated. The formula used for estimation, shown in Figure A22.2.4, was arrived at between waiting time, bus fare level and bus use population within the bus service area based on the following preconditions:

- Bus operation is on schedule. Intervals between buses are 5 minutes and 10 minutes during peak period and off-peak period respectively.
- It is assumed that the ratio of population in bus service area by zone/zonal population is in proportion to the square of the ratio of bus service area/zone area.

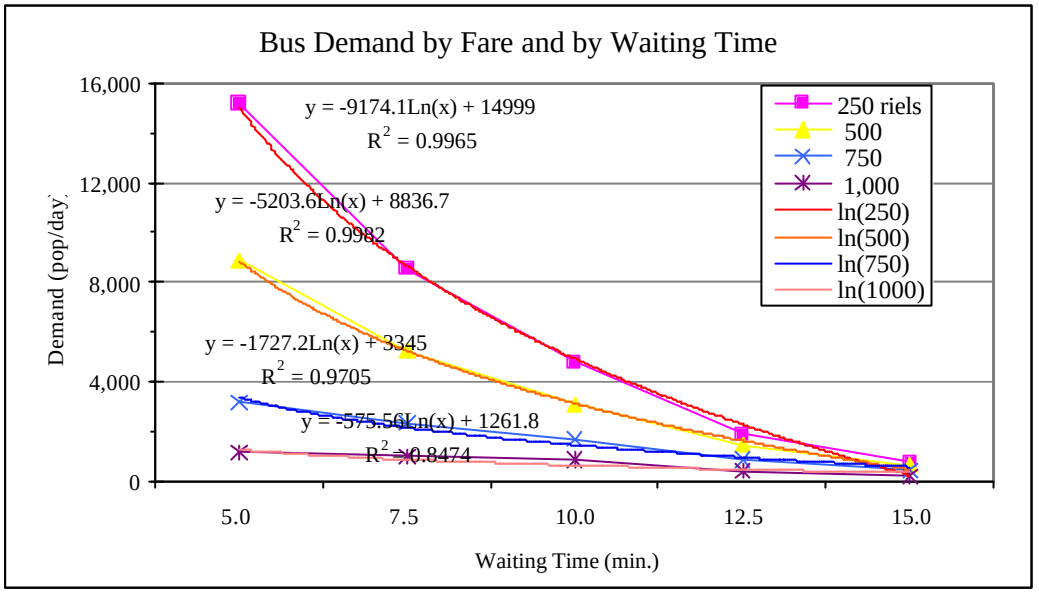


Figure A20.2.4 Bus rider-ship within bus service area by fare and by waiting time

ii) This estimate does not include those trips in which 'residence' is neither the origin nor the destination, such as business trips and tourists.

iii) It is assumed that 50% of intercity taxi-bus passengers whose origin/destination is within the bus service area are transfer passengers to city bus from intercity taxi-bus at Chav Ampav market, which is located at the south end of the Monivong route. The other half of intercity passengers will use the motodop.

10,300persons	×8.1%	×50%	=417trips
Intercity taxi-bus passengers	Bus route coverage	Modal share of bus	

iv) The estimated daily number of bus passengers that will be covered by the experiment is 4,865 (1,869 person×2.38 trips/person = 4,448 trips and 417 trips as mentioned above), as shown in Figure A20.2.5. This figure is arrived at considering a fare level of 800 riels and waiting time of 7.5 minutes, details of which are in the following section (3), the graphic presentation in Figure A20.2.4, and the transfer passengers discussed earlier. More tourists and passengers on business can be expected depending on how effective is the advertisement regarding the experiment.

v) Twenty (20) buses will be prepared for the experiment. Assuming a daily passenger volume of 300 per bus – this is based on the World Bank data of Asian bus companies and the interview to private intercity bus companies – total daily capacity of this experiment is 6,000 passengers (20 x 300). Therefore, the bus passenger demand is 81% out of total daily capacity.

