

APP 3- 1. On-boing Projects at TEPA

Projects which are on-going at TEPA were described in the CSTS Interim Report, and are repeated again in this "working paper." However, the projects are illustrated here on maps which show the various project locations in the Lahore metropolitan area. Project numbers are as they appear in the Interim Report. Sections of this paper begin with the map showing the project locations. Project descriptions follow.

Since some of the projects appear on more than one map, they are listed more than once for the sake of clarity. Some projects may be shown on a map, but are not listed in the following description. This may be either because the entire project is not shown on the map for the particular section of this working paper or because the level of detail is better on another map. In any case, all projects which could be located are shown and described.

At the end of the paper, a number of projects are listed which are not shown on any of the maps. This is because either the project could not be found, or because it is a compound of numerous small projects which are scattered throughout the LMA. The project descriptions should be adequate in these cases.

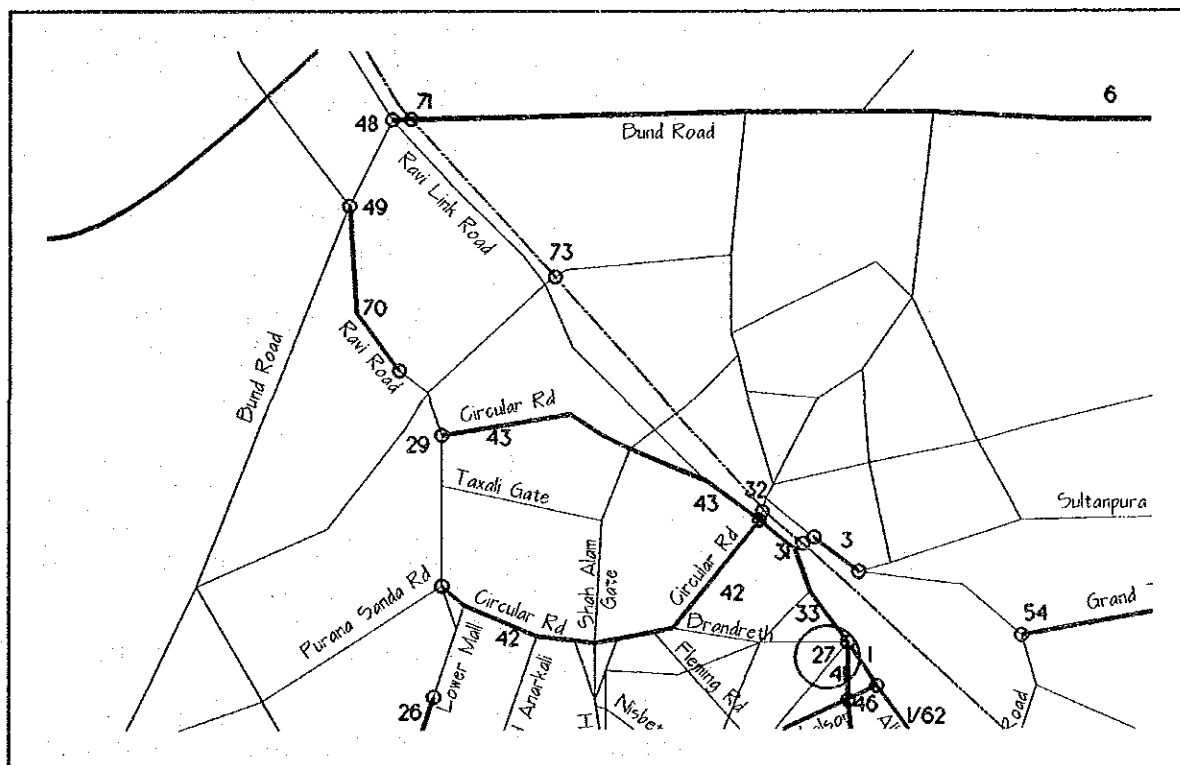


Figure 1

3. Grand Trunk Road from Do Moria to Co-operative Store -
- SDP (PC-I June 1988)

This portion of G.T. Road is must serve a large amount of traffic in the vicinity of the Walled City. Repairs are needed for the road pavement, sidewalks, and street lights.

6. Bund Road (North) -- SDP (PC-I June 1988)

This scheme is to pave the long section of Bund Road from the Ravi Bridge to G.T. Road. Specifics are not known at this time.

27. Railway Station Area Improvements -- PUDP

Comprehensive traffic management scheme involving minor modifications to existing one-way circulation; provision of extensive pedestrian areas; channelization of through traffic flows; formalization of terminal facilities for local buses and minibuses; parking areas for cars, taxis, and tongas; protected contra-flow cycle lanes; re-phasing and repositioning of five sets of existing signals; retention of GT Bus Stand. Project underway as of Wednesday, 24 April 1991.

29. Azadi Chowk -- PUDP

Provision of channelization, curbing, and pedestrian crossing facilities; relocation of existing signals. Project underway as of Wednesday, 24 April 1991.

31. Eik Moria -- PUDP

Provision of channelization, curbing, and introduction of local traffic management measures; relocating, supplementing, and re-timing of existing traffic signals; provision of waiting area for tongas to north of railway. Scheduled for early implementation.

32. Do Moria -- PUDP

Restrictions on right-turning traffic to and from double arch bridge; closure of one carriageway to all traffic except cycles and pedestrians; provision of median and protected turning lane for right-turning traffic. Scheduled for early implementation.

33. Road linking Do Moria and Railway Station -- PUDP

Installation of narrow median and strict control of encroachment, parking, and on-street loading. Scheduled for early implementation.

42. Inner Circular Road and Bhatti Gate -- PUDP

Complex traffic management scheme where 2-lane dual carriageway will be changed to a 2-lane dual carriageway plus animal carriageway. Project includes addition of sidewalks and improved drainage system; improvement and increase of street lighting; improvement and extension of medians; channelization of intersections with improvements and additions to existing signals; addition of bus bays and rationalization of parking scheme. (2.6 km) Contract documents completed and out to tender as of Wednesday, 24 April 1991.

43. Outer Circular Road -- PUDP

2-4-lane dual carriageway to be changed to 2-lane dual carriageway plus animal carriageway. Includes improvements of sidewalks and street drainage; improvement and extension of medians and intersection channelization; bus bays and parallel parking to be added. A complex scheme designed to separate the animal drawn traffic from motorized traffic, which is a major cause of traffic congestion at present. (1.6 km) Contract documents complete.

48. Bund Road - Ravi Link Road -- PUDP

Dangerous and ill-defined intersection with heavy pedestrian and animal drawn traffic. Work will include edge definition, channelization of traffic flows, provision of an area as a bus terminal, a mini-bus terminal, pedestrian refuges, and a pedestrian concourse; installation of street lighting, drainage, and signalization. Contract documents complete.

49. Bund Road - Ravi Road -- PUDP

Although this intersection performs adequately at present, there is a need for separation of traffic by mode to protect pedestrians and cyclists. Project to include pedestrian refuges, sidewalks, channelization of traffic, improvement of existing signal system, addition of bus bays; removal of encroachment, and rationalization of parking scheme. Project deleted from PUDP.

54. G.T. Road - Shalimar Road -- PUDP

Provision of a central island and channelization. Project proposed but not scheduled for design or implementation.

70. Ravi Road

Provision of central median, edge definition, parking,

and service areas to adjacent markets, segregated lanes from Chota Ravi Bridge to Bund road (1.8 km) Project completed.

71. Level crossing on Northern Bund Road

Improvements to gate width, road surface within crossing and gate mechanism. Project recommended, awaiting design and funding.

73. Level crossing at Data Nagar (Badami Bagh)

Improvements to gate width, road surface within crossing, approach gradient and width, and gate mechanism. Project recommended, awaiting design and funding.

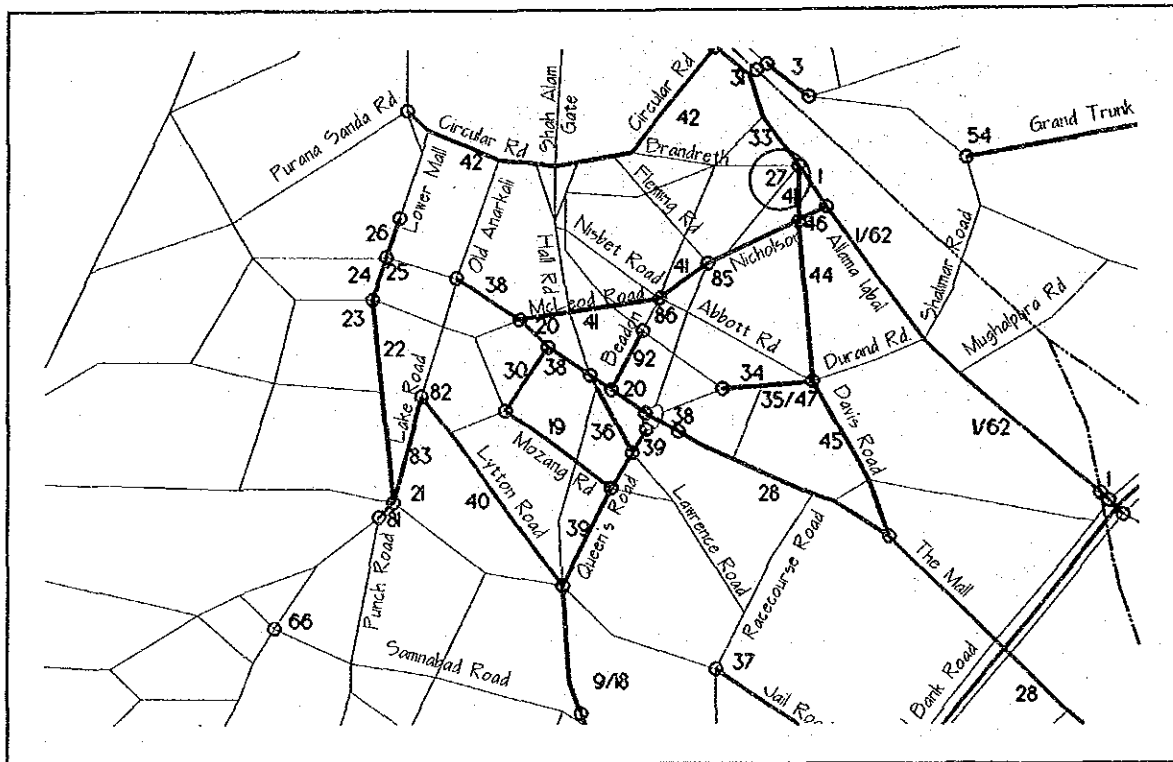


Figure 2

1. Allama Iqbal Road from the Railway Station to the Canal -- SDP (PC-I June 1988)

This important arterial road has a dual carriageway which has seriously deteriorated due to both heavy traffic and heavy vehicles. Improvements are to be made are resurfacing, rehabilitation of damaged medians, repair of sidewalks, and traffic signal repair.

3. Grand Trunk Road from Do Moria to Co-operative Store -
- SDP (PC-I June 1988)

This portion of G.T. Road is must serve a large amount of traffic in the vicinity of the Walled City. Repairs are needed for the road pavement, sidewalks, and street lights.

9. Ferozpur Road from Qartaba Chowk to Mian Mir Drain --
PUDP

Provision of central median, edge definition and channelization of minor junctions. This project is almost complete as of Wednesday, 24 April 1991. (1.0 km)

18. Ferozpur Road Drainage -- PUDP

This project nearing completion as of Wednesday, 24 April 1991.

19. Mozang Road -- PUDP

Provision of edge definition, sidewalks, and parking areas on the sides. Structural work on drainage system. This project nearing completion as of Wednesday, 24 April 1991.

20. Mall Service Roads -- PUDP

Establishment of controlled parking areas on the Mall service roads between Assembly Chambers and McLeod Road. Definition of areas and letting of concessions.

21. Lower Mall at Lake Road Junction -- PUDP

Removal of traffic signals and provision of central island and channelization within curtilage of existing roadway. Scheme being revised as of Wednesday, 24 April 1991.

22. Lower Mall from Lake Road to MAO College -- PUDP

Provision of central median, edge definition and segregated lanes from Lake Road junction to MAO. Project underway as of Wednesday, 24 April 1991.

23. Lower Mall at MAO College Junction -- PUDP

Removal of traffic signals, provision of central island and channelization within curtilage of existing carriageway. Including junction with Sanda Road. Project underway as of Wednesday, 24 April 1991.

24. Lower Mall from MAO College to Civil Secretariat --
PUDP

Provision of central median and edge definition, (0.5 km) including junction with Lodge Road. Project underway as of Wednesday, 24 April 1991.

25. Lower Mall at junction at Civil Secretariat, Church Road, and the Mall -- PUDP

Provision of channelization, central islands, sidewalks and bus bays. Retain existing median, relocation and re-phasing of signals at the junction. Project underway as of Wednesday, 24 April 1991.

26. Lower mall between junction at District Courts and Central Model School -- PUDP

Provision of medians and channelization islands. Relocation and re-timing of existing signals, provision of bus stopping facilities, include section of Lower Mall. Project underway as of Wednesday, 24 April 1991.

27. Railway Station Area Improvements -- PUDP

Comprehensive traffic management scheme involving minor modifications to existing one-way circulation; provision of extensive pedestrian areas, channelization of through traffic flows; formalization of terminal facilities for local buses and minibuses; parking areas for cars, taxis, and tongas; protected contra-flow cycle lanes; re-phasing and repositioning of five sets of existing signals; retention of GT Bus Stand. Project underway as of Wednesday, 24 April 1991.

28. The Mall (Railway to Zoo) -- PUDP

Regrading of pavement to improve drainage; realignment and re-signalling of junction with Canal Bank Road; resurfacing of pavement. Amendment to junction with Davis Road, realignment of cycle track, provision of lane markings. Project underway as of Wednesday, 24 April 1991.

30. Fane Road -- PUDP

Removal of encroachment into road space; relocation of existing electric lines; provision of sidewalks; improvement of drainage. Project underway as of Wednesday, 24 April 1991.

31. Eik Moria -- PUDP

Provision of channelization, curbing, and introduction of local traffic management measures; relocating, supplementing, and re-timing of existing traffic signals; provision of waiting area for tongas to north of railway. Scheduled for early implementation.

33. Road linking Do Moria and Railway Station -- PUDP
 Installation of narrow median and strict control of encroachment, parking, and on-street loading. Scheduled for early implementation.
34. Egerton Road -- PUDP
 Widening and edge definition; provision of sidewalks; improved drainage; accidental removal of ancient trees. Project scheduled for early implementation.
35. Shimla Hill Intersection (Egerton, Davis, Empress, and Durand Road junction) -- PUDP
 Provision of channelization and curbing to existing and one-way system; relocation and re-timing of existing signals. Project scheduled for early implementation
36. Lawrence Road (Queen's Road to the Mall) -- PUDP
 Introduction of amended traffic circulation pattern, including necessary signing, road marking, and physical curbing; provision of sidewalks, and contra-flow protected cycle lanes as required. Junction modification at Queen's Road. Scheme in abeyance.
37. Racecourse Road - Jail Road Intersection -- PUDP
 Provision of central island, channelization, and bus stops. Scheme in abeyance.
38. The Mall (Zoo to Museum) -- PUDP
 Improvement and extension of sidewalks, improvement of drainage, with pavement water discharged to nearest drain. Additional construction and improvement of existing street lighting. Addition of median to separate traffic and to provide for pedestrian refuge in shopping area. Channelization at intersections; improvement of existing bus bays; improvement of parking in service road areas. Contract documents completed.
39. Queen's Road (Shariah Fatima Jinnah) -- PUDP
 4-lane single carriageway to be changed to 2-lane dual carriageway with improved edge definition; provision of curbing, improvement of drainage; provision of median with pedestrian refuges, addition of sidewalks. Channelization at intersections; addition of bus bays and parking where space permits. (1.5 km) Contract documents completed.

40. Lytton Road / Qartaba Chowk -- PUDP

Partial 2-lane dual carriageway and 4-lane single carriageway to be changed to 2+3-lane dual carriageway. Provision of sidewalks, improved drainage, extended and improved central median, channelization improvements at intersections; installation of bus bays and parking. Control of encroachment from Jain Mander to Qartaba Chowk. (1.5 km) Contract documents completed.

41. McLeod Road -- PUDP

4-lane single carriageway in parts with 2-lane dual carriageway to be changed to 3-lane dual carriageway with service roads where room is available. Includes addition of sidewalks and improved drainage; improvement and increase of street lighting; improvement and extension of medians; improvements to intersection channelization; addition of bus bays and creation of controlled parking and letting of concessions; strict control of encroachments into right of way. (2.3 km) Contract documents completed.

42. Inner Circular Road and Bhatti Gate -- PUDP

Complex traffic management scheme where 2-lane dual carriageway will be changed to a 2-lane dual carriageway plus animal carriageway. Project includes addition of sidewalks and improved drainage system; improvement and increase of street lighting; improvement and extension of medians; channelization of intersections with improvements and additions to existing signals; addition of bus bays and rationalization of parking scheme. (2.6 km) Contract documents completed and out to tender as of Wednesday, 24 April 1991.

44. Empress Road -- PUDP

2-lane single carriageway to be changed to a 3-lane dual carriageway. Includes addition of sidewalks and pavement drainage; improvement of street lighting, addition of medians and intersection channelization; addition of bus bays and rationalization of street parking areas. (1.0 km) Project being revised as of Wednesday, 24 April 1991.

45. Davis Road -- PUDP

4-lane single carriageway to be changed to a 2-lane dual carriageway, including the addition of sidewalks, drainage, and street lighting. Addition of medians and intersection channelization; parking bays to be added. (1.3 km) Design complete, contract documents being written as of Wednesday, 24 April 1991.

46. Nicholson Road -- PUDP
 4-lane single carriageway to be changed to 2-lane dual carriageway. Includes addition of median and sidewalks; improved street drainage; addition of street lighting; channelization of intersections; addition of parking facilities and bus bays. Design complete, documents being written as of Wednesday, 24 April 1991.
47. Shimla Hill Intersection -- PUDP/NESPAK (with Egerton Rd. design)
 Gyrotory intersection with park in center of Empress, Abbot, Egerton, Davis, and Durand Roads. Improvements to include greatly improved signalization at Abbot/Empress junction, and Durand/Davis junction; channelization at all junctions; addition of sidewalks on both sides with the addition of refuges to assist pedestrians in crossing, as there is a mosque in the central island. Includes removal of encroachment on Durand Road and redefinition of private entrances. Project under preparation.
54. G.T. Road - Shalimar Road -- PUDP
 Provision of a central island and channelization. Project proposed but not scheduled for design or implementation.
62. Allama Iqbal road
 Provision of median, edge definition and cycle lanes / parking areas from Nicholson Road junction to railway over-bridge (2.6 km). Including minor junctions and accesses. Project most likely completed, but in deteriorating state.
66. Junction of Multan Road and Samnabad Road
 Provision of channelization, bus bays and repositioning and re-timing of existing signals. Project completed.
81. Chouburji Chowk
 Remodelling of existing channelization and central island, removal of traffic signals and abandonment of earlier proposals to widen carriageway. Project awaiting funding.
82. Jain Mander Crossing
 Provision of channelization and central island within curtilage of existing carriageway at Cust Road / Lake Road junction, and re-phasing and relocation of existing signals at Lytton Road / Edward Road

junction. Second stage of scheme involves removal of signals and construction of roundabout. Project awaiting funding.

83. Lake road

Provision of central median, edge definition, and parking areas from Chouburji to Jain Mander (0.6 km). Project awaiting funding.

85. Junctions of McLeod Road and Nicholson / Montgomery Road: -- PUDP

Provision of channelization islands, pedestrian refuges, sidewalks, parking areas for tongas, and replacement of existing signals. Project awaiting funding.

86. Junction of McLeod Road and Abbot Road / Nisbet Road: -- PUDP

Provision of channelization islands, pedestrian refuges, sidewalks, parking areas for tongas, and replacement of existing signals. Project awaiting funding.

92. Beadon Road (Cooper Road to the Mall)

Control of vehicular access at defined hours of day to specified vehicle types and reversal of current one-way circulation. Project awaiting funding.

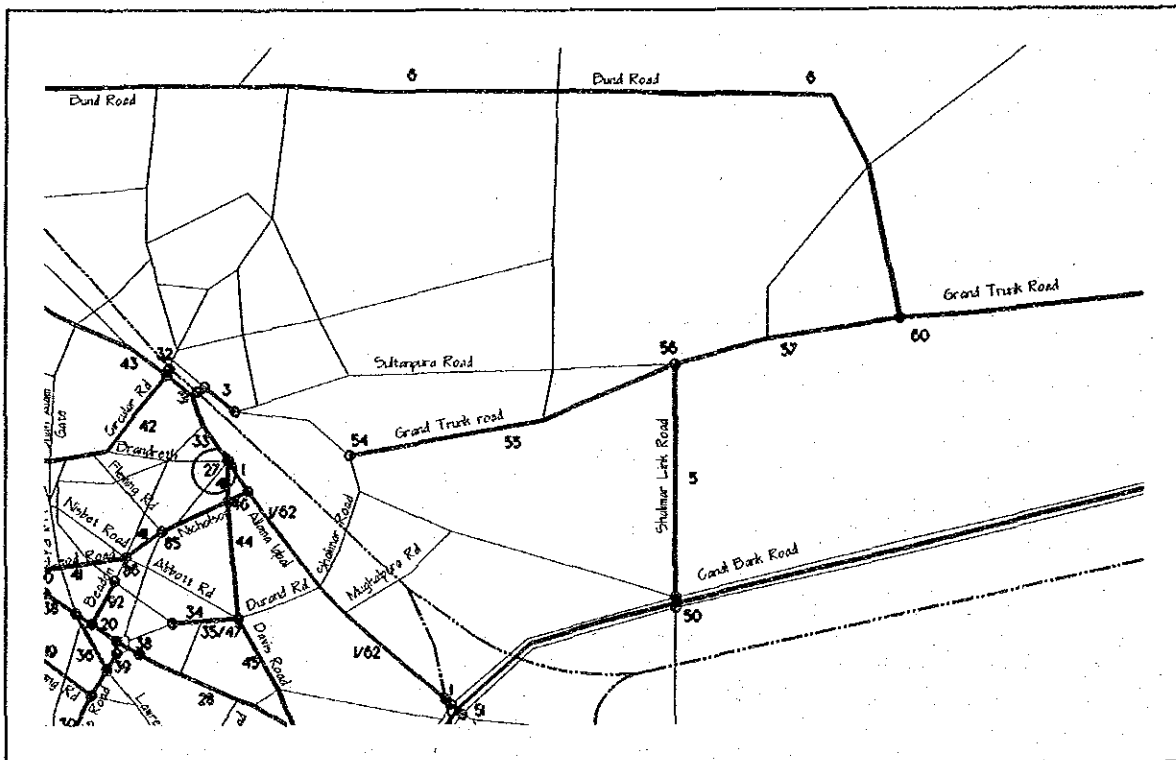


Figure 3

1. Allama Iqbal Road from the Railway Station to the Canal -- SDP (PC-I June 1988)

This important arterial road has a dual carriageway which has seriously deteriorated due to both heavy traffic and heavy vehicles. Improvements are to be made are resurfacing, rehabilitation of damaged medians, repair of sidewalks, and traffic signal repair.

3. Grand Trunk Road from Do Moria to Co-operative Store - - SDP (PC-I June 1988)

This portion of G.T. Road must serve a large amount of traffic in the vicinity of the Walled City. Repairs are needed for the road pavement, sidewalks, and street lights.

5. Shalimar Link Road -- SDP (PC-I June 1988)

This road is a heavily used arterial which connects G.T. Road and Canal Bank Road. It is wide, but in poor condition. It is a primary route for city transit buses, and has a high demand for parking along its length. The median is in bad condition as are the intersections with the major roads on both ends. Plans call for median repair, geometric improvements to limit access, and rationalization of on street parking.

6. Bund Road (North) -- SDP (PC-I June 1988)

This scheme is to pave the long section of Bund Road from the Ravi Bridge to G.T. Road. Specifics are not known at this time.

