

APPENDICES

APPENDIX 1 HANDOUT OF SEMINAR

**Preparatory Survey on JICA Cooperation
Program for Industrial Development
(Investment Climate Improvement in Karachi)**

**- Infrastructure Sector –
(Road Development Project &
Electrical Power Development Project)**

**Japan International Cooperation Agency (JICA)
Study Team : Nippon Koei Co., Ltd.**

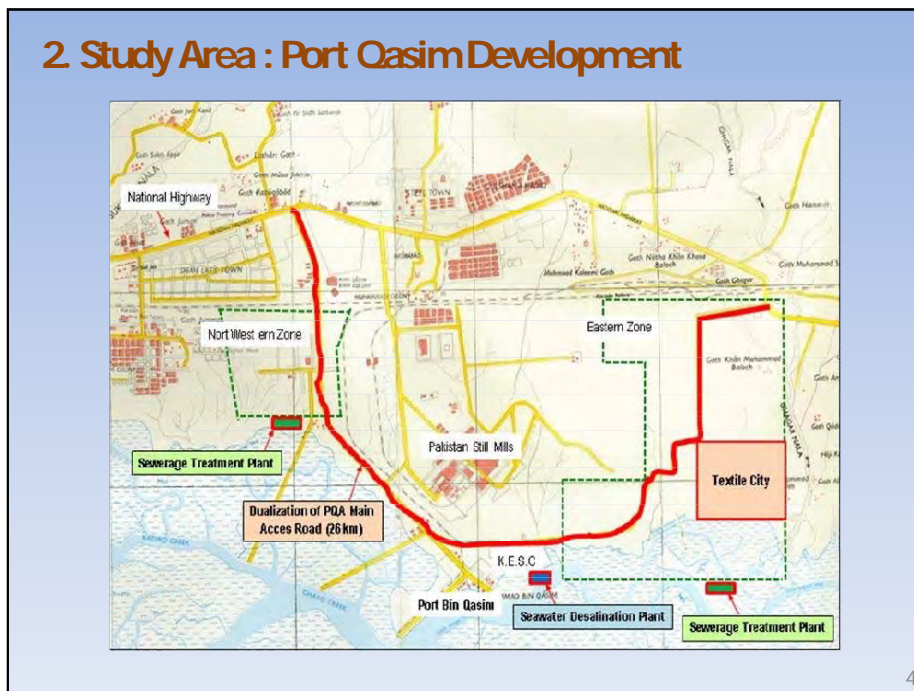
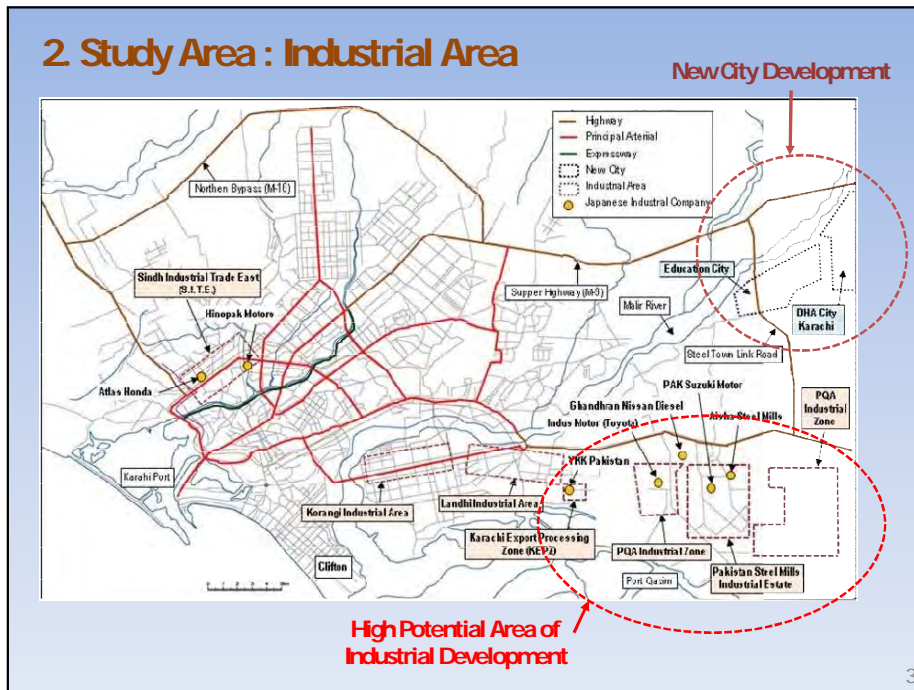
1. Object of Study

(1) Electrical Power Development Project

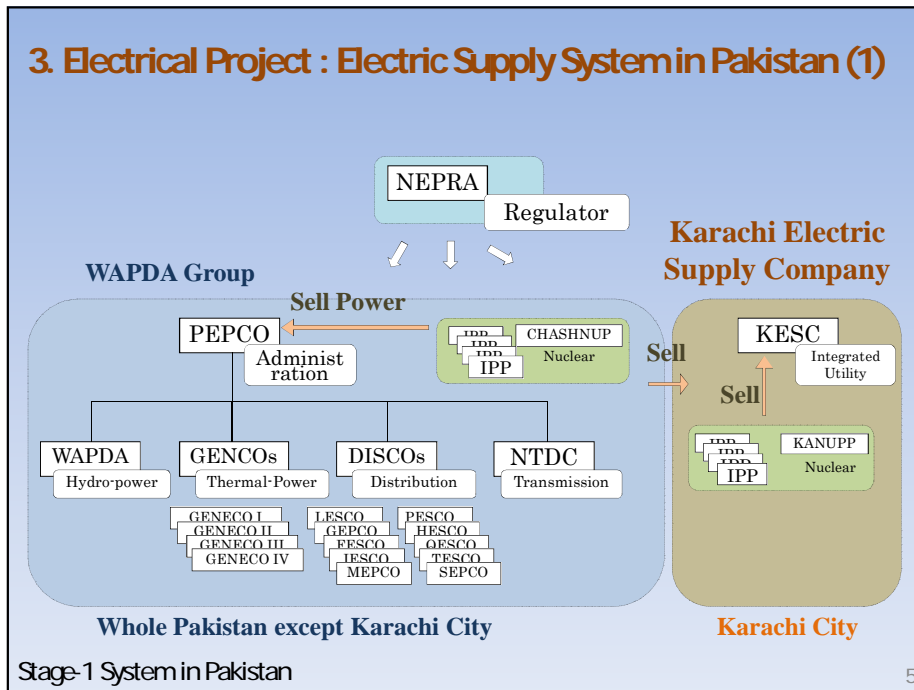
- Collecting Data / Information of Electrical Projects in Karachi
- Assessment & Evaluation on Investment Climate Aspect
- Recommendation of 4 High Priority Projects

(2) Road Development Project

- Collecting Data / Information of Road Network Development in Karachi
- Conduct Traffic Survey and Future Demand Forecast
- Setting Three (3) Priority Road Development Projects to Improve Accessibility to Port Qasim
- Select One (1) Highest Priority Project and Conducting Pre-Feasibility Study

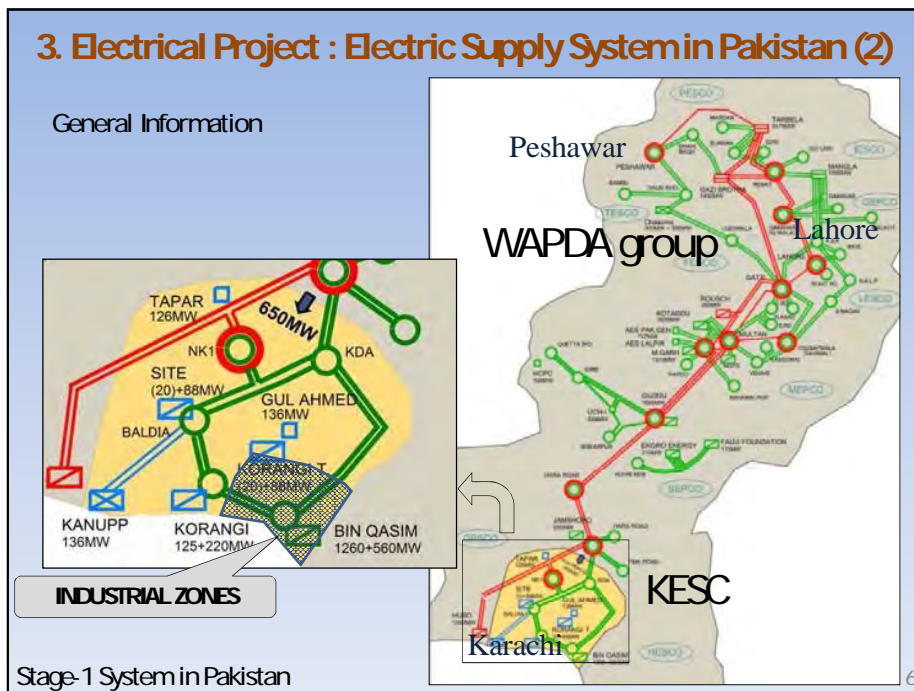


3. Electrical Project : Electric Supply System in Pakistan (1)

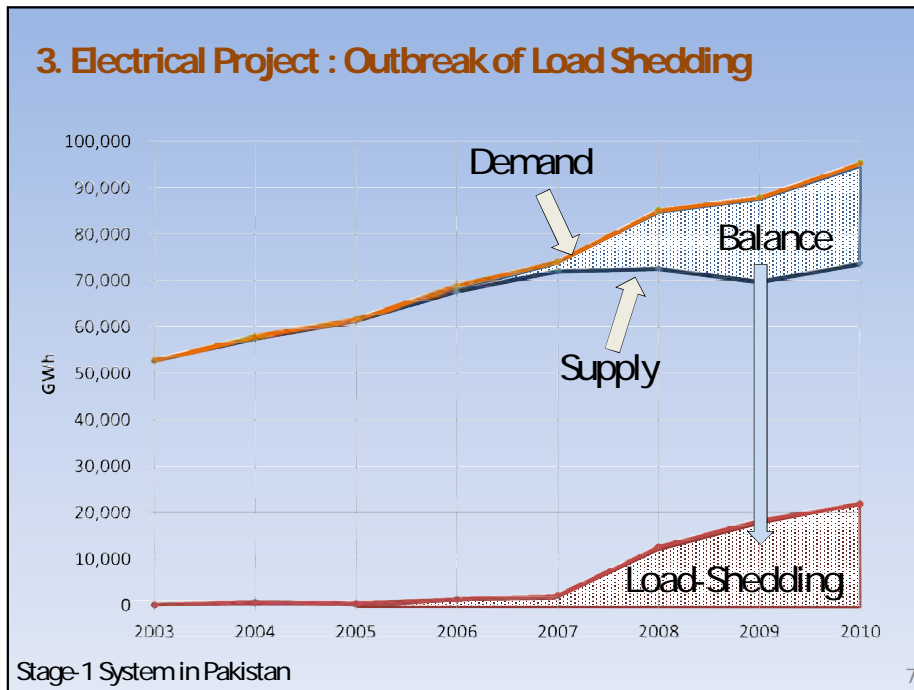


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3. Electrical Project : Electric Supply System in Pakistan (2)



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3. Electrical Project : Why Focus on KESC ?

KESC is ;

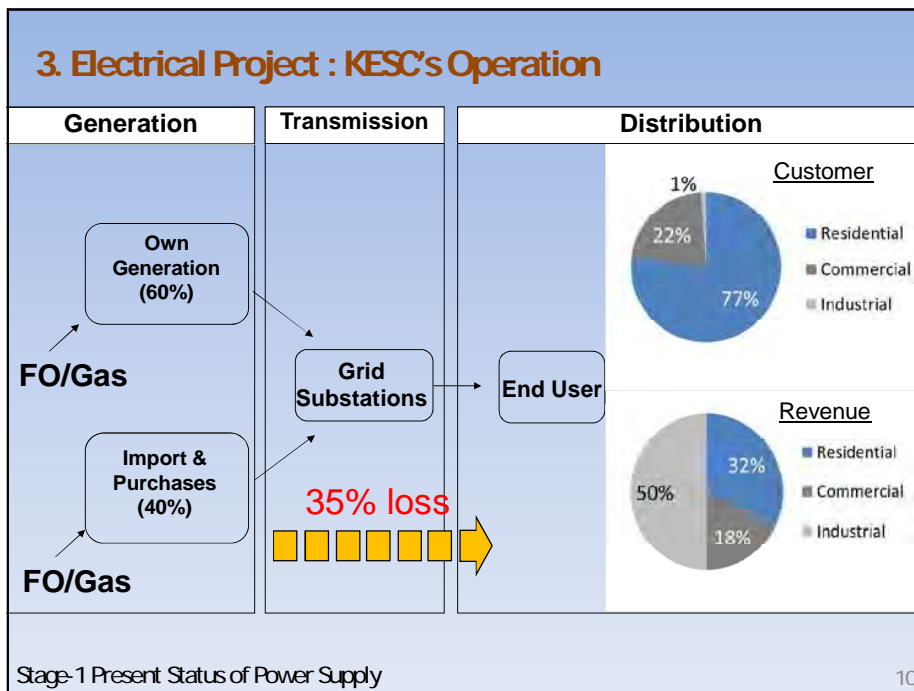
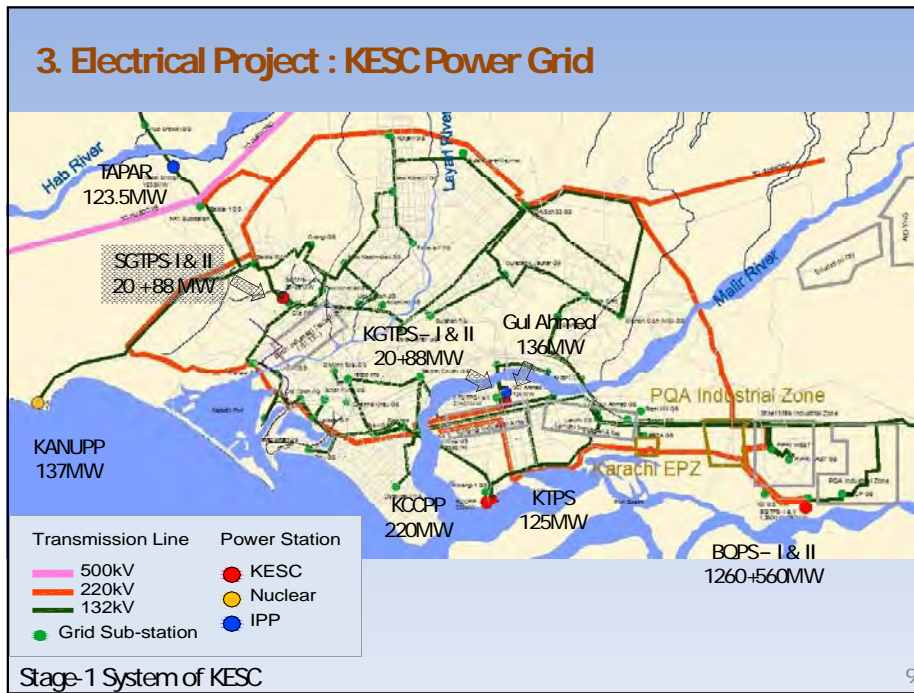
- 73% Privatized
- but
- Monopoly Power Supplier in Karachi**

Investor should select

KESC Power or **Self Generation**

Stage-1 Why Focus on KESC

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3. Electrical Project

Government instructed WAPDA to supply 650MW to KESC : signed 2010 for 5 years

Because:

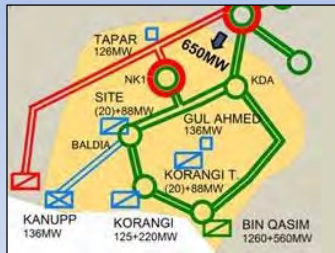
KESC is Privatized Company
Profit Making



Priority on Industrial Consumers



Difficulty on Residential Consumers



But :

Power-shortage in WAPDA is severer than KESC



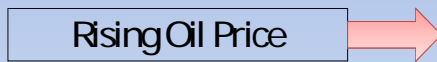
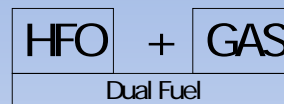
Uncertain Renewal for 650MW after 2015

Stage-1 Present Status of Power Supply

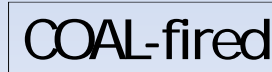
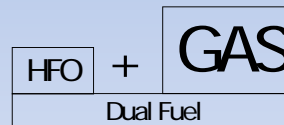
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3. Electrical Project : Approach for Fuel Conversion

Bin Qasim Power Station



Gas demand increase



Stage-1 Present Status of Power Supply

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3. Electrical Project : Overview of Listed Projects

✓ : Applicable Projects

	Projects	Approx. Cost	Planned
(1)	Bin Qasim Power Station - I (BQPS-I) Fuel conversion to Coal-fired (420MW)	USD250M	KESC
(2)	Karachi Waste-to-Energy, Build and Operation (22MW)	USD65-70M	KESC
(3)	Thar Coal Thermal Power Plant (300MW, overall 1,200MW)	USD450M	KESC
(4)	Import Overseas LNG, Build and Operation (use for BQPS-II 560MW)	USD300-350M	KESC
✓ (5)	Korangi Combined Cycle Power Plant (KCCPP) Convert Open mode unit to combined cycle mode	USD44M	KESC
✓ (6)	Korangi Gasturbine Power Station-II (KGTPS-II) Add combined mode	USD24M	KESC
✓ (7)	S.I.T.E Gasturbine Power Station-II (SGTPS-II) Add combined mode	USD24M	KESC
(8)	Co-generation with Desalination Plant (25MGD), by BOT	Unknown	POA
✓ (9)	Renovation of Distribution Line	USD100M (*1)	Study Team
✓ (10)	Construction of grid substations and 132kV transmission lines	USD130M (*1)	CDGK

(*1) Project Scale can be variable.

