Workshop on Standards in Action
Pallanza, Italy, Oct 5, 2004

서울시 서초구 우면동 142번지 (한국교원단체총연합회8층) http://www.ksic.net

Toward Implementing Draft CD ISO 19134

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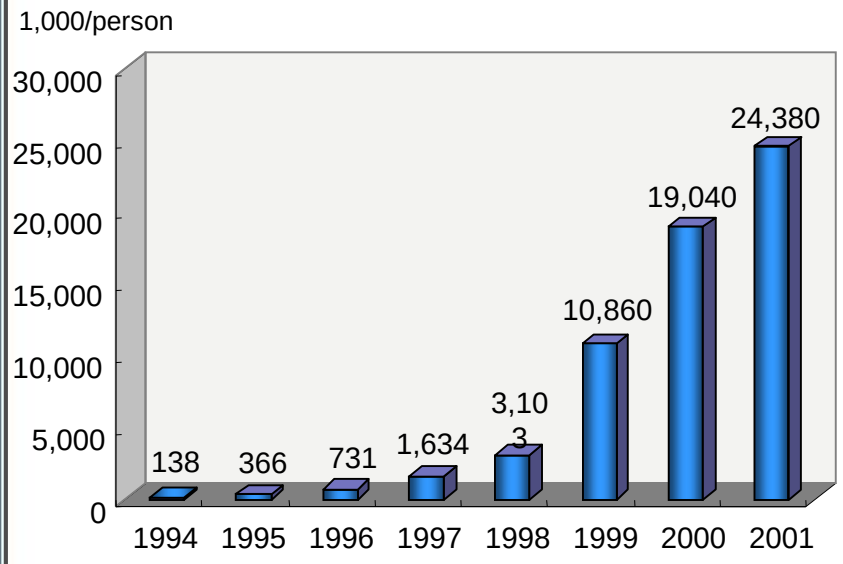
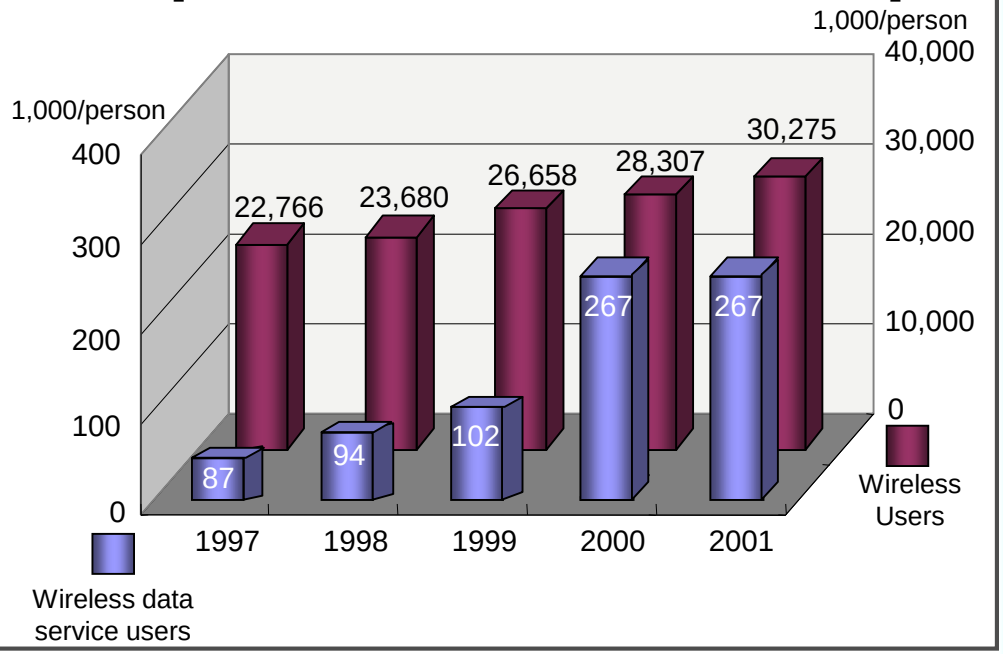
Internet & Wireless Communication in Korea

- Since 1994, Growth of internet users double every year.
- Rapid Growth in Wireless communications (CP, PDA, Mobile PC, etc) and data service

[Internet users in Korea]



[Wireless communication & Data service]

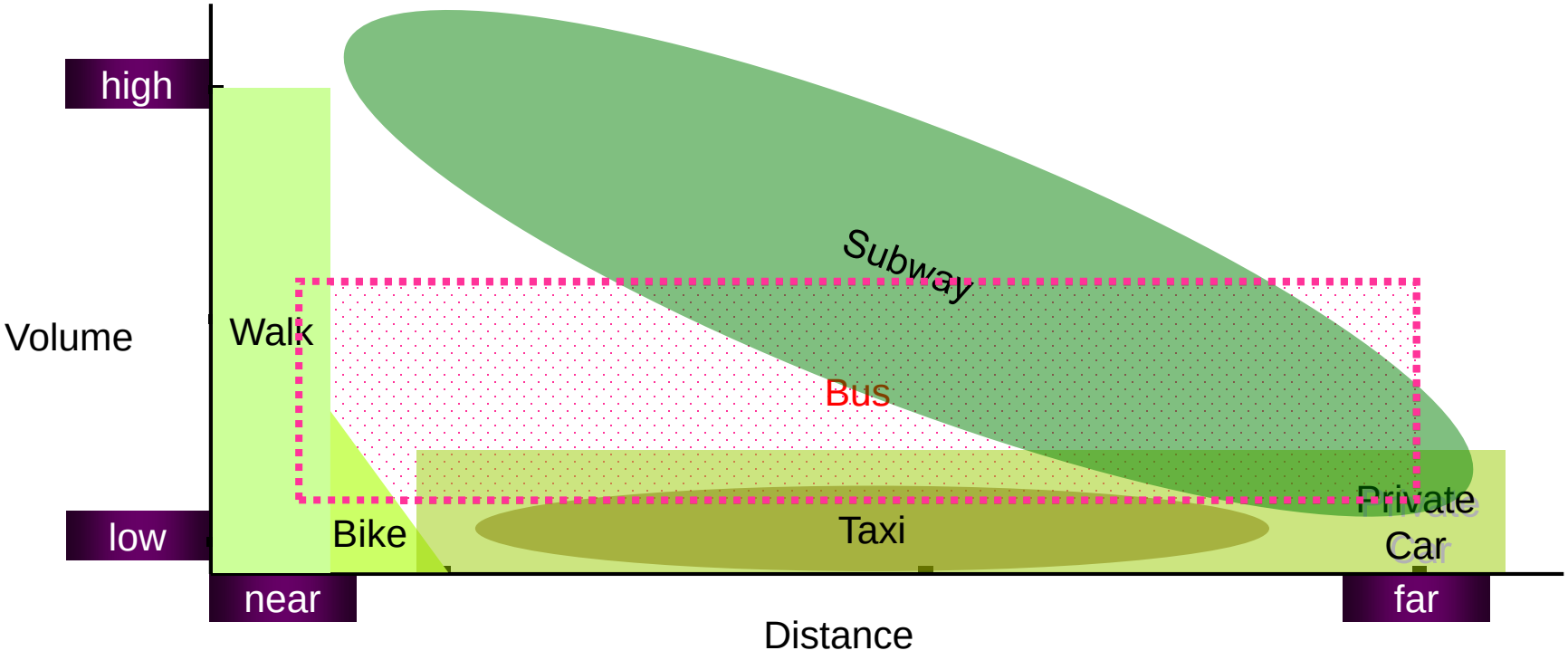


➔Wireless communications such as CP, PDA, Mobile PC are major Information medium for daily activities and for data services in Korea