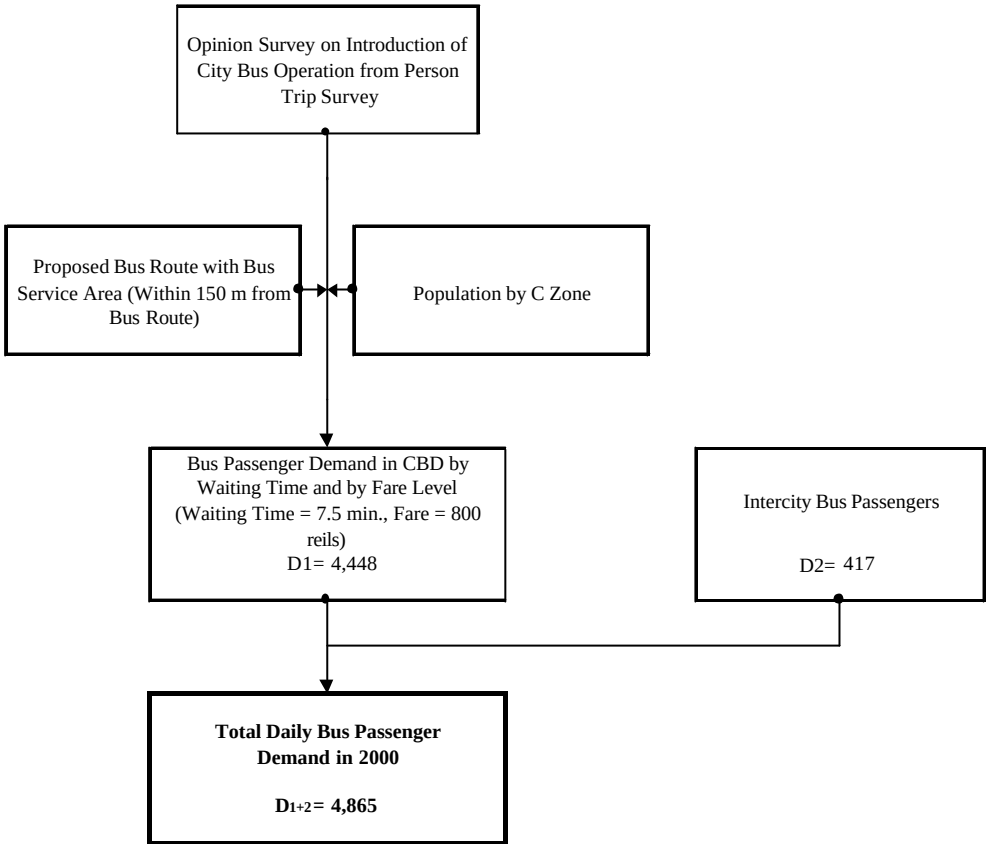


Figure A20.2.5 Preliminary bus demand forecast for bus operation experiment

c. Details of Bus Operation Experiment

The proposed city bus operation for public experiment, presented in Table A20.2.1, is based on the following considerations and strategies. To implement the smooth transfer from the public experiment to future actual bus operation, planning of the concept of city bus operation has been carried out keeping in mind the need to impress the people living in Phnom Penh with the advantages of a bus system.

Table A20.2.1 Summary of City Bus Operation

a. Bus route	**Ring route and radial route shown in Figure A20.2.3**
b. Bus fleet	**22 aircon minibus (29 seats)**
c. Fare system	**800 riels flat fare** **(Cheaper fare than 800 riels for starting few days)**
d. Operation hours and frequency	**5:30 - 19:30 (14 Hours)** **Every 5 - 10 minutes**
e. Bus stop and bus shelter	**56 bus stops installation and 8 shelters renovation** **Bus stop will provide every 300 - 500m**
f. Improvement of the circumstances of the bus routes	**Prohibition of motorcycles along bus route,** **Installation of bus stop marking** **Prohobition of vehicler parking in front of bus stop**
g. Advertisement and others	**Traffic campaign** **Distribution of bus route maps**

i) Bus routes (refer to Figure A20.2.3)
There will be a circular route and a radial route. The circular route, Sihanouk – Nerhu – Kampuchea – Nordom route is 6.8 km long and will be introduced as a clockwise one-way system; the route color is green because of the many trees alongside this route. The radial route, Monivong between Cambodia-Japan Bridge and Chav Ampav Terminal located on the east side of Monivong Bridge, is 7.5 km long. Its route color is blue because this route runs parallel to rivers, such as Mekong River and Tonle Sap.