Stage-1 Listed Projects

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3. Electrical Project : List of 4 High Priority Projects

PJT	Planned	Approx. Cost	Planned
(1)	Korangi Combined Cycle Power Plant (KCCPP) Convert Open mode unit to combined cycle mode	USD44M	KESC
(2)	Korangi Gasturbine Power Station-II (KGTPS-II) Add combined cycle mode	USD24M	KESC
(3)	S.I.T.E Gasturbine Power Station-II (SGTPS-II) Add combined mode	USD24M	KESC
(4)	Renovation of Distribution Line	USD100M (*1)	Study Team

(1), (2), & (3) contribute to increase of installed capacity in Karachi by high efficiency combined cycle without increasing fuel consumption as well as carbon emissions.

(4) contributes to reduce large distribution loss. It can be equivalent to construction of new power station. It also reduces chances of trips due to overload condition.

Stage-1 Listed Projects

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3. Electrical Project : Recommendation to GOP's Action

1) Bin Qasim Power station-I (BQPS-I)

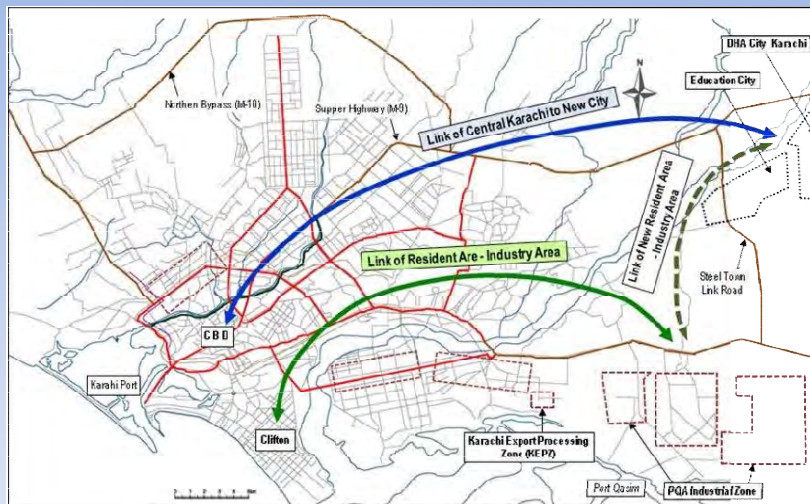
- ➔ Fuel conversion to Coal-fired, by KESC
(It is said that fund is almost finalized. Further action for implementation should be urged.)

2) F/S for Renovation of Distribution Line

- ➔ Conducting F/S incl. B/D of the Renovation of Distribution Line by GOP himself or applying JICA
(Rough scope and design of the Project should be established.)

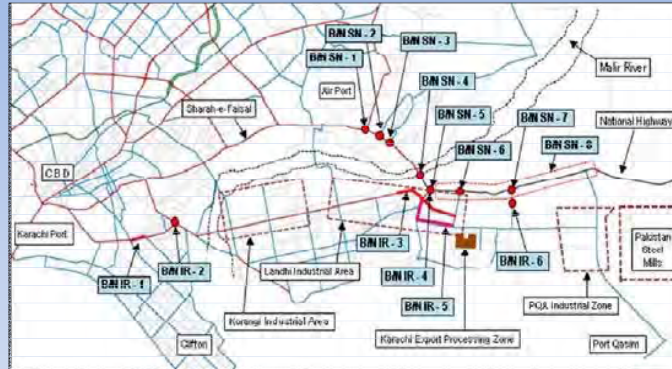
15

4. Road Project : Important Aspect of Project



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4. Road Project : Current Bottleneck Condition



1) Shahrah-e-Faisal - National Highway Route

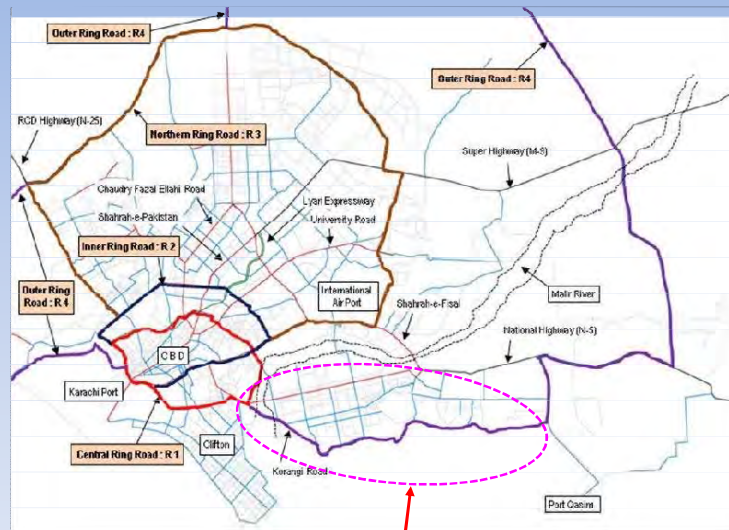
- i) Narrow Road after International Airport (only 4 lane), ii) Congestion at Intersection,
- iii) Parking of Tanker/Trailer on Road Shoulder after Quaid Abad Flyover

2) 8000 feet Road – Mehran Highway Route

- i) 8000 feet Road : Narrow at Future Colony, ii) Mehran Highway : Narrow from Rice Godown to Hospital Chowrangj

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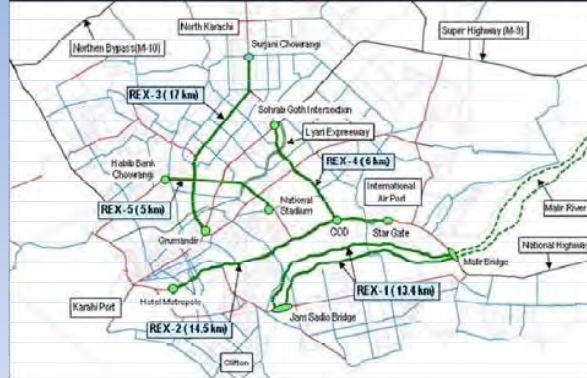
4. Road Project : Ring Road Plan in KSDP-2020



Coastal Road : Part of Outer Ring Road (R-4)

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4. Road Project : Expressway Plan by KMC



1) Elevated Expressway Projects (4 Routes)

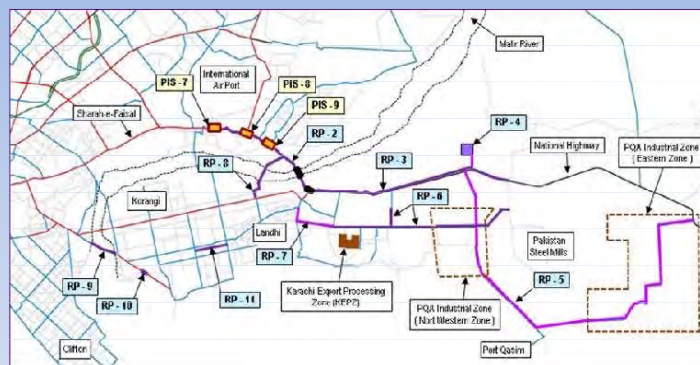
- i) Shahrah-e-Faisal from Star Gate to Hotel Metropole (14.5 km), ii) Surjani Chowranghi to Grumandir (17 km), iii) Rashid Milhas Road from COD to Sohrab Goth Intersection (6 km)
- iv) Sir Shah Suleman Road from National Stadium to Habib Bank Chowranghi, Site Area (5 km)

2) Malir Expressway Project

- Phase-I : Jam Sadio Bridge to Malir Bridge (Shahrah-e-Faisal) L=13.4 km
- Phase-II : Malir Bridge (Shahrah-e-Faisal) to Super Highway (M-9) L=28 km

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4. Road Project : Shahrah-e-Faisal / National Highway Improvement Plan by KMC



- i) Road Improvement to 6-lane Carriageway : Airport to Malir Bridge Section and Quaidabad to Still Mills Section
- ii) Construction of 3 Flyover : Airport Intersection (under construction), Malir Halt Intersection, Malir No. 15 Intersection
- iii) Construction of Oil Tanker Parking (more 2,000 Tanker) : under construction

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4. Road Project : Setting 3 Priority Projects

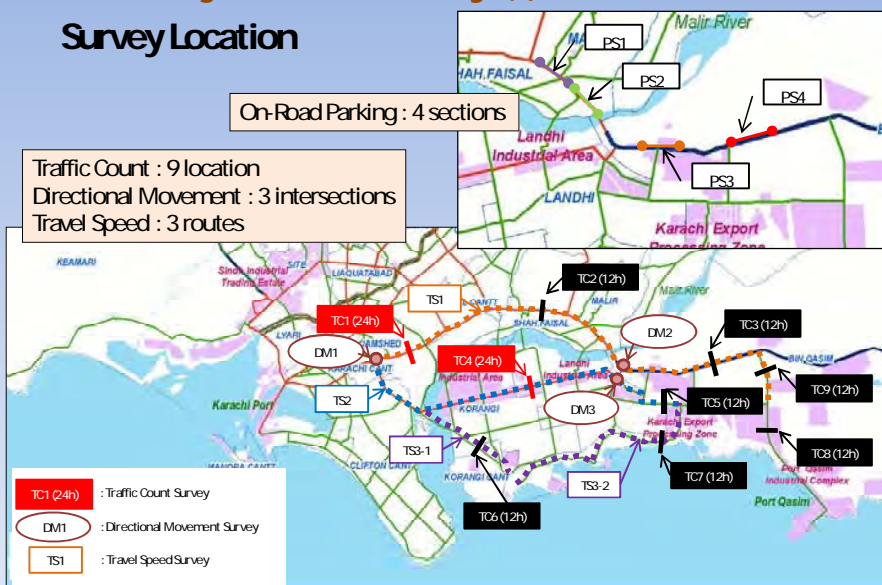


- i) Rehabilitation and Construction of Costal Road (6-lane) : L=26.3 km
(Intersection with Creek Avenue on Korangi Road - Port Qasim Access Road)
- ii) Construction of Malir Bund Road (6-lane) : L=21.3 km (Expressway 17.3 km)
(Intersection with 3000 feet Road on 8000 feet Road - National Highway at Goth Juman)
- iii) Improvement of Shahrāh-e-Faisal - National Road (6-lane + Service Road) : L=15.3 km
(International Airport to Intersection with Port Qasim Access Road)

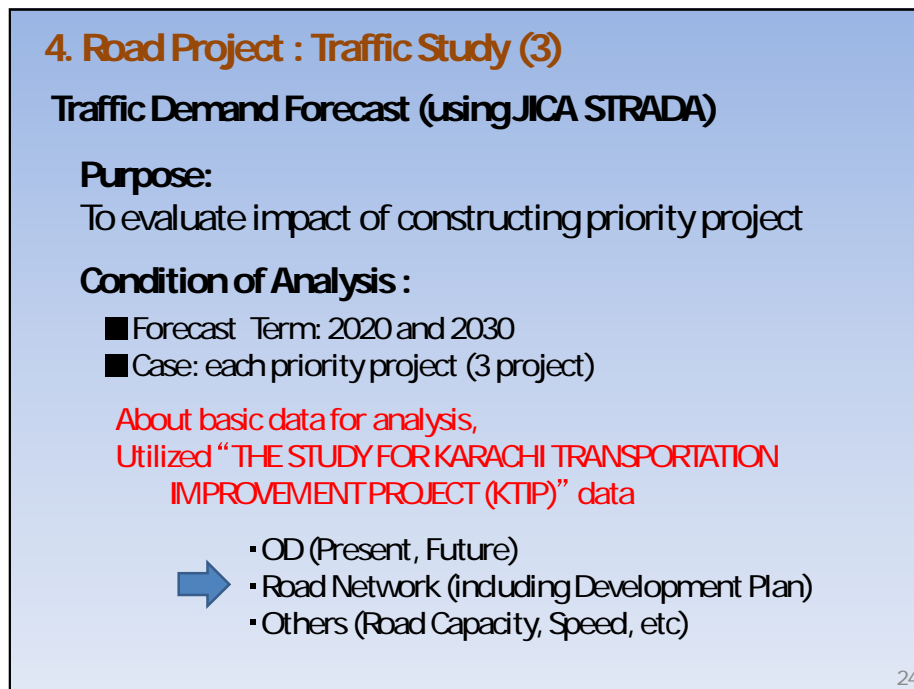
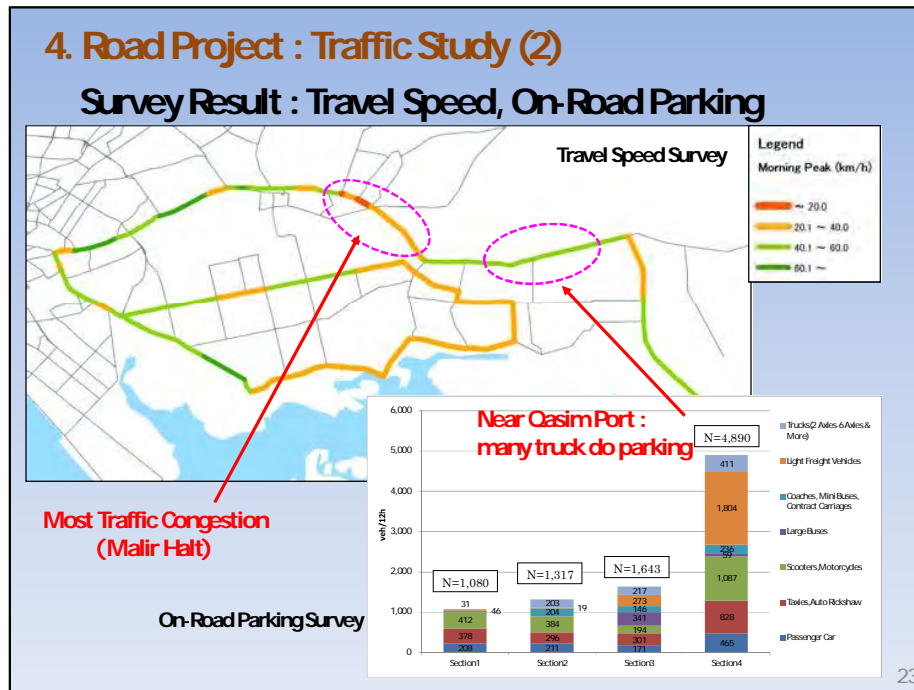
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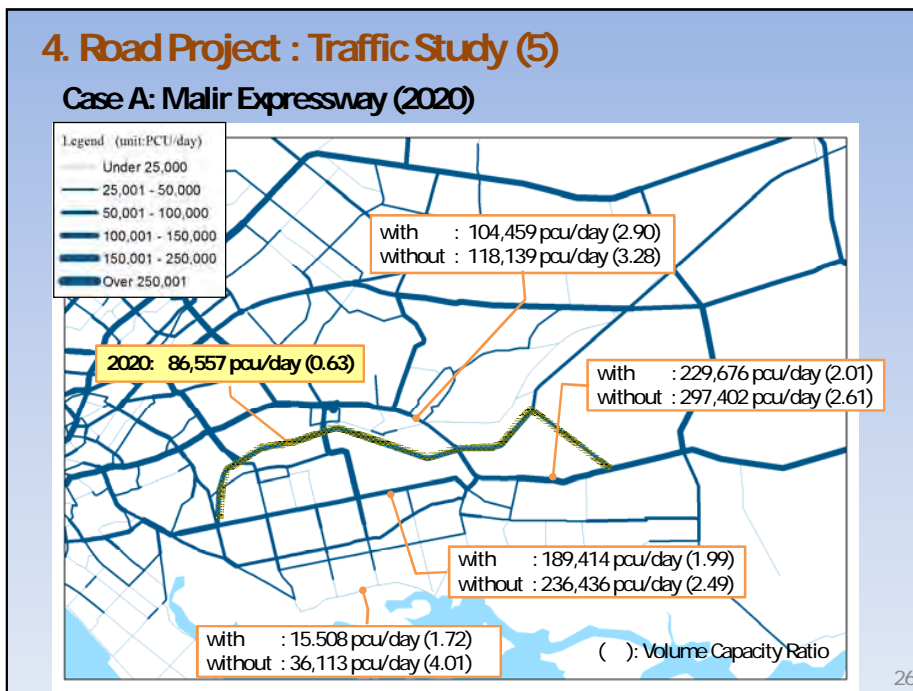
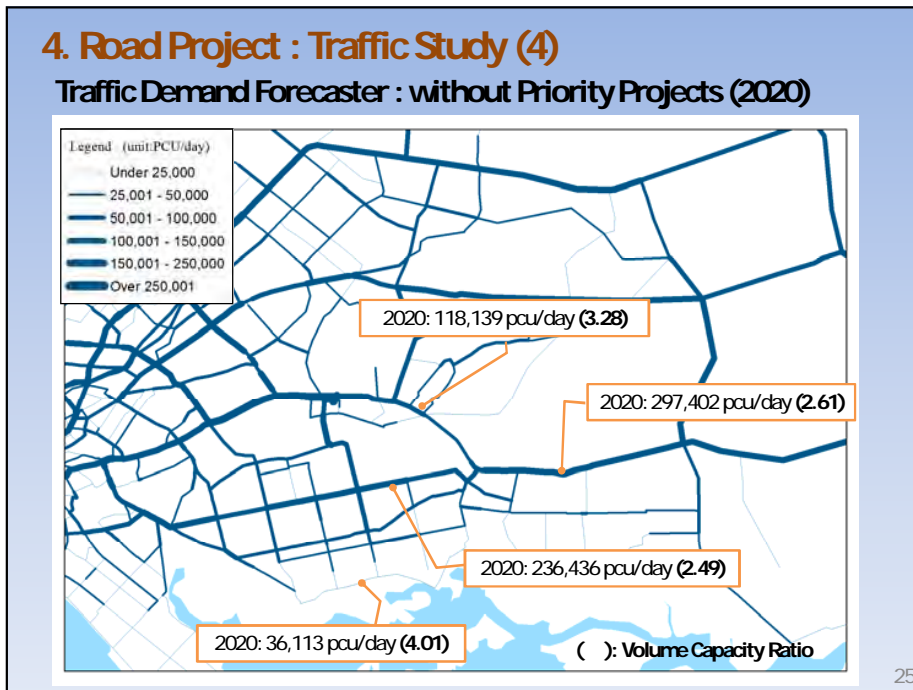
4. Road Project : Traffic Study (1)