I. Seoul Metropolitan Area: An Introduction

Seoul Metropolitan Area

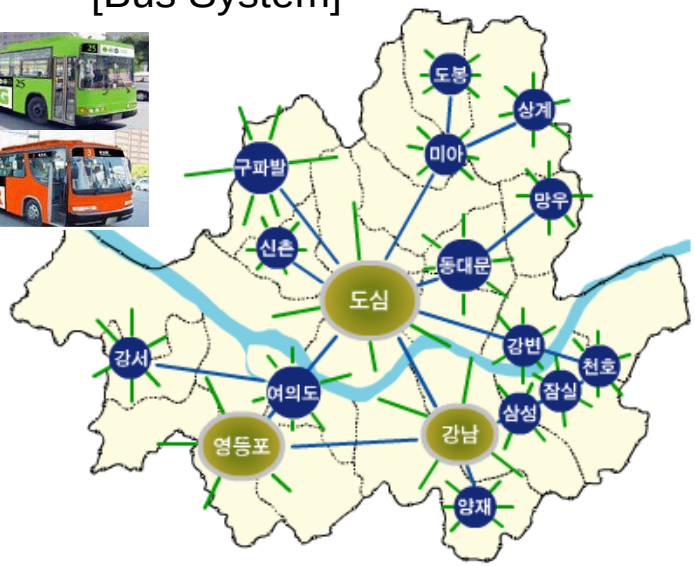
- Multimodal Users: 29,375,000 persons per day
- About 70% of daily travelers use public transit.
- Characteristics of Multimodal Users: See below .



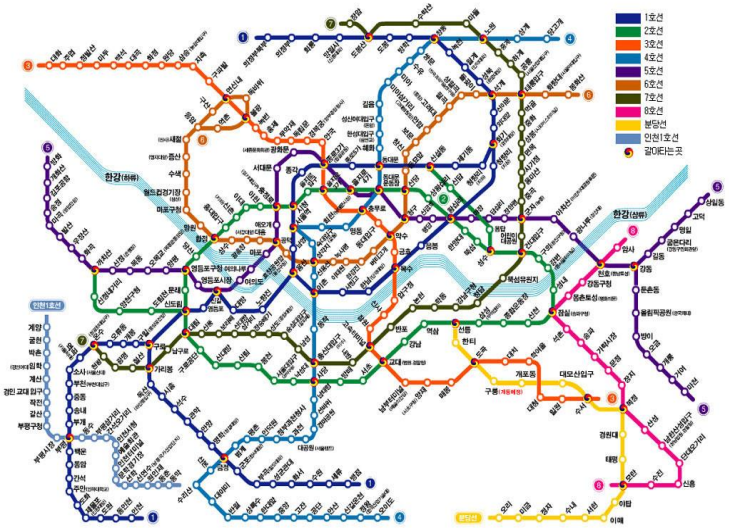
Public Transit System in Seoul

- 6 Types of Buses: Feeder (G), Inter-District (B), Inter-City (R), District Circular (Y), Airport and City Tour.
- Subway: 16 lines
- Korea Rail: 6 lines
- The system provides services to every corner in Seoul, albeit complex routes and transfers

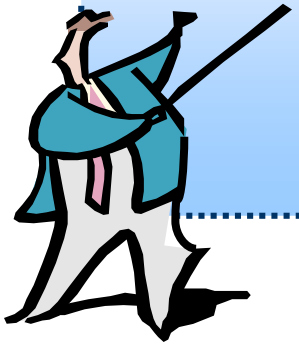
[Bus System]



[Subway System]

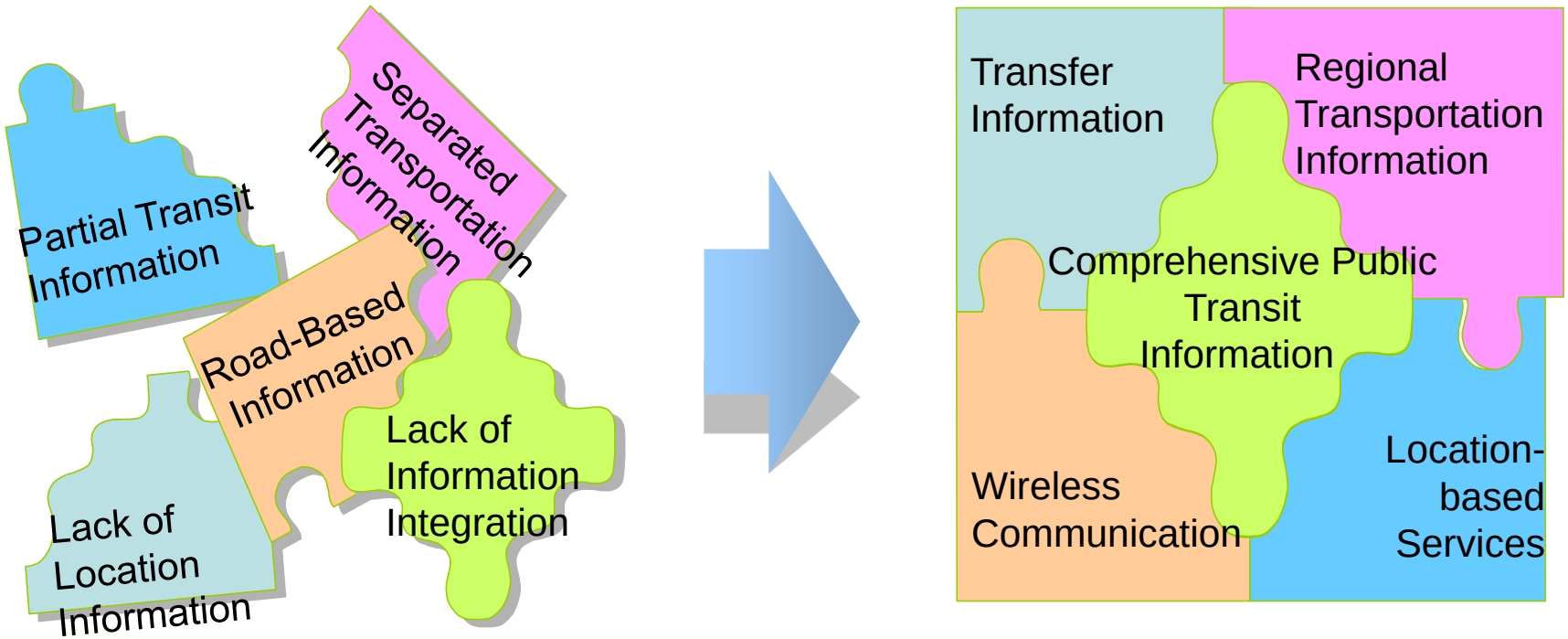


II. Metropolitan Public Transit User Information System: ALGOGA



Goal

- **To enable travelers to search the most convenient transit route(s) using PDA, Internet or Cell Phone**