50. Shalimar Link Road - Canal Bank Road -- PUDP

A complex intersection where Shalimar Link and Tufail Road, (a major north-south corridor which has heavy truck traffic) meet with Canal Bank Road (an important east-west distributor) and the Pakistan Rail link going east to the Indian border. Canal Bank Road at this point functions as two parallel 2-lane single carriageway rather than as a 2-lane dual carriageway. The proposed design for this intersection is a grade-separated interchange where the north-south road will fly over the Canal Bank and the railroad. Contract documents complete.

51. Allama Iqbal - Canal Bank Road -- PUDP

This is a very complex and dangerous intersection involving the Canal Bank Road, Allama Iqbal, and Ghazi (or Sunder Das Road). Compounding the complexity is the diagonal crossing of the main branch of the Karachi-Lahore railroad at this junction. Due to the complexity of the intersection and other problems,

vehicles are often seen headed the wrong way against traffic. Details of the design for this interchange are unknown at this time. Contract documents complete.

54. G.T. Road - Shalimar Road -- PUDP

Provision of a central island and channelization. Project proposed but not scheduled for design or implementation.

55. G.T. Road -- PUDP

Provision of a median, edge definition, and segregated lanes from Shalimar Road junction for 3.5 km east. Including minor junctions and accesses. Project proposed but not scheduled for design or implementation.

56. G.T. Road - Shalimar Link Road -- PUDP

Provision of a central island and channelization. Project proposed but not scheduled for design or implementation.

57. G.T. Road -- PUDP

Provision of median, edge definition and parking areas as required from Shalimar Link Road junction for 2.2 km to east. Including minor junctions and accesses. Project proposed but not scheduled for design or implementation.

60. Junction of G.T. Road and Northern Bund Link Road

Provision of channelization islands. Project awaiting funding.

62. Allama Iqbal road

Provision of median, edge definition and cycle lanes / parking areas from Nicholson Road junction to railway over-bridge (2.6 km). Including minor junctions and accesses. Project most likely completed, but in deteriorating state.

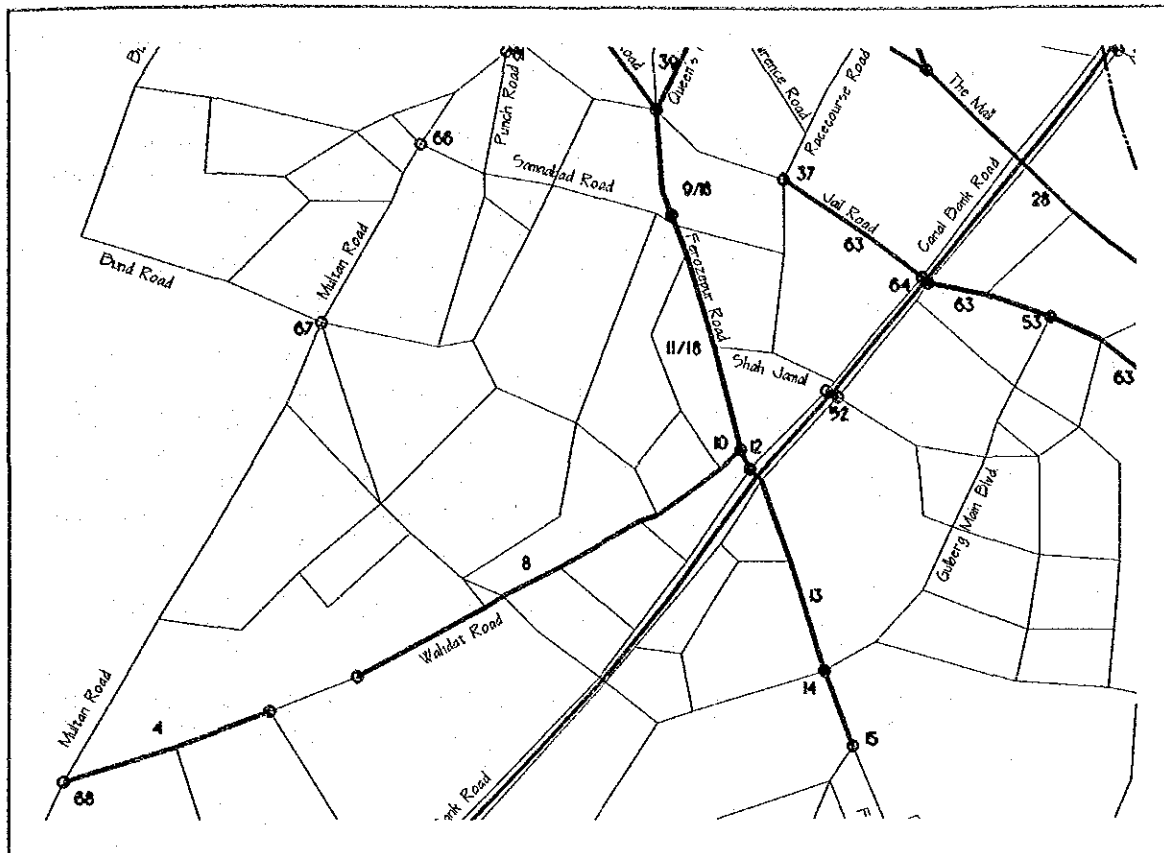


Figure 4

4. Wahdat Road -- SDP (PC-I June 1988)

Although part of Wahdat Road is part of the PUDP, the pavement of the section closest to Multan Road is in bad condition and needs resurfacing. Although traffic on this section is light, it creates continuity and safety problems since vehicles must travel this section at less than 5 km/hr.

8. Wahdat Road -- PUDP

Provision of central median, edge definition, and minor junction treatment from Ferozepur Road to University Campus (2.5 km). Including redesign of junction with Ring Road from Campus to Allama Iqbal Town. Project underway.

9. Ferozepur Road from Qartaba Chowk to Mian Mir Drain -- PUDP

Provision of central median, edge definition and channelization of minor junctions. This project is almost complete as of Wednesday, 24 April 1991. (1.0 km)

10. Ferozpur Road from Junction with road adjacent to Mian Mir Drain -- PUDP

Provision of channelization and relocation and re-timing of existing signals. This project is almost complete as of Wednesday, 24 April 1991.

11. Ferozpur Road from Mian Mir Drain to Canal Crossing -
- PUDP

Widening of existing median to accommodate protected lanes for turning traffic, provision of edge definition, and segregated lanes where possible for cyclists. Definition of pedestrian areas and location of bus stops at points of maximum demand. This project is almost complete as of Wednesday, 24 April 1991.

12. Ferozpur Road between Wahdat and Canal Bank Roads --
PUDP

Provision of channelization and relocation and re-timing of existing signals. This project is almost complete as of Wednesday, 24 April 1991.

13. Ferozpur Road from Canal Crossing to Model Town --
PUDP

Provision of median, edge definition, cycle lanes (where possible), and stopping facilities for buses. (approx 3.5 km). Including junction improvements and channelization at Stadium Road, Garden Town bus depot, and minor roads and accesses. This project has been completed.

16. Ferozpur Road at junction with Kot Lakhpat Road and adjacent level crossing -- PUDP

Local widening and channelization of turning traffic. Provision of bus stops, widening of level crossing approach.

18. Ferozpur Road Drainage -- PUDP

This project nearing completion as of Wednesday, 24 April 1991.

28. The Mall (Railway to Zoo) -- PUDP

Regrading of pavement to improve drainage; realignment and re-signalling of junction with Canal Bank Road; resurfacing of pavement. Amendment to junction with Davis Road, realignment of cycle track, provision of lane markings. Project underway as of Wednesday, 24 April 1991.

37. Racecourse Road - Jail Road Intersection -- PUDP

Provision of central island, channelization, and bus stops. Scheme in abeyance.

52. Canal Bank Road - Shah Jamal Road -- PUDP

Additional bridge to be constructed for service road. Contract documents complete.

53. Main Gulberg Road - Jail Road -- PUDP

This "T" junction is heavily used as it is the end of Main Gulberg Road, the most important arterial leading into the relatively high income Gulberg area of Lahore. Although signalized, the operation of the signals is poor at best. At worst the signals do not function, and either the police attempt to control it, or there is no control. Due to poor control by the signals, long queues develop on the western leg of Jail Road, leading to poor driver behavior. Needed are improved signals, channelization, and pedestrian facilities. Details of the design are on-going and not available at this time. Contract documents complete.

63. Jail Road

Provision of central median, edge- definition, and pedestrian crossing facilities from Racecourse road junction to Sher Pao Bridge (3.4 km). Including minor junctions (including Zafar Ali road and College Road), accesses and short term parking in association with Lahore Race Club. Project completed.

64. Junction of Jail Road and Canal Bank Road

Provision of channelization and modifications to layout to incorporate service roads; replacing, relocating, and simplifying signals. Project awaiting funding.

65. Junction of western end of Sher Pao Bridge

Removal of signals and extensions to existing central island. Project awaiting funding.

66. Junction of Multan Road and Samnabad Road

Provision of channelization, bus bays and repositioning and re-timing of existing signals. Project completed.

67. Junction of Multan Road and Bund Road

Provision of channelization, bus bays, and repositioning and re-timing of existing signals. Project awaiting funding.

68. Junction of Multan and Wahdat Roads

Provision of channelization facilities for buses and trucks at Octroi post. Project awaiting funding.

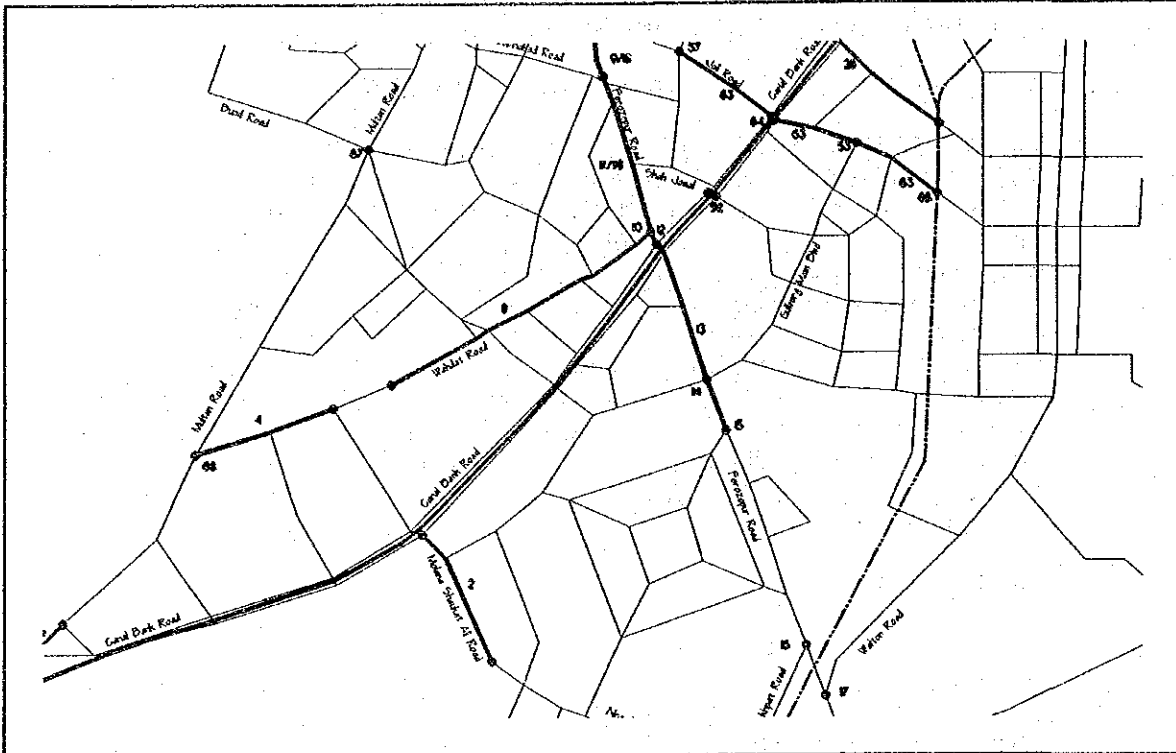


Figure 5

2. Molana Shaukat Ali Road -- SDP (PC-I June 1988)

This road is a two lane distributor road between Peco Road and Canal Bank Road. The existing pavement is in such bad condition, that traffic routinely diverts to smaller roads in the area. Pavement improvements are planned. In another section, there are plans to rehabilitate the pavement, provide bus bays for bus stops, construct a pedestrian platform around the bus bays, provide for standard signing and street marking.

4. Wahdat Road -- SDP (PC-I June 1988)

Although part of Wahdat Road is part of the PUDP, the pavement of the section closest to Multan Road is in bad condition and needs resurfacing. Although traffic on this section is light, it creates continuity and safety problems since vehicles must travel this section at less than 5 km/hr.

8. Wahdat Road -- PUDP

Provision of central median, edge definition, and minor junction treatment from Ferozpur Road to

- University Campus (2.5 km). Including redesign of junction with Ring Road from Campus to Allama Iqbal Town. Project underway.
10. Ferozpur Road from Junction with road adjacent to Mian Mir Drain -- PUDP
Provision of channelization and relocation and re-timing of existing signals. This project is almost complete as of Wednesday, 24 April 1991.
 11. Ferozpur Road from Mian Mir Drain to Canal Crossing -- PUDP
Widening of existing median to accommodate protected lanes for turning traffic, provision of edge definition, and segregated lanes where possible for cyclists. Definition of pedestrian areas and location of bus stops at points of maximum demand. This project is almost complete as of Wednesday, 24 April 1991.
 12. Ferozpur Road between Wahdat and Canal Bank Roads -- PUDP
Provision of channelization and relocation and re-timing of existing signals. This project is almost complete as of Wednesday, 24 April 1991.
 13. Ferozpur Road from Canal Crossing to Model Town -- PUDP
Provision of median, edge definition, cycle lanes (where possible), and stopping facilities for buses. (approx 3.5 km). Including junction improvements and channelization at Stadium Road, Garden Town bus depot, and minor roads and accesses. This project has been completed.
 14. Ferozpur Road at junction with Main Boulevard (Gulberg) -- PUDP
Provision of channelization and bus stops, resurfacing of existing carriageway around central island.
 15. Ferozpur Road with junction with Model Town Access -- PUDP
Channelization and repositioning / replacing / redesign of existing signals. Provision of bus stopping facilities. Project in tendering as of Wednesday, 24 April 1991.
 16. Ferozpur Road at junction with Kot Lakhpat Road and adjacent level crossing -- PUDP
Local widening and channelization of turning traffic.

Provision of bus stops, widening of level crossing approach.

17. Ferozepur Road at junction with Walton Road (Amar Sadhu) -- PUDP

Provision of channelization and facilities for buses. Project submitted to tendering as of 5 May 1991.

68. Junction of Multan and Wahdat Roads

Provision of channelization facilities for buses and trucks at Octroi post. Project awaiting funding.

69. Junctions on Multan Road at Niaz Beg

Provision of channelization and bays for buses, etc. Project awaiting funding.

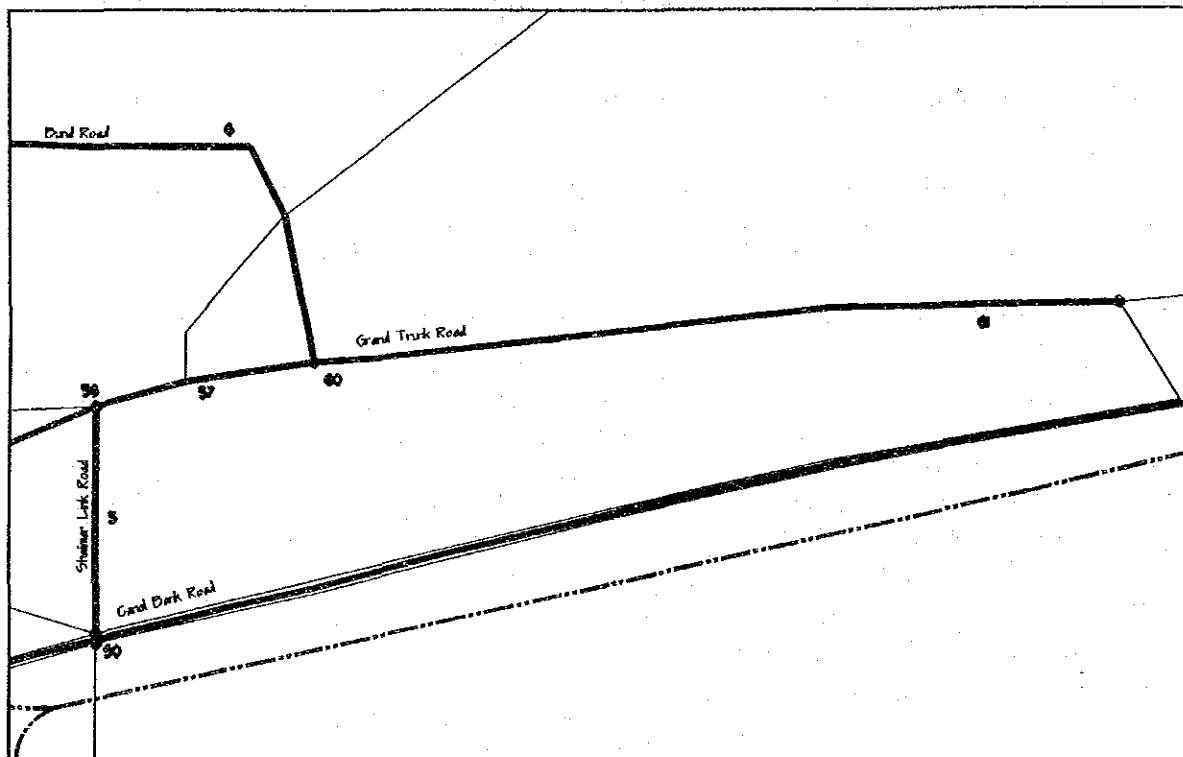


Figure 6

5. Shalimar Link Road -- SDP (PC-I June 1988)

This road is a heavily used arterial which connects G.T. Road and Canal Bank Road. It is wide, but in poor condition. It is a primary route for city transit buses, and has a high demand for parking along its length. The median is in bad condition as are the intersections with the major roads on both ends. Plans call for median repair, geometric improvements to limit access, and rationalization of on street parking.

6. Bund Road (North) -- SDP (PC-I June 1988)

This scheme is to pave the long section of Bund Road from the Ravi Bridge to G.T. Road. Specifics are not known at this time.

50. Shalimar Link Road - Canal Bank Road -- PUDP

A complex intersection where Shalimar Link and Tufail Road, (a major north-south corridor which has heavy truck traffic) meet with Canal Bank Road (an important east-west distributor) and the Pakistan Rail link going east to the Indian border. Canal Bank Road at this point functions as two parallel 2-lane single carriageway rather than as a 2-lane dual carriageway. The proposed design for this intersection is a grade-separated interchange where the north-south road will fly over the Canal Bank and the railroad. Contract documents complete.

56. G.T. Road - Shalimar Link Road -- PUDP

Provision of a central island and channelization. Project proposed but not scheduled for design or implementation.

57. G.T. Road -- PUDP

Provision of median, edge definition and parking areas as required from Shalimar Link Road junction for 2.2 km to east. Including minor junctions and accesses. Project proposed but not scheduled for design or implementation.

60. Junction of G.T. Road and Northern Bund Link Road

Provision of channelization islands. Project awaiting funding.

61. G.T. Road

Provision of lane markings and edge definition (rural), east of junction with northern Bund to Batapur. Project awaiting funding.

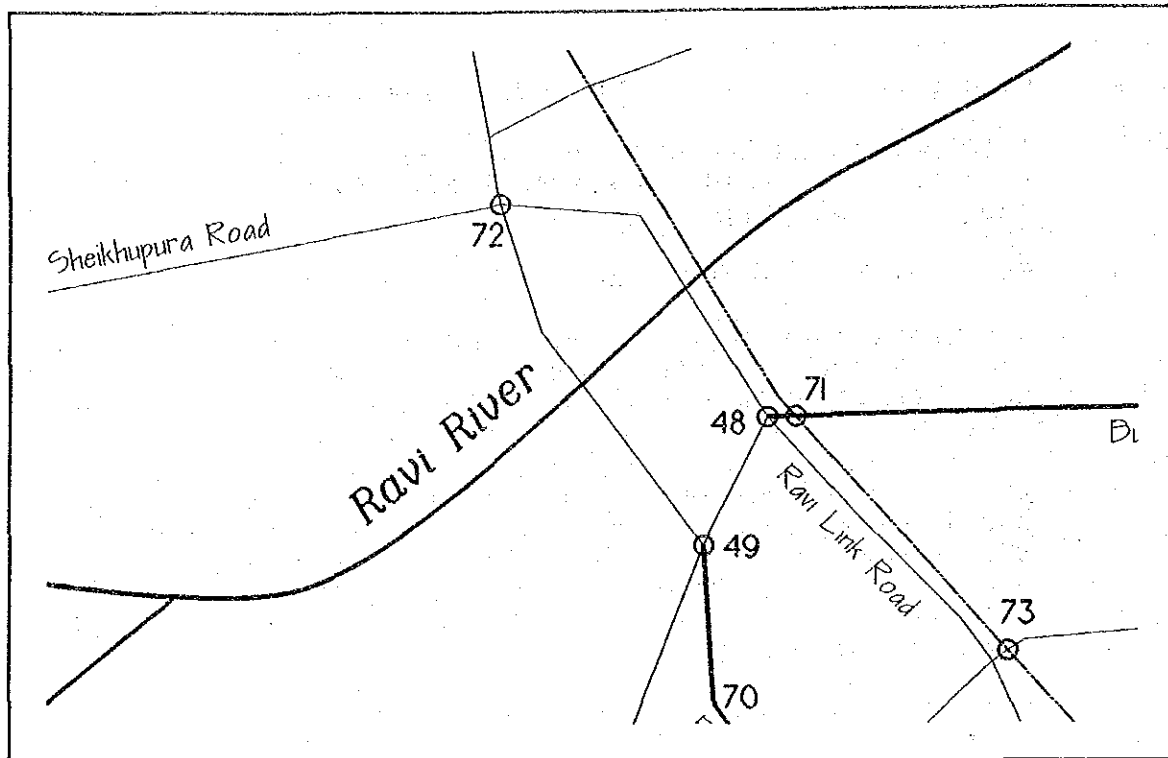


Figure 7

48. Bund Road - Ravi Link Road -- PUDP

Dangerous and ill-defined intersection with heavy pedestrian and animal drawn traffic. Work will include edge definition, channelization of traffic flows, provision of an area as a bus terminal, a mini-bus terminal, pedestrian refuges, and a pedestrian concourse; installation of street lighting, drainage, and signalization. Contract documents complete.

49. Bund Road - Ravi Road -- PUDP

Although this intersection performs adequately at present, there is a need for separation of traffic by mode to protect pedestrians and cyclists. Project to include pedestrian refuges, sidewalks, channelization of traffic, improvement of existing signal system, addition of bus bays; removal of encroachment, and rationalization of parking scheme. Project deleted from PUDP.

70. Ravi Road

Provision of central median, edge definition, parking, and service areas to adjacent markets, segregated lanes from Chota Ravi Bridge to Bund road (1.8 km) Project completed.

71. Level crossing on Northern Bund Road
Improvements to gate width, road surface within crossing and gate mechanism. Project recommended, awaiting design and funding.
72. Junction of G.T. Road and Sheikhupura Road (Shahdara)
Improvements to existing channelization and central island, and provision of facilities for buses. Project awaiting funding.
73. Level crossing at Data Nagar (Badami Bagh)
Improvements to gate width, road surface within crossing, approach gradient and width, and gate mechanism. Project recommended, awaiting design and funding.

Projects which are not shown on any of the preceding maps are listed below.