Survey Location



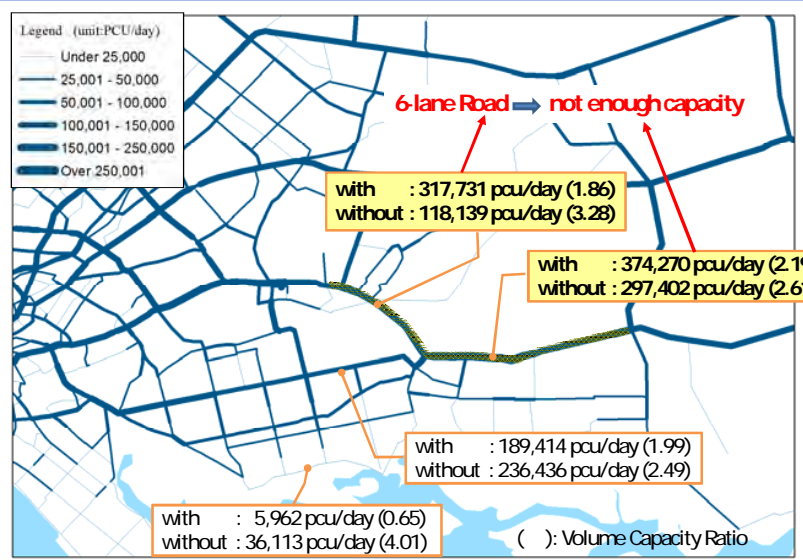
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4. Road Project : Traffic Study (6)

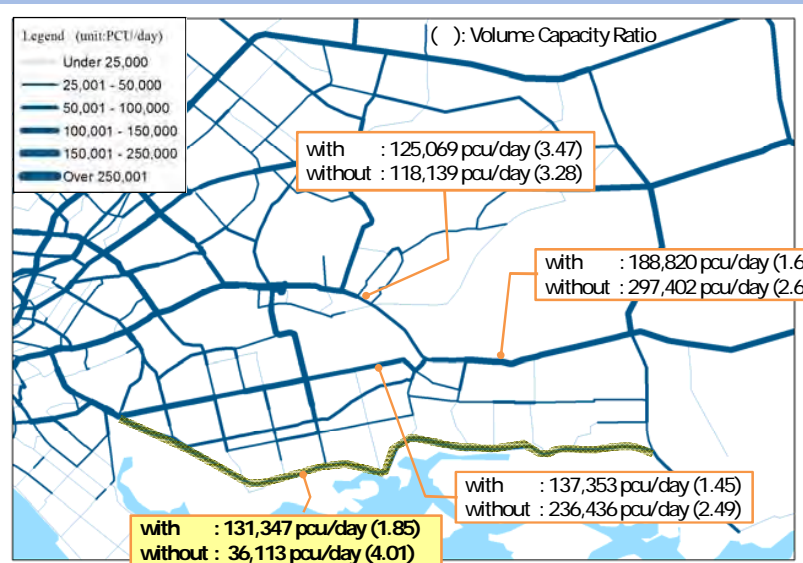
Case B: Shahrah-e-Faisal Road (2020)



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4. Road Project : Traffic Study (7)

Case C: Coastal Road (2020)



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4. Road Project : Traffic Study (8)

Evaluate Demand Forecast

- **Malir Expressway is the highest traffic demand.**
(V/C ratio is low, travel speed is high)

Case No	Priority Project	Traffic Demand to change the route (PCU)	Reference	
			Average Volume Capacity Ratio	Average Travel Speed (km/h)
A	Malir Expressway	132,820	0.79	67.1
B	Improvement of Shahrah-e-Faisal / National Highway	94,310	1.39	63.9
C	Coastal Road	53,204	1.34	45.8

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4. Road Project : Malir Expressway Project (1)

Proposed Road Alignment



Right-side Bund : Very Difficult due to Resettlement Issues



Recommend to Construction on Left-side Bund

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4. Road Project : Malir Expressway Project (2)

Project Outline

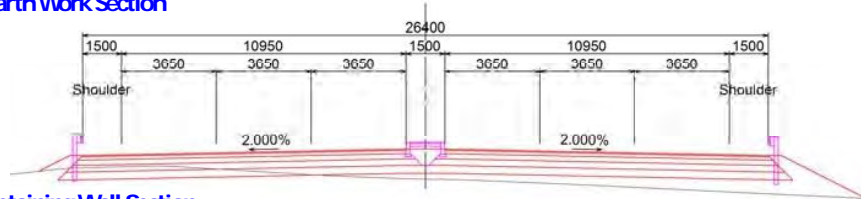
Construction of Malir River Bund Road	
Start Point	The Intersection of Main Korangji Industrial Road and Korangji Industrial Area (3000) Road
End Point	National Highway at Goth Juman
Design Speed	80 km/h (Ramp : 40km/h)
Length	20.9 km
Number of Lane	6 Lanes of Both Direction
Bridge	6 Bridge (Total Length : 3,150m)
Ramp	3 Nos

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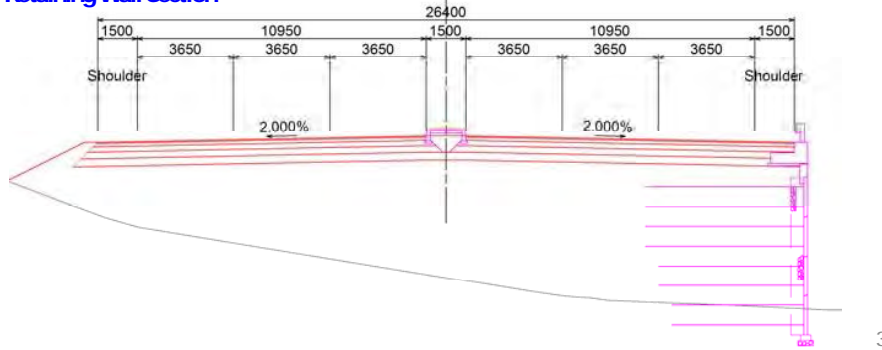
4. Road Project : Malir Expressway Project (3)

Typical Cross Section (1)

Earth Work Section

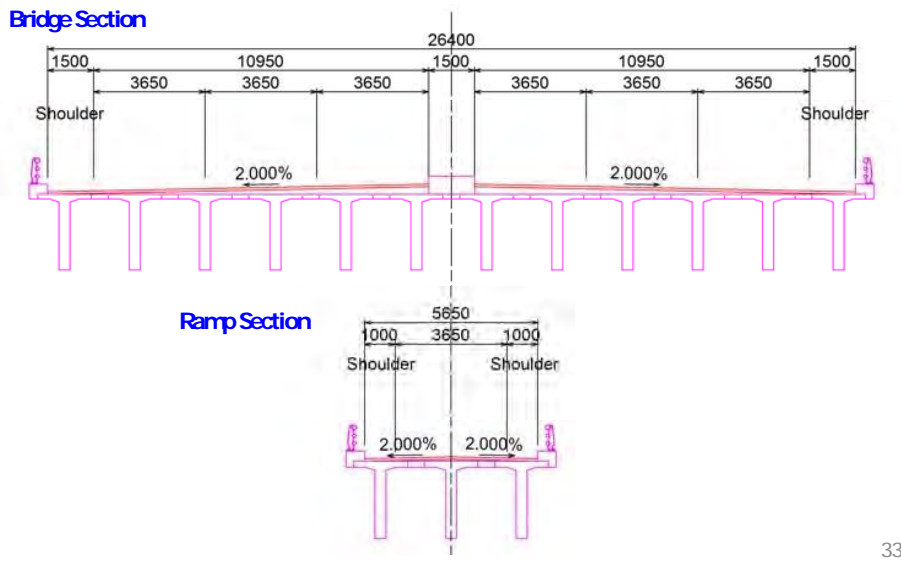


Retaining Wall Section



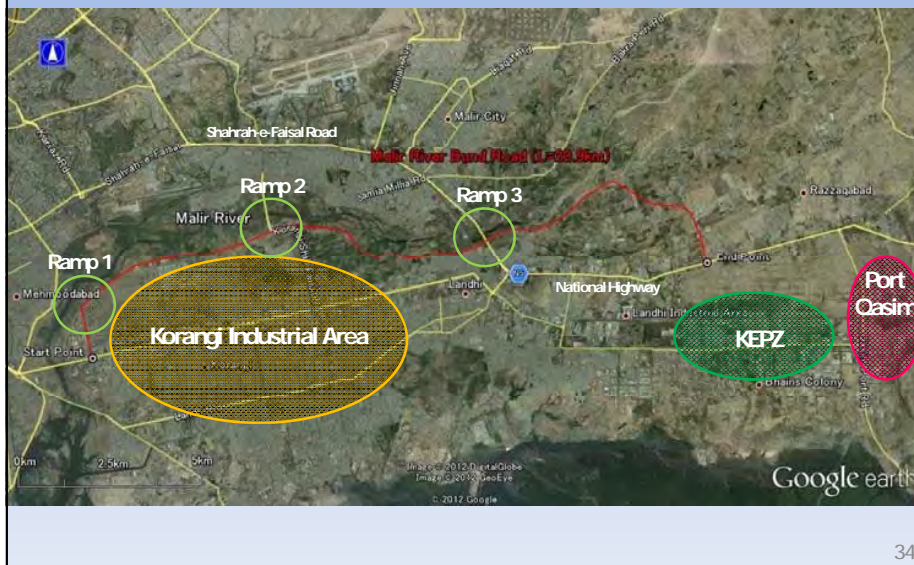
32

4. Road Project : Malir Expressway Project (4) Typical Cross Section (2)



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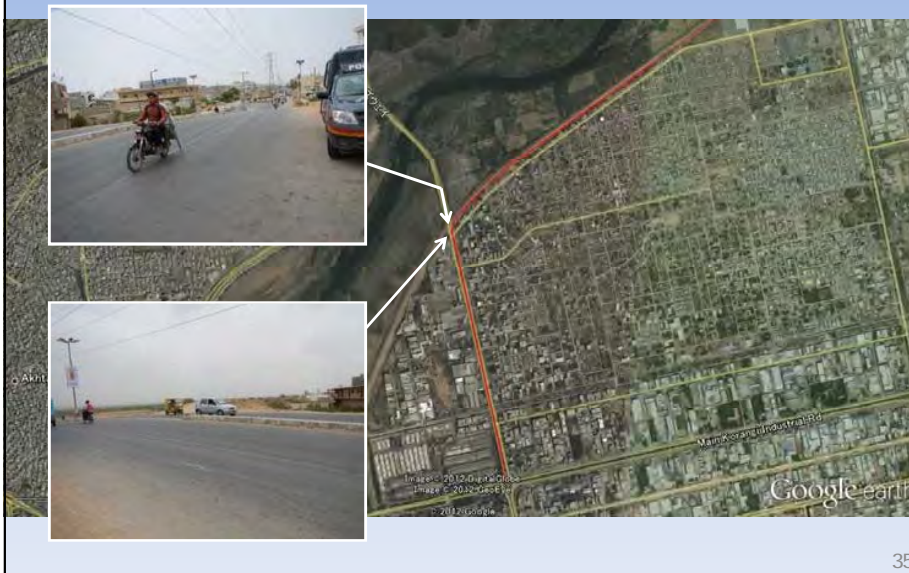
4. Road Project : Malir Expressway Project (5) Location of Ramp (Interchange)



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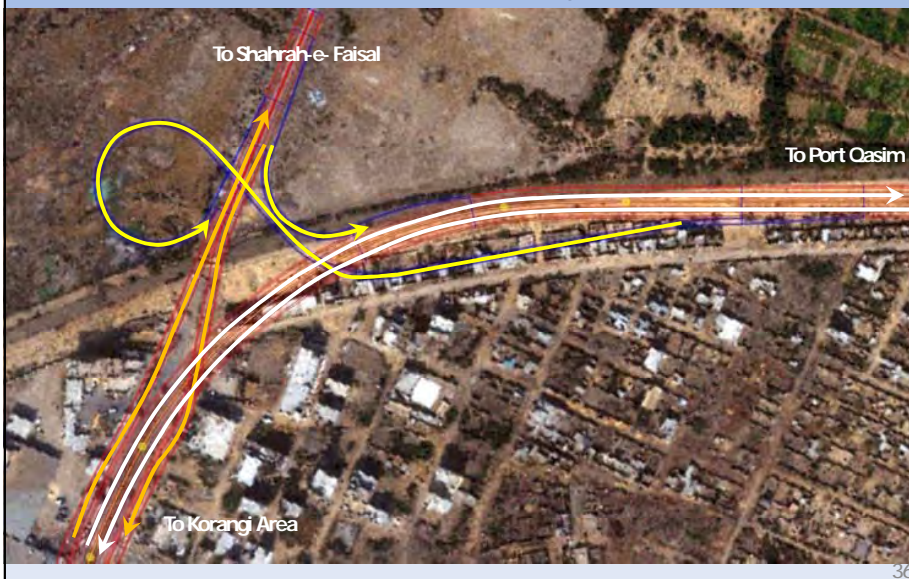
4. Road Project : Malir Expressway Project (6)

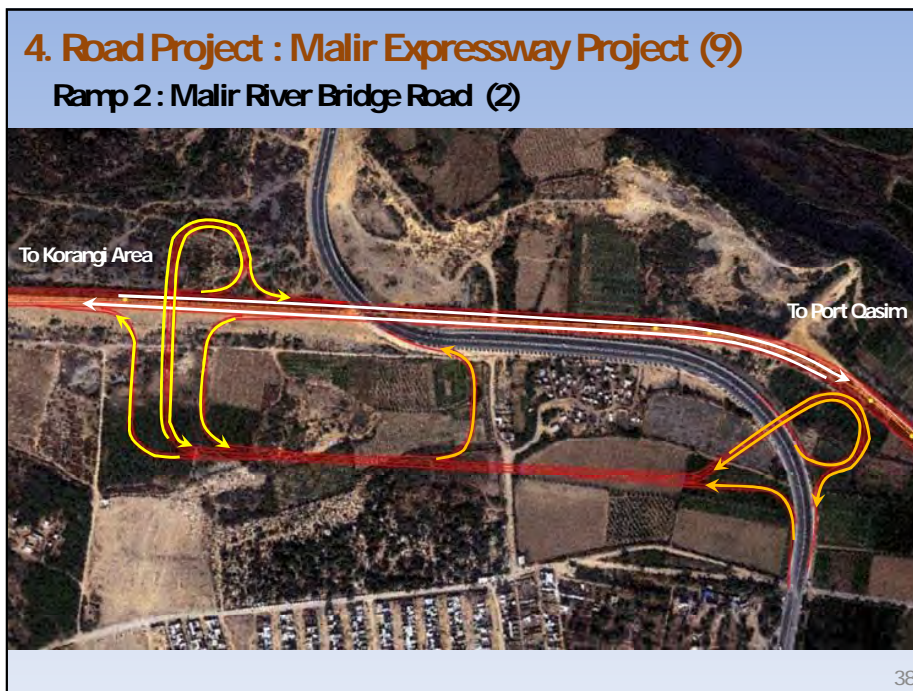
Ramp 1 : 3000 feet Road / EBVI Causeway (1)



4. Road Project : Malir Expressway Project (7)

Ramp 1 : 3000 feet Road / EBVI Causeway (2)





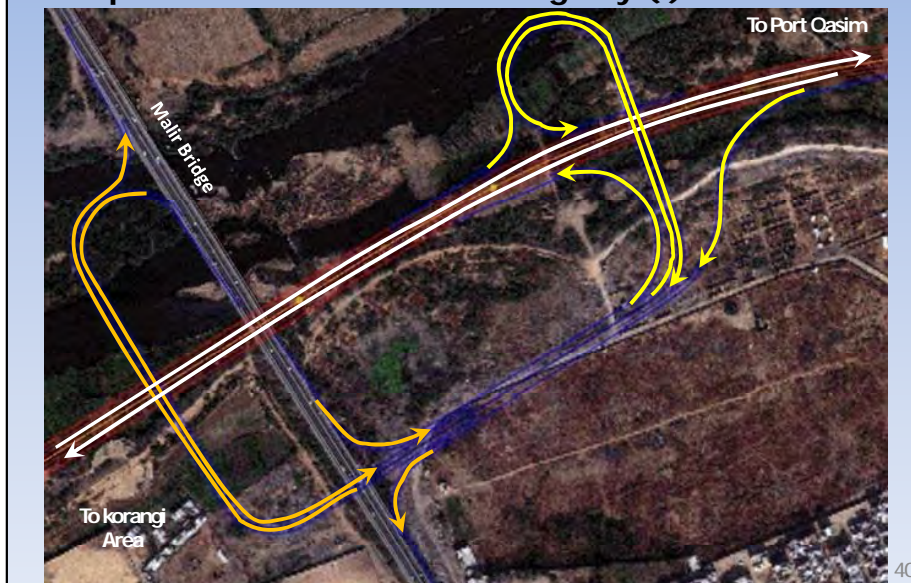
4. Road Project : Malir Expressway Project (10)

Ramp 3 : Shahrah-e-Faisal / National Highway (1)



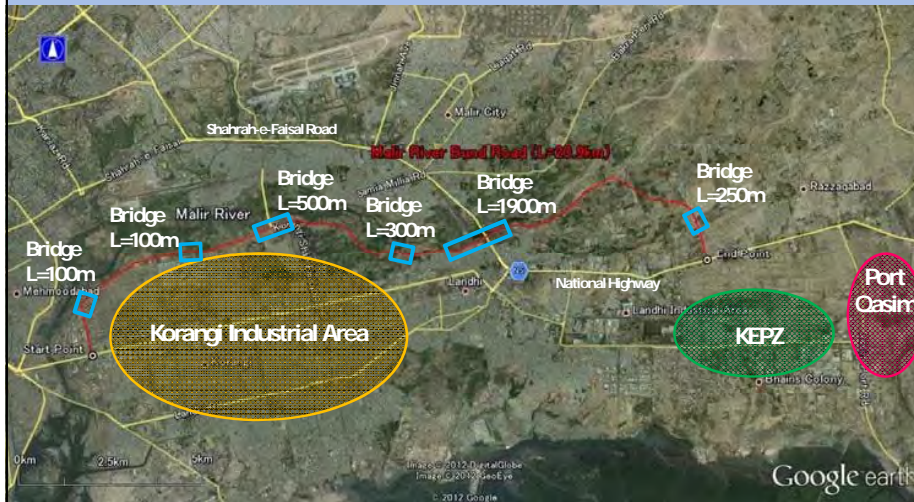
4. Road Project : Malir Expressway Project (11)