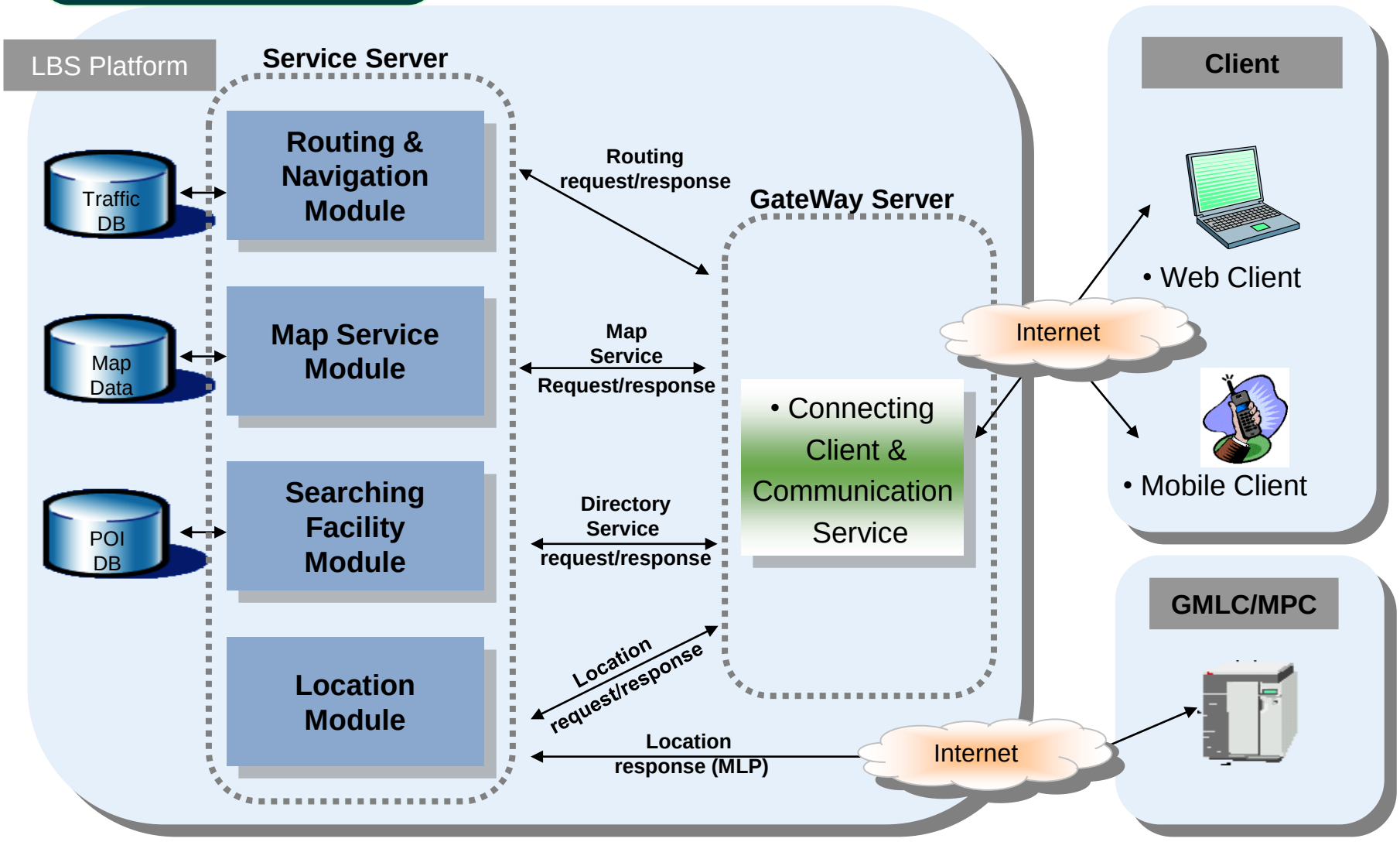


feature

- Provision of comprehensive transit information for the Seoul Metropolitan area
- Provision of the “best” route(s) for users
- Provision of parking availability at transit transfer locations.
- Upgrade information frequently
- Currently 6,000 users per day

ALGOGA

System Architecture



MLP: Mobile Location Protocol; GMLC/MPC: GeoMobility Location Center/Mobile Positioning Center

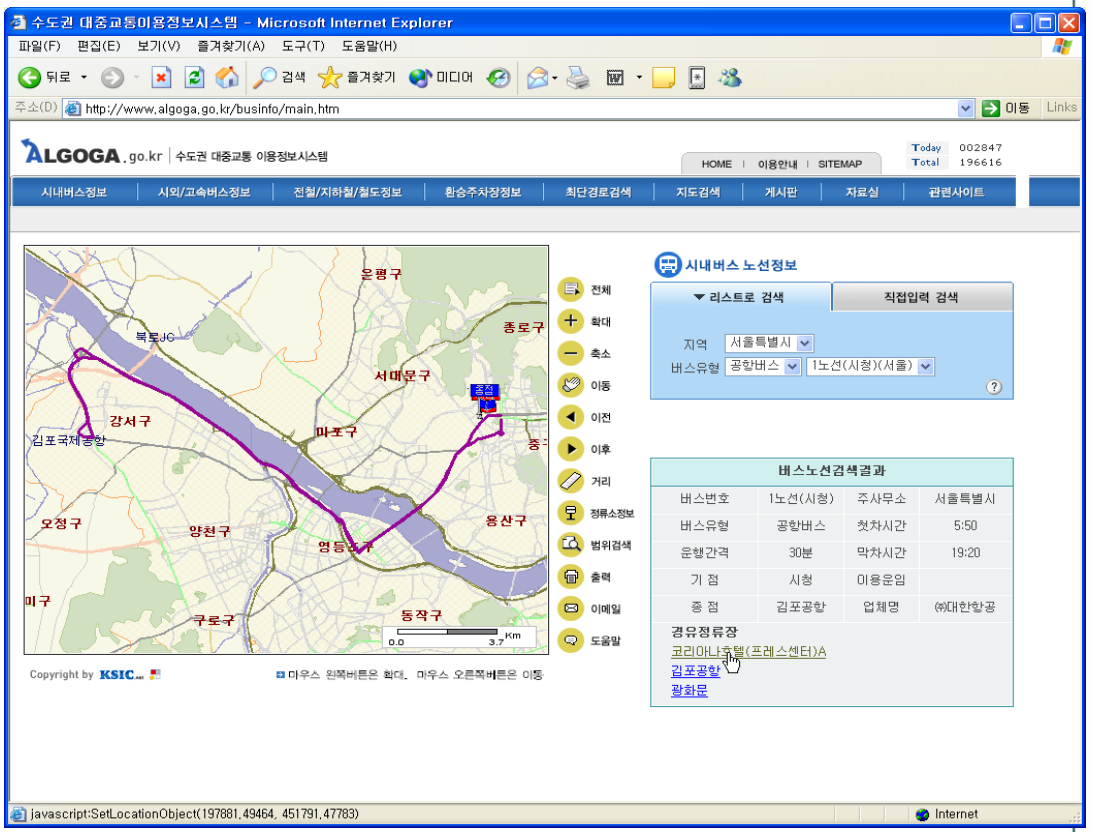
Database

Items	Route & Station	Content
Korea Rail	• 6 railways, 81 stations	• Station location • Service information
Subway	• 16 lines, 344 stations	• Station location and exit information by lines • Services Information by station
Inter-District Bus	• Seoul 627 routes • In-cheon 111 routes • Local 1107 routes	• Bus stop location by routes • Service information by routes
Airport and Inter-City Bus	• Airport bus 44 routes • Long-distance bus 373 routes	• Location of bus stops by routes • Service Information by terminal and routes
Parking Facility	• 69 public parking places	• Location of public parking • Service Information

ALGOGA: Web Service

Bus routes Information

- Schedule by type for each route
- Arrival, departure and transfer information
- Station exits and connecting bus information
- Parking information for subway station
- Calculating the “best” route(s) including transfer(s) to Bus/Subway given origin and destination