7. New traffic signals needed immediately and are to be placed at the following intersections: -- SDP (PC-I June 1988)
- Daroghawala - G.T. Road
 - New Muslim Town Canal Bridge
 - Garden Town - Mughalpura Canal Bridge Crossing (PUDP project)
 - Davis Road - Shahrah-e-Quaid-e-Azam (PUDP project)
 - Dharam Pura Cavalry Ground Road
 - Dubai Chowk - Allama Iqbal Town
 - Hall Road - McLeod Road
 - Nakhuda Chowk
 - Canal Bank Road - Shahrah-e-Quaid-e-Azam (PUDP project)
58. New and Improvement of signals along PUDP project roads -- PUDP
- A substantial number of roads are scheduled to receive a series of signals. These roads are:
- Ferozepur Road
 - Jail Road
 - Canal Bank Road
 - Lower Mall Road
 - Ravi Road
59. Other selected intersections where signals will be installed are: -- PUDP

- Grand Trunk - Mughapura
- Grand Trunk - Shalimar Link
- Allama Iqbal Town Main Boulevard - Wahdat Road
- Chauburji Chowk
- New Garden Town Road - "Model Town East-West Collector"

74. Faiz Bagh / Sultanpura area

A number of minor small scale improvements to selected routes to enable small minibuses to operate. Exact details to be determined on-site, but encompassing local widening of pinch-points, removal of encroachment, repair of surfacing, levelling of man hole covers, etc. Project awaiting funding.

75. Road signs

Provision of basic road signs - No Entry, Stop, Keep Left - to a consistent and comprehensive program throughout the strategic and subsequently secondary road network.

76. Street lighting

Provision of street lighting to specified standards throughout the strategic road network (to be installed and maintained by LDA).

Concentrate initially on schemes included within the high priority projects and traffic improvement program.

77. Improvements to traffic signals

Re-phasing, relocating, and supplementing existing traffic signal installations to be retained. Surplus equipment from other locations to be reused. Anomalies in existing phasing and light sequences to be removed.

78. Provision of pedestrian refuges / islands at locations throughout the urban area where pedestrian concentrations and traffic volumes indicate.

79. Provision of road markings to consistent standards initially throughout the strategic road network, and subsequently to the secondary road network.

80. Definition of bus stopping places throughout the urban area

Provision of necessary bus bays, road marking, stops, shelters, and waiting areas.

84. Crown Adda Junction

Provision of channelization, revised central island, segregation of animal-drawn traffic, and bus bays.

87. The Mall: -- PUDP

Provision of pedestrian crossing facilities and refuges at various points including the Lahore Zoo, Assembly Chambers, Regal Crossing, Hall Road (High Court, Bank Square, Anarkali, Lahore Museum.) Projects awaiting funding.

88. Establishment of controlled parking areas at Bank Square Nila Gumbad, Dhani Ram Road, and Katcheri Road

Definitions of areas and letting of concessions; introduction of one-way traffic. Project awaiting funding.

89. New Anarkali

Control of vehicular access at defined hours of day to specified vehicle types (Katcheri Road - Circular Road). Project awaiting funding.

90. Nabha Road / Edward Road junction (AG office)

Provision of channelization and redesign of existing traffic signal layout; widening of sidewalks and provision of bus bays and pedestrian crossing facilities. Project awaiting funding.

91. Provision of facilities for cyclists on Bank Road / Katcheri Road / Changar Road from Lower Mall (MAO College) to Circular Road (Mori Gate); and on the Mall from Assembly Chambers to Bank Square / Nila Gumbad (total 3.8 km). Project awaiting funding.

APPENDICIES FOR CHAPTER 4

Appendix Table 4.2.1 Bus Trips and Capacity... Private bus

A Route	B LENGTH km	C Regist'd (perm'd)	D CUR'T STREN'	E Normal Capa/Veh	F Trav Minu.	K ONEWAY TRIPS	L ONEWAY SEATS
3 a	12.8	48	38	50	38	300	15000
9 a	8.0	11	9	50	24	110	5500
9 b	11.2	32	26	50	34	229	11450
12	24.0	3	2	50	72	10	500
14	38.4	8	6	50	115	17	850
17	16.0	29	23	50	48	145	7250
17 a	19.2	7	6	50	58	29	1450
19 a	12.8	7	6	50	38	44	2200
33	52.8	4	3	50	158	6	300
9 c	9.6	20	16	50	29	167	8350
32	20.8	28	22	50	62	108	5400
32 a	20.0	24	19	50	60	96	4800
35	30.0	20	16	50	90	107	5350
Total							
12	275.60	241	192.80		826.80	1368	68400
			0.80		V=20		

Appendix Table 4.2.2 Bus Trips and Capacity... PRTC Bus

A Route	B LENGTH km	C Regist'd (perm'd)	D CUR'T STREN'	E Normal Capa/Veh	F Trav Minu.	K ONEWAY TRIPS	L ONEWAY SEATS
1	18.0	6	5	70	54	27	1890
5	20.4	4	3	70	61	16	1120
6	28.0	10	8	70	84	29	2030
7	11.0	10	8	70	33	73	5110
8	40.0	8	6	70	120	16	1120
19	19.0	8	6	70	57	34	2380
23	27.0	4	3	70	81	12	840
24	22.0	4	3	70	66	15	1050
53	16.6	4	3	70	50	19	1330
56	21.2	12	10	70	64	45	3150
57	22.6	8	6	70	68	28	1960
112	20.0	9	7	70	60	36	2520
114	18.1	9	7	70	54	40	2800
115	22.0	8	3	70	66	14	980
151	28.0	2	1	70	84	4	280
152	20.0	8	3	70	60	15	1050
155	19.2	8	6	70	58	33	2310
212	27.0	5	4	70	81	15	1050
213	27.0	8	6	70	81	24	1680
216	27.0	5	4	70	81	15	1050
218	23.0	4	3	70	69	14	980
50	18.0	10	8	70	54	44	3080
253	22.0	8	6	70	66	29	2030
254	26.0	2	2	70	78	6	420
255	28.0	4	3	70	84	11	770
263	23.0	4	3	70	69	14	980
311	10.0	7	6	70	30	56	3920
312	45.0	8	6	70	135	14	980
313	61.0	12	10	70	183	16	1120
314	42.0	15	12	70	126	28	1960
316	23.0	8	6	70	69	28	1960
Total							
33.	775.1	222	170		2325	770	53900
			0.80		V=20		

Appendix Table 4.2.3 Bus Trips and Capacity... Mini Bus

A	B	C	D	E	F	K	L	
Route	Length km	Regist'd (perm'd)	Existing Veh'les	Normal Capa/Veh	Owy Trav time Min.	ONEWAY TRIPS	ONEWAY SEATS	
1	22.0	112	90	20	66	300	6000	
2	17.5	48	38	20	53	219	4380	
3	9.2	56	45	20	28	300	6000	
3 a	12.2	42	34	20	37	275	5500	
3 b	4.0	6	4	20	12	120	2400	
4	20.0	94	75	20	60	300	6000	
5	28.0	94	75	20	84	269	5380	
7	9.5	56	45	20	29	300	6000	
8	9.9	68	54	20	30	300	6000	
9	20.0	159	127	20	60	300	6000	
9 a	8.0	36	29	20	24	300	6000	
	25.0	6	4	20	75	19	380	
9 c	19.0	27	22	20	57	114	2280	
10	17.0	63	50	20	51	296	5920	
11	16.0	27	22	20	48	135	2700	
12	24.0	54	43	20	72	180	3600	
10 a	6.0	6	4.80	20	18	80	1600	
10b	7.0	6	4.80	20	21	69	1380	
13	16.0	79	63	20	48	300	6000	
14	26.0	116	93	20	78	300	6000	
15	17.0	35	28	20	51	165	3300	
16 b	10.0	14	11	20	30	112	2240	
18	19.4	24	19	20	58	99	1980	
19	18.0	22	18	20	54	98	1960	
19 a	24.0	4	3	20	72	13	260	
20	16.0	90	72	20	48	300	6000	
21	12.0	10	8	20	36	67	1340	
23	10.0	4	3	20	30	32	640	
24	17.0	56	45	20	51	264	5280	
25	9.0	72	58	20	27	300	6000	
27	22.0	36	29	20	66	131	2620	
28	11.0	18	14	20	33	131	2620	
30	10.1	3	2	20	30	24	480	
31	19.0	14	11	20	57	59	1180	
32	22.0	109	87	20	66	300	6000	
32 a	14.0	21	17	20	42	120	2400	
32 b	16.0	11	9	20	48	55	1100	
33	26.0	58	46	20	78	178	3560	
34	26.0	129	103	20	78	300	6000	
35	11.0	23	18	20	33	167	3340	
38	19.2	34	27	20	58	142	2840	
39	16.0	6	5	20	48	30	600	
40	16.0	5	4	20	48	25	500	
41	9.1	6	5	20	27	53	1060	
42	10.8	12	10	20	32	89	1780	
43	17.0	116	93	20	51	300	6000	
44	20.0	32	26	20	60	128	2560	
46	16.0	6	5	20	48	30	600	
47	27.0	79	63	20	81	234	4680	
48	50.0	21	17	20	150	34	680	
34b	26.0	110	99	20	78	5000	250	
Total	50.00	846.9	2225	1780		2541	8456	169120
			0.80		V=20			

Appendix Table 4.2.4 Bus Trips and Capacity... Suzuki Wagon

A Route	B Length km	C Regist'd (perm'd)	D Existing Veh'les	E Normal Capa/Veh	F Owy Trav time Min.	K ONEWAY TRIPS	L ONEWAY SEATS
60	13.7	122	73	10	55	300	3000
64	9.5	36	22	10	29	227	2270
66	10.8	55	33	10	32	300	3000
67	10.0	7	4	10	30	42	420
Total	44.00	220	132		146	869	8690
			0.60		V=20		

Source: RTA Lahore and PRTC, 1990

Notes:

- D. Buses in operation are determined to be 80 % or 60 % of the permitted(registered).
- E. Capacity per vehicle includes some standing persons.
- K. Daily operation hour is 15 hours including queuing, waiting, and resting.
The net operation hour is assumed at 10 hours for all types of buses.
Peak hour trips have a 3 minute interval and others have a five minute interval in the busy routes (the maximum trips are 300 per direction).

Appendix Table 4.5.1 Passenger Traffic, Lahore Airport, 1981-1987 (Persons)

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
International							
Embarked	31805	32013	32359	42240	61072	58936	60692
Disembarked	17980	19720	24326	40348	54162	49340	47554
Total	49785	57733	56685	82588	115234	108276	108246
Domestic							
Embarked	406219	394493	412571	454883	504437	557980	610118
Disembarked	407671	384742	420222	470038	516370	580474	639815
Total	813890	779235	832793	924921	1020807	1138454	1249933
Total							
Embarked	438024	426506	444930	497123	565509	616916	670810
Disembarked	425651	404462	444548	510386	570532	629814	687369
Total	863675	830968	889478	1007509	1136041	1246730	1358179

Excluding transit passengers

Source : Civil Aviation Statistics of Pakistan (Civil Aviation Authority, 1987, 1988)

Appendix Table 4.5.2 Cargo Handled at Lahore Airport, 1981-1987 (in tons)

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87
International							
Loaded	971 (3)	1021 (11)	334 (3)	468 (6)	812 (7)	486 (5)	344 (8)
Unloaded	451 (12)	649 (8)	902 (65)	1097 (14)	1065 (16)	965 (14)	813 (12)
Total	1422 (15)	1670 (19)	1236 (67)	1565 (20)	1875 (23)	1451 (19)	1157 (20)
Domestic							
Loaded	4242 (290)	5114 (295)	5696 (294)	5944 (321)	7579 (329)	9351 (288)	10533 (289)
Unloaded	5148 (359)	5793 (417)	6010 (432)	6142 (436)	7732 (440)	7231 (390)	6550 (406)
Total	9390 (649)	10907 (712)	11706 (726)	12086 (758)	15311 (769)	16582 (678)	17083 (685)
Total							
Loaded	5213 (293)	6135 (306)	6030 (297)	6412 (327)	8391 (336)	9837 (293)	10877 (297)
Unloaded	5599 (371)	6442 (425)	6912 (497)	7239 (450)	8797 (456)	8196 (404)	7363 (418)
Total	11382 (664)	12007 (731)	12942 (794)	13651 (778)	17188 (792)	18033 (697)	18240 (705)

Source : Civil Aviation Statistics of Pakistan (Civil Aviation Authority, 1987, 1988)

Remarks : Upper figures for cargo and lower figures in () for mail.

APPENDIX Table 4.5.3 (1) PR Passenger Tickets Sold at Stations

Station		85/86	86/87	87/88	88/89	89/90	85-89
<u>Main Line</u>							
Lahore	p	4,284,199	4,316,366	4,515,277	4,912,009	5,643,712	1.32
	m	1,047,400	1,021,200	1,131,250	1,021,200	1,348,300	1.29
Cantt	p	229,619	208,578	205,319	227,044	211,560	0.92
	m	126,050	113,850	113,900	114,250	131,800	1.05
Walton	p	130,929	116,261	107,378	122,672	125,796	0.96
	m	7,050	7,800	7,850	10,300	10,700	1.52
Kot Lakhpat	p	495,103	472,206	485,533	510,645	531,694	1.07
	m	415,850	278,700	281,800	341,250	336,400	0.81
Kana Kacha	p	107,978	67,489	61,797	66,767	69,657	0.65
	m	37,300	39,400	41,000	32,800	39,400	1.06
Haloki	p	163,014	148,799	129,741	119,309	108,674	0.67
	m	133,150	131,600	132,100	176,150	180,600	1.36
Jia Bogga	p	146,911	95,073	87,569	74,643	65,430	0.45
	m	124,250	120,250	123,300	39,450	142,600	1.15
Karial	P	28,662	86,006	91,561	92,009	92,647	3.23
	m	70,800	82,331	92,547	96,427	106,150	1.50
Raiwind	p	605,743	515,189	548,898	570,593	683,843	1.13
	m	100,450	86,100	87,250	208,700	223,400	2.22
Total	p	6,192,158	6,025,967	6,233,073	6,695,691	7,533,013	1.22
	m	2,062,300	1,881,231	2,010,997	2,040,527	2,519,350	1.22
<u>Main line</u>							
Badami Bagh	p	262,412	250,597	214,915	183,459	215,649	0.82
	m	14,400	19,500	18,450	6,100	5,700	0.40
Shadhara Bagh	p	364,771	315,841	298,694	295,300	338,699	0.93
	m	114,700	85,650	85,700	72,000	88,800	0.77
Kala S kaku	p	3,657	1,892	1,744	2,686	3,103	0.85
	m	-	-	-	-	1,200	-
Koh-i-Noor	p	426	463	555	1,061	837	1.96
	m	24,600	3,000	3,000	4,200	3,400	0.14
Muriduke	p	8,958	7,853	7,037	9,651	9,515	1.06
	m	19,300	8,700	8,550	8,700	14,400	0.75
Total	p	640,224	576,646	522,945	492,157	567,803	0.89
	m	173,000	116,850	115,700	91,000	113,500	0.66
<u>Narowal Line</u>							
Kot Mulchand	p	34,691	40,971	36,867	26,572	24,042	0.69
	m	6,350	6,250	6,300	6,000	12,100	1.91
Bubak wal	p	18,462	19,558	15,835	21,912	10,938	0.59
	m	12,450	8,450	8,500	-	7,200	0.58
Sri Ram Pura	p	55,480	38,464	58,685	51,633	52,051	0.94
	m	34,150	40,150	40,200	65,150	63,600	1.86
Total	p	108,633	98,993	111,387	100,117	87,031	0.80
	m	52,950	54,850	55,000	71,150	82,900	1.57

Station		85/86	86/87	87/88	88/89	89/90	85-89	
<u>Wagah line</u>								
Maghalpura	p	61,773	41,364	29,389	21,470	12,168	0.20	
	m	4,400	2,150	2,200	150	2,550	0.58	
Muslimabad	p	55,573	39,917	33,332	27,268	19,890	0.36	
	m	10,950	7,800	7,500	8,450	5,100	0.47	
Harbans Pura	p	41,850	29,788	20,645	14,940	8,101	0.19	
	m	6,700	4,100	4,150	1,100	600	0.09	
Gullar pir	p	51,294	35,193	13,586	14,215	9,645	0.19	
	m	14,400	5,350	5,000	1,500	600	0.04	
Jallo Park	p	It is not a looking _____. The tickets are sold from						
	m	Jallo station.						
Tagkipur	p	48,140	48,445	50,883	44,883	28,493	0.59	
	m	15,550	5,800	5,500	5,450	5,100	0.33	
Jallo	p	78,152	41,660	26,009	21,947	11,953	0.15	
	m	43,150	12,500	11,800	7,300	5,500	0.13	
Wagah	p	18,641	16,962	15,058	11,503	7,709	0.41	
	m	3,350	1,150	1,150	2,250	3,300	0.99	
[India connection]								
Outward via wagah		183,559	177,045	233,685	261,144	210,076	1.14	
Inward via wagah		129,630	34,599	24,809	40,417	73,806	0.57	
Total	p	538,982	430,374	422,587	417,370	308,035	0.57	
	m	228,130	73,449	62,109	66,617	96,556	0.42	

Station		85/86	86/87	87/88	88/89	89/90	85-89
<u>West Line</u>							
Missan Kalar	p	111,118	77,590	75,460	63,609	52,140	0.47
	m	55,200	33,150	34,200	42,800	43,900	0.80
Shakirabad	p	9,861	21,380	2,840	24,457	6,762	0.69
	m	-	7,000	-	9,600	6,200	-
Qila S. Shah	p	41,674	28,119	20,689	17,262	16,075	0.39
	m	10,100	-	-	17,200	13,750	1.36
Chichoki Mallian	p	73,720	54,174	55,461	73,099	50,259	0.68
	m	10,200	9,650	9,700	16,200	15,600	1.53
Sheikhpura	p	440,104	697,340	707,778	402,103	426,876	0.97
	m	170,000	155,700	161,750	265,400	324,300	1.91
Total	p	676,477	878,603	862,228	580,530	552,112	0.82
	m	245,500	205,500	205,650	351,200	403,750	1.64
G. TOTAL	p	8,156,474	8,010,583	7,289,992	8,285,865	8,495,882	1.04
	m	2,761,880	2,331,880	2,449,456	2,620,494	3,216,056	1.16

Remarks : International passengers are excluded. At Lahore station 20% of the normal ticket passengers move in LMA. An average daily passengers subject for this LMA study is 18,940 including the monthly ticket users. The number of free riders is unknown.

Note : p : Passengers buying an oneway ticket.
m : monthly ticket users converted to those per day.

Appendix Table 4.5.3 (2) PR Cargo Handled at Major Stations

Station		Cargo Loaded and unloaded					(tonnes)	
		85/86	86/87	87/88	88/89	89/90	85-89	
Lahore	Out	47,189	50,330	28,804	22,981	22,965	0.49	
	In	641,137	782,621	869,450	747,955	538,140	0.84	
Cantonment	Out	5,701	6,990	5,298	8,279	6,826	1.20	
	In	27,918	94,458	93,561	32,762	25,433	0.91	
Badami Bagh	Out	1,220	944	1,361	454	322	0.26	
	In	274,787	303,424	348,323	288,652	285,002	1.04	
Total	Out	54,110	58,264	35,463	31,714	30,113	0.56	
	In	943,842	1,180,503	1,311,334	1,069,369	848,575	0.90	

Source : Marketing Dept. Pakistan Railways

Appendix Table 4.6.1 Bus Fares since July 1990

A. Buses plying on urban routes:-

i) Upto 5 K.M.	Rs.1.00 Per passenger.
ii) 5 to 8 K.M.	Rs.2.00 " "
iii) 8 to 12 K.M.	Rs.3.00 " "
iv) Above 12 K.M.	Rs.5.00 " "
v) Students.	Rs.0.25 " "

B. Mini-buses plying on urban routes:-

i) Upto 3 K.M.	Rs.1.00 Per passenger.
ii) 3 to 5 K.M.	Rs.1.50 " "
iii) 5 to 8 K.M.	Rs.2.00 " "
iv) 8 to 11 K.M.	Rs.2.50 " "
v) 11 to 14 K.M.	Rs.3.00 " "
vi) Above 14 K.M.	Rs.3.50 " "

C. Suzuki vans plying on urban routes:-

i) Upto 5 K.M.	Rs.1.50 Per passenger.
ii) 5 to 10 K.M.	Rs.2.00 " "
iii) 10 to 15 K.M.	Rs.2.50 " "
iv) Above 15 K.M.	Rs.3.00 " "

Source : Punjab Transport Authority, November 1990

Appendix Table 4.6.7 Bus Passenger Interview Sheet

BUS PASSENGER INTERVIEW

JICA-TEPA-LDA Tel: 211697 1 2 3 4 5 6 7 8 9 10

Location: _____ Direction: _____ Your name: _____ No. _____

Time: AM = 1 PM = 2 Time	2. Where are you living LMC & La Cantt. = 1 Lahore Metropol. Area = 2 Outside = 3	3. Origin of the trip No. _____ Street _____ Area/Mohallah _____ Division/District _____	4. For what purpose 1. To Work 2. To School 3. To Home 4. Shopping 5. Social 6. Eating 7. Mosque/Church 8. Recreation/Other Private 9. On Business	5. Modes to come here 1. Walk 2. Bicycle 3. M. Cycle/Scooter 4. Tonga 5. Taxi/Rickshaw 6. Private (Car/Jeep/Van/Pick-up/Small Truck) 7. Institutional Bus 8. Public (Suzuki Wagon/Mini-bus/Bus) 9. Railway 10. Others	6. Travel in Minu. from the Origin to here Waiting time _____ Street _____ Area/Mohallah _____ Division/District _____	7. Destination No. _____ Street _____ Area/Mohallah _____ Division/District _____
8. Routes No. you ride, if you transfer, what will be the following route No. PRTC/GTS _____ Private Bus _____ Mini Bus _____ Suzuki (Wagon) _____	9. How many minutes from here _____ Rs. _____	10. How much do you pay from here _____ Rs. _____	11. OCCUPATION 1. Professional/Technical 2. Administrative/Managerial 3. Clerical 4. Sales 5. Service 6. Agricultural, etc. 7. Production 8. Transport/Communication 9. Armed Forces 10. Student (Primary, etc.) 11. Student (Others) 12. House wife 13. Not classifiable 14. Jobless/others	12. Your age _____ 13. Your monthly income _____ Rs. _____	14. Are you satisfied with the current service by Bus, Mini-Bus, etc. No = 1 (Use Table B) --> Yes = 2 Others = 3	TABLE (B) REASONS 1. Slow 2. High fare 3. Less freq. 4. Irregular 5. Uncomfortable and crowded 6. Others
15. Do you or does your family own motor vehicles M. Cycle = 1 Car/Jeep = 2 Others = 3 No Vehicles = 9	16. If motor vehicles owned, then reason not using them today 1. Other Family member is using 2. The vehicle is out of order 3. Roads are too congested 4. Difficult for parking 5. Do not feel economical 6. Others	17. Bus & mini-bus priority lanes saving travel time by 10-15%. HOW MUCH DO YOU PAY ADDITIONALLY? Rs. _____ No use.	18. Express and AC bus & mini-bus saving travel time by 20-30%. HOW MUCH DO YOU PAY ADDITIONALLY? Rs. _____ No use.	19. A new rail transit with frequent service and cut travel time by half. HOW MUCH DO YOU PAY ADDITIONALLY? Rs. _____ No use.		