Ramp 3 : Shahrah-e-Faisal / National Highway (2)



4. Road Project : Malir Expressway Project (12)

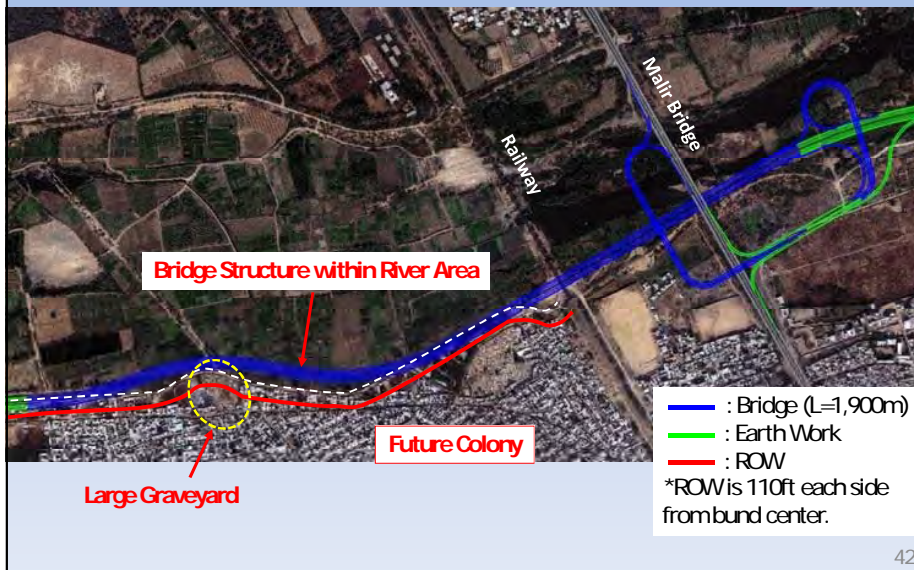
Bridge Location : 6 location (Total Length =3,150m)



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4. Road Project : Malir Expressway Project (13)

1,900m Bridge : Future Colony to Shahrah-e-Faisal / National Highway



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4. Road Project : Malir Expressway Project (14)

- Preliminary Design (Plan / Profile)
- Quantity Calculation
- Rough Cost Estimation → under Working
- Economic Evaluation



**The Study Team will report in Draft Final Report.
(end of August)**

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4. Road Project : Recommendation to GOP's Action

1) Traffic Congestion Issue on Shahrah-e-Faisal Road

- Promoting Flyovers Construction Plan by KMC.
(Malir Expressway will not fully solve issue due to demand.)

2) On-Road Parking Issue on National Highway

- - Accelerating Oil Tankers Parking Terminal Construction by KMC.
- Formulating Dissemination / Enforcement Framework.
- Taking Care of Private Automobile Workshops on Road Side.

3) Mitigating Heavy Traffic Impact on National Highway

- Accelerating Completion of Mehran Highway Project.

4) Preparation of Malir Expressway Project

- Conducting Full-Scale Feasibility Study.
 - Determination of New ROW (existing ROW : 110 feet (33.5 m) from center of River Bund).
 - Formulation of Resettlement / Additional Land Acquisition Action Plan.

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Thank You Very Much

Appendix : Improvement of Shahrah-e-Faisal/National Road (1)

Project Outline

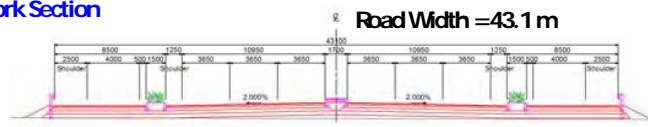
Improvement of Shahrah-e-Faisal – National Highway	
Start Point	The Intersection Shahrah-e-Faisal Road and Jinnah Terminal Road (to Air Port)
End Point	Port Qasim Road
Design Speed	80 km/h
Length	15.3 km
Number of Lane	6 Lanes of Both Direction +Service Road 1 Lane
Bridge	5 Bridge (Total Length : 3,000m)

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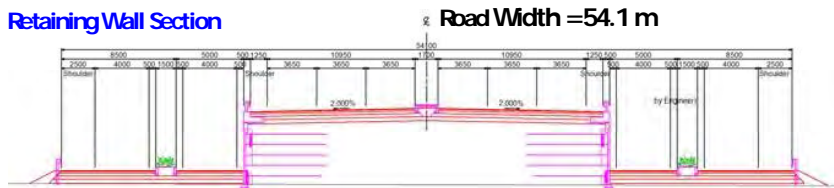
Appendix : Improvement of Shahrah-e-Faisal/National Road (2)

Typical Cross Section

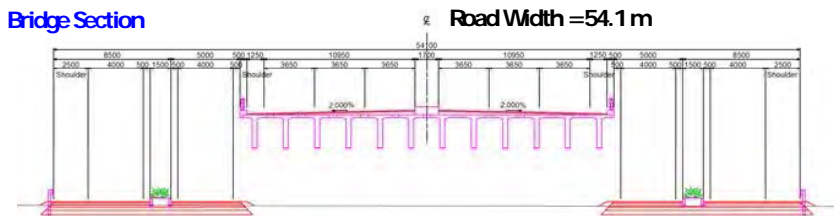
Earth Work Section



Retaining Wall Section

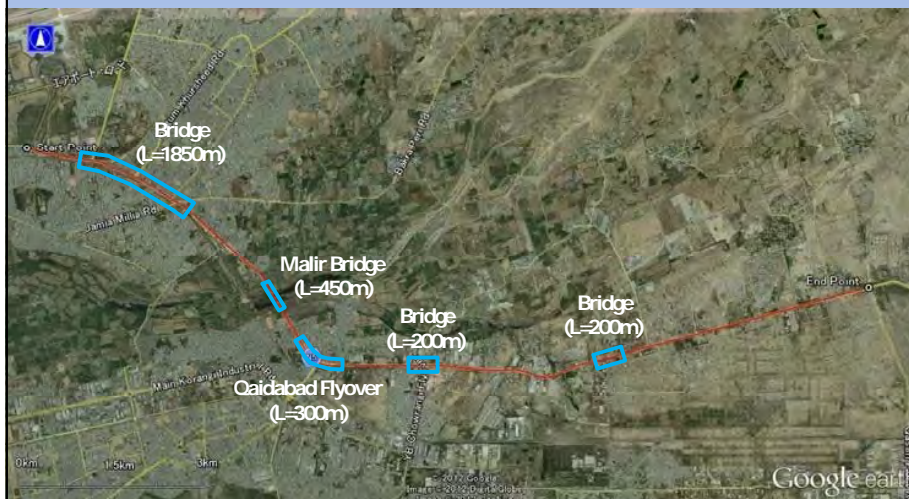


Bridge Section



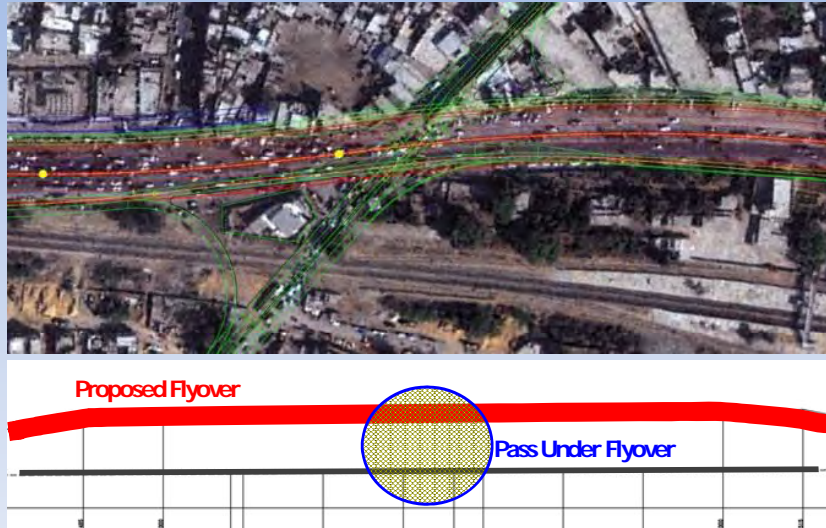
Appendix : Improvement of Shahrah-e-Faisal/National Road (3)

Bridge Location : 5 location (Total Length =3,000m)



Appendix : Improvement of Shahrah-e-Faisal/National Road (4)

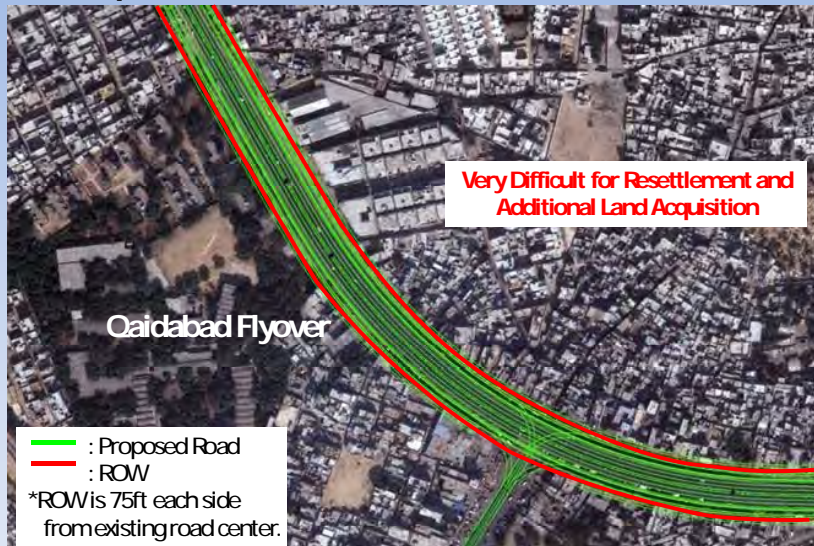
Grade Separation Design : at Malir No. 15 Intersection



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Appendix : Improvement of Shahrah-e-Faisal/National Road (5)

Land Acquisition / Resettlement Issue



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Appendix : Coastal Road (1)

Project Outline

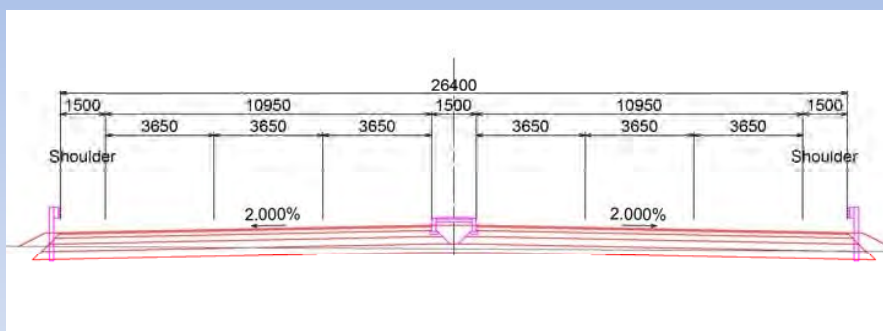
Construction and Rehabilitation of Coast Road and Creek Road

Start Point	The Intersection with Creek Avenue on Korangi Road
End Point	Port Qasim Access Road
Design Speed	80 km/h
Length	24.8 km
Number of Lane	6 Lanes of Both Direction
Bridge	1 Bridge (Length : 1,500m)

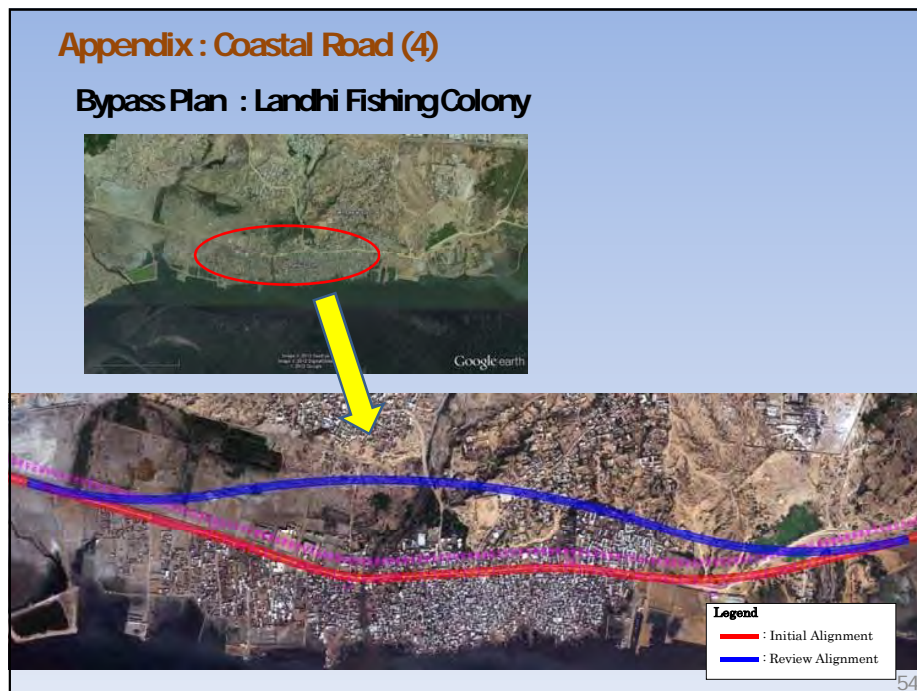
51

Appendix : Coastal Road (2)

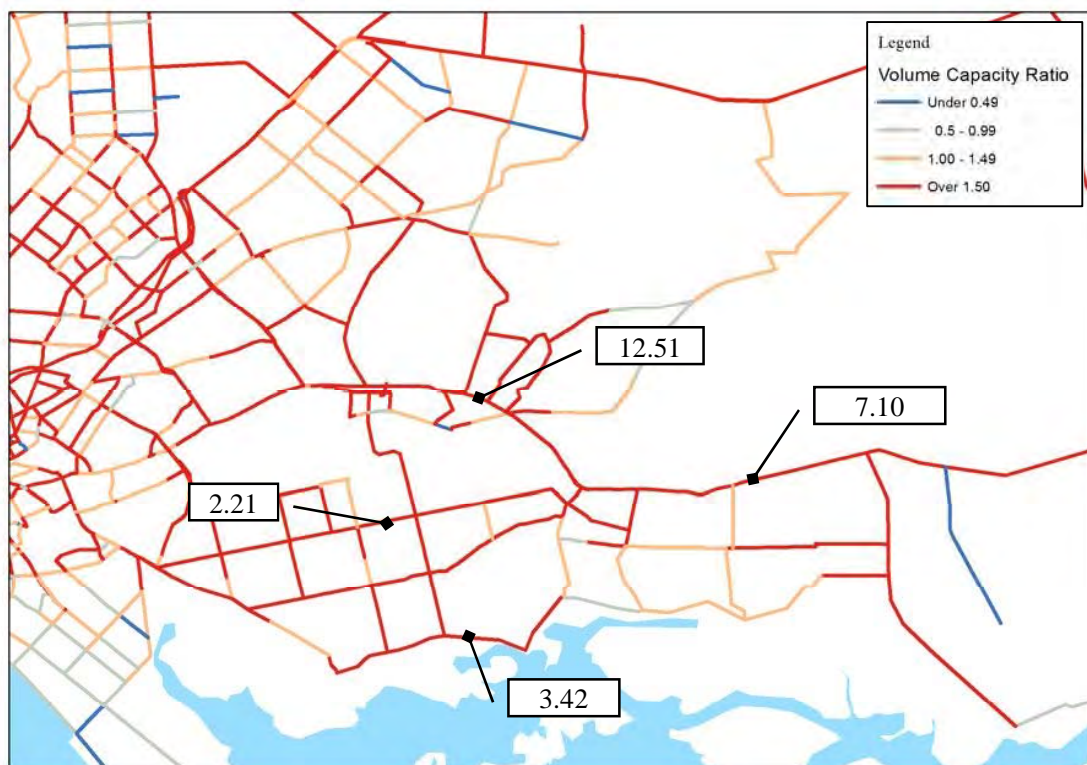
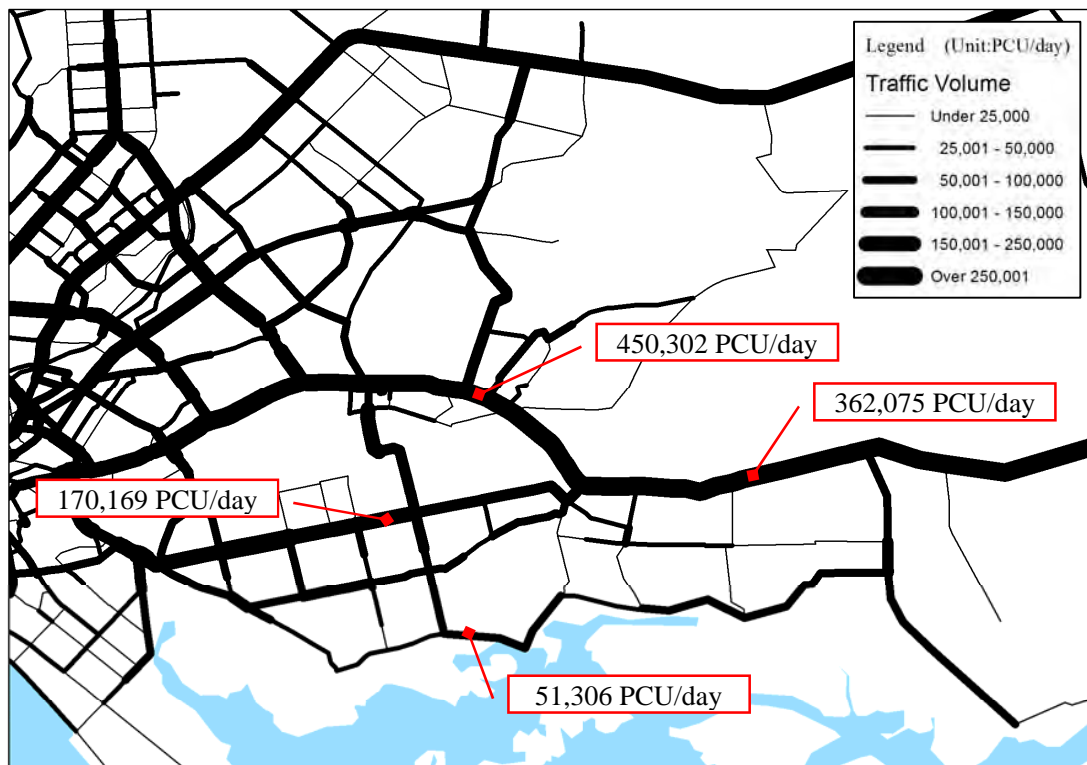
Typical Cross Section