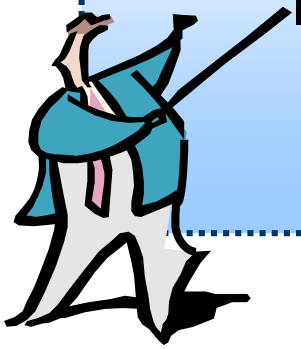


ALGOGA: Mobile Phone Service

Location based Public transit Information

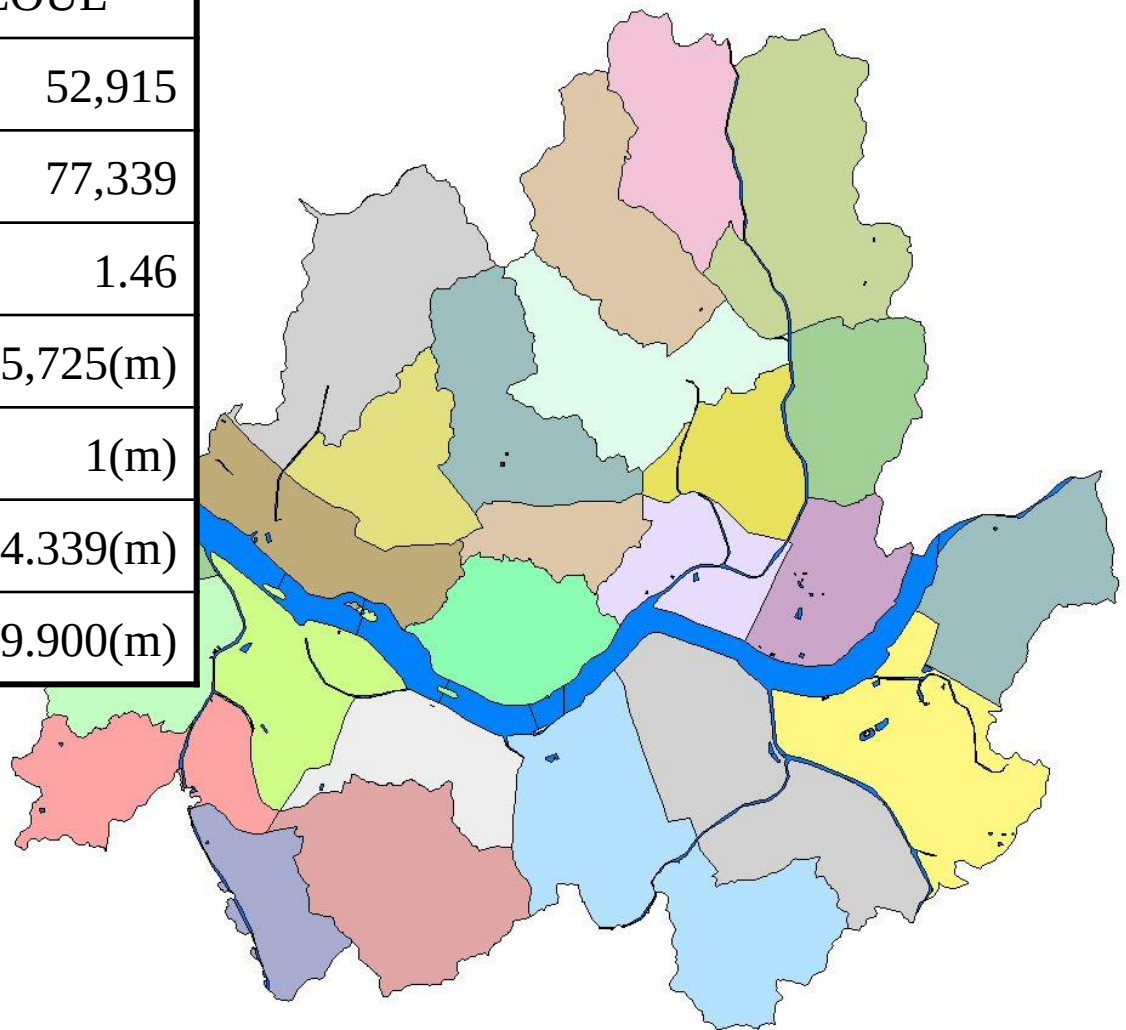
- The same information as the bus route information based on user's current location
- Searching POI: Locating Schools, Hospitals and other POIs located nearby from User's current location

III. A Simulation

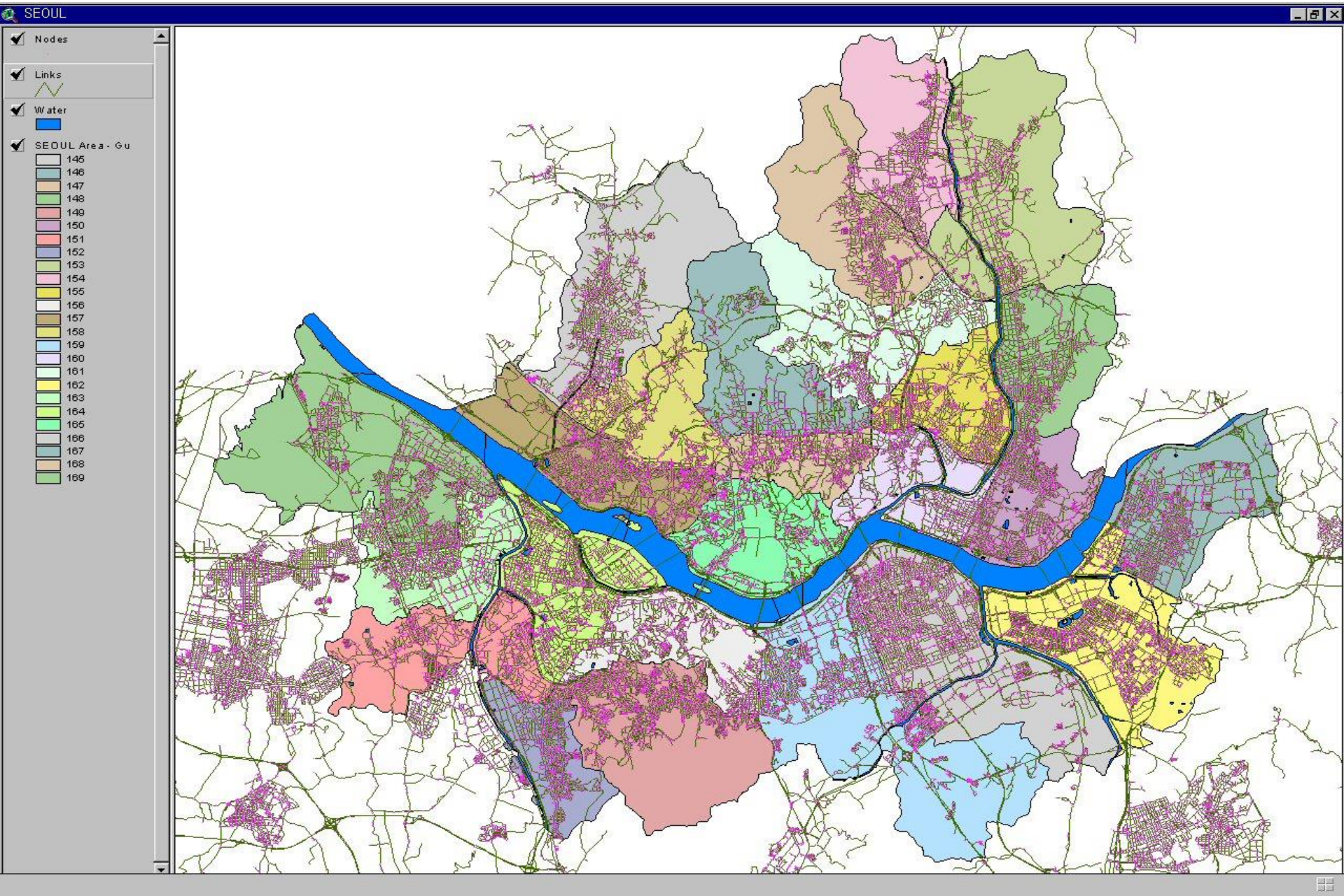


Seoul Network Database

Network Name	SEOUL
Number of Nodes	52,915
Number of Arcs	77,339
Arc/Node Ratio	1.46
Maximum Arc Length	5,725(m)
Minimum Arc Length	1(m)
Average Arc Length	104.339(m)
Standard Deviation	149.900(m)