Appendices for Chapter 6

APP. 6.1 Zone Code System, 88 / 22 zone

INNER LMA			OUTER LMA		
88(57+27+4)	22(12+6+4)	HIS Code	88(57+27+4)	22(12+6+4)	HIS Code
1	1	10101	58	13	11301
2	1	10102	59	13	11302
3	1	10103	60	13	11303
4	1	10104	61	13	11304
5	1	10105	62	13	11305
6	1	10106	63	13	11306
7	1	10107	64	13	11307
8	2	10201	65	14	11401
9	2	10202	66	14	11402
10	2	10203	67	14	11403
11	2	10204	68	14	11404
12	2	10205	69	18	11405
13	2	10206	69	18	11405
14	2	10207	70	18	11406
15	2	10208	70	18	11406
16	3	10301	70	18	11406
17	3	10302	70	18	11406
18	3	10303	71	18	11501
19	3	10304	71	18	11501
20	3	10305	72	18	11502
21	4	10401	72	18	11502
22	4	10402	72	18	11502
23	4	10403	73	18	11503
24	4	10404	74	18	11504
25	5	10501	74	18	11504
26	5	10502	74	18	11504
27	5	10503	74	18	11504
28	5	10504	75	18	11505
29	6	10601	75	18	11505
30	6	10602	75	18	11505
31	7	10701	75	18	11505
32	7	10702	76	15	11506
33	7	10703	77	15	11507
34	7	10704	78	16	11601
35	7	10705	79	16	11602
36	8	10801	80	17	11701
37	8	10802	81	17	11702
38	9	10901	82	17	11703
39	9	10902	83	17	11704
40	9	10903	84	17	11705
41	9	10904			
42	9	10905			
43	9	10906			
44	9	10907			
45	10	11001			
46	10	11002			
47	11	11101			
48	11	11102			
49	11	11103			
50	11	11104			
51	11	11105			
52	12	11201			
53	12	11202			
54	12	11203			
55	12	11204			
56	12	11205			
57	12	11206			
			OUTSIDE LMA		
			85	19	30100, 30400
			(North)		50000, 70000
			86	20	20202, 30200
			(West)		30500
			87	21	20302, 20400
			(S. West)		30300, 30600
					30700, 40000
					60000
			88	22	20100, 20201
			(South)		20301

APP. 6.2 Future OD Table by Mode, 2010

B-ZONE OD TABLE
LAHORE 2010
BY MODE

FOR MODE 1 : Walk

DISTRICT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	TOTAL
1	223759	10967	1390	3452	8746	0	4301	1244	73	0	110	0	0	0	0	0	0	0	0	0	0	0	254042
2	10286	93889	18308	4788	15813	452	2024	525	2550	0	1400	0	0	0	0	0	0	0	0	0	0	0	149985
3	1505	21098	138126	2237	3519	10524	675	0	5489	1894	618	0	0	0	0	0	0	0	0	0	0	0	185680
4	4273	5711	2083	167717	111	0	11880	0	0	0	915	0	0	0	0	0	0	0	0	0	0	0	192691
5	8978	15901	3427	79	444382	947	335	1061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	475110
6	0	500	9957	0	1387	304978	0	0	43	269	0	0	0	0	1713	0	0	0	0	0	0	0	318847
7	5278	2369	491	10954	408	0	942197	256	15	0	1988	0	0	0	0	0	0	0	0	0	0	0	969956
8	871	293	0	0	623	0	143	486942	0	0	0	0	0	0	0	0	1308	0	0	0	0	0	500180
9	79	2955	5925	0	0	31	19	0	185564	6770	1003	2746	0	60	156	0	0	0	0	0	0	0	185398
10	0	0	2725	0	0	305	0	0	7913	199740	0	229	0	0	559	0	0	0	0	0	0	0	211471
11	56	1571	491	1051	0	0	2347	0	1268	0	547424	2760	89	0	0	0	0	0	0	0	0	0	537037
12	0	0	0	0	0	0	0	0	3731	310	2849	409115	0	302	78	0	0	0	0	0	0	0	416385
13	0	0	0	0	0	0	0	0	0	0	82	0	314745	0	0	0	0	0	0	0	0	0	314827
14	0	0	0	0	0	0	0	0	63	0	0	1032	11	204642	146	0	0	0	0	0	0	0	205894
15	0	0	0	0	0	1027	0	0	0	66	0	43	0	117	2636172	0	0	0	0	0	0	0	2637435
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	363391	0	0	0	0	1895	0	365286
17	0	0	0	0	0	0	0	1498	0	0	0	0	0	0	0	826781	0	2530	13	0	0	0	830822
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	221860	0	0	0	0	0	221860
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1450	0	0	0	0	0	1450
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	415	0	0	433
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1036	0	0	0	0	0	0	1036
22	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
TOTAL	255035	153254	182923	190278	474989	318264	963921	501525	186709	209049	556385	415925	314845	206174	2688824	364427	829557	221860	2530	438	1695	0	8988748

2010 OD Table (2)

B-ZONE OD TABLE
LAHORE 2010
BY MODE

FOR MODE 2 : Private Two Wheel

DISTRICT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	TOTAL
1	67001	19458	12169	11866	30632	5181	27738	18016	4766	2147	9562	3291	480	168	3955	280	1615	0	623	175	13	51	219237
2	20439	38299	16007	16132	44753	10109	30679	19605	7411	4311	20655	7707	1167	1118	10044	544	1065	876	172	50	23	53	251220
3	14380	18376	108154	4594	15444	24343	5313	5282	19054	5562	5180	4490	0	257	8478	106	22	0	41	340	4	161	239581
4	15911	20247	5471	70864	1802	784	50573	4784	2517	695	11841	1173	807	30	0	0	0	72	0	0	0	0	197521
5	31345	39726	13146	1130	144768	1980	3108	4771	2890	401	1794	555	137	170	0	0	31	0	73	337	2	0	246420
6	3512	11819	24912	501	2873	57419	818	737	3770	1932	481	1197	0	0	12749	0	74	482	0	0	0	66	125242
7	31768	87630	5755	45006	4383	1730	353636	14665	5979	125	22742	1610	3109	138	4260	1810	1138	181	221	0	0	0	584276
8	9557	9477	2298	2603	2928	380	6238	281134	400	0	304	127	154	126	0	0	24673	0	134	384	0	0	340937
9	5706	8633	18867	2197	3166	3555	5683	1230	77277	18991	6644	13263	133	1914	9750	0	0	0	0	96	76	87	171268
10	2228	4608	8345	759	236	1725	23	18942	55415	233	2458	2458	0	2468	24438	0	672	294	0	0	0	0	121843
11	13481	39289	8932	13533	3176	855	27471	1330	10151	465	180650	11898	939	102	8905	0	0	0	0	21	0	135	314433
12	3603	7144	4341	968	752	686	2076	546	16243	2712	8932	33729	348	1843	16109	0	0	134	0	0	32	265	150513
13	639	1301	0	717	1195	0	3428	422	101	0	1067	1111	100712	0	376	0	1023	0	0	19	0	0	112111
14	108	917	39	42	105	0	208	240	3846	4849	331	2527	113	29734	9466	0	0	0	0	0	0	108	52633
15	2128	3137	1749	178	-9	5203	2781	0	2689	9285	268	2113	128	1675	473662	0	0	2711	20	0	21	182	507961
16	473	747	0	0	0	235	0	0	0	0	0	0	0	0	0	45915	0	658	77	0	234	151	48490
17	1202	367	58	0	78	0	375	31199	56	471	0	-3	262	0	0	91149	0	34910	0	413	42	0	126553
18	74	402	0	37	0	213	68	0	138	0	139	0	0	0	4570	535	0	0	0	0	0	490	41576
19	100	195	0	27	11	10	34	181	0	0	11	0	0	0	0	0	197	0	187	9	0	0	872
20	0	19	0	28	18	0	62	48	0	0	0	0	0	0	0	0	92	0	0	0	0	0	288
21	55	65	5	16	0	10	21	201	23	0	0	0	0	0	0	156	47	0	200	10	125	21	955
22	55	57	113	16	0	69	129	0	236	0	27	231	11	96	147	289	46	394	190	62	16	0	2684
TOTAL	225865	255823	229462	171214	256112	114487	519532	384291	174351	103489	270722	137614	106500	39839	586939	47625	121845	41262	2822	1966	594	1780	3796584

2010 OD Table (3)

B-ZONE OD TABLE
LAHORE 2010
BY MODE

FOR MODE 3 : Private Car

DISTRICT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	TOTAL
1	32454	19929	18219	5299	17179	4261	13382	10259	13788	4795	3564	8853	749	243	10933	1232	10442	710	4554	3550	1466	593	185449
2	19348	84608	77615	8756	36632	12551	20260	13537	76446	24152	13829	37492	1349	2095	9726	158	2326	359	1089	2408	927	278	445241
3	20700	80860	144812	2593	10842	24725	4829	5902	70233	14361	7000	15089	443	954	13645	74	1837	684	4772	1173	1308	386	433002
4	5046	10973	3274	17880	1385	357	15494	2217	5391	637	2777	2648	804	409	0	0	209	0	477	223	148	199	71548
5	17443	33983	9383	839	47497	846	1142	2098	6603	201	1668	807	15	134	4682	0	1016	0	1288	930	219	113	139917
6	4015	12143	26387	283	1200	36067	769	1103	8392	2385	533	539	330	284	12767	134	123	47	13	70	0	251	108635
7	15641	26168	6416	14338	1707	557	106041	2848	5882	353	8026	1833	6029	82	7472	238	1150	0	796	583	1156	148	207514
8	5188	7057	2895	1125	1125	336	1454	40349	1934	282	613	172	16	42	0	0	5727	0	3480	1041	181	328	73375
9	17524	85131	65844	4409	6689	9453	5157	3640	213895	34773	15410	42867	1542	989	28696	231	2107	470	891	1719	551	441	542449
10	3555	29723	15846	248	147	2722	254	515	37004	49420	1177	2110	103	596	8930	229	128	1457	0	161	13	31	153269
11	5291	22304	9097	2727	2299	806	10318	1806	19801	2255	7971	40427	238	747	0	360	633	0	780	277	122	379	200448
12	7301	37515	14510	2330	1254	238	1655	755	41046	2108	35633	178421	79	2153	10112	439	534	250	449	69	63	830	337344
13	1243	1166	901	1013	77	229	7050	37	1836	1116	346	327	27331	31	674	92	353	49	15	26	0	244	43556
14	345	2342	606	202	70	404	187	261	1371	1200	933	1864	147	17453	2700	0	102	0	15	111	65	80	30488
15	5195	9539	3288	60	839	5153	635	98	7200	2332	70	2542	32	446	242665	0	0	2769	186	721	442	289	224561
16	581	424	628	0	3	193	731	0	142	0	0	0	0	0	0	26943	7	216	48	195	5848	506	36355
17	5920	1007	1543	16	713	86	1659	8586	946	121	426	616	382	9	1024	22	73299	69	5933	6351	87	579	109336
18	308	709	230	3	0	116	5	0	680	413	61	206	11	110	1048	77	102	11133	54	16	220	1016	16408
19	3640	3125	2506	486	1693	75	1625	1978	2091	267	703	315	216	83	55	256	3466	171	96	203	1052	166	24238
20	3458	1938	182	378	1253	284	445	1393	519	53	706	75	4	38	260	92	2145	71	83	28	143	124	13733
21	617	235	582	767	196	81	107	210	224	29	94	133	17	18	179	2904	331	911	1330	261	441	241	9368
22	626	787	393	123	99	274	231	201	310	161	336	948	44	123	684	1092	206	812	363	206	63	124	8476
TOTAL	177649	471726	405089	63875	132899	100464	193461	98393	515829	141694	173756	338214	38881	26929	362452	34573	106123	20178	26712	20322	14515	7496	3472330

2010 OD Table (4)

B-ZONE OD TABLE
LAHORE 2010
BY MODE

FOR MODE 4 : Private Total

DISTRICT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	TOTAL
1	99455	39337	30388	17165	47811	9442	41170	28275	18549	6942	13126	12144	1229	411	14888	1512	12057	710	5177	3725	1479	644	405686
2	39887	12297	93622	24888	81385	33142	59339	33142	83857	28463	34484	45199	2516	3213	19770	702	3392	1235	1261	2458	950	331	697461
3	35080	99236	252986	7187	26286	49068	10142	11134	89287	19923	12180	19539	443	1211	28123	180	1659	684	4813	1513	1312	547	672533
4	21957	31220	8745	38744	3187	1141	68067	6951	7908	1332	14618	3821	1611	439	0	0	209	72	477	223	148	199	235069
5	48788	73709	22539	1969	192265	2826	4250	6669	9493	602	3452	1362	152	304	4682	0	1047	0	1361	1317	227	113	377337
6	9627	23962	51299	784	3873	93486	1587	1840	12762	4517	1014	1736	330	284	26516	134	197	529	13	70	0	317	233877
7	47409	63798	12171	59344	6090	2287	459677	17513	11861	478	30768	3693	9138	220	11732	238	2288	181	1917	583	1156	148	741730
8	15745	16594	5103	3728	4053	1216	7722	322033	2364	292	917	299	170	168	0	0	30400	0	3614	1425	181	328	416912
9	23250	93764	84711	6506	9855	13008	9940	4870	291172	48764	22034	4566	103	3064	33668	229	800	470	891	1815	627	528	713717
10	5783	34331	24192	1007	383	4447	277	515	53946	105835	1410	4566	103	3064	33668	229	800	470	891	1815	627	528	713717
11	18772	55593	17129	16260	5475	1661	37789	3138	29952	2730	260421	52323	1177	849	8905	360	633	0	780	298	122	514	514861
12	10934	44639	18851	3298	2006	974	3731	1301	57289	4820	44568	282150	427	3995	28221	439	534	434	449	69	95	1145	438337
13	1882	2467	901	1730	1272	229	10473	459	1497	1116	1413	1438	128043	31	1050	92	1376	49	15	45	0	244	155757
14	453	3259	645	244	175	404	395	501	5217	5049	1294	4391	260	47187	12186	0	102	0	15	111	65	188	82141
15	7313	12676	5047	238	830	10356	3416	98	9889	11677	338	4655	160	2121	716357	0	0	5480	206	721	483	431	792522
16	1034	1171	628	0	3	428	731	0	142	0	0	0	0	0	0	72858	7	874	125	195	692	757	85055
17	7122	1374	1603	16	791	86	2034	39785	1002	592	426	613	644	9	1024	22	164448	59	6317	6764	129	579	235949
18	382	1111	230	40	0	329	73	0	660	551	61	345	11	0	5618	612	102	46043	54	16	220	1506	57994
19	3740	3230	2506	513	1704	85	1659	2159	2091	287	714	315	216	83	55	255	3683	171	283	212	1052	166	25160
20	3458	2017	182	406	1272	284	508	1441	519	53	706	75	4	38	260	92	2237	71	83	28	143	124	14001
21	672	300	587	783	196	91	128	411	247	29	94	133	17	18	179	3060	438	911	1330	271	566	282	10923
22	681	844	506	139	99	343	360	201	546	151	413	1179	455	219	1031	1381	252	1706	553	268	79	124	11160
TOTAL	403514	727549	634551	235089	389011	214951	712993	482664	690160	245133	444478	476128	148331	68768	949411	82398	227968	61440	29334	22288	15109	9276	7238894

2010 OD Table (5)

B-ZONE OD TABLE
LAHORE 2010
BY MODE

FOR MODE 5 : Public

DISTRICT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	TOTAL
1	35483	16038	10056	8409	19132	11142	23323	31203	4885	5797	12486	5051	1282	3024	34895	3794	27433	3069	15453	20864	5479	3127	302435
2	16618	16708	20483	14005	44261	21690	32456	25696	11947	14214	17674	17462	5295	5857	67262	4687	15387	8940	11196	15912	5248	3396	334374
3	11299	20609	32892	5633	9760	27174	8347	13749	14328	18653	7272	9058	1079	3587	41333	1914	2401	6731	8795	13386	5803	3545	262338
4	9989	18076	6095	24826	809	3284	25296	4769	3901	1518	4762	2263	1729	59	0	0	3763	2129	3017	4371	528	607	119791
5	21167	49974	8628	677	29104	3407	2153	6122	4476	378	1417	2164	41	679	651	506	3541	173	8678	7045	2698	853	148532
6	11628	20710	26720	2159	3603	64017	1211	3074	3595	4318	760	866	111	423	29597	1119	555	7016	1263	2201	892	999	188763
7	27037	37465	8166	24315	3599	1228	183814	8232	5030	769	14858	2375	15029	466	364	1386	4876	919	7959	6705	3678	1543	359313
8	13148	12028	6860	1472	3057	1262	4186	55797	843	124	673	1048	742	420	335	83	32571	88	8337	17089	1552	1737	168452
9	6018	14059	13978	2391	3969	3751	3966	1189	17000	16932	3463	15815	24	5093	49159	2094	1838	1677	4724	5703	1788	1926	177157
10	6268	17474	15942	1169	445	4586	775	434	16404	25157	1139	2521	575	351	16367	344	202	1051	261	2689	1586	226	115516
11	19449	24773	7485	6050	2216	1140	17450	2488	4583	928	106895	20416	3838	1720	11341	1948	2762	0	4449	5013	1940	913	247447
12	5099	16528	6504	1666	2039	1087	1359	1123	14800	2710	14694	63606	454	15612	18307	521	2875	327	3715	1675	311	6682	134184
13	1750	4649	1129	3331	230	170	14975	1973	365	558	6574	810	3237	703	2254	0	322	0	277	1721	48	230	74896
14	3929	5233	2709	876	450	133	582	493	5412	495	3137	13967	515	15741	12243	0	2485	1199	1038	358	390	192	71287
15	20670	22156	7153	0	187	13885	307	898	15771	2992	1222	6478	99	3556	241362	3340	9637	19391	1799	1326	2177	1939	378355
16	3085	4877	3056	0	1277	965	476	158	4666	790	856	321	72	0	14993	51780	0	4086	56	44	15838	870	108257
17	16367	9331	1846	1507	2511	582	2191	45596	1333	101	704	1937	408	730	4215	94	120032	1362	24143	13981	407	425	243813
18	2796	6080	3999	642	166	4006	465	345	1112	1154	430	274	0	1680	45971	3118	1308	41145	65	863	3145	5450	124165
19	17088	9886	8622	2024	4890	504	4617	16873	2746	1659	3893	1936	1640	582	5059	538	18506	1154	1426	3094	7171	626	114324
20	19863	11126	5027	2049	4928	616	7332	19673	3007	560	2024	979	1088	663	4677	85	6135	732	3210	1419	1166	986	97245
21	2767	988	2663	491	709	960	1090	1855	768	432	1090	753	23	85	13652	8847	720	2146	2446	1035	1335	937	46023
22	3572	4735	3868	685	1451	817	1531	604	1840	861	1876	5750	32	633	286	5956	65	6237	557	2287	561	1741	46105
TOTAL	280093	325403	205301	105177	138793	166356	338402	242294	138813	96300	207589	175730	65403	61650	614393	92154	256994	109572	113874	128791	62041	38350	3975073

Appendices for Chapter 7

Traffic Assignments

The OD tables to be assigned to a network were prepared for three transport mode types, i.e., 2-wheel vehicle, 4-wheel vehicle and public transportation passenger. The public mode demand can consequently be split into bus and rail transit system after assignment work using the model of modal choice, as shown in Appendix 7.1.

The assignment of the OD traffic volume of each mode of the transportation networks is done by the multi-step shortest path method. This method distributes the OD traffic volume part-by-part in several times considering the relationship among the capacity, traffic volume, and speed in each link (section) of traffic networks. In this study, assignment was made five times, and the OD traffic volume split ratio was made as follows: 30%, 20%, 20% and 10%. For 2-wheel vehicle and public transport, however, 50% each was distributed in the first and the second assignment.

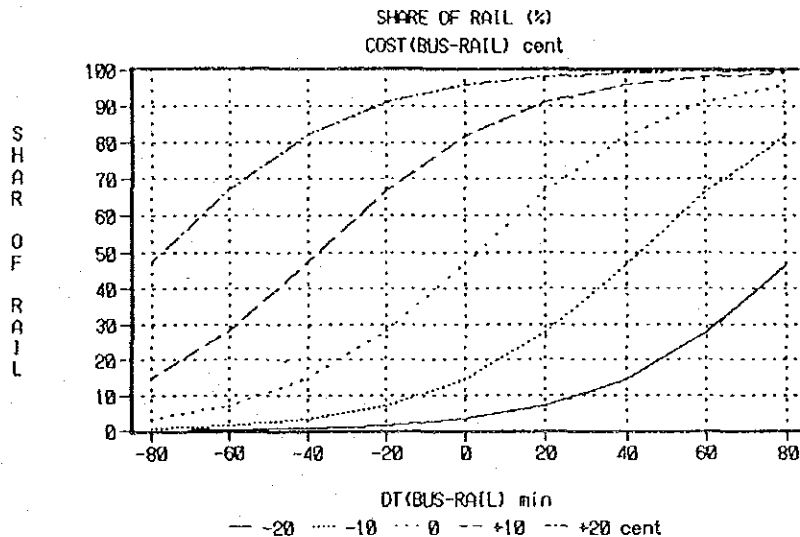
As the necessary input for making the assignment, each road link is identified by nodes at both ends (intersections), length and Q-V curve, etc. Link data are shown in Appendix 7.4 and Appendix 7.5. The Q-V curve shows the relationship between the traffic volume (Q) and the speed (V) of vehicle under such a traffic volume. Appendix 7.2 represents a general Q-V curve, while Appendix 7.3 shows types of Q-V curves.

The result of traffic assignment is shown in Appendix 7.6.

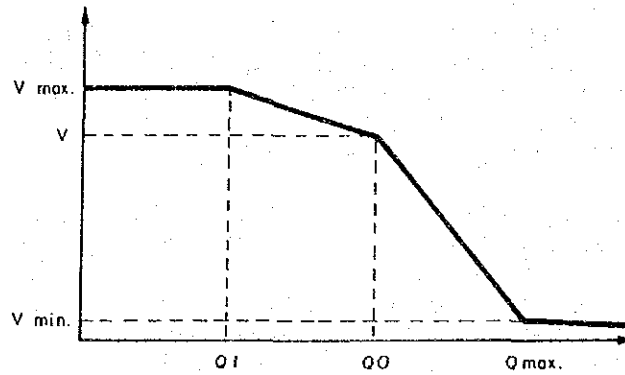
Appendix 7.1 Applied Model of Modal Choice

$$p = \frac{1}{1 + e^{\alpha + \beta \Delta t + \gamma \Delta c}}$$

p : Share of Rail in %
 $\alpha = 0.127$
 $\beta = -0.041$
 $\gamma = -16.500$



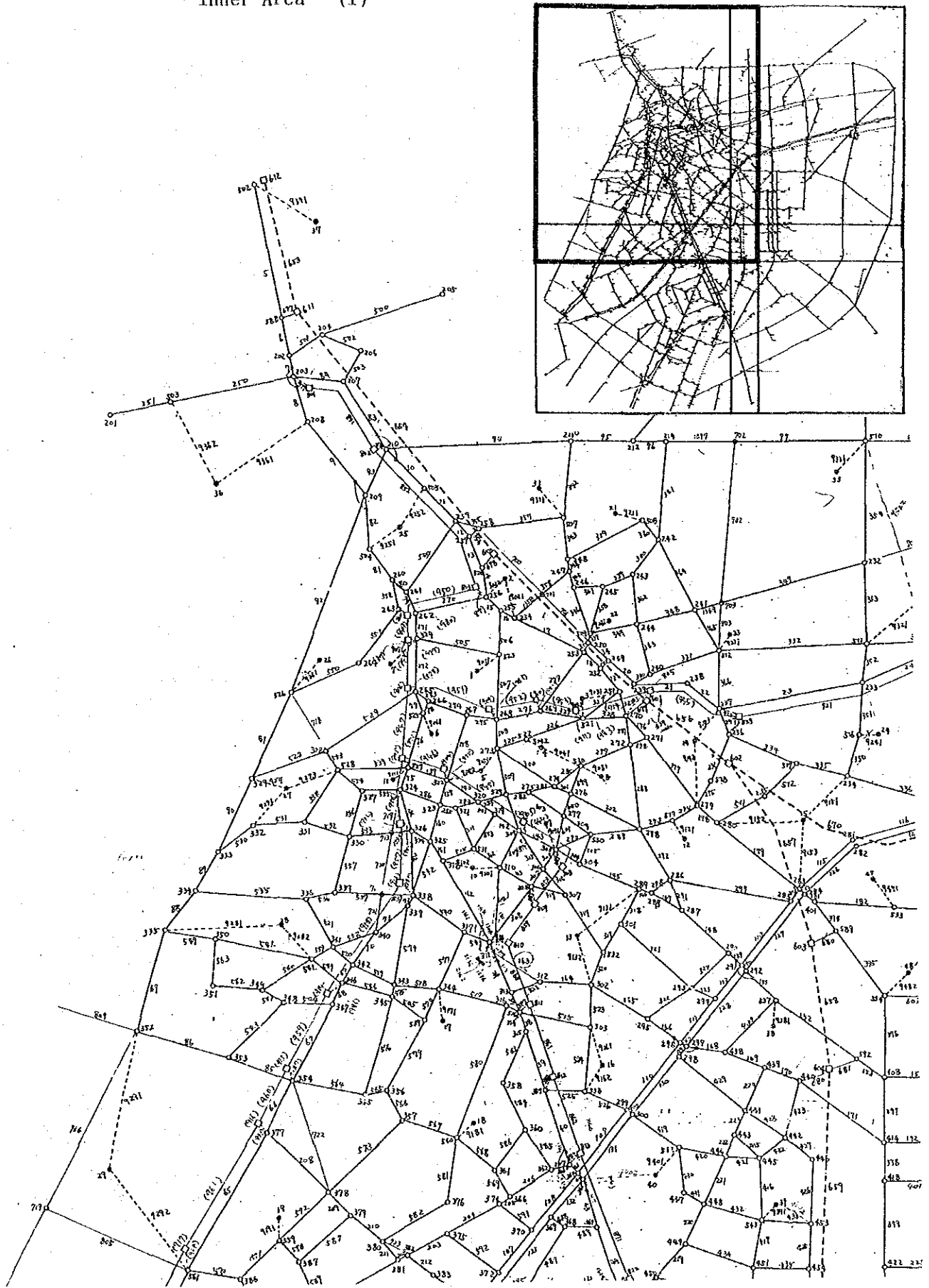
Appendix 7.2 Q-V Curve (Traffic Volume and Velocity)