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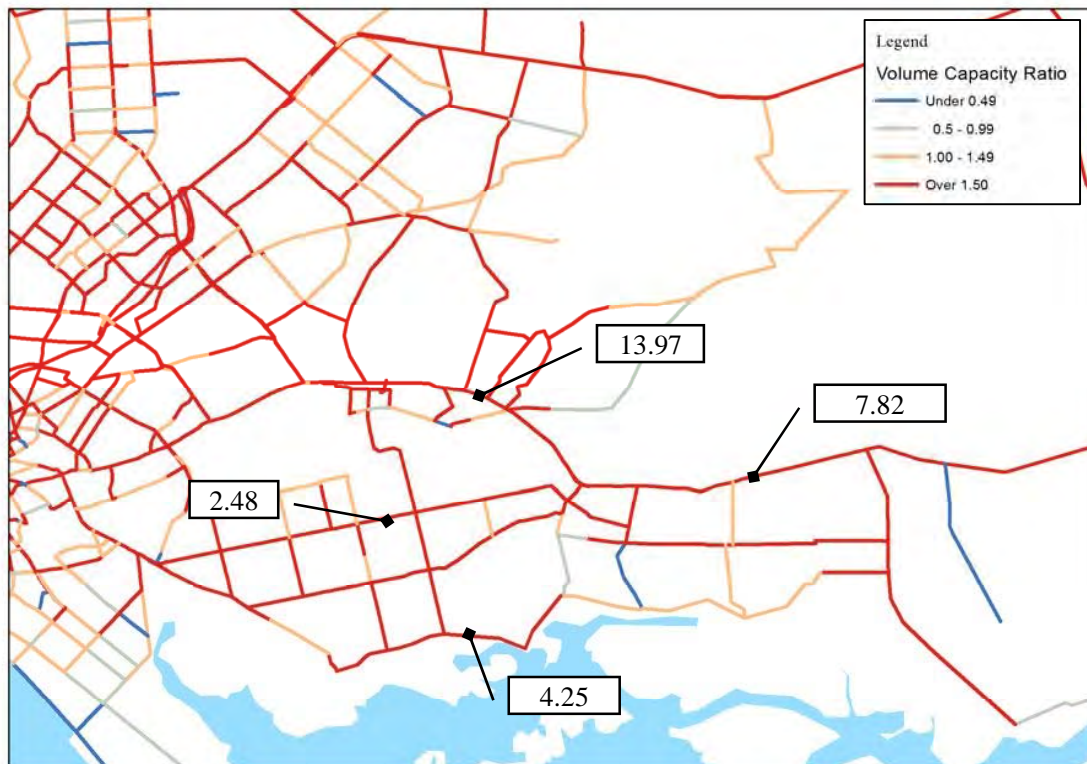
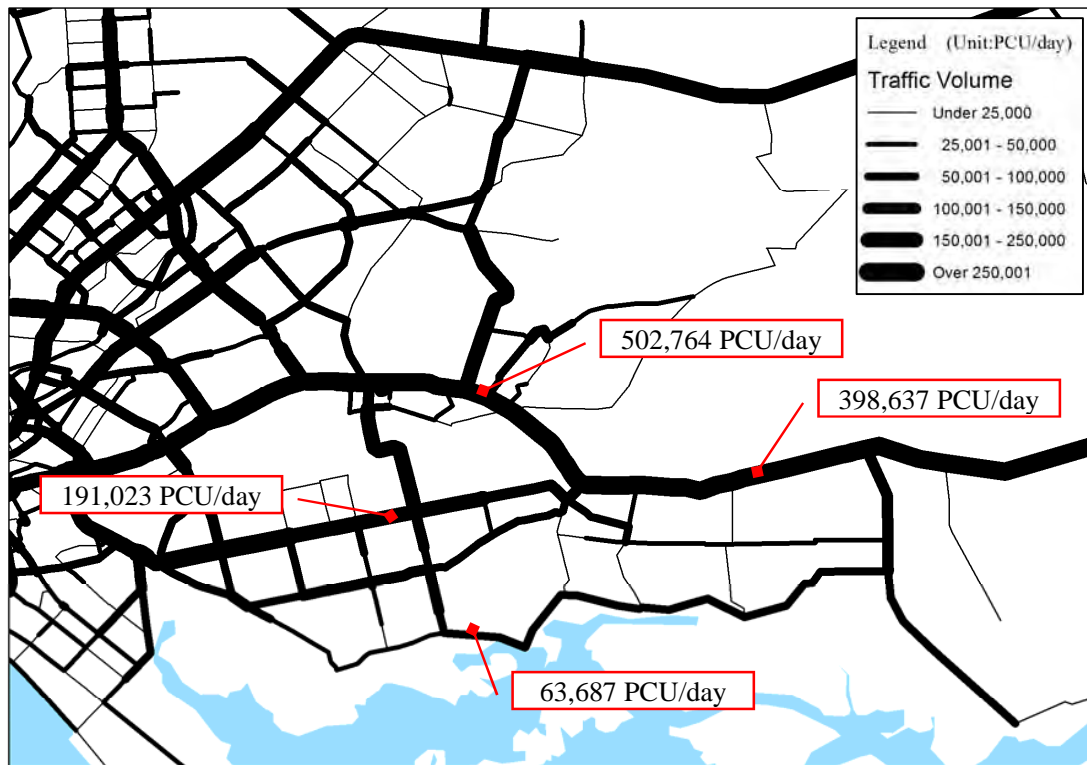


APPENDIX 2 TRAFFIC DEMAND FORECAST



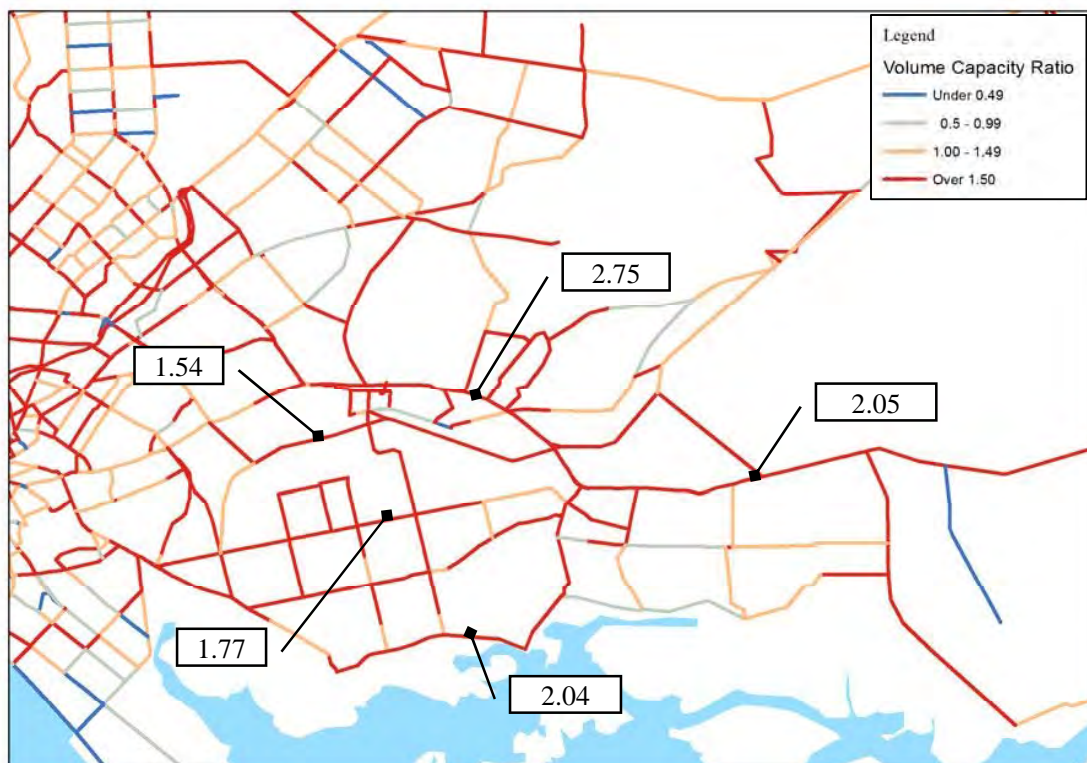
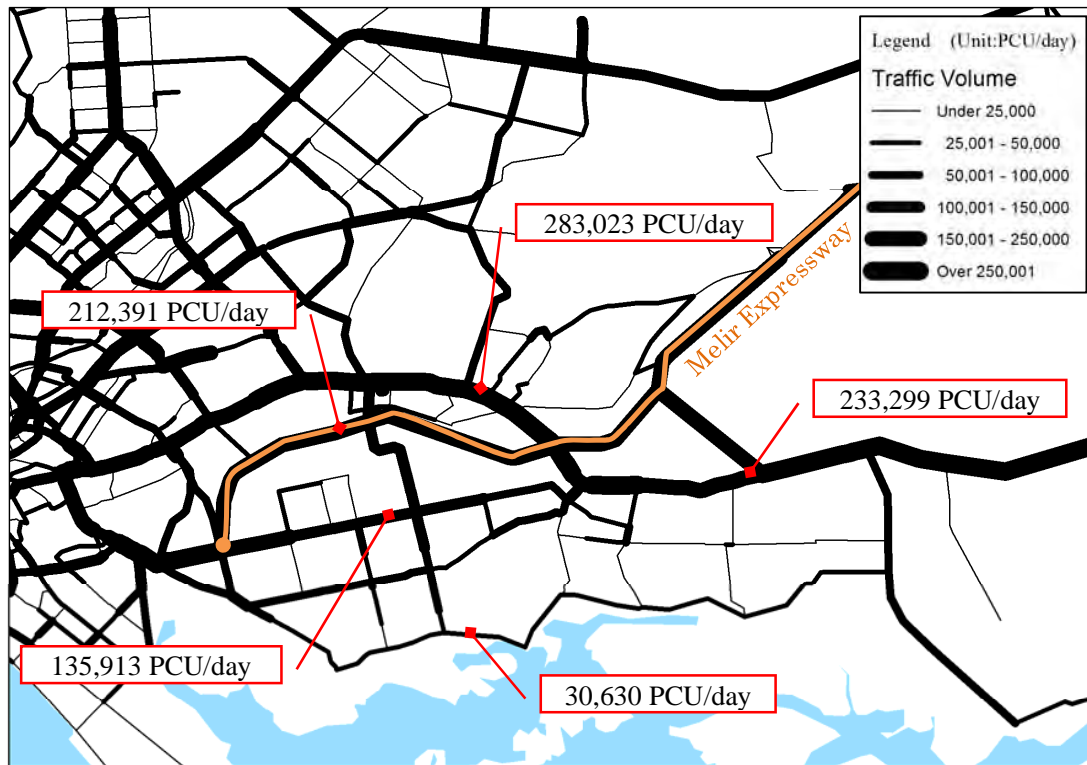
Source: JICA Study Team

Figure A2.1.1 Future Traffic Demand and Volume Capacity Ratio (2020, Case01 Do-Nothing)



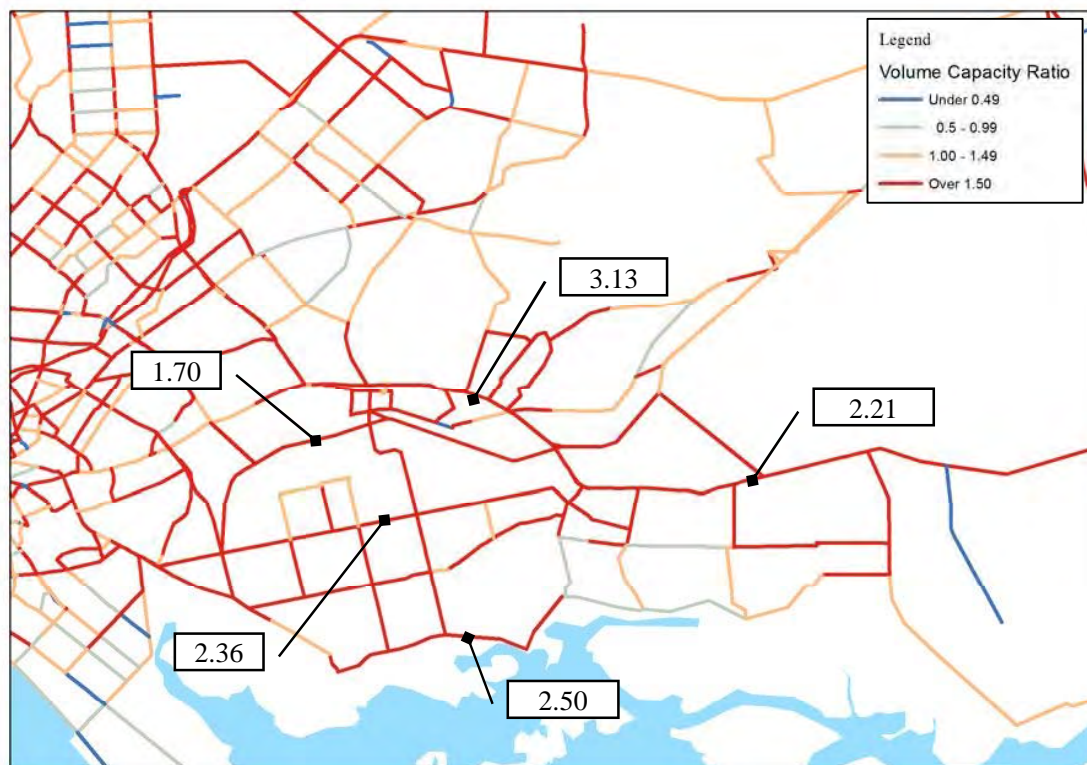
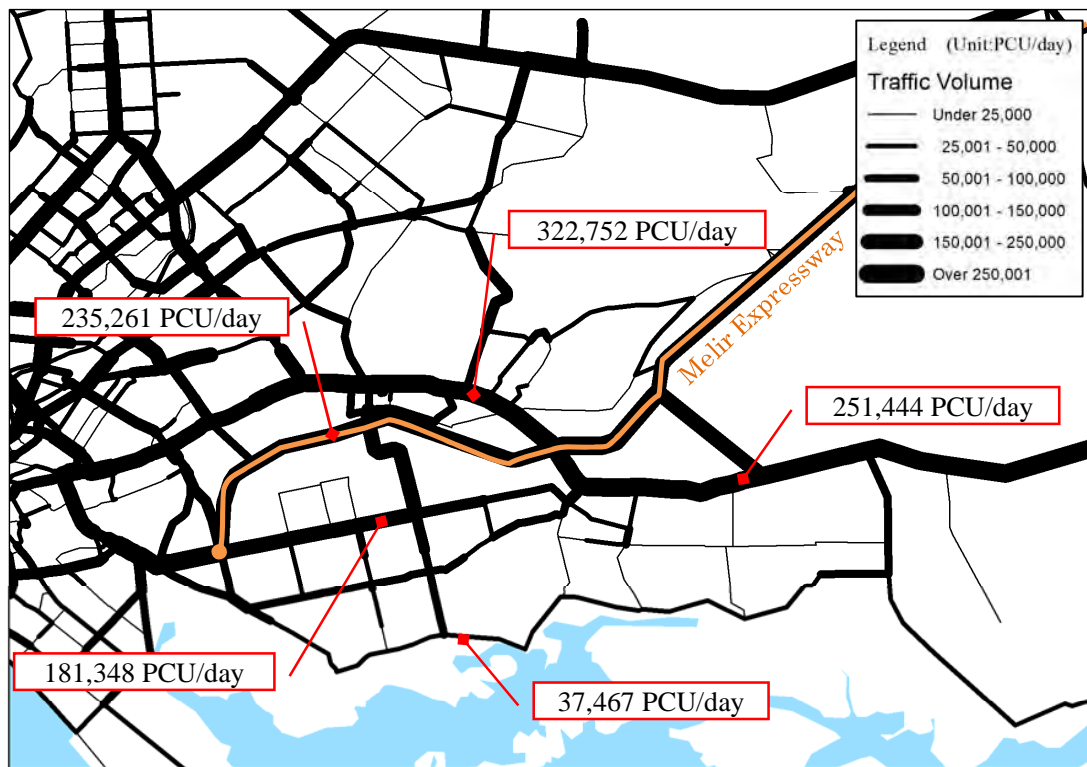
Source: JICA Study Team

Figure A2.1.2 Present Traffic Demand and Volume Capacity Ratio (2030, Case02 Do-Nothing)