Transportation Network in Seoul

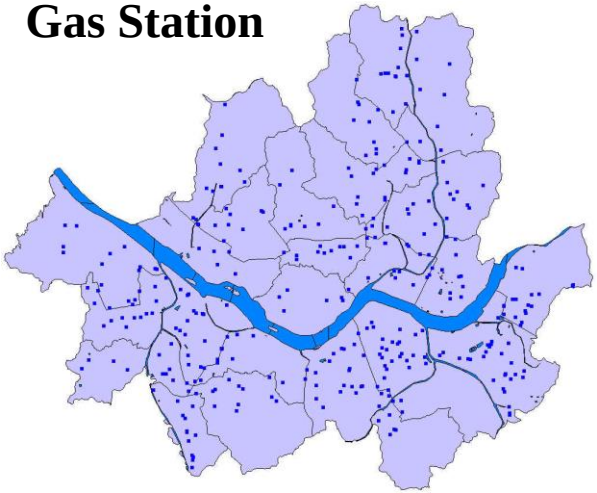


POI Database

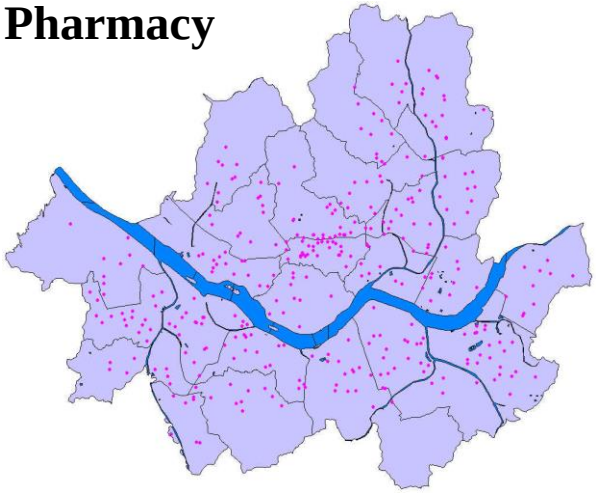
POI Name	Number of POIs	Item Name	Unit	Price Range (5 classes)
Gas Station	348	Gasoline	Liter	1,000 ~ 1,500
Pharmacy	350	Medicine	Bottle	10,000 ~ 25,000
Flower Shop	210	Roses	stick	1,000 ~ 1,500
Bakery	200	Cakes	box	10,000 ~ 15,000
Auto Repair Shop	140	Service	Service Fee	20,000 ~ 45,000