ii) Bus fleet (refer to Figure A20.2.6)
The city bus system will be known as 'Phnom Penh City Shuttles'. Air-conditioned buses with a passenger capacity of 29 will be used. Number of fleet is 22 (14 for Monivong routes, 6 for circular route and 2 for spare). There will be logo stickers on both sides of the bus' body and a plate of the designated bus route will be affixed on its front side.

iii) Fare system
A flat fare of 800 riels will be charged. This amount has been deemed reasonable based on the motodop fare (500 – 1,000 riels), resulting from the public transport users survey, and the fare of 800 riels suggested by bus operators. For the first few days or the first week of city bus operation, the charge for all rides will be under 800 riels because the most important issue of this public experiment is for the citizens of Phnom Penh to ride on the bus and get a first-hand experience of the bus system.
Three (3) types of ticket (green and blue 800 riels tickets, and transfer ticket) will be prepared.
Bus passengers who want to transfer between the two routes can do so only at two transfer points, namely, Monivong/Kampuchea and Monivong/Sihanouk. The handicapped, the elderly and children below 8 years old will be free of charge.

iv) Operating hours and frequency
Operating hours are from 5:30 to 19:30 and intervals between buses are 5 minutes for peak period (6:30 to 8:30 and 16:30 to 18:30) and 10 minutes for off-peak period.

v) Bus stop and bus shelter
Existing bus stops and bus shelters will be refurbished as much as possible, especially Monivong Blvd. Paint of eight (8) bus shelters is peeling but the structure is steady, therefore, these will have to be repainted. All existing bus stops are deteriorated, therefore, the bus stops along Monivong and Kampuchea Krom will be replaced with newly designed bus stops.
Bus stops interval is 300m to 500m (average is 400m). Number of bus stops is 56. Design of bus stop and the structure of bus shelter are shown in Figure A20.2.7 and Figure A22.2.8, respectively.

vi) Improvement of circumstances of the bus routes
To create a better circumstance of bus operation and safe loading/unloading to/from buses, bus stop marking (refer to Figure A20.2.9) and traffic management measures, such as prohibition of motorcycles along bus routes, are to be introduced.

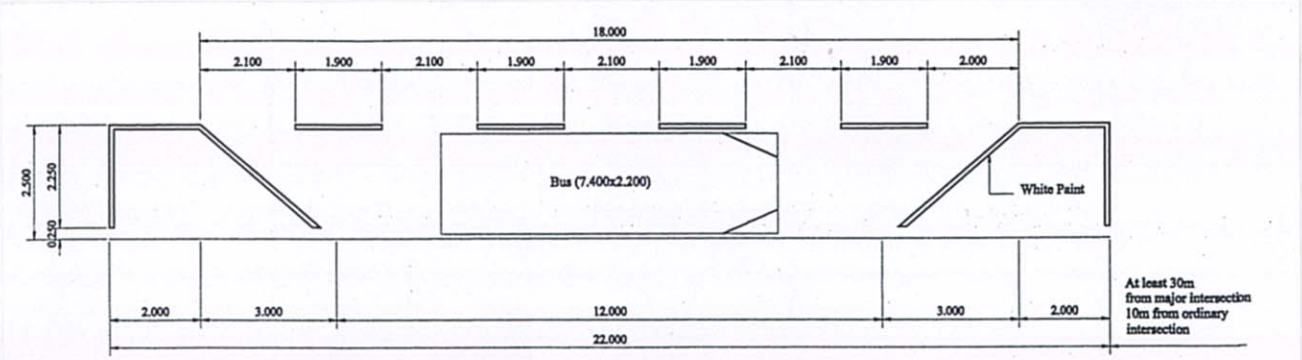
vii) Advertisements and others
A traffic campaign by TV, radio, newspapers and banners will be carried out to provide a better understanding of the public experiment. Leaflets of the bus route map will also be distributed to the people living in Phnom Penh and to tourists.

viii) Coordination among the relevant organizations
For smooth and effective implementation of the experiment, the study team coordinates among the relevant organizations, such as Municipality of Phnom Penh, Department of Public Works and Transport, traffic police and district office in the central area.