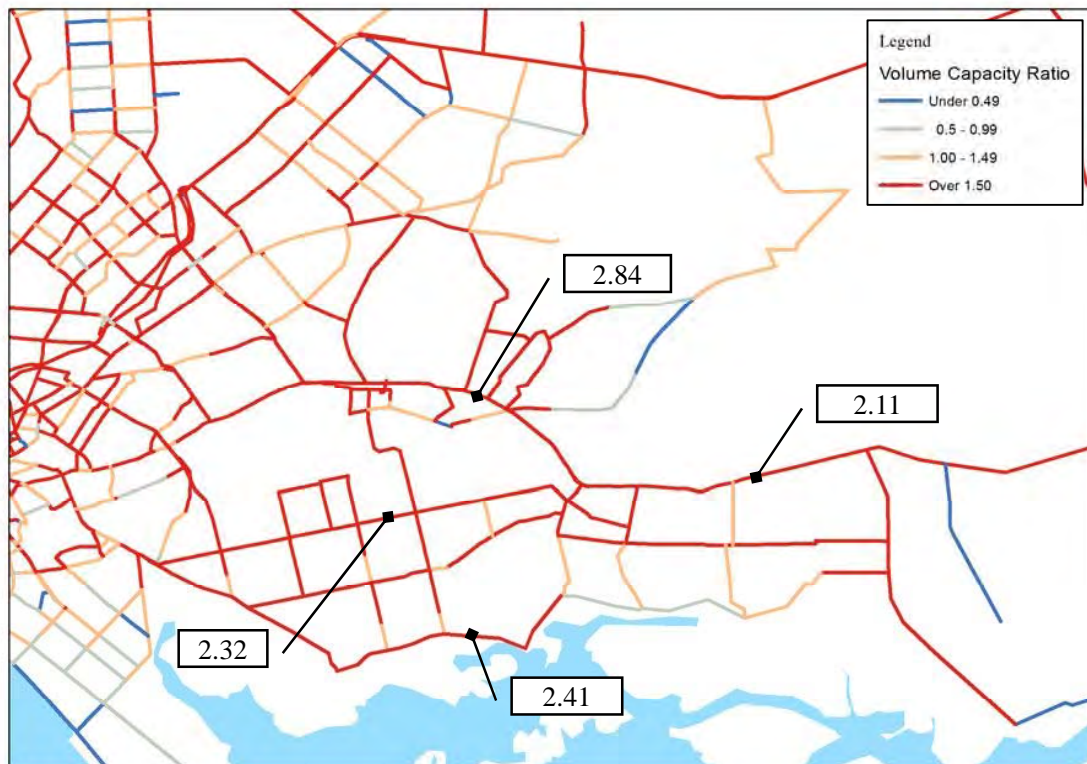
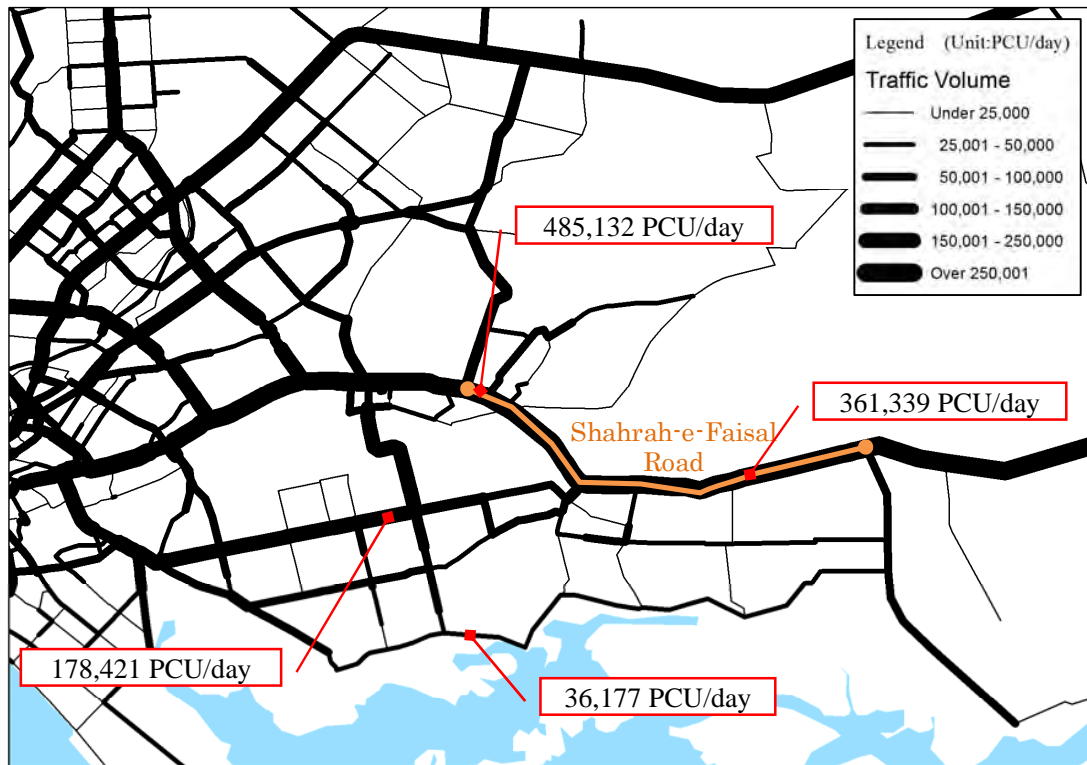
Source: JICA Study Team

Figure A2.1.3 Future Traffic Demand and Volume Capacity Ratio (2020, Case03 With Malir Expressway)



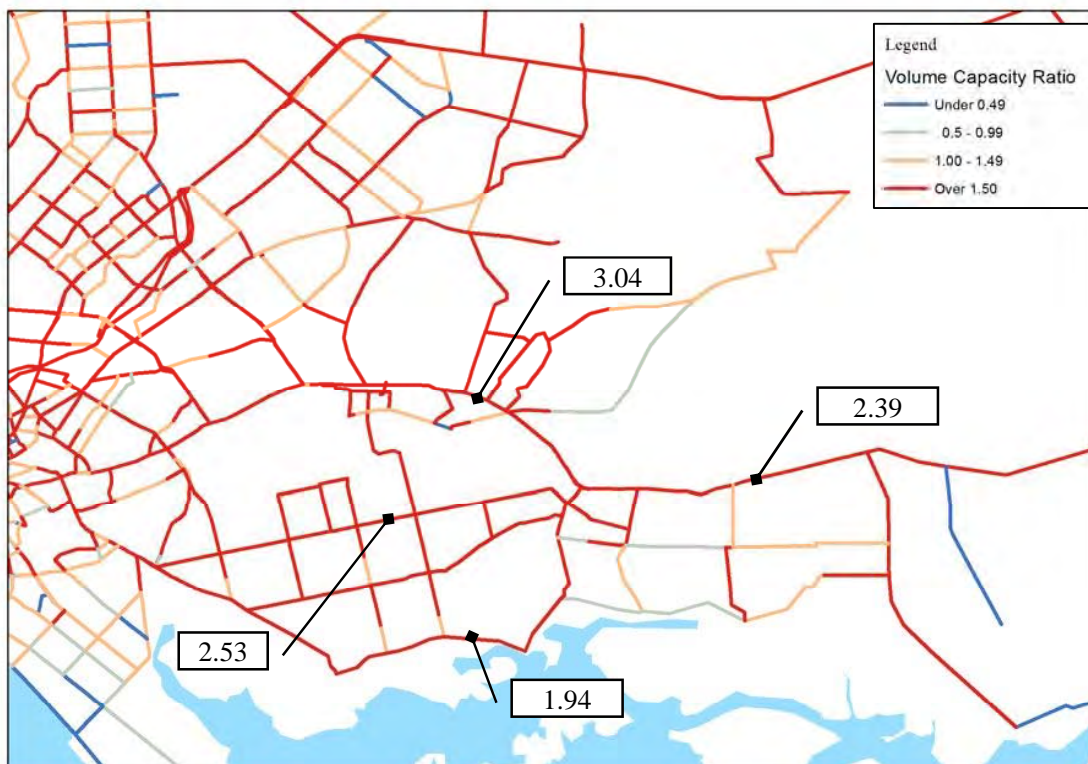
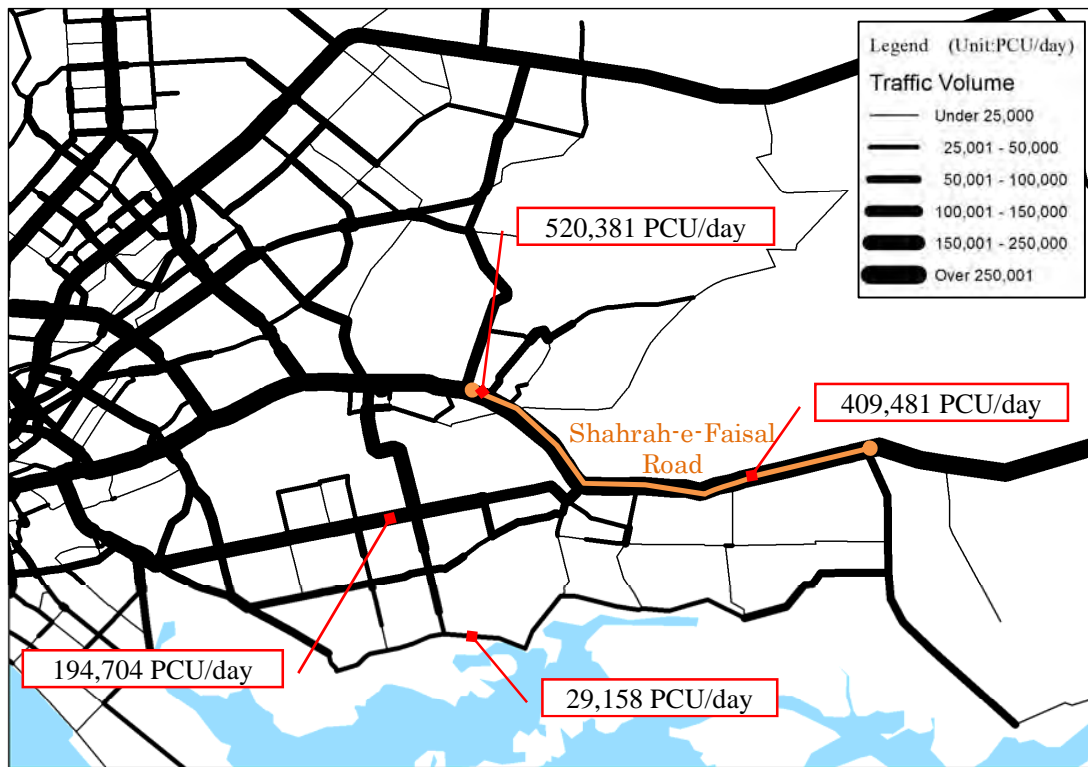
Source: JICA Study Team

Figure A2.1.4 Future Traffic Demand and Volume Capacity Ratio (2030, Case04 With Malir Expressway)



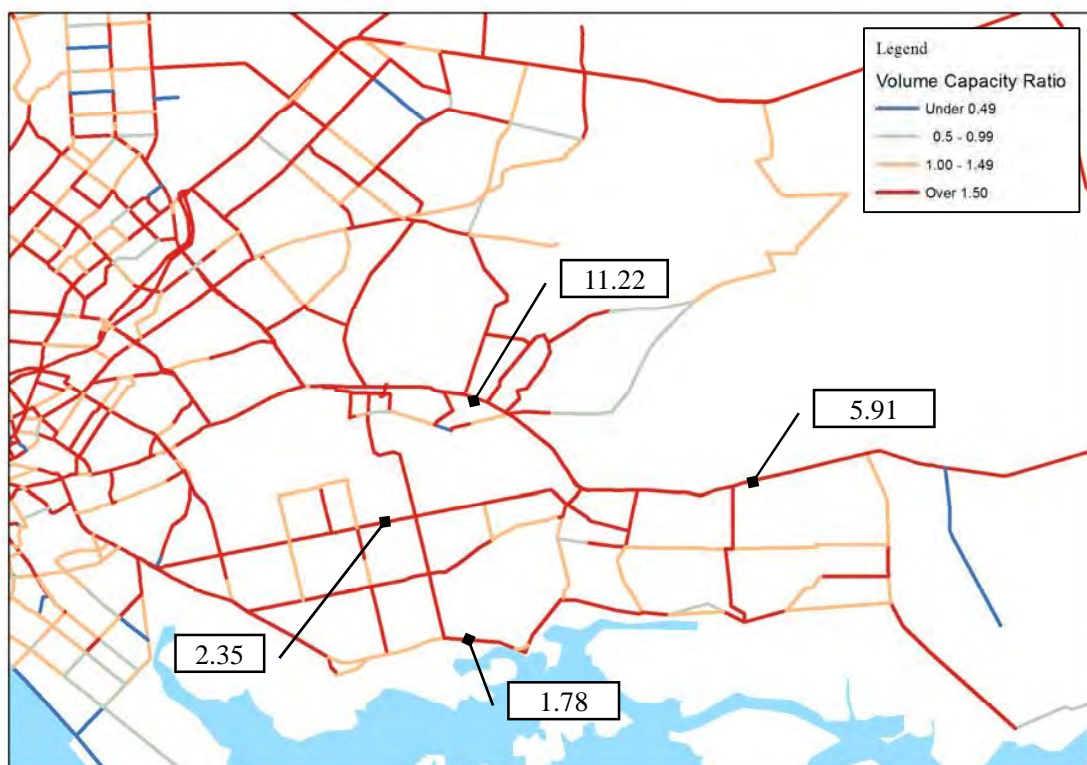
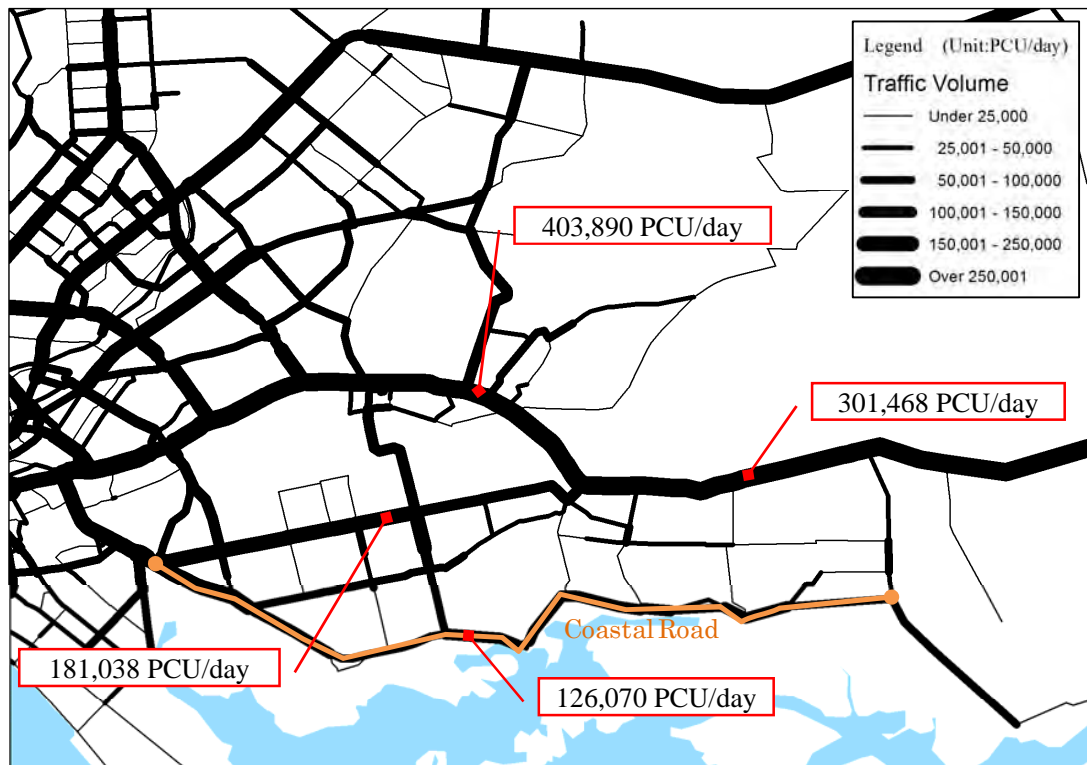
Source: JICA Study Team