Location of POI's

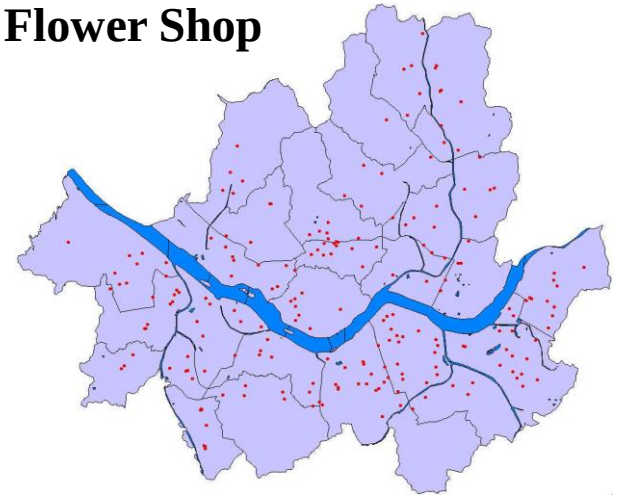
Gas Station



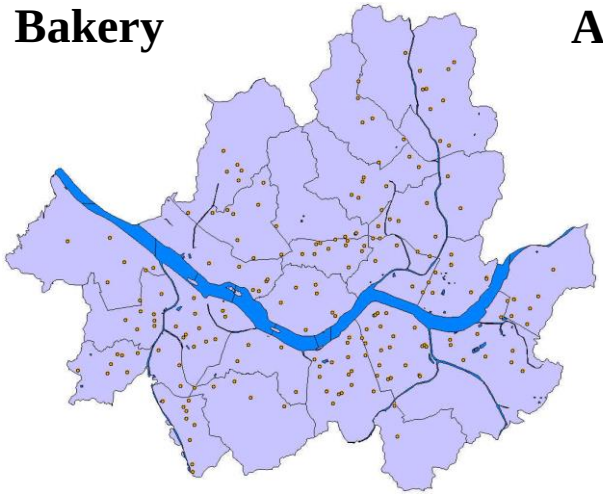
Pharmacy



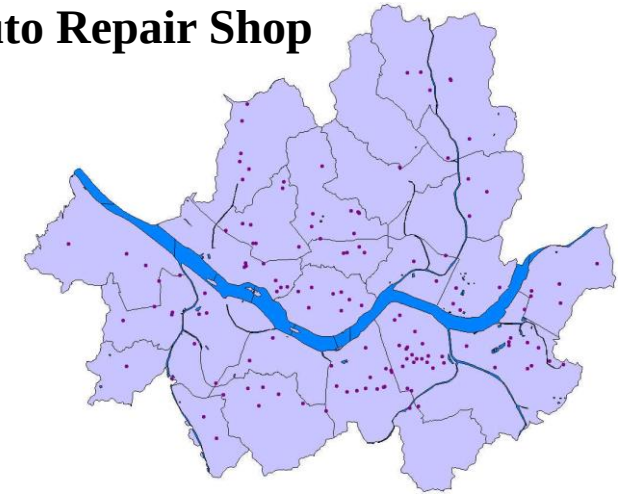
Flower Shop



Bakery



Auto Repair Shop

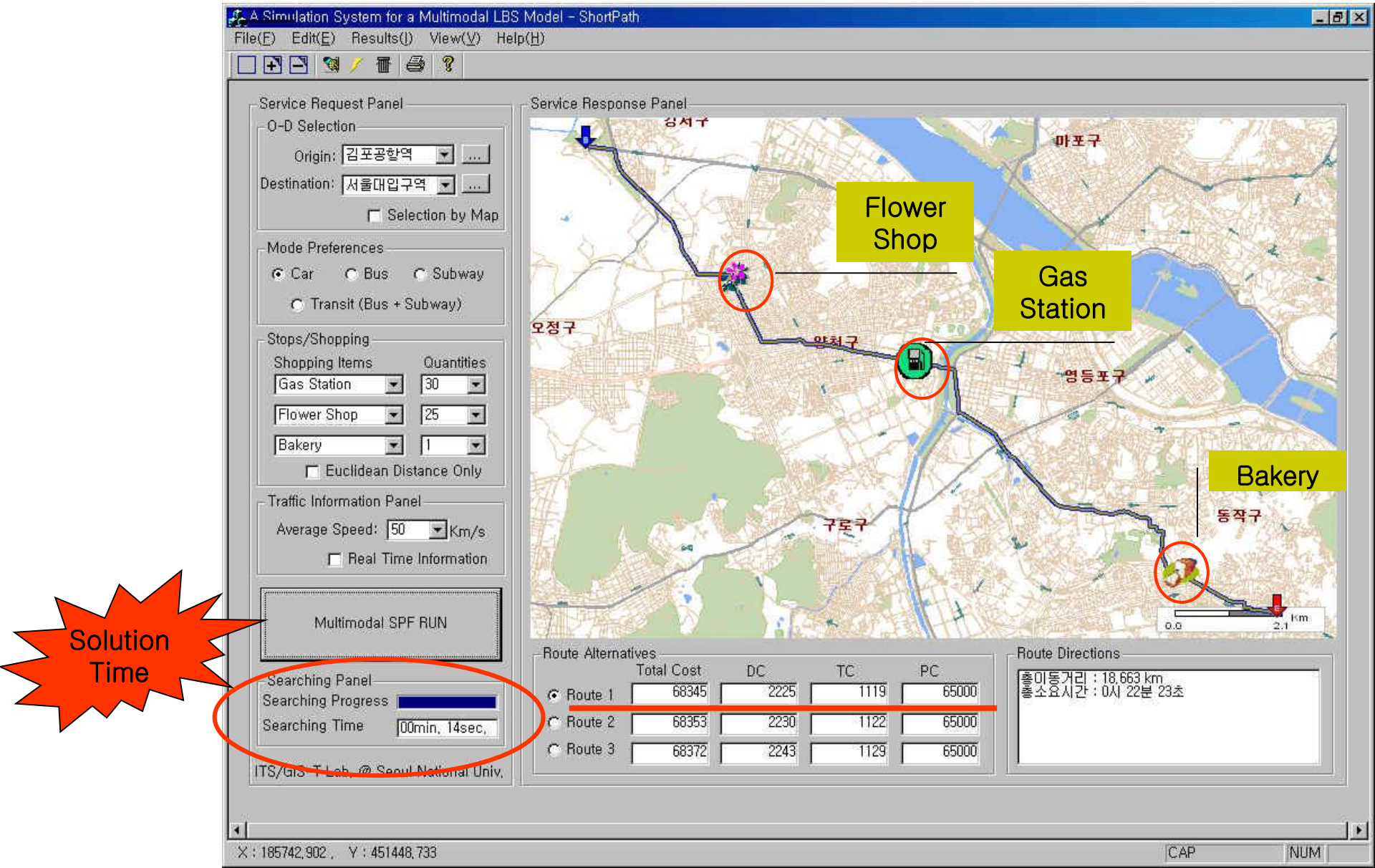


Simulation for a Multimodal LBS – Service Request

Scenario: On the way from Office to Home

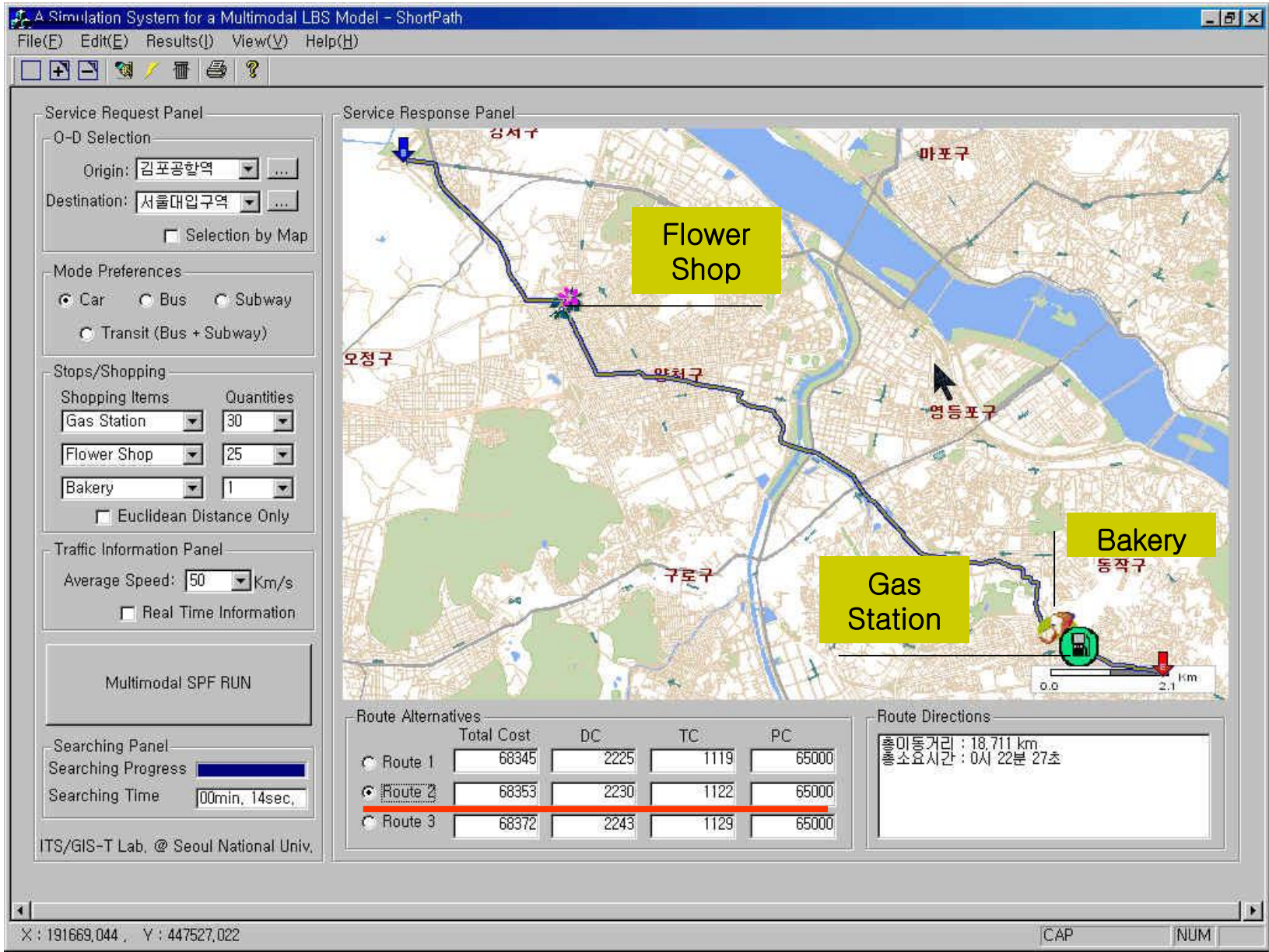
- Items and quantity for purchase
  - Gas Station – 30 liters of gasoline
  - Flower Shop – 12 roses
  - Bakery – 1 birthday cake
- Scenario 1: Private Car
  - Origin: Office at Gimpo Airport
  - Destination: Home at Sinlim-Dong
- Scenario 2: Bus and Subway
  - Origin: Office at Naksungdae
  - Destination: Home at Garak-Dong