Logo Design for City Bus Operation Experiment

Bus Body Design

Figure A20.2.6 Bus Model for Bus Operation Experiment



Materials

Traffic paint	:	JIS K-5665(3-1)
Grass beads	:	JIS R-3301

The amount of paint and glass beads per 100m2 shall be as follow

Paint	more than 380 kg
Grass beads	more than 16.5kg

Figure A20.2.7 Design of Bus Stop Marking for City Bus Operation Experiment

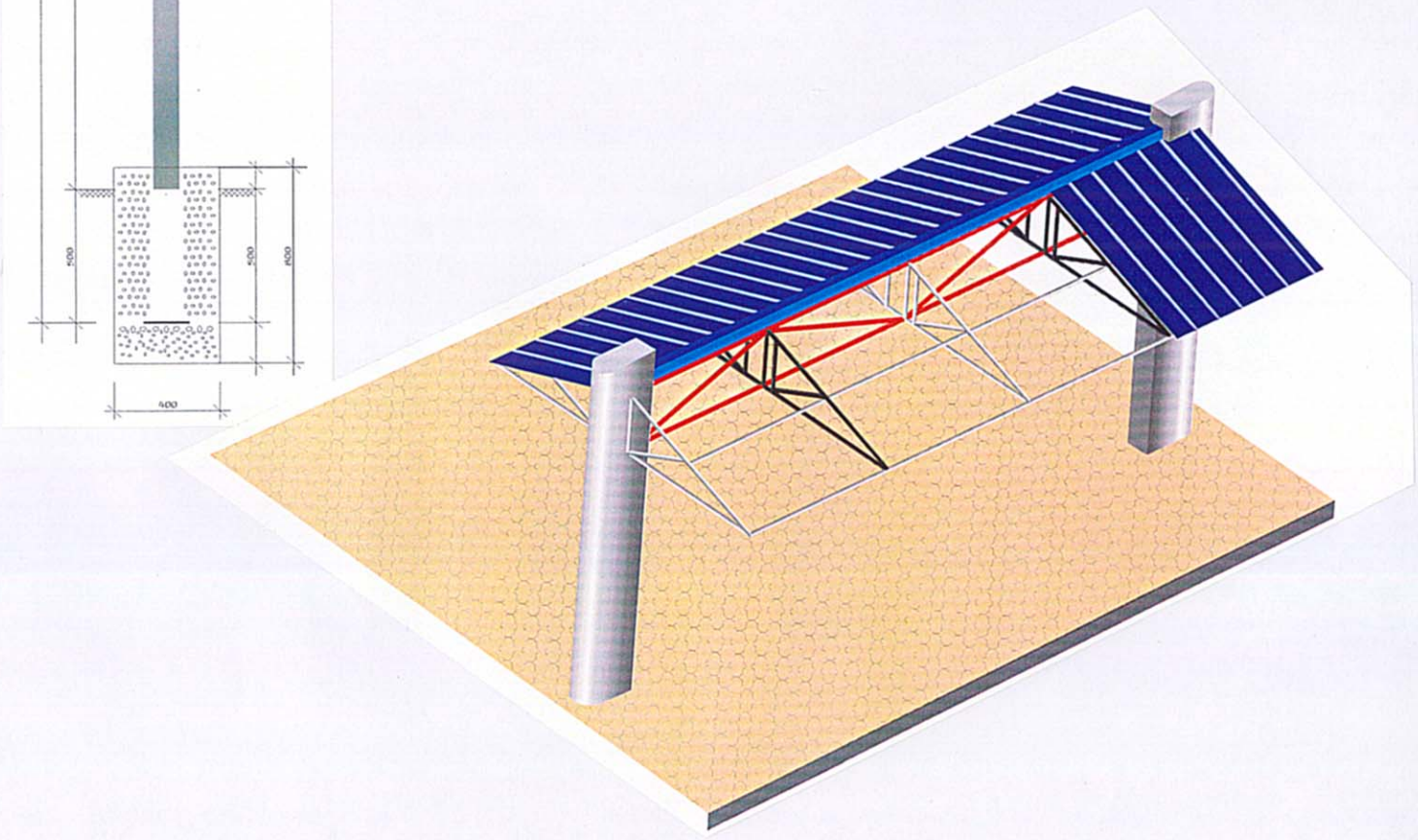


Figure A20.2.8 Bus Stop and Bus Shelter for City Bus Operation Experiment