**Figure A2.1.5 Future Traffic Demand and Volume Capacity Ratio
(2020, Case05 With improvement Shahrah-e-Faisal Road)**



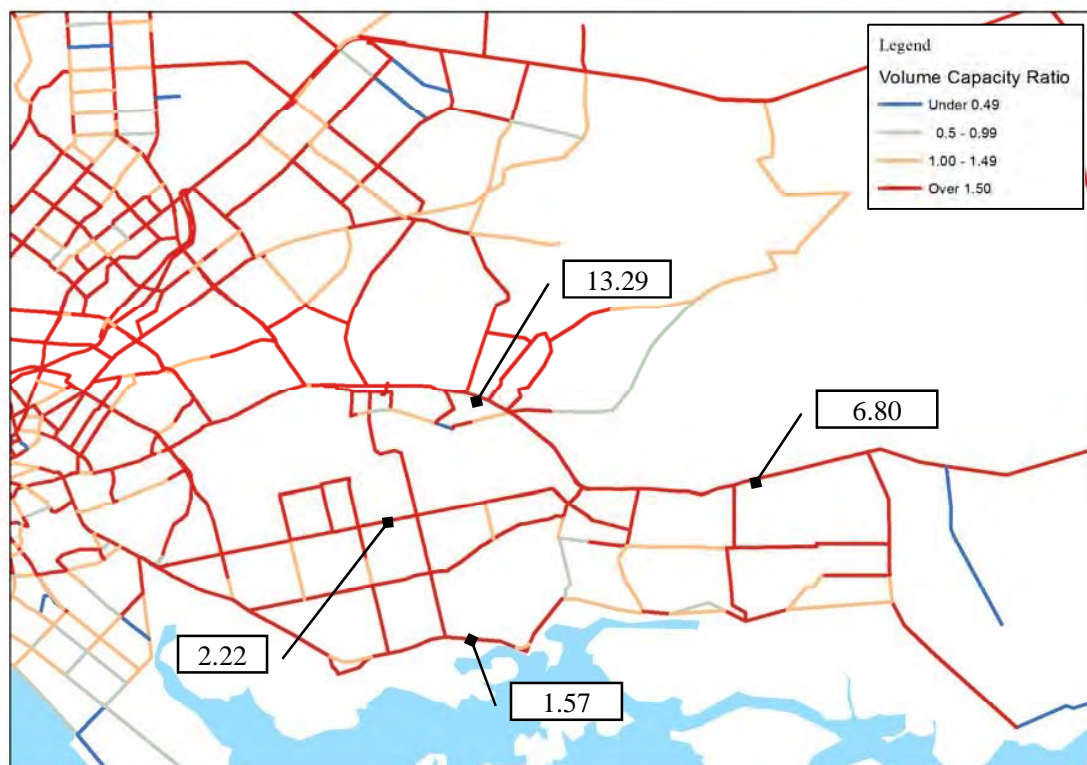
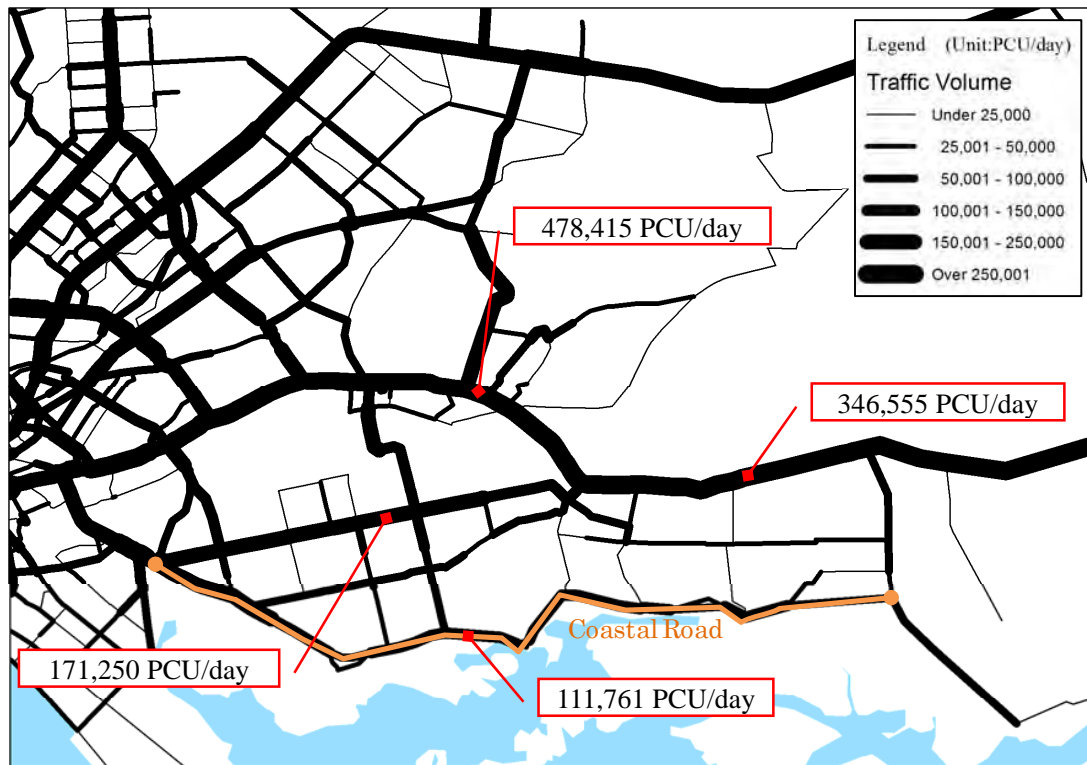
Source: JICA Study Team

**Figure A2.1.6 Future Traffic Demand and Volume Capacity Ratio
(2030, Case06 With improvement Shahrah-e-Faisal Road)**



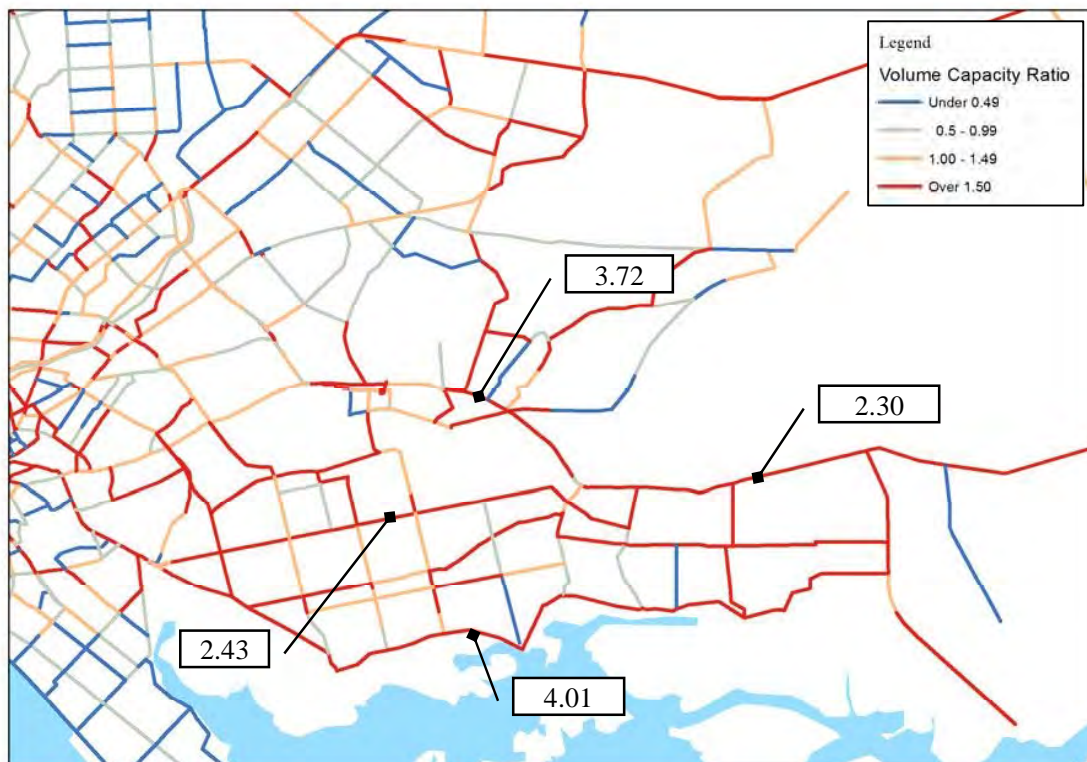
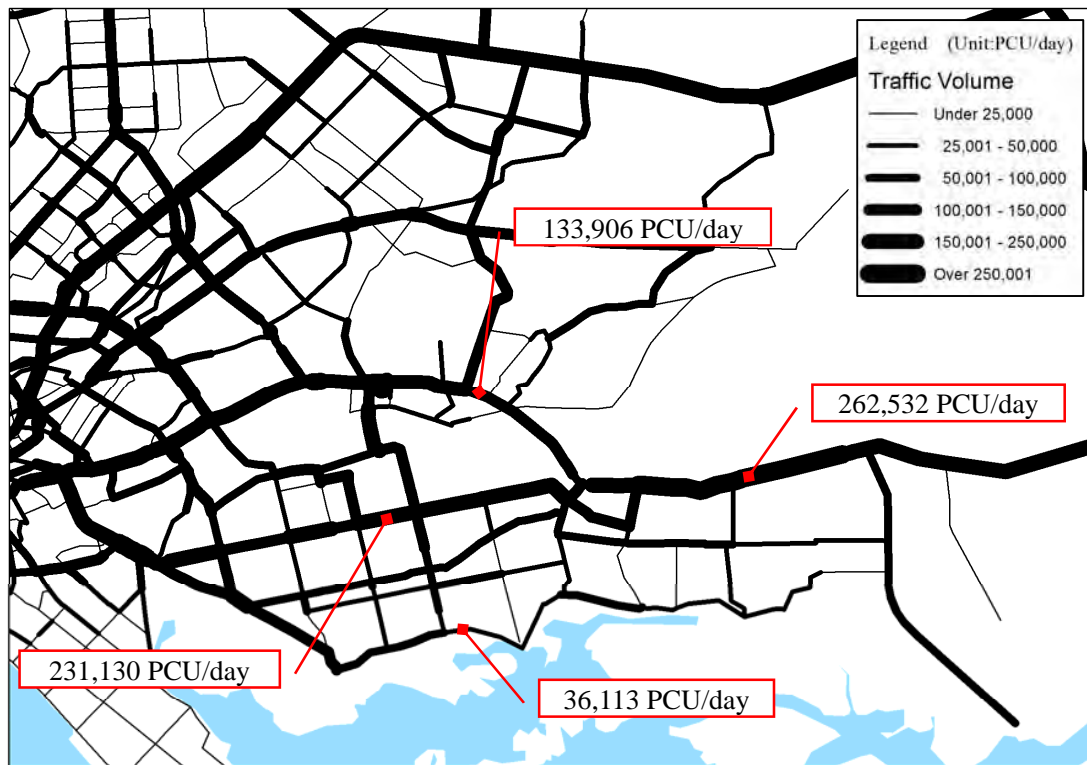
Source: JICA Study Team

Figure A2.1.7 Future Traffic Demand and Volume Capacity Ratio (2020, Case07 With Coastal Road)



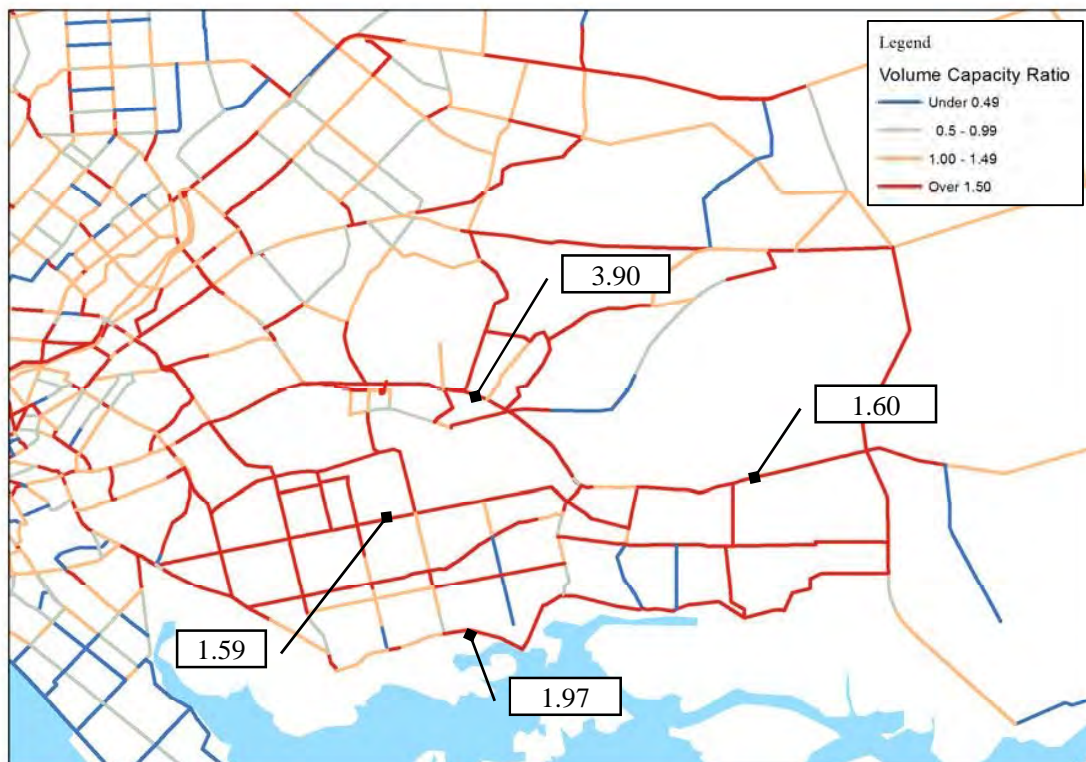
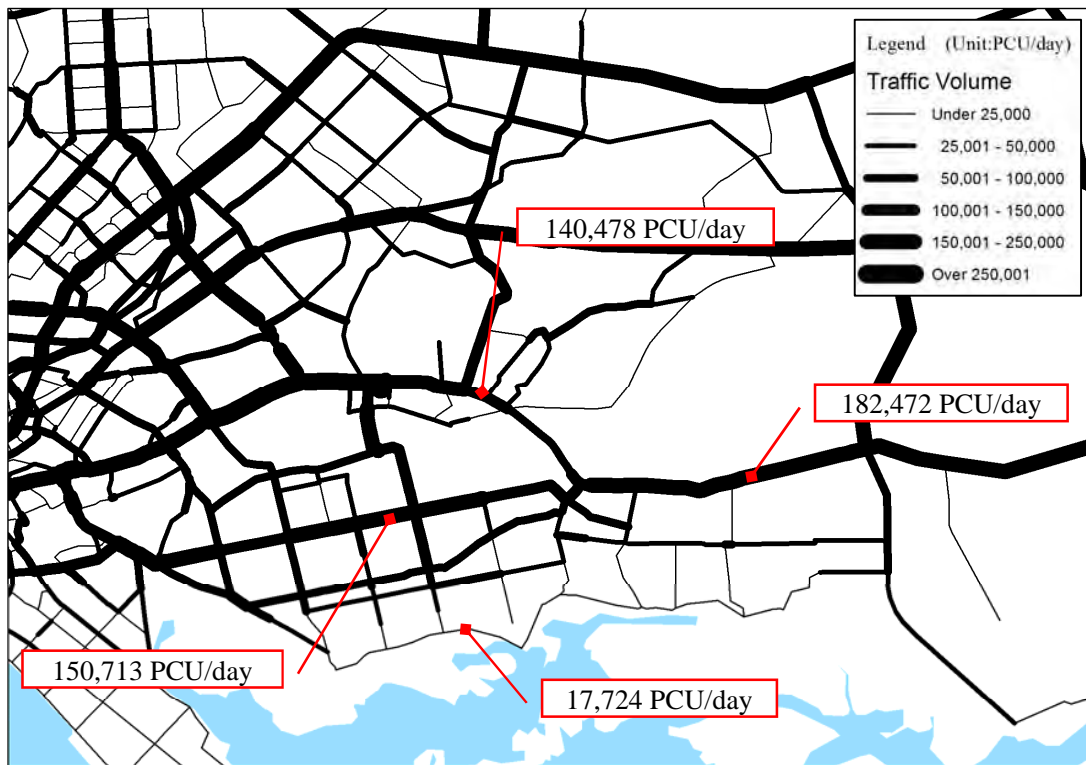
Source: JICA Study Team

Figure A2.1.8 Future Traffic Demand and Volume Capacity Ratio (2030, Case08 With Coastal Road)



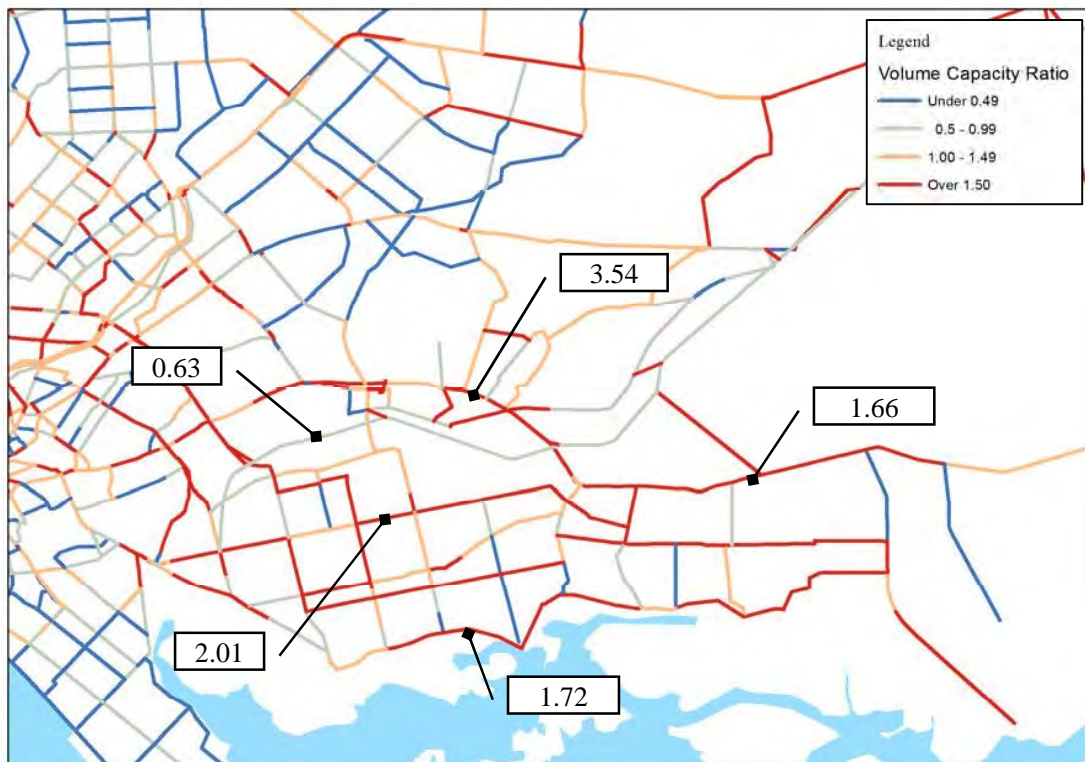
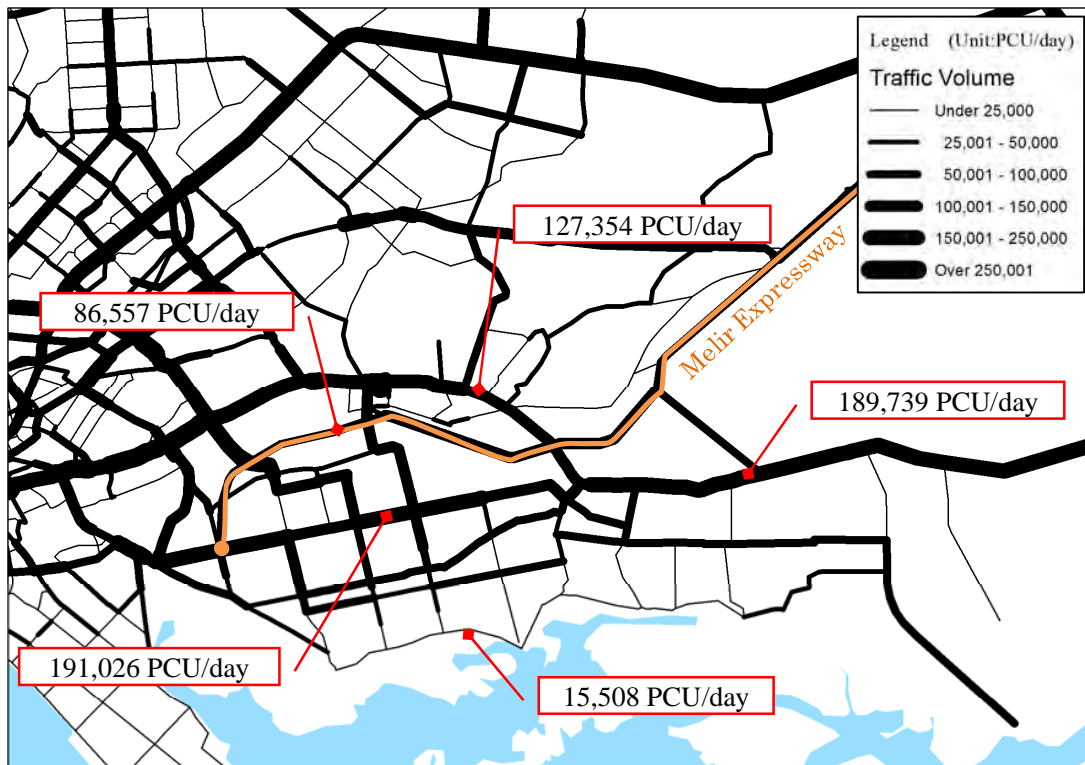
Source: JICA Study Team