Simulation Result for a Multimodal LBS: Scenario 1-Alternative 1

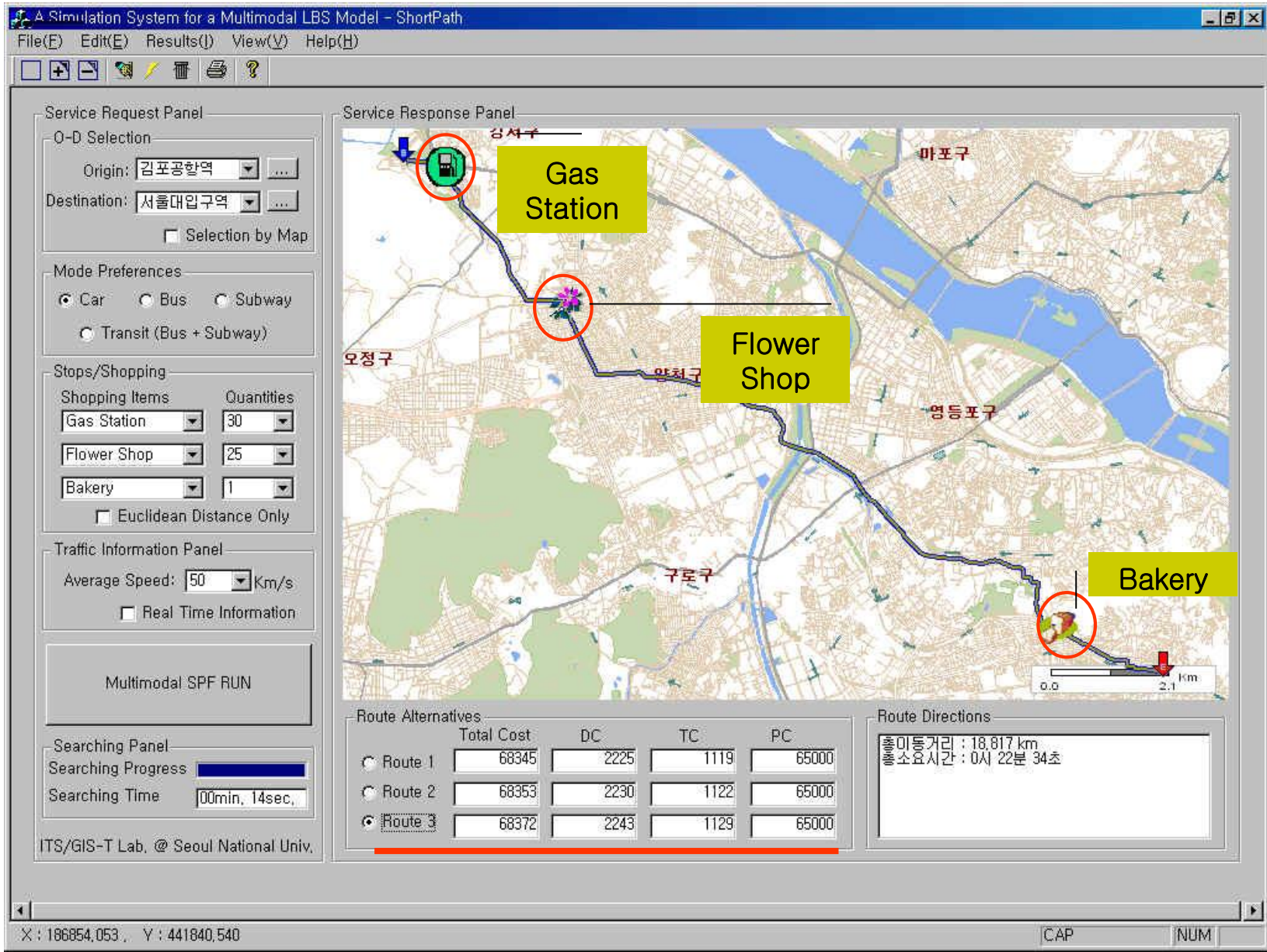


Solution Time

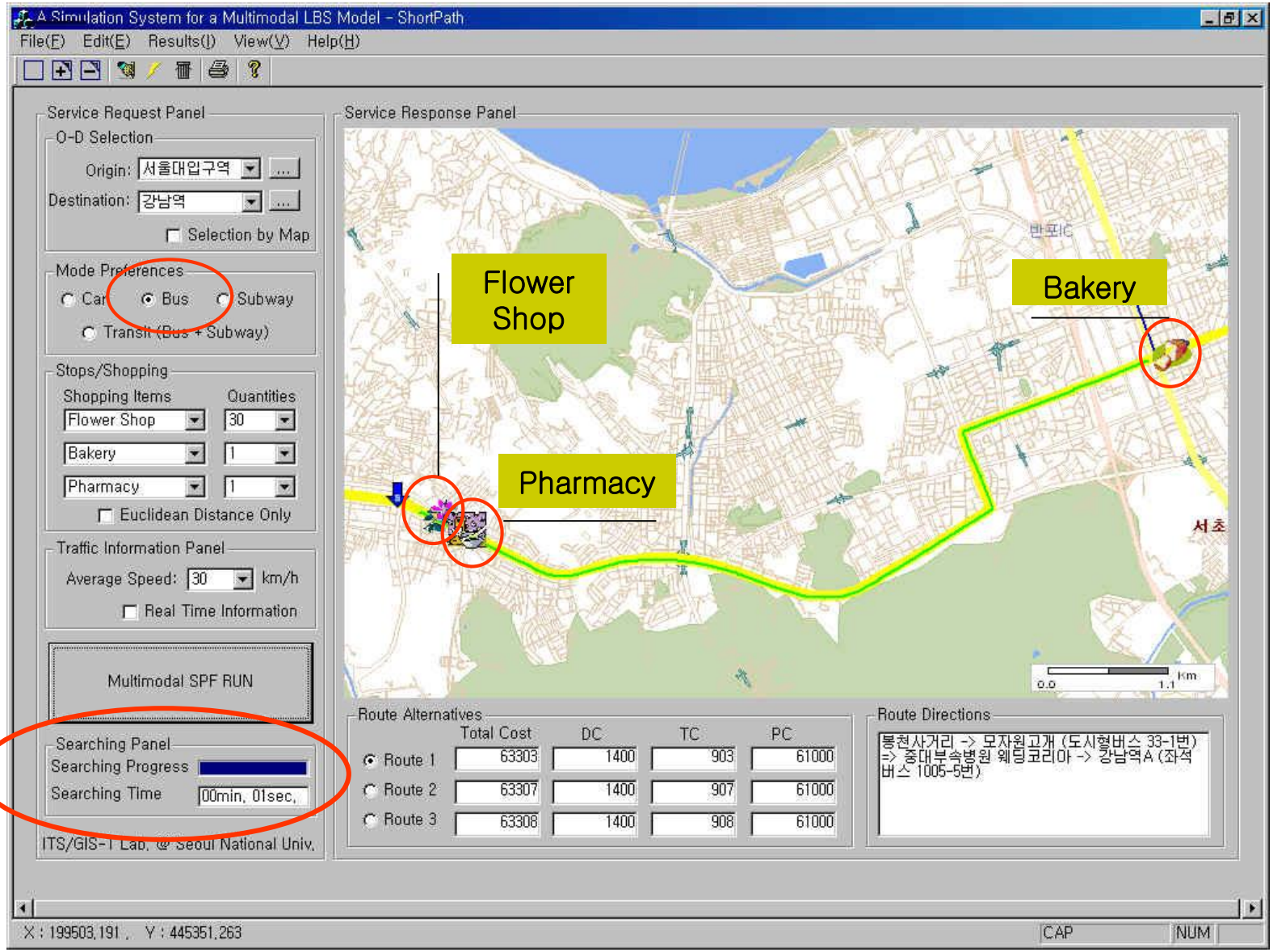
Simulation Result for a Multimodal LBS: Scenario 1-Alternative 2



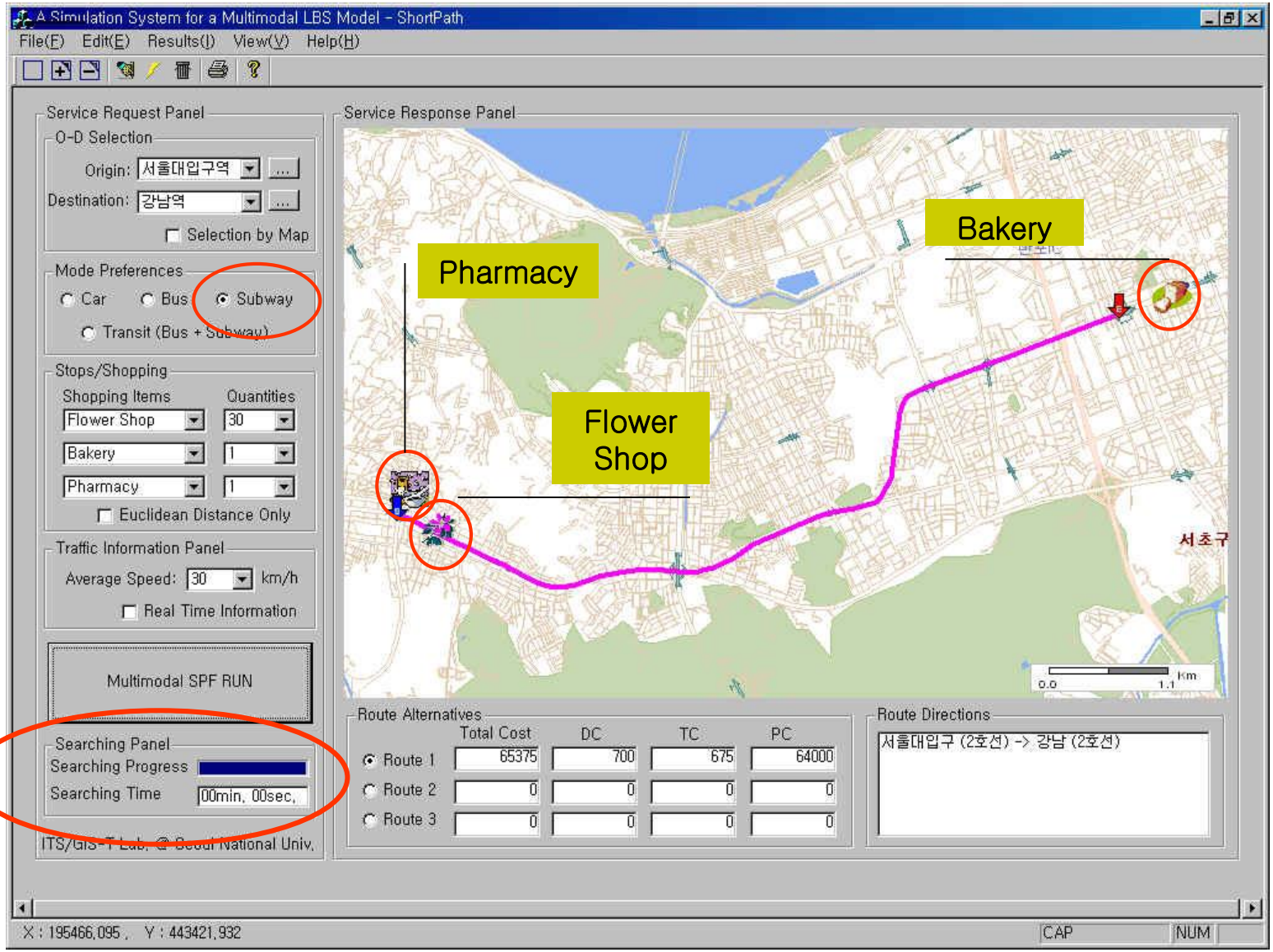
Simulation Result for a Multimodal LBS: Scenario 1-Alternative 3