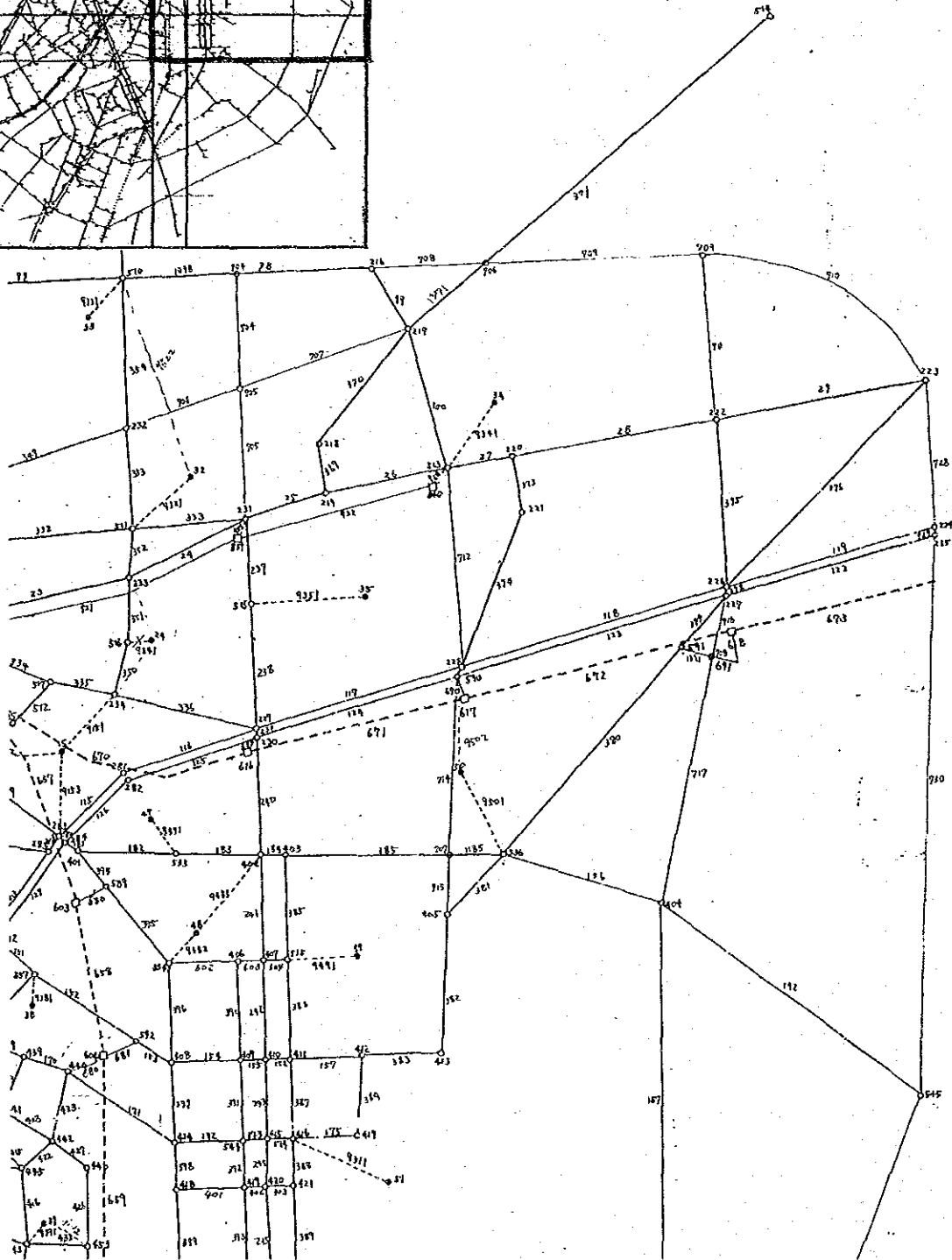
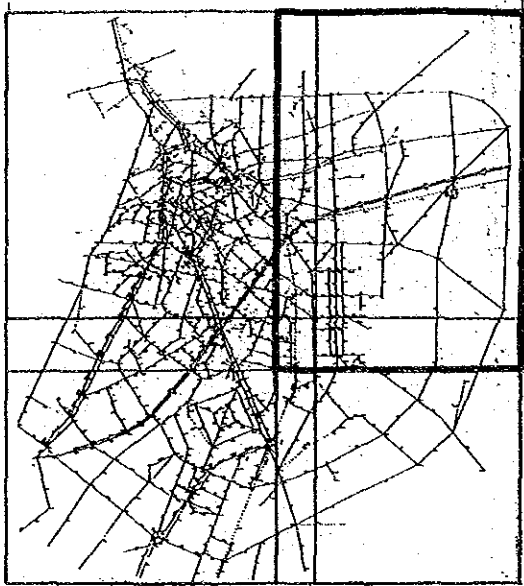
Appendix 7.3 Speed-Flow Curve of Road

Model No.	Location	No. of Lanes	Free-Flow		Capacity		Cut-Off Point	
			V max (km/hr)	Q1 (veh/day)	V (km/hr)	Q0 (veh/day)	V min (km/hr)	Q max (veh/day)
1		2(narrow)	40	3,600	30	9,600	5	12,000
2		2(wide)	50	4,800	35	12,800	5	16,000
3	Urban Area	4	50	14,400	35	38,400	5	48,000
10		6	50	21,600	35	57,600	10	72,000
4		One-way 2	45	7,200	30	19,200	5	24,000
5		One-way 4	50	14,400	35	38,400	5	48,000
6	Rural	2	45	5,100	30	13,600	10	17,000
7	Area	4	60	20,400	40	54,400	10	68,000
8		6	60	30,600	40	81,600	10	102,000

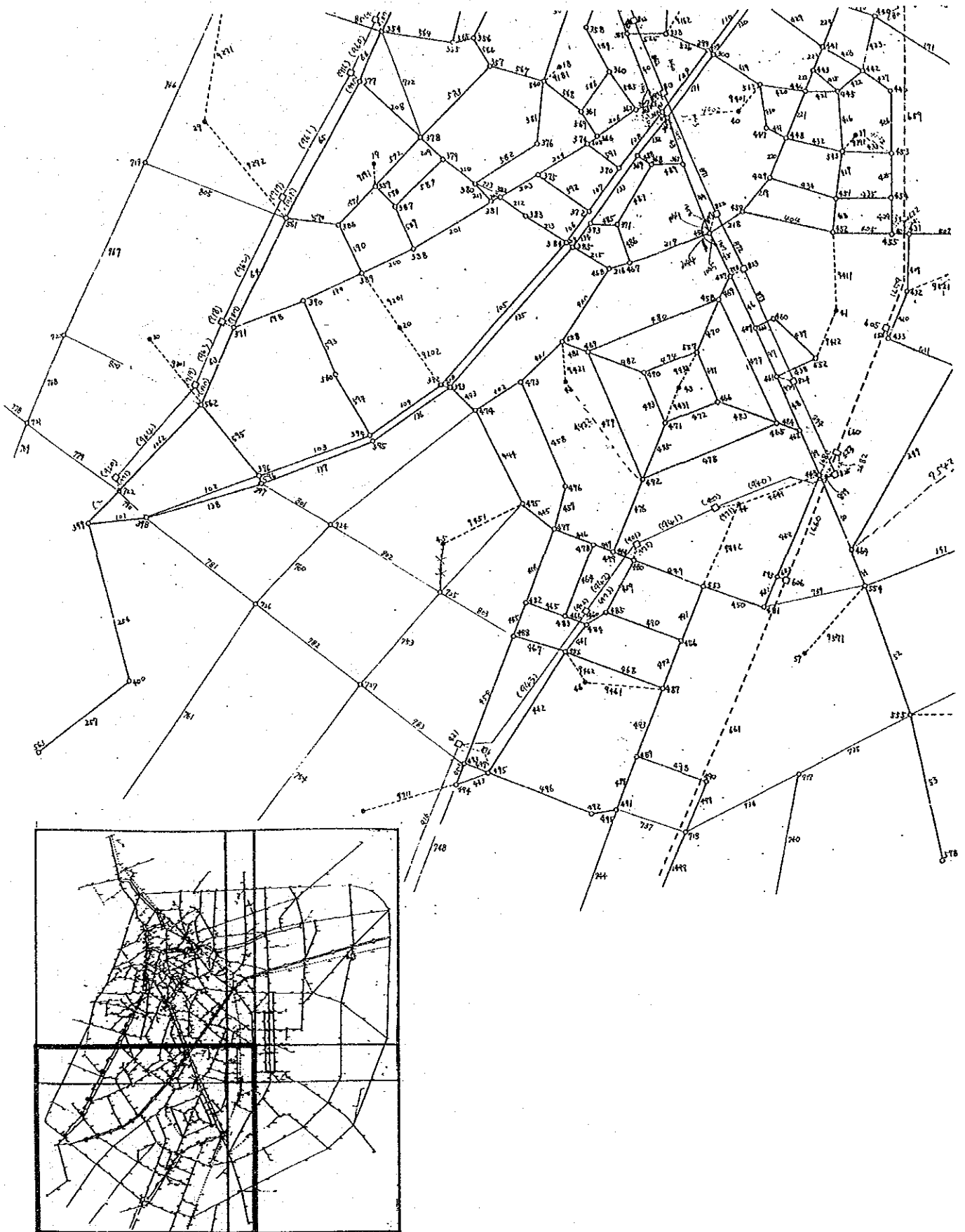
Appendix 7.5 Transport Network for the Traffic Assignment
- Inner Area - (1)



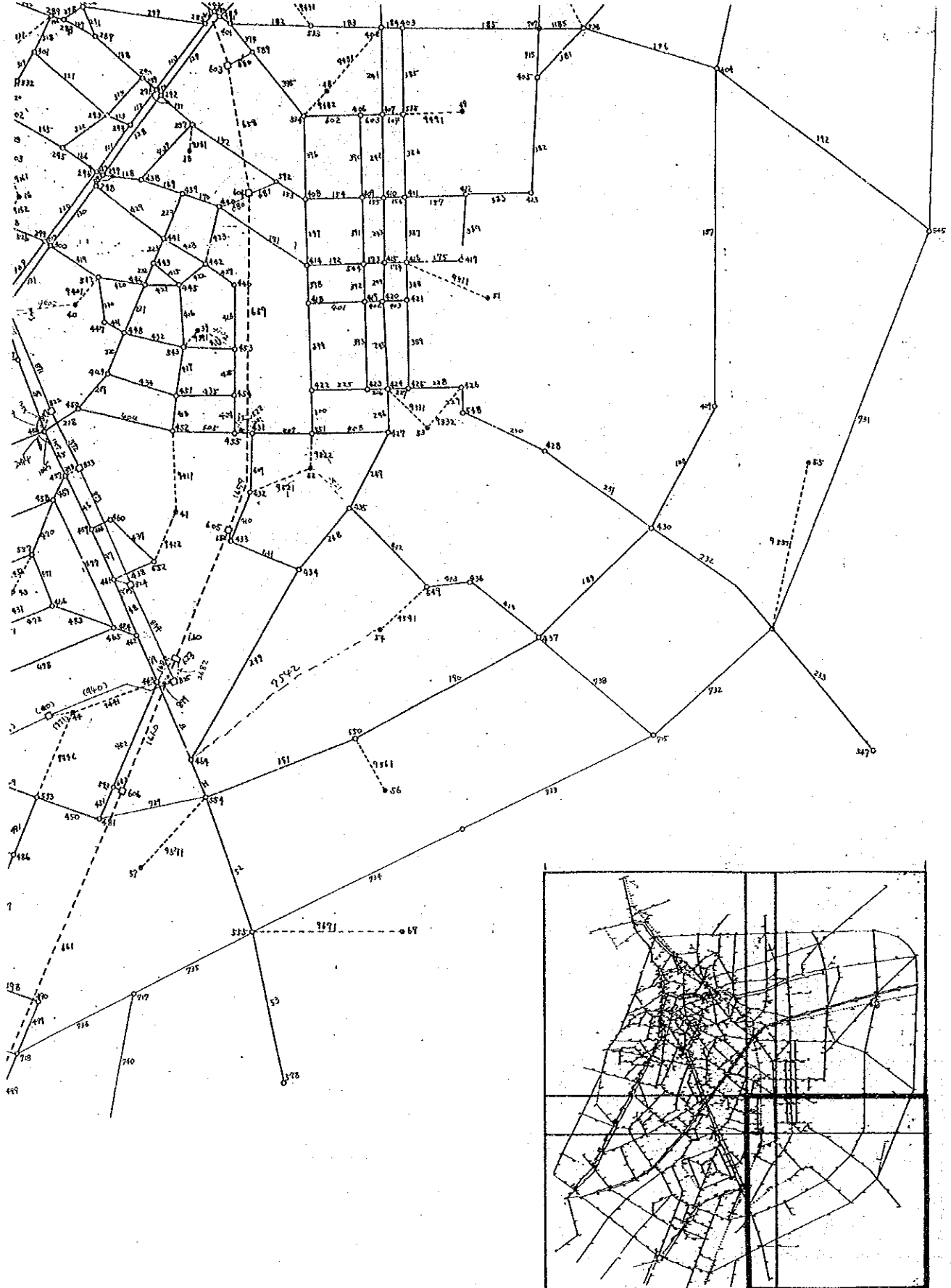
Appendix 7.5 Transport Network for the Traffic Assignment
- Inner Area - (2)



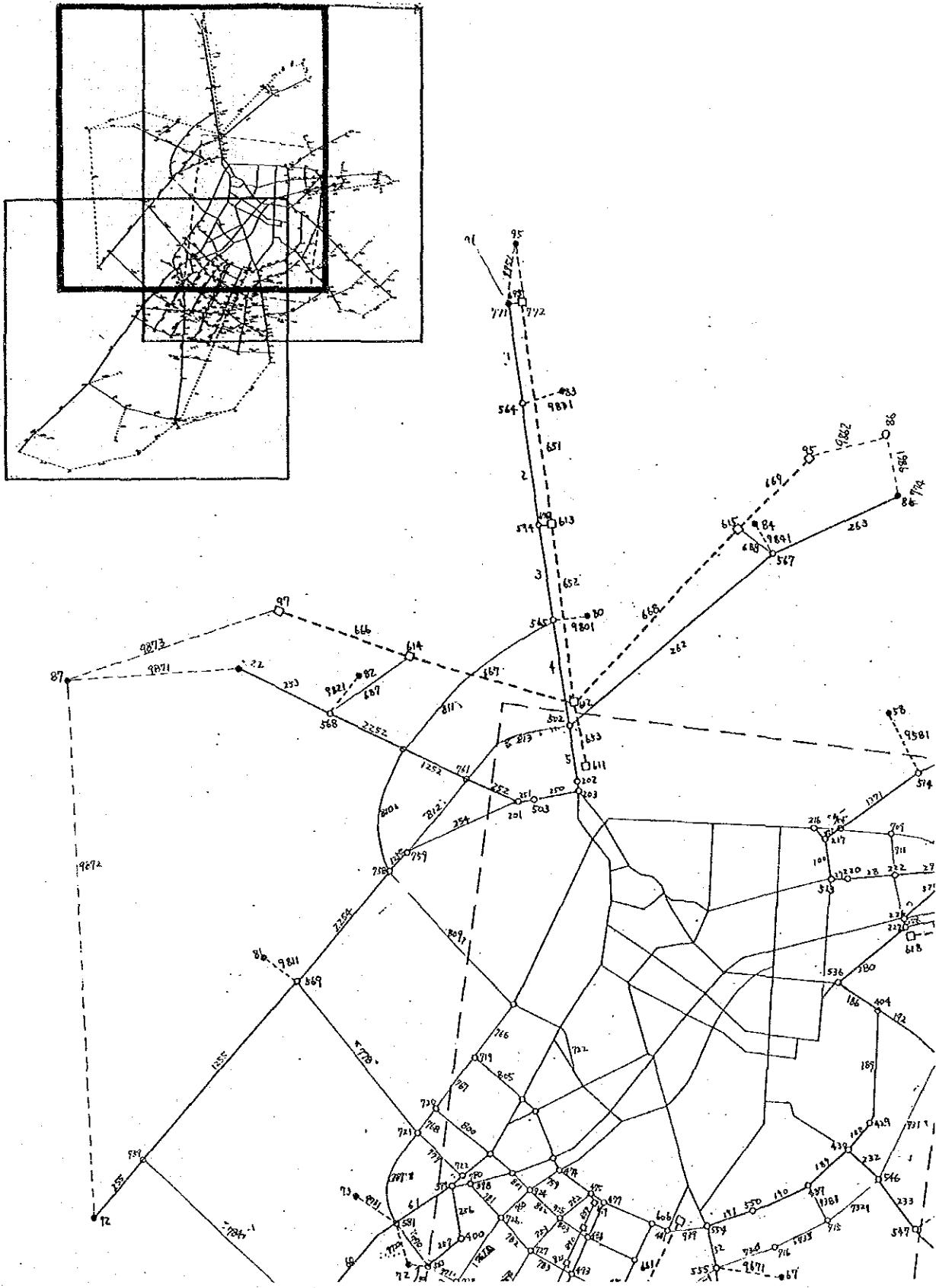
Appendix 7.5 Transport Network for the Traffic Assignment
- Inner Area - (3)



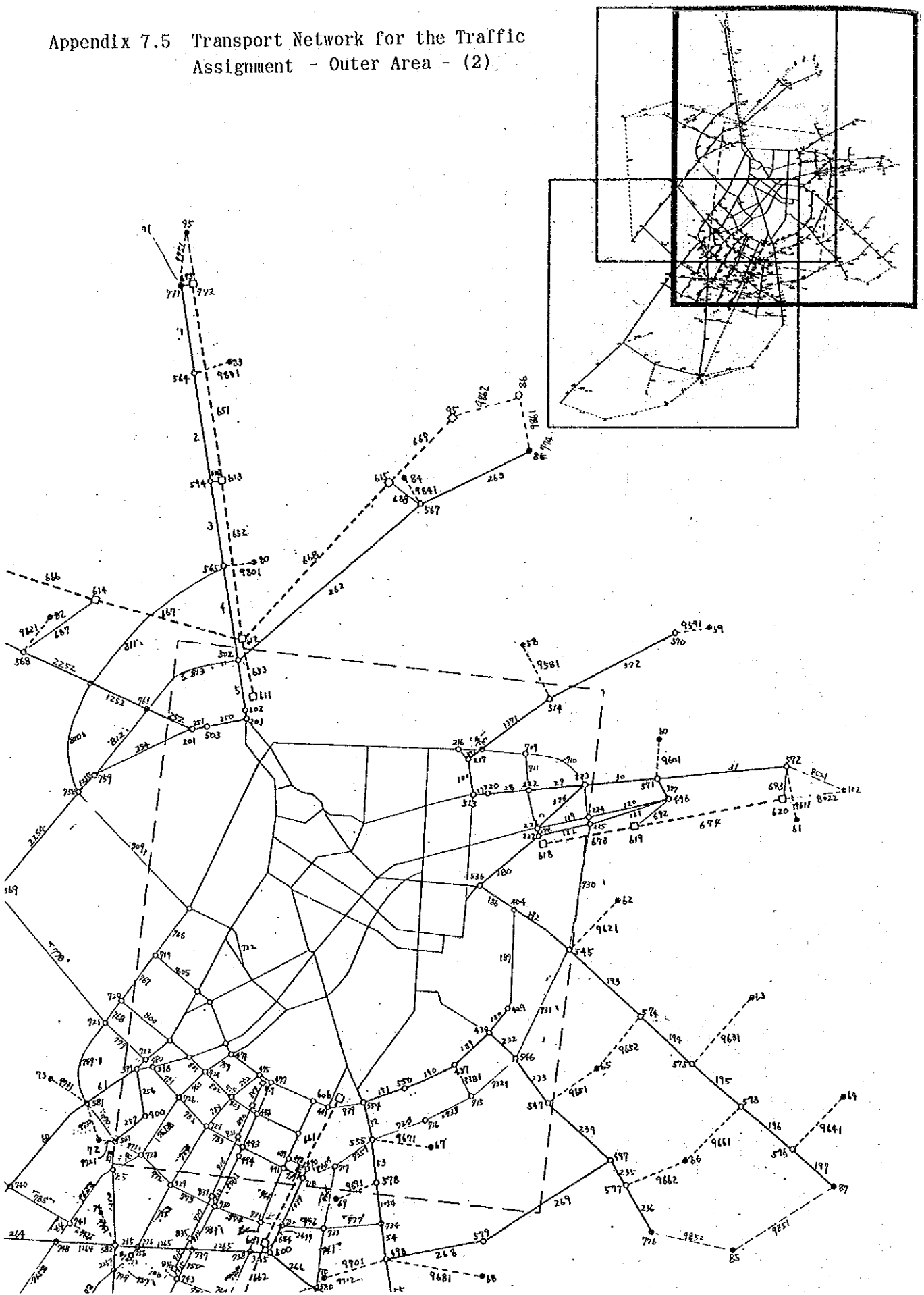
Appendix 7.5 Transport Network for the Traffic Assignment
- Inner Area - (4)