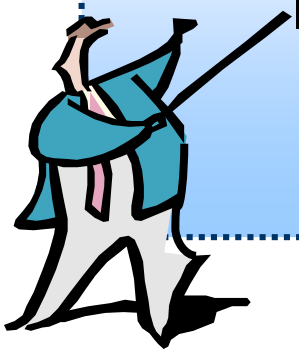
Simulation Result for a Multimodal LBS: Scenario 2-Bus Alternative



Simulation Result for a Multimodal LBS: Scenario 2-Subway Alternative



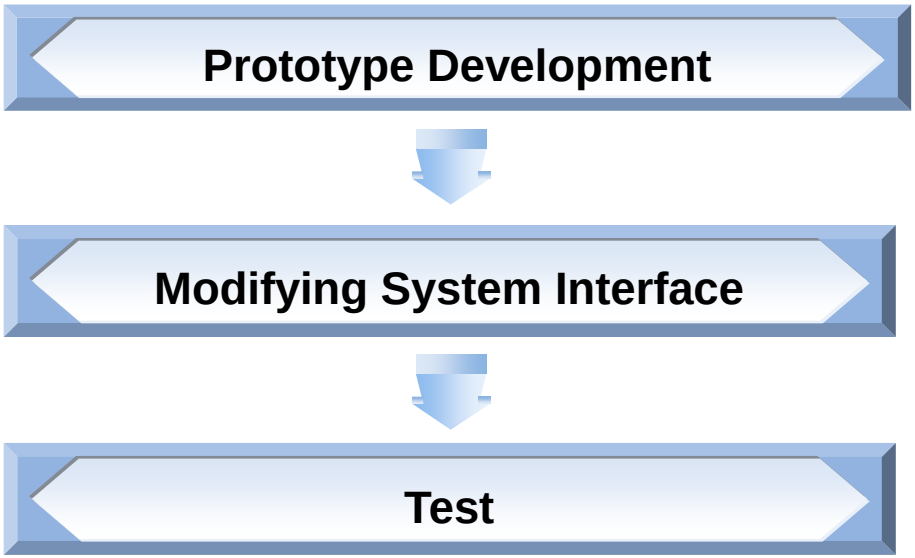
IV. Future Work



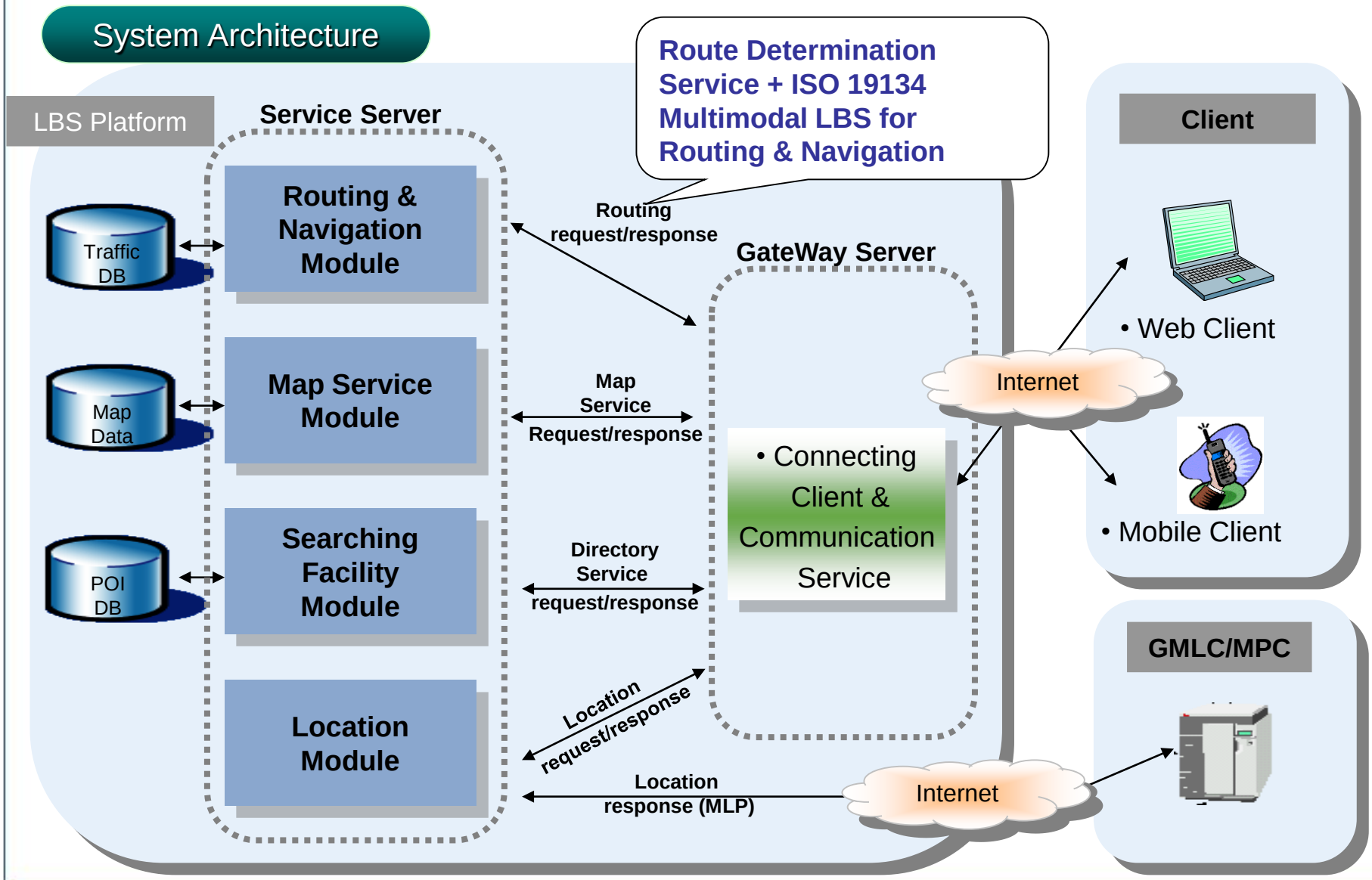
Future Work

Standardization

- Testing of the draft CD ISO 19134 Multimodal LBS for Routing and Navigation



System Architecture



Thank you!