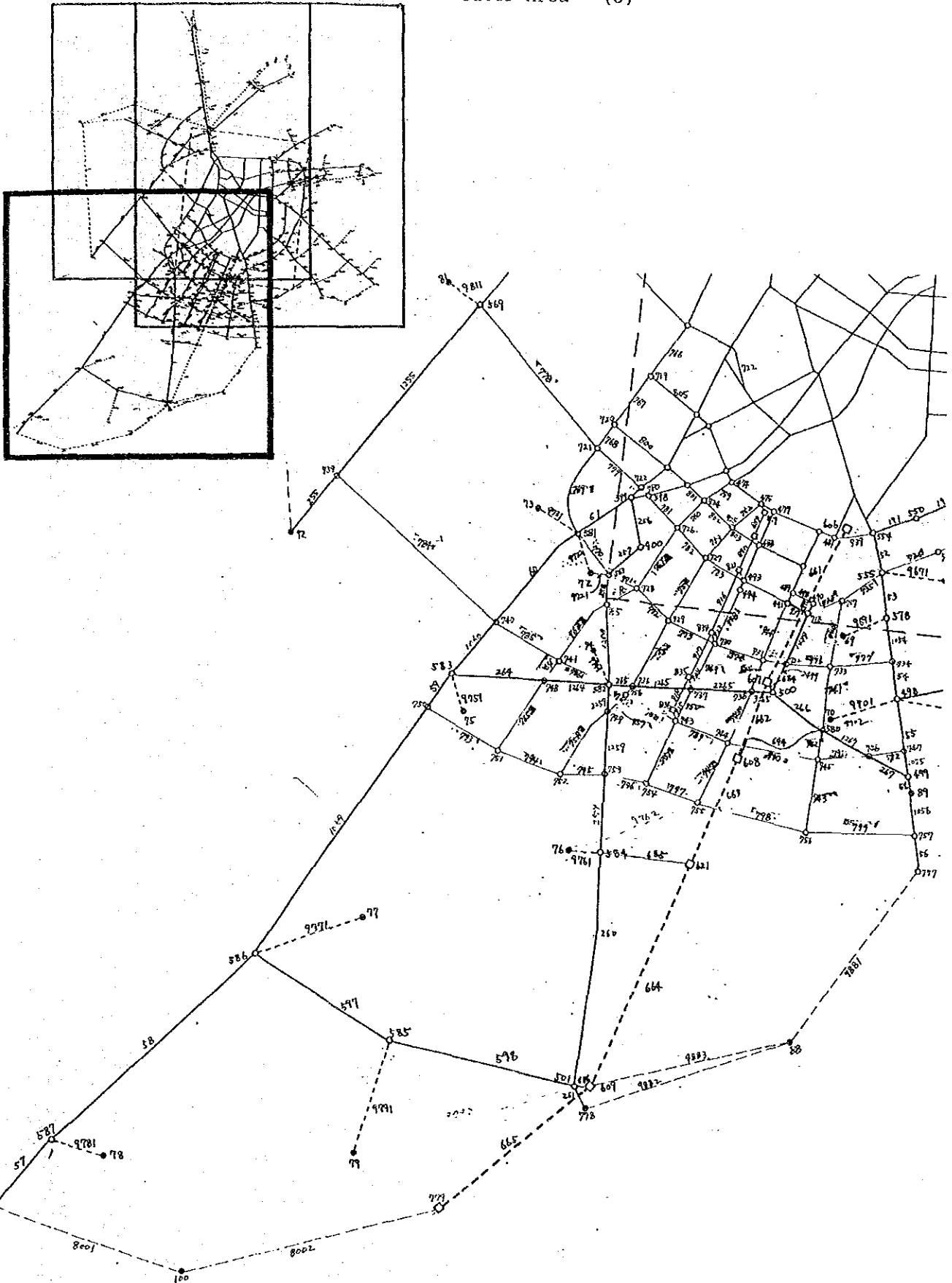
Appendix 7.5 Transport Network for the Traffic Assignment
- Outer Area - (1)



Appendix 7.5 Transport Network for the Traffic Assignment - Outer Area - (2)



Appendix 7.5 Transport Network for the Traffic Assignment
- Outer Area - (3)



Appendix 7.6 The Result of the Traffic Assignment (4)

NO.	LINK	NODE1	NODE2	DIST (km)	VELO (km/h)	TIME (h)	CONGEST	TOTAL	BICY	CAR	PUBL	RAIL
238	219	449	450	.60	10.00	.06	1.71	98310.	11923.	83326.	3060.	0.
239	220	448	449	.60	10.00	.06	1.42	81818.	11154.	67604.	3060.	0.
240	221	444	448	.80	29.24	.03	1.14	65944.	8355.	54529.	3060.	0.
241	222	443	444	.30	39.21	.01	.89	51208.	7904.	39667.	3637.	0.
242	223	441	443	.30	30.32	.01	1.11	64007.	9296.	50995.	3708.	8.
243	224	439	441	.80	38.37	.02	.92	53225.	6659.	44216.	2343.	8.
244	225	422	423	.80	5.00	.16	1.31	16769.	74.	16603.	82.	9.
245	226	423	424	.30	5.00	.06	2.03	26036.	1453.	22202.	2380.	1.
246	227	424	425	.30	5.00	.06	1.82	23246.	3022.	15887.	4075.	262.
247	228	425	426	.60	35.94	.02	.96	12296.	1356.	9502.	1220.	218.
248	229	426	548	.30	35.96	.01	.97	12361.	1391.	9318.	1435.	218.
249	230	428	548	1.00	35.96	.03	.97	12361.	1391.	9318.	1435.	218.
250	231	428	430	2.00	5.00	.40	1.29	12361.	1391.	9318.	1435.	218.
251	232	430	546	2.00	5.00	.40	1.29	12344.	1443.	9245.	1438.	218.
252	233	546	547	2.50	33.14	.08	.89	12123.	5402.	4664.	1842.	215.
253	234	497	547	4.00	37.94	.11	.69	9342.	4529.	3779.	881.	153.
254	235	497	577	1.50	37.85	.04	.69	9409.	4529.	3846.	881.	153.
255	236	776	577	2.50	45.00	.06	.00	0.	0.	0.	0.	0.
256	237	231	515	1.00	5.00	.20	1.60	61336.	30089.	20740.	10390.	118.
257	238	229	515	1.40	20.77	.07	1.17	44826.	19986.	19339.	5265.	236.
258	239	229	230	.10	35.26	.00	1.02	39297.	17961.	14360.	6802.	175.
259	240	230	710	.70	47.67	.01	.49	18790.	6361.	6786.	5503.	140.
260	1240	402	710	.60	5.00	.12	1.47	18790.	6361.	6786.	5503.	140.
261	241	402	407	1.10	5.00	.22	1.36	17396.	5397.	10014.	1794.	192.
262	242	407	410	1.10	19.25	.06	1.32	16927.	4926.	12001.	0.	0.
263	243	410	415	.90	5.00	.18	2.10	26832.	11560.	15271.	0.	0.
264	244	415	420	.70	5.00	.14	2.56	32724.	9026.	23697.	0.	0.
265	245	420	424	1.10	5.00	.22	2.77	35411.	9026.	26385.	0.	0.
266	246	424	427	.60	5.00	.12	1.92	73561.	11393.	55436.	6231.	502.
267	247	427	435	1.10	5.00	.22	2.71	104250.	11105.	78887.	13153.	1104.
268	248	434	435	1.10	39.73	.03	.99	38128.	8912.	26790.	2032.	393.
269	249	434	464	2.90	39.44	.07	1.00	38588.	6628.	29784.	2134.	42.
270	250	203	503	1.60	5.00	.32	1.26	48375.	11820.	6711.	27950.	1894.
271	251	201	503	.80	5.00	.16	1.75	67043.	25654.	12356.	27445.	1588.
272	252	201	761	2.50	5.00	.50	1.41	54152.	24831.	3368.	24365.	1588.
273	1252	760	761	3.00	26.91	.11	1.10	42397.	6998.	15143.	19414.	841.
274	2252	568	760	3.10	47.89	.06	.78	42397.	6998.	15143.	19414.	841.
275	253	782	568	4.10	55.13	.07	.55	29728.	561.	11632.	16835.	700.
276	254	201	759	5.00	50.00	.10	.34	12891.	823.	8988.	3080.	0.
277	1254	758	759	1.00	40.35	.02	.85	32454.	2817.	20839.	8797.	0.
278	2254	569	758	6.50	46.43	.14	.64	24512.	682.	17907.	5922.	0.
279	255	781	739	3.50	43.04	.08	.49	6716.	182.	3982.	2505.	47.
280	1255	569	739	10.00	50.00	.20	.17	6716.	182.	3982.	2505.	47.
281	256	399	400	2.50	40.00	.06	.00	7.	0.	7.	0.	0.
282	257	400	563	1.80	40.00	.04	.00	7.	0.	7.	0.	0.
283	258	563	735	1.50	37.83	.04	.51	4921.	393.	1617.	2625.	285.
284	1258	582	735	3.20	34.18	.09	.74	7144.	459.	3191.	3209.	285.
285	259	584	753	3.30	35.87	.09	.76	10386.	887.	3637.	5447.	414.
286	1259	749	753	2.70	34.18	.08	.74	7144.	459.	3191.	3209.	285.
287	2259	582	749	1.50	34.18	.04	.74	7144.	459.	3191.	3209.	285.
288	260	501	584	10.50	36.17	.29	.75	10228.	887.	3778.	5563.	0.
289	261	778	501	2.50	32.39	.08	.91	12373.	500.	3653.	4903.	3317.
290	262	502	567	11.10	45.00	.25	.26	3511.	372.	2047.	978.	114.
291	263	774	567	6.00	45.00	.13	.00	0.	0.	0.	0.	0.
292	3265	500	738	1.10	40.00	.03	.00	0.	0.	0.	0.	0.
293	266	500	580	2.80	37.07	.08	.78	7502.	0.	7479.	23.	0.
294	268	498	579	5.00	40.00	.13	.01	79.	0.	79.	0.	0.
295	269	497	579	7.50	40.00	.19	.01	79.	0.	79.	0.	0.
296	270	256	262	1.00	45.49	.02	.63	36437.	4254.	30084.	1887.	212.
297	271	262	524	.30	10.00	.03	1.41	81285.	27912.	29510.	19489.	4373.
298	272	265	524	.70	10.00	.07	1.41	81298.	32119.	25454.	19184.	4541.
299	273	265	266	.30	27.73	.01	1.11	64214.	26553.	21624.	15361.	677.
300	274	266	267	.60	20.35	.03	1.17	44880.	20247.	13051.	10906.	677.
301	275	267	268	.40	5.00	.08	1.69	64942.	22868.	30491.	10906.	677.
302	276	268	269	.60	5.00	.12	1.49	57054.	17828.	31526.	7350.	349.
303	277	253	269	1.00	21.87	.05	1.13	43220.	10532.	27409.	5010.	269.
304	278	271.	272	.30	13.20	.02	1.26	24176.	5280.	13094.	5255.	548.
305	279	272	520	.70	5.00	.14	2.66	25552.	3405.	15439.	6160.	548.
306	280	274	520	.40	29.38	.01	1.15	44158.	7627.	27670.	7626.	1235.
307	281	274	275	.30	25.72	.01	1.15	44219.	7097.	28365.	7523.	1235.
308	282	275	529	.30	5.00	.06	1.49	57169.	8183.	40228.	7523.	1235.
309	283	320	529	.40	5.00	.08	1.51	58049.	8047.	40152.	9192.	658.
310	284	320	321	.30	5.00	.06	1.29	49591.	5728.	32083.	11780.	0.
311	285	321	323	.30	28.60	.01	1.22	47035.	5441.	30919.	10675.	0.
312	286	323	324	.60	5.00	.12	1.75	22445.	0.	20899.	1546.	0.
313	287	272	270	.30	42.70	.01	.74	28534.	7052.	15018.	5838.	626.
314	288	272	278	1.10	5.00	.22	1.47	18846.	8927.	2999.	6294.	626.
315	289	278	530	.60	5.00	.12	1.40	53746.	22474.	24676.	4469.	2127.
316	290	305	530	.60	38.25	.02	.91	34818.	12071.	16151.	4469.	2127.

Appendix 7.6 The Result of the Traffic Assignment (5)

NO.	LINK	NODE1	NODE2	DIST (km)	VELO (km/h)	TIME (h)	CONGEST	TOTAL	BICY	CAR	PUBL	RAIL
317	291	286	287	.50	5.00	.10	1.37	52503.	8859.	37253.	6302.	89.
318	292	278	286	.90	5.00	.18	1.92	73663.	17424.	49847.	6302.	89.
319	293	278	519	.60	5.00	.12	1.77	68054.	23269.	38300.	4896.	1590.
320	294	279	519	.40	5.00	.08	1.80	69190.	30424.	28923.	8502.	1341.
321	295	279	518	.40	5.00	.08	1.31	50411.	24304.	18291.	7138.	677.
322	296	236	518	.60	5.00	.12	1.31	50411.	24304.	18291.	7138.	677.
323	297	236	237	.30	5.00	.06	1.54	59092.	26998.	23846.	7630.	619.
324	298	286	288	.30	5.00	.06	1.99	25518.	9771.	15746.	0.	0.
325	299	285	286	1.60	11.18	.14	1.32	16891.	11195.	5696.	0.	0.
326	300	273	274	1.00	5.00	.20	2.13	20450.	2680.	16855.	915.	0.
327	301	274	276	.30	5.00	.06	3.07	29470.	2149.	27321.	0.	0.
328	302	276	278	.90	5.00	.18	3.14	30101.	7253.	22848.	0.	0.
329	303	275	277	.60	5.00	.12	1.35	12950.	1087.	11863.	0.	0.
330	304	277	530	.30	5.00	.06	1.62	15570.	2344.	13226.	0.	0.
331	305	304	530	.40	39.23	.01	.87	33255.	10573.	22682.	0.	0.
332	306	305	306	.30	5.00	.06	1.58	60745.	15702.	39908.	5135.	0.
333	307	306	308	.30	5.00	.06	1.61	61875.	16079.	39998.	5798.	0.
334	308	308	1310	.70	5.00	.14	1.41	54302.	13915.	34895.	5492.	0.
335	1308	1310	311	.20	5.00	.04	1.95	74994.	15873.	52296.	6825.	0.
336	309	310	309	.50	5.00	.10	1.43	18266.	6910.	9025.	2265.	66.
337	310	310	1310	1.00	39.92	.03	1.62	20692.	1958.	17401.	1333.	0.
338	311	321	531	.60	38.75	.02	1.02	38983.	287.	37591.	1106.	0.
339	312	310	531	.40	5.00	.08	1.87	23909.	3426.	18671.	1812.	0.
340	313	308	310	.50	13.31	.04	1.45	18513.	4402.	12454.	306.	1350.
341	314	307	308	.50	42.17	.01	.75	9590.	2238.	7352.	0.	0.
342	315	306	309	.60	5.00	.12	1.35	17341.	5075.	11604.	663.	0.
343	316	306	307	.50	5.00	.10	1.27	16212.	4698.	11514.	0.	0.
344	317	307	532	.90	5.00	.18	2.02	25802.	6936.	18866.	0.	0.
345	318	289	301	.60	35.81	.02	1.01	38791.	4097.	33827.	866.	0.
346	319	301	532	.40	49.48	.01	.44	16914.	4719.	11329.	866.	0.
347	320	302	532	.60	35.12	.02	1.02	39290.	10413.	28011.	866.	0.
348	321	293	301	1.30	5.00	.26	1.88	24078.	621.	23457.	0.	0.
349	322	293	295	.80	49.06	.02	.41	5302.	1044.	4258.	0.	0.
350	323	293	294	.40	5.00	.08	2.40	30670.	654.	30017.	0.	0.
351	324	290	293	.80	5.00	.16	1.34	17212.	1011.	16201.	0.	0.
352	325	273	522	.40	5.00	.08	1.33	17067.	8321.	5377.	3303.	66.
353	326	521	522	.80	5.00	.16	1.36	17435.	10401.	3196.	3772.	66.
354	327	251	521	.60	45.44	.01	.58	7394.	5144.	940.	1290.	20.
355	328	270	521	.60	37.88	.02	.98	12487.	5573.	4439.	2440.	35.
356	329	269	521	.50	5.00	.10	1.39	17812.	7296.	8094.	2340.	81.
357	330	239	240	.30	5.00	.06	1.79	17137.	10198.	1536.	4829.	574.
358	331	240	512	1.00	5.00	.20	1.74	16725.	10198.	1536.	4461.	531.
359	332	511	512	2.00	5.00	.40	1.49	14288.	8694.	1052.	4275.	267.
360	333	231	511	1.30	5.00	.26	2.21	21253.	10407.	5656.	5152.	38.
361	334	236	517	1.00	20.25	.05	1.10	10536.	2693.	5555.	2229.	59.
362	335	234	517	.70	5.00	.14	1.28	16341.	9584.	4469.	2229.	59.
363	336	229	234	1.50	5.00	.30	1.61	20596.	12791.	4920.	2878.	6.
364	337	250	509	.20	5.00	.04	2.62	25195.	8905.	13162.	2884.	244.
365	338	245	509	.70	36.85	.02	.75	7215.	1378.	5022.	769.	46.
366	339	243	245	.40	38.41	.01	.99	12702.	3932.	7955.	769.	46.
367	340	242	243	.60	40.46	.01	.91	11609.	3932.	6450.	1138.	89.
368	341	214	242	1.60	23.99	.07	1.11	14238.	11682.	1100.	1455.	0.
369	342	211	507	1.00	5.00	.20	1.26	12066.	1403.	10088.	576.	0.
370	343	248	507	.60	25.54	.02	1.04	10028.	2757.	6695.	576.	0.
371	344	247	248	.20	20.19	.01	1.10	10542.	2697.	7269.	576.	0.
372	345	246	247	.20	9.23	.02	1.21	11594.	5564.	5454.	576.	0.
373	346	246	509	.40	35.82	.01	.64	6107.	3010.	2521.	576.	0.
374	347	244	509	.70	5.00	.14	1.68	16125.	7503.	7290.	1310.	22.
375	348	241	244	.60	5.00	.12	1.84	17630.	7503.	8795.	1310.	22.
376	349	232	703	2.10	7.05	.30	1.32	12680.	1746.	10472.	463.	0.
377	1349	241	703	.40	5.00	.08	1.38	13216.	5700.	6556.	939.	22.
378	350	234	516	.60	36.86	.02	.81	7768.	1259.	6228.	281.	0.
379	351	233	516	.80	36.86	.02	.81	7768.	1259.	6228.	281.	0.
380	352	233	511	.60	5.00	.12	3.94	37817.	7463.	30354.	0.	0.
381	353	232	511	1.20	5.00	.24	1.79	17178.	213.	16965.	0.	0.
382	354	232	510	1.70	40.00	.04	.44	4268.	213.	4055.	0.	0.
383	355	258	259	.50	48.33	.01	.48	18545.	9445.	9100.	0.	0.
384	356	257	258	.30	50.00	.01	.17	2213.	0.	2213.	0.	0.
385	357	258	507	1.30	41.13	.03	.74	9531.	1505.	8026.	0.	0.
386	358	247	701	.50	5.51	.09	1.24	11951.	6633.	5317.	0.	0.
387	1358	254	701	.40	34.69	.01	.71	6789.	4814.	1975.	0.	0.
388	359	248	508	1.20	6.23	.19	1.24	11882.	4899.	6983.	0.	0.
389	360	242	508	.50	5.00	.10	1.46	18689.	12011.	3465.	3124.	89.
390	361	245	246	.40	48.71	.01	.43	5487.	2554.	2933.	0.	0.
391	362	243	244	.70	40.00	.02	.20	1916.	0.	1505.	369.	43.
392	363	240	244	.80	40.00	.02	.04	412.	0.	0.	369.	43.
393	364	241	242	1.20	35.91	.03	.80	7718.	1505.	5682.	531.	0.
394	365	241	512	.70	20.98	.03	1.26	12131.	3308.	7921.	902.	0.

Appendix 7.6 The Result of the Traffic Assignment (6)

NO.	LINK	NODE1	NODE2	DIST (km)	VELO (km/h)	TIME (h)	CONGEST	TOTAL	BICY	CAR	PUBL	RAIL
395	366	237	512	.90	17.01	.05	1.21	46504.	17007.	24275.	4766.	456.
396	367	212	213	1.30	50.00	.03	.00	0.	0.	0.	0.	0.
397	368	215	510	1.00	40.00	.03	.00	0.	0.	0.	0.	0.
398	369	218	219	.60	37.14	.02	1.02	9755.	0.	9755.	0.	0.
399	370	217	218	1.60	37.14	.04	1.02	9755.	0.	9755.	0.	0.
400	371	217	706	1.30	37.49	.03	.99	9547.	1169.	7022.	1333.	23.
401	1371	514	706	3.70	12.93	.29	1.22	11743.	4653.	5048.	2019.	23.
402	372	514	570	7.00	39.37	.18	.44	4231.	1036.	2536.	646.	14.
403	375	222	226	1.90	33.64	.06	1.18	15042.	695.	14347.	0.	0.
404	376	223	226	3.10	50.00	.06	.08	1044.	390.	654.	0.	0.
405	377	496	571	1.00	40.00	.03	.00	0.	0.	0.	0.	0.
406	378	226	227	.10	5.00	.02	1.49	14318.	1168.	12766.	384.	0.
407	379	227	591	.80	40.00	.02	.03	296.	55.	241.	0.	0.
408	380	536	591	2.90	40.00	.07	.03	296.	55.	241.	0.	0.
409	381	405	536	.90	5.00	.18	1.62	15507.	13812.	1695.	0.	0.
410	382	405	413	1.50	5.00	.30	1.94	18615.	13873.	4742.	0.	0.
411	383	412	413	.80	5.00	.16	1.94	18615.	13873.	4742.	0.	0.
412	384	412	417	1.00	38.91	.03	.67	6397.	3064.	3333.	0.	0.
413	385	403	535	1.10	5.00	.22	1.40	13426.	2415.	7622.	3389.	0.
414	386	411	535	1.10	5.00	.22	1.34	12892.	3337.	7341.	2174.	41.
415	387	411	416	.90	5.00	.18	1.59	15242.	2208.	10421.	2607.	6.
416	388	416	421	.60	5.00	.12	1.95	18722.	1795.	12648.	4235.	45.
417	389	421	425	1.10	5.00	.22	1.68	16122.	1795.	10048.	4235.	45.
418	390	406	409	1.10	5.00	.22	1.50	14422.	0.	13212.	1019.	191.
419	391	409	544	.90	5.00	.18	2.19	20999.	3465.	15782.	1752.	0.
420	392	419	544	.60	5.00	.12	2.39	22940.	1527.	19090.	2313.	10.
421	393	419	423	1.10	5.00	.22	2.39	22940.	1527.	19090.	2313.	10.
422	394	401	589	.50	5.00	.10	1.42	13608.	4053.	5870.	3506.	179.
423	395	534	711	.60	5.00	.12	1.42	13608.	4053.	5870.	3506.	179.
424	1395	589	711	.50	5.00	.10	1.42	13608.	4053.	5870.	3506.	179.
425	396	408	534	1.10	5.00	.22	1.39	13303.	4051.	5223.	3764.	265.
426	397	408	414	.90	5.00	.18	2.14	20530.	282.	13897.	6250.	101.
427	398	414	418	.60	5.00	.12	1.87	17937.	66.	11761.	5879.	230.
428	399	418	422	1.10	5.00	.22	1.86	17849.	66.	11673.	5879.	230.
429	400	422	551	.60	5.00	.12	1.54	14753.	141.	8562.	5811.	240.
430	401	418	419	.80	40.00	.02	.01	88.	0.	88.	0.	0.
431	402	419	420	.30	40.00	.01	.01	88.	0.	88.	0.	0.
432	403	420	421	.30	40.00	.01	.27	2599.	0.	2599.	0.	0.
433	404	450	452	1.30	36.72	.04	1.12	43084.	1940.	37275.	2243.	1626.
434	405	452	455	.80	37.33	.02	1.06	40691.	2776.	34468.	2031.	1416.
435	406	431	455	.20	5.00	.04	1.74	66836.	9905.	53125.	2392.	1414.
436	407	431	551	.80	31.71	.03	1.18	45466.	2022.	39308.	2290.	1846.
437	408	427	551	1.00	36.33	.03	1.10	42292.	1882.	30746.	8058.	1606.
438	409	431	432	.80	5.00	.16	3.94	37792.	7966.	29724.	102.	0.
439	410	432	433	.70	5.00	.14	3.94	37792.	7966.	29724.	102.	0.
440	411	433	434	1.00	5.00	.20	3.98	38227.	7966.	29724.	102.	435.
441	412	435	549	1.70	10.00	.17	1.47	84394.	10279.	61952.	10719.	1445.
442	413	436	549	.60	38.14	.02	.90	51840.	8280.	36286.	6715.	559.
443	414	436	437	.90	38.14	.02	.90	51840.	8280.	36286.	6715.	559.
444	415	443	445	.50	21.56	.02	1.11	14233.	1392.	11328.	1505.	8.
445	416	445	543	.90	5.00	.18	1.35	51741.	8305.	41923.	1505.	8.
446	417	451	543	.60	35.28	.02	1.18	45433.	3583.	39989.	1649.	212.
447	418	451	452	.50	5.00	.10	1.90	24355.	2814.	19680.	1649.	212.
448	419	300	542	.80	5.00	.16	1.34	51309.	7459.	42178.	1673.	0.
449	420	444	542	.60	5.00	.12	1.32	50682.	4360.	45104.	1219.	0.
450	421	444	445	.40	37.46	.01	.95	36612.	4811.	31801.	0.	0.
451	422	442	445	.30	44.47	.01	.66	25396.	6353.	19042.	0.	0.
452	423	440	442	1.00	36.09	.03	1.01	38801.	10121.	28680.	0.	0.
453	424	454	455	.60	5.00	.12	2.07	26456.	7129.	18657.	361.	309.
454	425	453	454	.60	5.00	.12	2.07	26456.	7129.	18657.	361.	309.
455	426	446	453	.80	5.00	.16	1.45	18607.	4945.	13662.	0.	0.
456	427	442	446	.80	5.00	.16	1.45	18607.	4945.	13662.	0.	0.
457	428	441	442	.60	50.00	.01	.14	5201.	1177.	4024.	0.	0.
458	429	298	441	1.20	5.00	.24	1.66	15982.	3813.	10803.	1366.	0.
459	430	447	542	.60	9.46	.06	1.27	16215.	2879.	13336.	0.	0.
460	431	447	448	.30	9.46	.03	1.27	16215.	2879.	13336.	0.	0.
461	432	448	543	.80	5.00	.16	1.51	19340.	3301.	16039.	0.	0.
462	433	453	543	.70	50.00	.01	.12	1598.	1290.	308.	0.	0.
463	434	449	451	1.00	49.66	.02	.55	21078.	769.	20309.	0.	0.
464	435	451	454	.80	50.00	.02	.00	0.	0.	0.	0.	0.
465	436	459	460	.30	50.00	.01	.83	10594.	0.	10594.	0.	0.
466	437	460	552	.60	50.00	.01	.83	10594.	0.	10594.	0.	0.
467	438	461	552	.50	50.00	.01	.83	10594.	0.	10594.	0.	0.
468	439	438	537	.90	24.87	.04	1.18	45440.	11967.	33473.	0.	0.
469	440	468	558	1.30	5.00	.26	1.71	65815.	8558.	51389.	4322.	1545.
470	441	473	558	.60	5.00	.12	1.75	67078.	14486.	43998.	7323.	1271.
471	442	473	474	.90	5.00	.18	1.47	56501.	10564.	42843.	2645.	449.
472	443	393	474	.50	5.00	.10	2.30	88163.	20129.	56002.	11894.	139.
473	444	474	475	1.50	5.00	.30	1.27	48620.	16038.	21669.	10326.	588.

Appendix 7.6 The Result of the Traffic Assignment (7)

NO.	LINK	NODE1	NODE2	DIST (km)	VELO (km/h)	TIME (h)	CONGEST	TOTAL	BICY	CAR	PUBL	RAIL
474	445	475	477	.60	5.00	.12	1.44	55138.	12869.	34188.	7371.	709.
475	446	477	478	.60	25.64	.02	1.15	44100.	9335.	29644.	4405.	716.
476	447	478	479	.30	40.65	.01	.83	32062.	6114.	22109.	3123.	716.
477	448	479	480	.30	23.65	.01	1.19	45779.	9312.	31122.	4623.	723.
478	449	480	553	.90	36.37	.02	.99	38090.	10418.	20134.	7345.	193.
479	450	481	553	.90	32.80	.03	1.22	46794.	12522.	29401.	4327.	544.
480	451	481	593	.50	48.38	.01	.63	24247.	1422.	21665.	616.	544.
481	452	463	593	1.80	48.68	.04	.62	23774.	1422.	21665.	616.	71.
482	453	493	494	.20	43.39	.00	.66	25493.	3998.	13412.	7209.	875.
483	454	488	493	2.20	49.35	.04	.41	15914.	2625.	6800.	5674.	815.
484	455	482	488	.40	37.31	.01	.92	35183.	7456.	19267.	7645.	815.
485	456	477	482	1.00	35.52	.03	.99	38045.	7456.	22130.	7645.	815.
486	457	476	477	.60	22.05	.03	1.12	43070.	3922.	33647.	4678.	821.
487	458	473	476	1.60	22.05	.07	1.12	43070.	3922.	33647.	4678.	821.
488	459	480	485	.90	38.81	.02	.93	53844.	10651.	31817.	7713.	3662.
489	460	484	485	.30	38.81	.01	.93	53844.	10651.	31817.	7713.	3662.
490	461	484	556	.40	25.00	.02	1.19	68744.	13872.	42215.	8995.	3662.
491	462	495	556	2.40	44.29	.05	.71	40756.	8463.	23622.	6965.	1705.
492	463	494	495	.30	44.88	.01	.63	36142.	11655.	15663.	7118.	1705.
493	464	478	483	1.00	5.00	.20	1.25	12038.	3221.	7535.	1282.	0.
494	465	482	483	.50	40.00	.01	.30	2863.	0.	2863.	0.	0.
495	466	483	484	.40	5.00	.08	1.55	14900.	3221.	10398.	1282.	0.
496	467	488	556	.70	5.00	.14	1.51	19269.	4831.	12467.	1971.	0.
497	468	487	556	1.30	50.00	.03	.18	2314.	0.	2314.	0.	0.
498	469	457	458	.30	5.00	.06	5.11	65408.	7804.	53381.	2828.	1395.
499	470	458	557	.80	5.00	.16	2.85	36416.	4024.	28169.	2828.	1395.
500	471	466	557	.90	35.23	.03	.99	12676.	1922.	10755.	0.	0.
501	472	466	471	.90	41.91	.02	.89	11354.	3235.	8120.	0.	0.
502	473	470	471	.90	47.77	.02	.91	11666.	2391.	7460.	1815.	0.
503	474	470	557	.90	45.24	.02	.98	12523.	0.	11267.	930.	326.
504	475	471	472	.90	5.00	.18	2.05	19634.	4048.	14321.	1264.	0.
505	476	472	479	1.10	5.00	.22	2.21	21210.	5213.	13982.	2009.	6.
506	477	458	465	2.00	5.00	.40	2.34	22488.	0.	22488.	0.	0.
507	478	465	472	2.00	5.00	.40	1.52	14569.	865.	13704.	0.	0.
508	479	469	472	2.00	5.00	.40	1.32	12686.	0.	12686.	0.	0.
509	480	458	469	2.00	5.00	.40	1.60	15358.	3780.	11577.	0.	0.
510	481	469	558	.50	5.00	.10	1.72	16495.	6172.	7253.	2745.	326.
511	482	469	470	.90	5.00	.18	1.44	13824.	2391.	8362.	2745.	326.
512	483	465	466	.90	5.00	.18	2.50	24031.	5156.	18874.	0.	0.
513	484	462	465	.30	5.00	.06	6.36	61088.	6021.	55066.	0.	0.
514	485	371	373	.40	34.05	.01	.80	7635.	767.	6868.	0.	0.
515	486	371	467	.60	5.00	.12	1.28	12299.	0.	12299.	0.	0.
516	487	368	371	.90	5.00	.18	2.08	19934.	767.	19166.	0.	0.
517	488	368	369	.30	40.00	.01	.01	64.	0.	64.	0.	0.
518	489	367	368	.40	5.00	.08	2.08	19998.	767.	19231.	0.	0.
519	490	485	486	1.00	40.00	.03	.00	0.	0.	0.	0.	0.
520	491	486	553	.90	29.05	.03	1.26	48440.	12627.	32670.	3014.	129.
521	492	486	487	.70	29.05	.02	1.26	48440.	12627.	32670.	3014.	129.
522	493	487	489	1.50	37.95	.04	.99	38059.	15262.	18756.	3865.	176.
523	494	489	491	.60	43.71	.01	.75	28843.	15262.	9540.	3865.	176.
524	495	491	492	.40	49.16	.01	.43	16592.	6512.	7799.	2280.	0.
525	496	492	495	1.30	49.16	.03	.43	16592.	6512.	7799.	2280.	0.
526	497	493	495	.30	48.28	.01	.55	21205.	3319.	15758.	2127.	0.
527	498	489	490	1.00	30.64	.03	.96	9216.	0.	9216.	0.	0.
528	499	490	718	.60	30.64	.02	.96	9216.	0.	9216.	0.	0.
529	1499	718	732	2.50	32.99	.08	1.11	10658.	0.	10554.	0.	104.
530	2499	500	732	.90	35.78	.03	.86	8278.	0.	7479.	23.	776.
531	500	204	205	1.50	40.00	.04	.00	0.	0.	0.	0.	0.
532	501	202	204	.50	5.00	.10	1.53	14660.	0.	14660.	0.	0.
533	502	204	206	.60	5.00	.12	1.53	14660.	0.	14660.	0.	0.
534	503	206	207	.60	5.00	.12	1.53	14660.	0.	14660.	0.	0.
535	504	259	261	1.10	33.40	.03	1.01	12986.	2892.	2267.	6098.	1728.
536	505	523	524	1.30	5.00	.26	1.48	14211.	12206.	2005.	0.	0.
537	506	255	523	.90	5.00	.18	3.24	31108.	15578.	15530.	0.	0.
538	507	268	523	.80	5.00	.16	3.85	49233.	11662.	21891.	14759.	921.
539	508	268	273	.30	5.00	.06	4.61	44282.	10769.	28332.	4697.	485.
540	509	273	529	.70	5.00	.14	1.66	15966.	3618.	8336.	3462.	550.
541	510	309	529	.50	5.37	.09	1.42	13615.	3754.	6941.	1793.	1127.
542	511	235	280	.80	5.00	.16	1.41	13510.	6890.	6619.	0.	0.
543	512	235	517	.60	5.00	.12	1.41	13510.	6890.	6619.	0.	0.
544	513	319	531	.60	40.00	.02	.59	5667.	94.	5573.	0.	0.
545	514	318	531	.40	5.00	.08	2.68	25704.	3045.	21714.	945.	0.
546	515	303	314	.90	5.00	.18	1.29	49669.	5395.	42643.	936.	695.
547	516	314	316	.20	5.00	.04	4.92	47199.	5979.	41220.	0.	0.
548	517	316	344	.90	5.00	.18	4.14	39714.	4027.	35687.	0.	0.
549	518	343	344	.60	5.00	.12	1.27	48674.	18520.	19949.	9615.	590.
550	519	342	343	.60	5.00	.12	1.48	14221.	4306.	3532.	5793.	590.
551	520	341	342	.30	5.00	.06	1.36	13068.	3403.	7771.	1894.	0.
552	521	336	341	.80	5.00	.16	2.36	22660.	18302.	2464.	1894.	0.

Appendix 7.6 The Result of the Traffic Assignment (8)

NO.	LINK	NODE1	NODE2	DIST (km)	VELO (km/h)	TIME (h)	CONGEST	TOTAL	BICY	CAR	PUBL	RAIL
553	522	312	313	.40	42.49	.01	1.04	39777.	4565.	32627.	455.	2130.
554	523	302	303	.60	5.00	.12	6.69	64209.	5652.	55705.	2853.	0.
555	524	303	538	.90	20.53	.04	1.30	49820.	5528.	41555.	2737.	0.
556	525	359	538	.50	5.00	.10	4.25	40801.	4893.	32466.	3353.	90.
557	526	299	538	.70	5.00	.14	2.02	19428.	1983.	16910.	535.	0.
558	527	299	300	.10	5.00	.02	2.97	37964.	4463.	32518.	984.	0.
559	528	328	329	1.30	14.60	.09	1.22	11760.	5247.	6513.	0.	0.
560	529	265	328	1.40	5.00	.28	1.47	14093.	8351.	5741.	0.	0.
561	530	332	333	.70	5.00	.14	2.73	26213.	7455.	12531.	6145.	82.
562	531	331	332	.60	5.00	.12	3.21	30857.	13859.	12399.	4479.	120.
563	532	330	331	.60	5.00	.12	1.81	17341.	5739.	7003.	4479.	120.
564	533	330	713	.60	5.00	.12	1.78	22814.	5739.	12709.	4247.	120.
565	1533	328	713	.30	26.08	.01	1.62	20703.	5513.	14258.	818.	114.
566	534	325	326	.30	31.41	.01	1.19	45590.	9973.	28960.	6408.	249.
567	535	334	336	1.40	35.71	.04	1.01	38731.	14839.	23892.	0.	0.
568	536	336	337	.50	5.00	.10	1.92	73847.	19394.	44286.	9197.	969.
569	537	337	714	.60	5.00	.12	1.53	58869.	19394.	31664.	6926.	885.
570	1537	338	714	.30	5.00	.06	1.28	48969.	15341.	27782.	4983.	863.
571	538	331	528	.90	5.00	.18	1.41	13516.	8120.	5396.	0.	0.
572	539	527	528	.90	5.00	.18	1.73	16645.	13662.	2983.	0.	0.
573	540	317	338	.90	5.00	.18	1.46	56154.	16409.	31250.	6994.	1501.
574	541	311	317	.30	5.00	.06	1.76	67528.	18846.	40187.	6994.	1501.
575	542	325	338	.80	5.00	.16	1.42	54451.	29461.	12804.	12187.	0.
576	543	348	353	1.00	5.00	.20	2.50	24045.	6852.	17193.	0.	0.
577	544	347	348	.60	37.42	.02	.85	8207.	1324.	6883.	0.	0.
578	545	345	539	.60	28.39	.02	1.42	13618.	0.	13618.	0.	0.
579	546	345	346	.70	5.00	.14	2.17	20848.	2195.	18653.	0.	0.
580	547	346	541	.50	5.00	.10	1.48	14223.	2195.	12029.	0.	0.
581	548	350	541	1.50	24.65	.07	1.08	10402.	0.	10402.	0.	0.
582	549	335	350	.70	5.00	.14	1.38	13205.	0.	13205.	0.	0.
583	550	264	526	1.00	18.37	.05	1.28	12280.	4350.	7931.	0.	0.
584	551	263	264	1.00	18.37	.05	1.28	12280.	4350.	7931.	0.	0.
585	552	260	263	.40	18.37	.02	1.28	12280.	4350.	7931.	0.	0.
586	553	328	528	.50	5.00	.10	1.76	16857.	7781.	3526.	5225.	325.
587	554	327	528	.50	5.00	.10	1.36	13099.	1650.	5898.	5225.	325.
588	555	324	327	.50	5.00	.10	2.15	20671.	1650.	12815.	5796.	410.
589	556	327	330	.60	24.27	.02	1.08	10338.	0.	8215.	2038.	85.
590	557	330	337	.90	5.00	.18	1.56	14977.	0.	12622.	2271.	85.
591	558	340	341	.70	5.00	.14	1.94	18618.	15789.	2829.	0.	0.
592	559	341	541	.30	5.00	.06	1.65	15658.	7722.	8136.	0.	0.
593	560	349	541	.90	5.00	.18	1.36	13034.	5527.	7507.	0.	0.
594	561	348	349	.40	5.00	.08	1.65	15837.	5527.	10310.	0.	0.
595	562	349	351	.60	40.00	.02	.29	2803.	0.	2803.	0.	0.
596	563	350	351	.70	40.00	.02	.29	2803.	0.	2803.	0.	0.
597	564	354	355	1.10	5.00	.22	1.29	12376.	8080.	254.	4042.	0.
598	565	355	356	.30	40.00	.01	.08	788.	191.	377.	220.	0.
599	566	356	357	.50	5.00	.10	1.75	16798.	4198.	9990.	2149.	461.
600	567	357	540	.80	5.09	.16	1.39	13322.	4529.	6294.	2038.	461.
601	568	361	540	.60	5.00	.12	2.41	23119.	6369.	12032.	3407.	1310.
602	569	361	366	.40	5.00	.08	2.01	19297.	2626.	11954.	3407.	1310.
603	570	386	561	.70	39.69	.02	.97	37335.	9718.	21656.	5908.	54.
604	571	386	559	.70	5.00	.14	4.62	59118.	15248.	35391.	8435.	44.
605	572	378	559	.90	5.00	.18	5.56	71146.	16420.	47215.	7317.	193.
606	573	357	378	1.50	5.00	.30	2.01	25667.	8345.	15531.	1791.	0.
607	574	339	343	1.10	5.00	.22	2.12	20330.	8825.	11505.	0.	0.
608	575	343	345	.20	5.00	.04	2.06	19820.	10466.	5158.	4196.	0.
609	576	345	355	1.40	5.00	.28	1.31	12590.	8271.	123.	4196.	0.
610	577	317	344	.90	5.00	.18	2.95	28367.	5588.	22779.	0.	0.
611	578	344	539	.40	5.00	.08	3.09	29628.	4007.	23232.	1929.	461.
612	579	356	539	1.30	5.00	.26	1.67	16010.	4007.	9613.	1929.	461.
613	580	316	540	2.00	5.00	.40	1.47	14084.	4310.	9774.	0.	0.
614	581	376	540	1.00	5.00	.20	1.33	12800.	7718.	5082.	0.	0.
615	582	376	380	1.00	5.00	.20	1.33	12800.	7718.	5082.	0.	0.
616	583	315	358	.50	5.00	.10	1.59	15254.	4229.	11026.	0.	0.
617	584	358	360	1.00	5.00	.20	1.59	15254.	4229.	11026.	0.	0.
618	585	360	362	.60	5.00	.12	1.35	12954.	1850.	11104.	0.	0.
619	586	360	361	.60	39.76	.02	.40	3821.	3743.	78.	0.	0.
620	587	379	387	1.00	5.00	.20	1.29	12367.	10151.	2216.	0.	0.
621	588	387	559	.40	5.00	.08	2.23	21435.	9531.	11904.	0.	0.
622	589	387	388	.60	5.00	.12	1.88	18035.	8347.	9688.	0.	0.
623	590	386	389	.70	6.03	.12	1.44	55445.	17340.	29007.	9001.	98.
624	591	370	374	.60	37.20	.02	.64	6176.	628.	5547.	0.	0.
625	592	372	375	.80	40.00	.02	.00	0.	0.	0.	0.	0.
626	593	390	560	1.00	37.77	.03	.57	5450.	1051.	4399.	0.	0.
627	594	394	560	1.00	37.77	.03	.57	5450.	1051.	4399.	0.	0.
628	595	396	562	1.30	5.00	.26	1.31	12542.	3960.	8139.	443.	0.
629	596	396	397	.10	36.51	.00	.59	5695.	1526.	3931.	239.	0.
630	597	585	586	7.00	40.00	.17	.07	714.	31.	377.	306.	0.
631	598	501	585	8.00	40.00	.20	.05	472.	31.	163.	278.	0.

Appendix 7.6 The Result of the Traffic Assignment (9)

NO.	LINK	NODE1	NODE2	DIST (km)	VELO (km/h)	TIME (h)	CONGEST	TOTAL	BICY	CAR	PUBL	RAIL
632	599	276	520	.40	5.00	.08	1.50	19211.	8238.	10973.	0.	0.
633	600	276	277	.30	5.00	.06	1.45	18579.	3134.	15445.	0.	0.
634	601	305	277	.50	10.86	.05	1.25	15959.	1877.	14082.	0.	0.
635	602	406	534	.80	12.97	.06	1.28	12285.	988.	10943.	353.	0.
636	603	406	407	.30	30.38	.01	1.09	10423.	988.	7872.	1372.	191.
637	604	407	535	.30	5.00	.06	1.58	15144.	2590.	11425.	1129.	0.
638	656	601	602	1.50	35.00	.04	.02	859.	0.	0.	0.	859.
639	657	602	603	2.70	35.00	.08	.02	859.	0.	0.	0.	859.
640	658	603	604	1.90	35.00	.05	.02	859.	0.	0.	0.	859.
641	659	604	622	3.20	35.00	.09	.04	2220.	0.	0.	0.	2220.
642	1659	605	622	1.60	35.00	.05	.06	2798.	0.	0.	0.	2798.
643	660	605	623	1.60	35.00	.05	.06	3149.	0.	0.	0.	3149.
644	1660	623	606	1.80	35.00	.05	.11	5274.	0.	0.	0.	5274.
645	661	606	607	8.00	35.00	.23	.11	5630.	0.	0.	0.	5630.
646	662	607	608	3.50	35.00	.10	.11	5583.	0.	0.	0.	5583.
647	663	608	621	5.00	35.00	.14	.10	4830.	0.	0.	0.	4830.
648	664	609	621	10.00	35.00	.29	.10	4981.	0.	0.	0.	4981.
649	679	270	601	1.00	20.00	.05	.00	35.	0.	0.	0.	35.
650	680	440	604	1.00	20.00	.05	.00	8.	0.	0.	0.	8.
651	681	592	604	1.00	20.00	.05	.04	1515.	0.	0.	0.	1515.
652	1681	455	622	1.00	20.00	.05	.01	311.	0.	0.	0.	311.
653	2681	431	622	1.00	20.00	.05	.01	432.	0.	0.	0.	432.
654	682	433	605	1.00	20.00	.05	.01	435.	0.	0.	0.	435.
655	1682	463	623	1.00	20.00	.05	.06	2259.	0.	0.	0.	2259.
656	2682	623	825	1.40	20.00	.07	.05	2102.	0.	0.	0.	2102.
657	683	593	606	1.00	20.00	.05	.01	473.	0.	0.	0.	473.
658	684	500	607	1.00	20.00	.05	.02	776.	0.	0.	0.	776.
659	685	584	621	1.00	20.00	.05	.04	1578.	0.	0.	0.	1578.
660	686	501	609	2.00	20.00	.10	.10	4170.	0.	0.	0.	4170.
661	694	580	608	1.00	20.00	.05	.03	1254.	0.	0.	0.	1254.
662	695	251	601	1.00	20.00	.05	.02	824.	0.	0.	0.	824.
663	700	258	701	1.20	47.84	.03	.50	19332.	7939.	11392.	0.	0.
664	701	250	701	.90	45.19	.02	.61	23572.	9181.	14391.	0.	0.
665	702	702	703	2.10	43.04	.05	.70	26816.	13074.	11369.	2261.	112.
666	703	512	703	.70	43.92	.02	.68	26280.	9119.	15285.	1786.	90.
667	704	704	705	1.30	5.00	.26	1.53	19636.	4827.	13329.	1480.	0.
668	705	231	705	1.50	6.15	.24	1.24	15877.	13361.	446.	2046.	23.
669	706	232	705	1.50	5.00	.30	1.58	20286.	1746.	18078.	463.	0.
670	707	217	705	2.00	5.00	.40	1.29	16528.	10280.	5195.	1029.	23.
671	708	216	706	1.30	47.57	.03	.50	19156.	1619.	16469.	1068.	0.
672	709	706	709	2.50	45.48	.05	.71	27087.	3879.	21693.	1515.	0.
673	710	223	709	3.00	50.00	.06	.45	17460.	3633.	12313.	1515.	0.
674	711	222	709	2.00	45.11	.04	.75	9627.	246.	9380.	0.	0.
675	712	228	513	2.30	5.00	.46	1.39	17762.	10284.	4504.	2889.	86.
676	713	228	590	.10	5.00	.02	3.48	44588.	25957.	11146.	7358.	127.
677	714	590	707	2.00	38.43	.05	1.09	13906.	1054.	12521.	331.	0.
678	715	405	707	.70	50.00	.01	.29	3694.	647.	3047.	0.	0.
679	716	227	708	.70	40.03	.02	.90	11503.	970.	9655.	877.	0.
680	717	404	708	2.70	40.03	.07	.90	11503.	970.	9655.	877.	0.
681	718	328	526	1.00	5.00	.20	1.45	18560.	10296.	2714.	5225.	325.
682	719	324	713	.60	26.77	.02	1.12	43118.	7258.	20980.	14849.	32.
683	720	713	714	.90	37.95	.02	1.09	41833.	7484.	22857.	11468.	25.
684	721	340	714	.60	42.09	.01	.84	32352.	2978.	19846.	9525.	3.
685	722	354	378	1.60	26.33	.06	1.07	41175.	18254.	16459.	6462.	0.
686	723	380	382	.40	5.00	.08	1.60	61526.	7434.	51596.	2302.	193.
687	728	223	224	1.70	46.19	.04	.64	24438.	7230.	15113.	2063.	32.
688	729	224	225	.10	46.19	.00	.65	25059.	7230.	15734.	2063.	32.
689	730	225	545	6.00	46.19	.13	.68	25979.	7230.	16654.	2063.	32.
690	731	545	546	5.50	50.00	.11	.37	14022.	695.	12266.	1018.	43.
691	732	546	715	2.00	29.72	.07	1.16	44422.	7320.	33283.	3494.	325.
692	733	715	716	2.80	40.26	.07	.89	34020.	8195.	24821.	930.	74.
693	734	555	716	3.00	40.26	.07	.89	34020.	8195.	24821.	930.	74.
694	735	555	717	1.80	36.83	.05	1.04	39797.	12724.	24749.	2101.	222.
695	736	717	718	1.80	24.97	.07	1.15	43993.	21774.	16001.	6145.	72.
696	737	491	718	1.00	29.38	.03	1.18	45435.	21774.	17339.	6145.	176.
697	738	437	715	2.00	7.03	.28	1.24	47638.	10514.	34309.	2564.	251.
698	739	481	554	1.50	5.00	.30	1.94	24821.	11100.	10010.	3711.	0.
699	740	717	733	3.00	43.09	.07	.71	27400.	11552.	11654.	4044.	150.
700	741	580	733	2.70	43.74	.06	.67	25648.	10641.	11881.	2893.	232.
701	742	580	745	1.30	49.42	.03	.43	16661.	13040.	3621.	0.	0.
702	743	745	756	3.20	50.00	.06	.09	3621.	0.	3621.	0.	0.
703	748	494	730	2.50	40.53	.06	.80	46317.	11983.	20444.	11755.	2135.
704	749	730	737	2.20	44.22	.05	.65	37606.	4000.	17813.	13919.	1874.
705	750	737	743	1.50	44.22	.03	.65	37606.	4000.	17813.	13919.	1874.
706	751	743	754	3.00	50.00	.06	.30	17365.	2705.	5777.	8772.	110.
707	759	474	724	2.50	50.00	.05	.30	11567.	2864.	6836.	1866.	0.
708	760	724	726	1.50	50.00	.03	.30	11567.	2864.	6836.	1866.	0.
709	761	726	728	3.00	50.00	.06	.38	14543.	2658.	9200.	2684.	0.
710	762	728	735	1.50	48.77	.03	.44	16891.	6479.	7682.	2730.	0.

Appendix 7.6 The Result of the Traffic Assignment (10)

NO.	LINK	NODE1	NODE2	DIST (km)	VELO (km/h)	TIME (h)	CONGEST	TOTAL	BICY	CAR	PUBL	RAIL
711	763	735	741	3.50	50.00	.07	.38	14667.	6413.	6109.	2146.	0.
712	764	741	748	1.00	50.00	.02	.00	152.	0.	152.	0.	0.
713	765	748	751	3.70	50.00	.07	.00	152.	0.	152.	0.	0.
714	766	352	719	2.50	17.05	.15	1.15	44145.	9970.	23068.	11107.	0.
715	767	719	720	2.50	5.00	.50	1.28	48984.	13559.	25733.	9693.	0.
716	768	720	721	1.50	21.46	.07	1.14	43637.	10036.	19918.	13682.	0.
717	769	581	721	3.00	18.70	.16	1.14	43615.	8834.	19084.	15586.	112.
718	770	563	581	2.20	50.00	.04	.19	7258.	552.	3989.	2579.	139.
719	771	563	728	1.30	50.00	.03	.33	12554.	4456.	5123.	2975.	0.
720	772	728	729	2.00	48.19	.04	.48	18375.	8277.	7078.	3020.	0.
721	773	729	730	2.20	48.19	.05	.48	18375.	8277.	7078.	3020.	0.
722	774	730	731	2.20	50.00	.04	.30	11508.	51.	10352.	843.	261.
723	775	731	732	1.10	50.00	.02	.30	11508.	51.	10352.	843.	261.
724	776	732	733	2.00	50.00	.04	.38	14710.	51.	13427.	821.	411.
725	777	733	734	2.70	50.00	.05	.35	13341.	962.	9914.	1971.	494.
726	778	569	721	8.00	50.00	.16	.38	14429.	519.	9744.	4054.	112.
727	779	721	722	2.50	50.00	.05	.30	11612.	1675.	8130.	1808.	0.
728	780	398	722	.50	45.95	.01	.63	24341.	4092.	14937.	5252.	60.
729	781	398	726	1.80	28.05	.06	1.13	43502.	5145.	32126.	6171.	60.
730	782	726	727	1.80	41.15	.04	.86	32878.	4692.	24463.	3662.	60.
731	783	493	727	2.00	41.15	.05	.86	32878.	4692.	24463.	3662.	60.
732	785	740	741	3.20	50.00	.06	.18	7011.	5840.	1019.	152.	0.
733	786	582	741	2.50	50.00	.05	.00	76.	0.	0.	76.	0.
734	787	582	742	1.00	50.00	.02	.00	76.	0.	0.	76.	0.
735	788	742	743	2.40	50.00	.05	.00	76.	0.	0.	76.	0.
736	789	743	744	2.50	50.00	.05	.35	13276.	13040.	1.	236.	0.
737	790	744	745	4.00	50.00	.08	.35	13276.	13040.	1.	236.	0.
738	791	745	746	2.50	50.00	.05	.01	236.	0.	1.	236.	0.
739	792	746	747	1.50	50.00	.03	.01	236.	0.	1.	236.	0.
740	793	750	751	3.50	50.00	.07	.02	953.	11.	419.	504.	19.
741	794	751	752	3.00	50.00	.06	.02	801.	11.	267.	504.	19.
742	795	752	753	2.00	50.00	.04	.02	801.	11.	267.	504.	19.
743	796	753	754	1.80	50.00	.04	.10	4005.	440.	714.	2742.	110.
744	797	754	755	2.50	50.00	.05	.04	1701.	381.	775.	545.	0.
745	798	755	756	4.80	50.00	.10	.04	1701.	381.	775.	545.	0.
746	799	756	757	4.70	50.00	.09	.14	5322.	381.	4396.	545.	0.
747	805	561	719	2.10	5.00	.42	1.35	17321.	3589.	12187.	1545.	0.
748	806	389	723	1.00	5.00	.20	1.31	16728.	5119.	7801.	3743.	65.
749	807	392	723	.90	5.00	.18	1.31	16728.	5119.	7801.	3743.	65.
750	808	392	393	.10	5.00	.02	6.77	86625.	17720.	58825.	9942.	139.
751	809	352	758	7.50	43.74	.17	.73	28044.	2571.	19948.	5524.	0.
752	812	759	761	4.00	47.11	.08	.56	21508.	1994.	13796.	5717.	0.
753	813	502	761	5.00	5.00	1.00	1.62	62387.	31270.	9057.	21314.	747.
754	858	808	809	.60	45.00	.01	.25	12363.	0.	0.	0.	12363.
755	859	809	810	.90	45.00	.02	.27	13432.	0.	0.	0.	13432.
756	860	810	1810	.60	45.00	.01	.29	14428.	0.	0.	0.	14428.
757	861	1811	812	1.00	45.00	.02	.33	16523.	0.	0.	0.	16523.
758	862	812	813	1.10	45.00	.02	.33	16613.	0.	0.	0.	16613.
759	871	1813	822	1.00	45.00	.02	.29	14733.	0.	0.	0.	14733.
760	872	822	823	.70	45.00	.02	.23	11600.	0.	0.	0.	11600.
761	873	823	1823	.90	45.00	.02	.23	11260.	0.	0.	0.	11260.
762	874	824	825	1.50	45.00	.03	.23	11280.	0.	0.	0.	11280.
763	1860	1810	811	.50	45.00	.01	.32	15783.	0.	0.	0.	15783.
764	1861	811	1811	.80	45.00	.02	.31	15430.	0.	0.	0.	15430.
765	1862	813	1813	1.00	45.00	.02	.29	14674.	0.	0.	0.	14674.
766	1873	1823	824	.90	45.00	.02	.22	11006.	0.	0.	0.	11006.
767	884	305	808	.30	20.00	.02	.12	4953.	0.	0.	0.	4953.
768	885	308	809	.30	20.00	.02	.03	1350.	0.	0.	0.	1350.
769	886	311	810	.30	20.00	.02	.04	1743.	0.	0.	0.	1743.
770	887	314	811	.30	20.00	.02	.01	353.	0.	0.	0.	353.
771	888	359	812	.30	20.00	.02	.00	90.	0.	0.	0.	90.
772	889	363	813	.30	20.00	.02	.09	3691.	0.	0.	0.	3691.
773	897	456	822	.30	20.00	.02	.08	3209.	0.	0.	0.	3209.
774	898	457	823	.30	20.00	.02	.03	1395.	0.	0.	0.	1395.
775	899	463	825	.40	20.00	.02	.23	9178.	0.	0.	0.	9178.
776	1887	315	1811	.30	20.00	.02	.03	1093.	0.	0.	0.	1093.
777	1886	313	1810	.30	20.00	.02	.03	1379.	0.	0.	0.	1379.
778	1889	367	1813	.30	20.00	.02	.02	817.	0.	0.	0.	817.
779	1898	459	1823	.30	20.00	.02	.01	254.	0.	0.	0.	254.
780	944	808	903	.60	45.00	.01	.21	10346.	0.	0.	0.	10346.
781	945	903	904	1.10	45.00	.02	.17	8628.	0.	0.	0.	8628.
782	946	904	905	.60	45.00	.01	.16	8024.	0.	0.	0.	8024.
783	947	905	906	1.00	45.00	.02	.11	5453.	0.	0.	0.	5453.
784	970	824	461	.30	20.00	.02	.01	274.	0.	0.	0.	274.
785	974	903	309	.30	20.00	.02	.05	1850.	0.	0.	0.	1850.
786	975	904	322	.30	20.00	.02	.03	1092.	0.	0.	0.	1092.
787	976	905	527	.30	20.00	.02	.09	3642.	0.	0.	0.	3642.
788	978	906	265	.30	20.00	.02	.14	5453.	0.	0.	0.	5453.

Appendix 7.6 The Result of the Traffic Assignment (11)

NO.	LINK	NODE1	NODE2	DIST (km)	VELO (km/h)	TIME (h)	CONGEST	TOTAL	BICY	CAR	PUBL	RAIL
789	9011	1	523	.50	4.00	.13	9.11	91065.	37499.	37886.	14759.	921.
790	9021	2	254	.50	4.00	.13	1.15	11466.	4439.	5368.	1392.	267.
791	9022	2	256	.50	4.00	.13	3.00	30032.	9707.	13492.	6622.	212.
792	9031	3	251	.50	4.00	.13	3.45	34548.	12603.	14623.	6985.	337.
793	9032	3	521	.50	4.00	.13	1.61	16062.	6213.	7990.	1767.	92.
794	9041	4	520	.50	4.00	.13	2.07	20658.	4842.	12776.	2612.	428.
795	9042	4	522	.50	4.00	.13	1.06	10628.	5039.	4246.	1343.	0.
796	9051	5	273	.50	4.00	.13	2.95	29536.	10769.	15984.	2783.	0.
797	9052	5	322	.50	4.00	.13	5.43	54331.	17601.	30571.	5069.	1091.
798	9061	6	525	.50	4.00	.13	3.43	34345.	9213.	17956.	6166.	1010.
799	9071	7	524	.50	4.00	.13	1.40	13980.	6548.	6136.	1129.	167.
800	9081	8	520	.50	4.00	.13	3.65	36501.	12679.	19356.	4208.	259.
801	9101	10	310	.50	4.00	.13	4.45	44499.	9528.	30817.	2737.	1416.
802	9102	10	318	.50	4.00	.13	4.02	40171.	10546.	24912.	4707.	6.
803	9111	11	527	.50	4.00	.13	8.63	86330.	26272.	45193.	12316.	2549.
804	9121	12	519	.50	4.00	.13	6.61	66131.	18677.	40322.	6199.	933.
805	9131	13	289	.50	4.00	.13	7.68	76834.	18887.	52477.	4886.	586.
806	9132	13	302	.50	4.00	.13	13.07	130734.	13389.	107631.	7595.	2118.
807	9141	14	237	.50	4.00	.13	2.61	26143.	7596.	12971.	5576.	0.
808	9142	14	279	.50	4.00	.13	2.60	26029.	8581.	11621.	4634.	1193.
809	9151	15	234	.50	4.00	.13	.83	8302.	1312.	6389.	600.	0.
810	9152	15	280	.50	4.00	.13	.89	8931.	2916.	5126.	848.	41.
811	9153	15	283	.50	4.00	.13	.98	9756.	1711.	7013.	953.	78.
812	9161	16	303	.50	4.00	.13	2.85	28550.	5518.	21285.	1052.	695.
813	9162	16	538	.50	4.00	.13	1.04	10409.	1347.	7821.	1151.	90.
814	9171	17	344	.50	4.00	.13	12.83	128346.	28810.	86942.	11544.	1051.
815	9181	18	540	.50	4.00	.13	5.81	58122.	22922.	30639.	3712.	849.
816	9191	19	559	.50	4.00	.13	8.31	83119.	19062.	59521.	4299.	237.
817	9201	20	389	.50	4.00	.13	10.62	106226.	25652.	68698.	10894.	983.
818	9202	20	392	.50	4.00	.13	7.86	78636.	12068.	61595.	4899.	74.
819	9211	21	508	.50	4.00	.13	3.06	30571.	16910.	10448.	3124.	89.
820	9221	22	509	.50	4.00	.13	2.55	25542.	15034.	7023.	3309.	176.
821	9231	23	512	.50	4.00	.13	5.61	56092.	25284.	22394.	7784.	630.
822	9241	24	233	.50	4.00	.13	3.78	37796.	21183.	13205.	3371.	38.
823	9242	24	234	.50	4.00	.13	1.10	11014.	6388.	3503.	1059.	65.
824	9251	25	504	.50	4.00	.13	1.92	19170.	6361.	9695.	2642.	473.
825	9252	25	505	.50	4.00	.13	.80	7970.	3132.	3559.	1279.	0.
826	9261	26	526	1.00	4.00	.25	3.69	36905.	19463.	12942.	4256.	243.
827	9272	27	332	.50	4.00	.13	5.14	51360.	21313.	24930.	4914.	202.
828	9282	28	336	.50	4.00	.13	9.53	95254.	38911.	44283.	11090.	969.
829	9291	29	352	.50	4.00	.13	3.21	32142.	12402.	13744.	5945.	51.
830	9292	29	561	.50	4.00	.13	2.98	29767.	11341.	14197.	4151.	79.
831	9301	30	562	.50	4.00	.13	5.80	57978.	15768.	32356.	9639.	215.
832	9302	30	720	.50	4.00	.13	2.55	25454.	7910.	12127.	5417.	0.
833	9311	31	259	.50	4.00	.13	2.98	29824.	18599.	7638.	3205.	383.
834	9312	31	211	.50	4.00	.13	.85	8514.	5382.	2818.	314.	0.
835	9321	32	511	.50	4.00	.13	5.73	57346.	24229.	24325.	8486.	305.
836	9322	32	510	.50	4.00	.13	4.25	42461.	19666.	16174.	6620.	0.
837	9331	33	510	.50	4.00	.13	5.49	54881.	36567.	13373.	4828.	112.
838	9341	34	513	.50	4.00	.13	10.40	104041.	42231.	44889.	16665.	256.
839	9351	35	515	.50	4.00	.13	8.52	85159.	39209.	33845.	11944.	160.
840	9361	36	208	.50	4.00	.13	5.64	56427.	27290.	23941.	4814.	382.
841	9362	36	503	.50	4.00	.13	2.60	25970.	13834.	5645.	6186.	305.
842	9371	37	502	.50	4.00	.13	10.38	103753.	54603.	27359.	21130.	660.
843	9381	38	537	.50	4.00	.13	2.60	25981.	3509.	21577.	798.	97.
844	9391	39	543	.50	4.00	.13	8.11	81104.	9072.	70070.	1742.	220.
845	9392	39	453	.50	4.00	.13	.63	6252.	894.	4687.	361.	309.
846	9401	40	542	1.00	4.00	.25	5.33	53346.	9698.	41994.	1655.	0.
847	9402	40	1367	1.00	4.00	.25	3.09	30899.	4472.	24719.	1350.	358.
848	9411	41	452	.50	4.00	.13	3.25	32477.	3640.	28339.	496.	2.
849	9412	41	459	.50	4.00	.13	1.25	12454.	4550.	7208.	442.	254.
850	9413	41	461	.50	4.00	.13	1.11	11145.	1673.	7620.	1575.	277.
851	9421	42	558	.50	4.00	.13	6.77	67736.	10204.	54232.	2686.	614.
852	9422	42	472	.50	4.00	.13	4.73	47269.	3355.	43071.	837.	6.
853	9431	43	471	.50	4.00	.13	3.23	32289.	9674.	19536.	3079.	0.
854	9432	43	557	.50	4.00	.13	4.87	48738.	5946.	39825.	1898.	1069.
855	9441	44	1463	.50	4.00	.13	3.48	34818.	8815.	23037.	1699.	1268.
856	9442	44	553	.50	4.00	.13	4.61	46082.	11520.	28788.	5552.	221.
857	9451	45	475	.50	4.00	.13	5.45	54532.	12643.	36077.	4793.	1020.
858	9461	46	487	.50	4.00	.13	4.43	44342.	16147.	24996.	3037.	161.
859	9462	46	556	.50	4.00	.13	7.06	70601.	16664.	46035.	5945.	1937.
860	9471	47	533	.50	4.00	.13	2.55	25484.	11205.	10027.	4034.	219.
861	9481	48	402	.50	4.00	.13	1.72	17175.	4957.	8779.	3433.	6.
862	9482	48	534	.50	4.00	.13	2.00	20030.	4213.	14326.	1406.	86.
863	9491	49	535	.50	4.00	.13	3.36	33640.	8342.	20409.	4848.	42.
864	9501	50	536	.50	4.00	.13	3.73	37298.	24946.	6299.	5933.	120.
865	9502	50	590	.50	4.00	.13	7.59	75904.	39271.	25136.	11370.	127.
866	9511	51	416	.50	4.00	.13	8.17	81723.	12640.	62520.	6159.	403.

Appendix 7.6 The Result of the Traffic Assignment (12)

NO.	LINK	NODE1	NODE2	DIST (km)	VELO (km/h)	TIME (h)	CONGEST	TOTAL	BICY	CAR	PUBL	RAIL
867	9521	52	435	.50	4.00	.13	3.10	30978.	3535.	26634.	756.	53.
868	9531	53	424	.50	4.00	.13	1.57	15726.	3979.	9242.	2265.	240.
869	9532	53	426	.50	4.00	.13	.07	718.	35.	468.	215.	0.
870	9541	54	549	.50	4.00	.13	7.05	70506.	13222.	51613.	4785.	886.
871	9542	54	464	.50	4.00	.13	6.70	66969.	11071.	48255.	6755.	887.
872	9551	55	546	.50	4.00	.13	4.10	40978.	3598.	34287.	2808.	284.
873	9571	57	554	.50	4.00	.13	4.52	45182.	16319.	22401.	5746.	715.
874	9581	58	514	.50	4.00	.13	.75	7512.	3617.	2512.	1373.	10.
875	9591	59	570	.50	4.00	.13	.42	4231.	1036.	2536.	646.	14.
876	9601	60	571	.50	4.00	.13	1.26	12571.	4832.	6263.	1472.	3.
877	9611	61	572	.50	4.00	.13	.54	5378.	493.	2948.	1904.	33.
878	9621	62	545	.50	4.00	.13	2.04	20364.	9310.	7160.	3883.	10.
879	9631	63	575	.50	4.00	.13	.66	6624.	2732.	2287.	1604.	1.
880	9641	64	576	.50	4.00	.13	.37	3707.	624.	1960.	1122.	0.
881	9651	65	547	.50	4.00	.13	.28	2817.	873.	905.	977.	62.
882	9652	65	574	.50	4.00	.13	.09	905.	117.	408.	381.	0.
883	9661	66	573	.50	4.00	.13	.06	556.	35.	492.	29.	0.
884	9662	66	577	.50	4.00	.13	.94	9409.	4529.	3846.	881.	153.
885	9671	67	555	.50	4.00	.13	.27	2716.	603.	1142.	845.	126.
886	9681	68	498	.50	4.00	.13	1.97	19691.	6187.	6237.	6282.	984.
887	9691	69	578	.50	4.00	.13	1.74	17390.	4938.	11471.	944.	38.
888	9701	70	498	.50	4.00	.13	1.79	17856.	6264.	6455.	4273.	664.
889	9711	71	494	1.00	4.00	.25	3.02	30193.	15412.	10346.	3589.	847.
890	9721	72	563	.50	4.00	.13	1.02	10210.	4297.	2744.	3022.	147.
891	9722	72	581	.50	4.00	.13	3.61	36137.	7617.	14271.	13710.	538.
892	9731	73	581	.50	4.00	.13	.92	9225.	3005.	3853.	2301.	67.
893	9741	74	741	.50	4.00	.13	.76	7580.	573.	4938.	2070.	0.
894	9742	74	743	.50	4.00	.13	3.88	38842.	16476.	12511.	7871.	1984.
895	9751	75	583	.50	4.00	.13	2.64	26397.	10526.	5521.	10264.	85.
896	9761	76	584	.50	4.00	.13	.14	1421.	0.	141.	116.	1164.
897	9762	76	754	.50	4.00	.13	1.60	16020.	2647.	5941.	7432.	0.
898	9771	77	586	.50	4.00	.13	1.31	13054.	2730.	2071.	8253.	1.
899	9781	78	587	.50	4.00	.13	1.67	16658.	1092.	7714.	7737.	116.
900	9791	79	585	1.00	4.00	.25	.02	242.	0.	214.	28.	0.
901	9792	79	501	1.00	4.00	.25	.53	5278.	912.	1197.	2316.	853.
902	9801	80	565	.50	4.00	.13	2.62	26189.	11801.	8671.	5598.	119.
903	9811	81	569	.50	4.00	.13	2.81	28110.	1305.	17437.	9303.	65.
904	9821	82	568	.50	4.00	.13	1.27	12748.	6437.	3511.	2659.	141.
905	9831	83	564	.50	4.00	.13	2.92	29166.	4898.	11947.	12181.	141.
906	9841	84	567	.50	4.00	.13	.35	3511.	372.	2047.	978.	114.
907	9851	85	775	.50	4.00	.13	.00	0.	0.	0.	0.	0.
908	9852	85	776	.50	4.00	.13	.00	0.	0.	0.	0.	0.
909	9861	86	774	.50	4.00	.13	.00	0.	0.	0.	0.	0.
910	9871	87	782	.50	4.00	.13	2.97	29728.	561.	11632.	16835.	700.
911	9872	87	781	.50	4.00	.13	.67	6716.	182.	3982.	2505.	47.
912	9881	88	777	.50	4.00	.13	2.67	26666.	1786.	12833.	11360.	686.
913	9882	88	778	.50	4.00	.13	1.54	15351.	751.	7538.	7063.	0.
914	9883	88	609	.50	4.00	.13	.09	920.	0.	0.	0.	920.
915	9911	91	771	.50	4.00	.13	.00	0.	0.	0.	0.	0.
916	9912	91	772	.50	4.00	.13	.00	0.	0.	0.	0.	0.
917	9921	92	782	.50	4.00	.13	.00	0.	0.	0.	0.	0.
918	9922	92	781	.50	4.00	.13	.00	0.	0.	0.	0.	0.
919	9923	92	783	.50	4.00	.13	.00	0.	0.	0.	0.	0.
920	9941	94	771	.50	4.00	.13	.00	0.	0.	0.	0.	0.
921	9942	94	772	.50	4.00	.13	.00	0.	0.	0.	0.	0.
922	9951	95	771	.50	4.00	.13	4.22	42154.	1174.	22307.	17858.	815.
923	9702	70	580	.50	4.00	.13	4.34	43358.	23681.	15739.	2916.	1022.
924	9742	74	743	.50	4.00	.13	.00	0.	0.	0.	0.	0.
925	9182	18	359	1.00	4.00	.25	1.12	11196.	0.	11088.	108.	0.
926	9403	40	367	1.00	4.00	.25	4.25	42458.	2876.	38136.	635.	810.
927	8001	100	780	.50	4.00	.13	1.27	12741.	232.	8328.	4065.	116.
928	8002	100	778	.50	4.00	.13	2.46	24580.	695.	9958.	10612.	3317.
929	8011	101	771	.50	4.00	.13	.00	0.	0.	0.	0.	0.
930	8012	101	772	.50	4.00	.13	.00	0.	0.	0.	0.	0.
931	8021	102	572	.50	4.00	.13	.00	0.	0.	0.	0.	0.