**Figure A2.1.9 Future Traffic Demand and Volume Capacity Ratio
(2020, Case09 Future road network excluding priority project)**



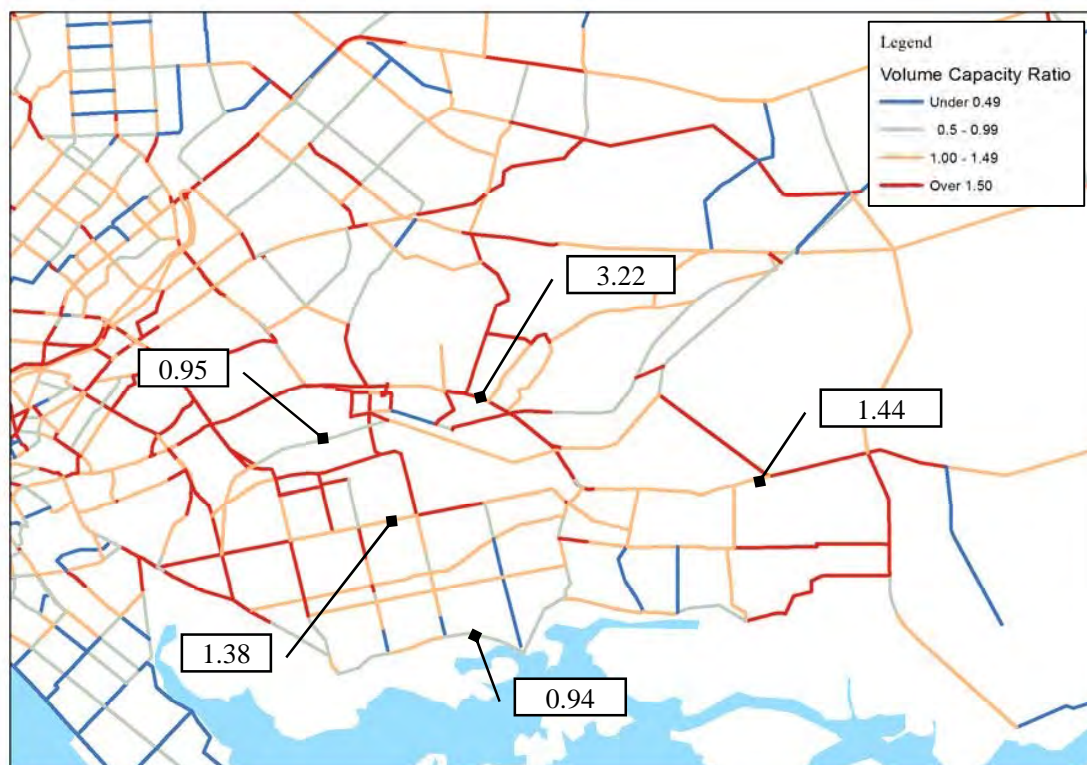
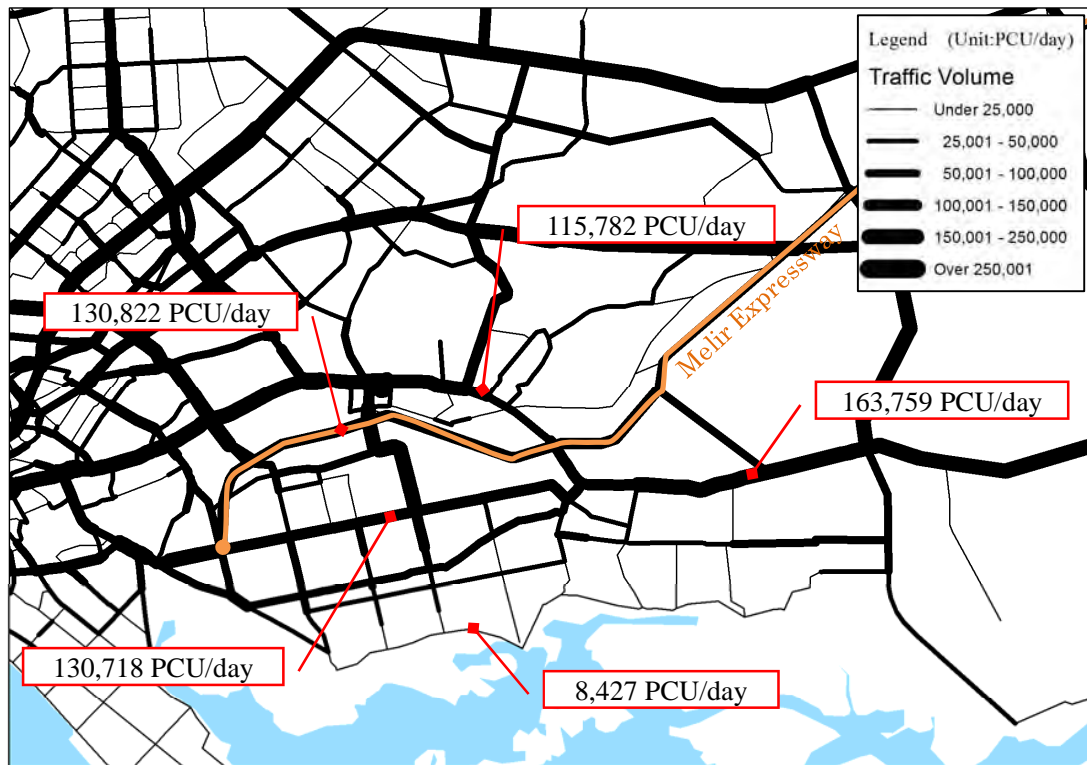
Source: JICA Study Team

**Figure A2.1.10 Future Traffic Demand and Volume Capacity Ratio
(2030, Case10 Future road network excluding priority project)**



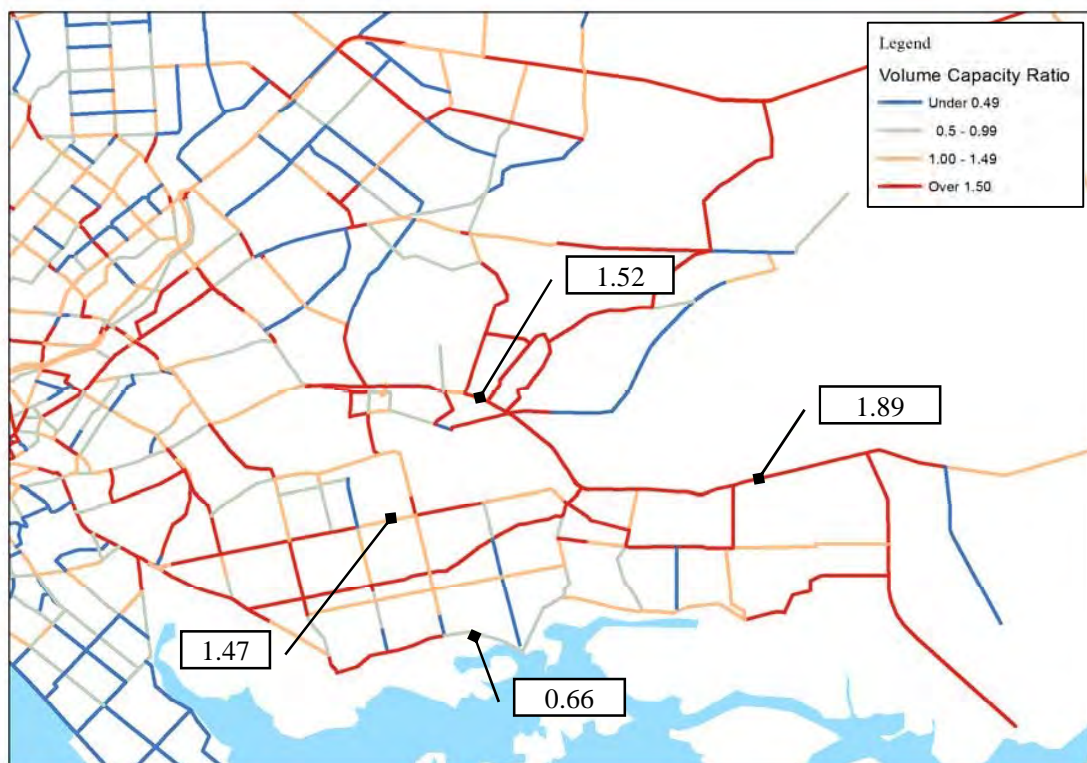
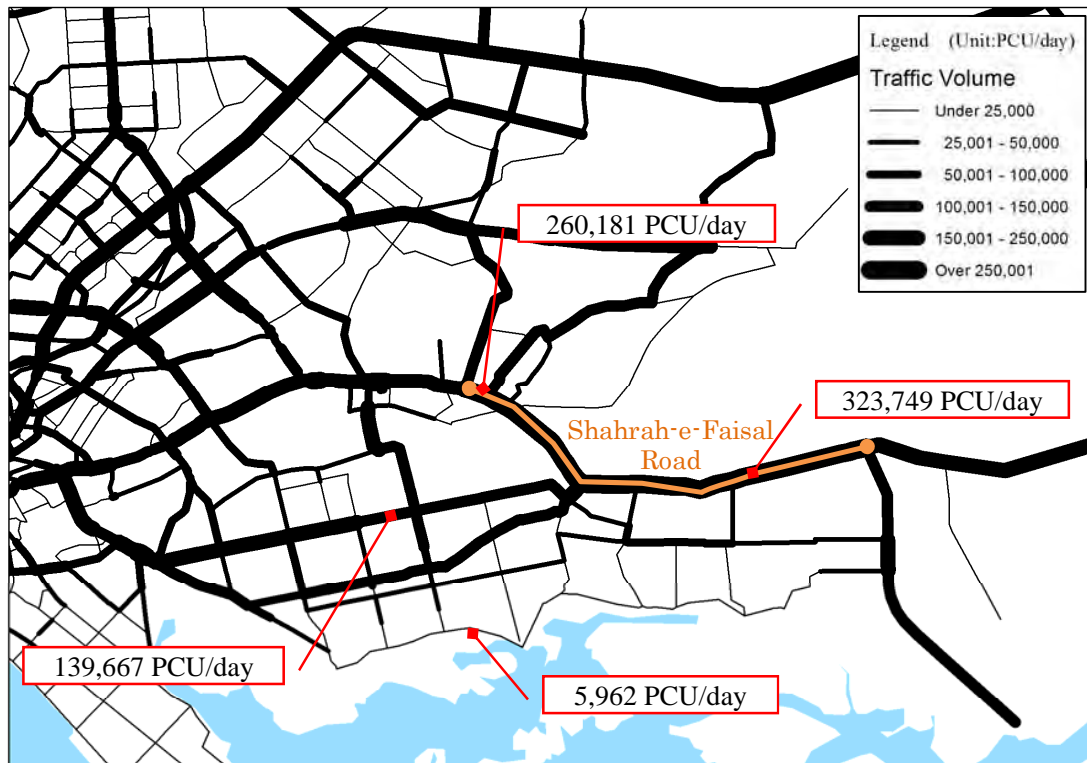
Source: JICA Study Team

**Figure A2.1.11 Future Traffic Demand and Volume Capacity Ratio
(2020, Case11 Future road network With Maril Expressway)**



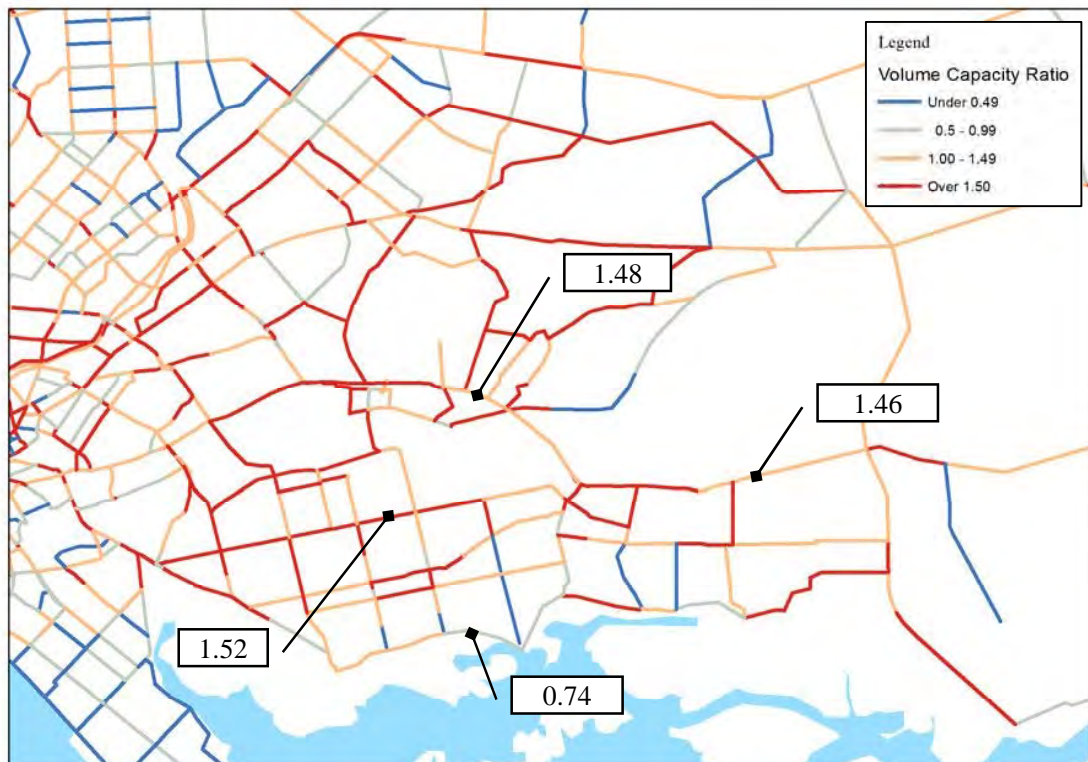
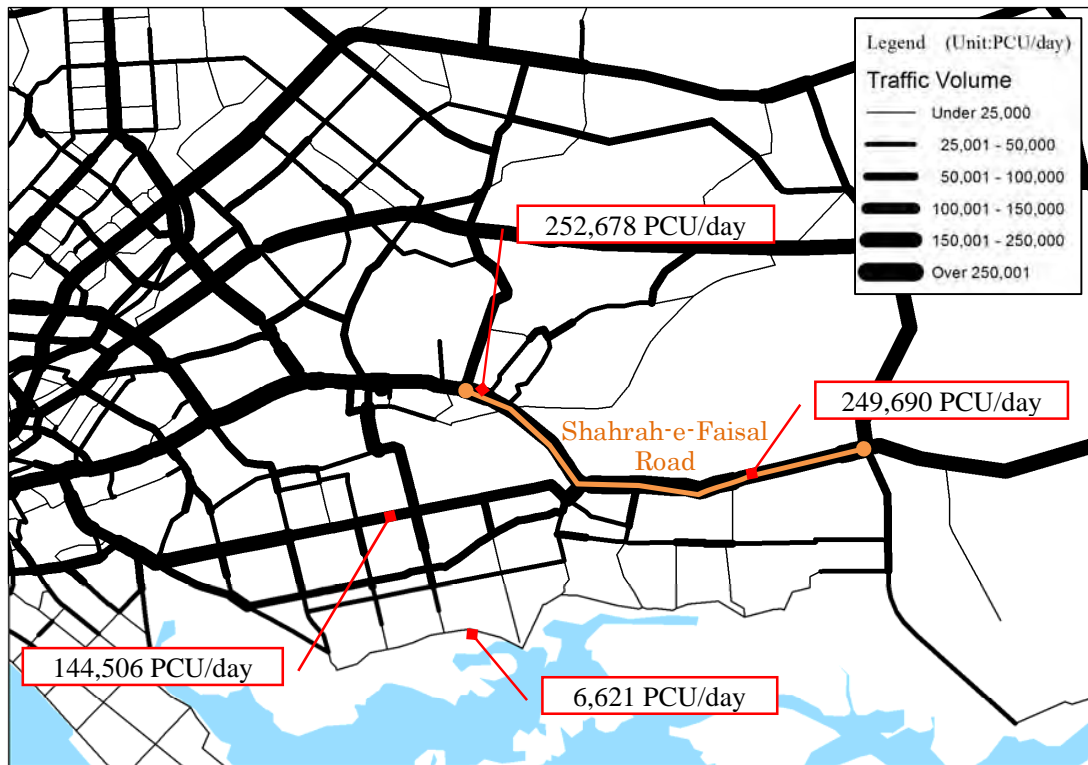
Source: JICA Study Team

**Figure A2.1.12 Future Traffic Demand and Volume Capacity Ratio
(2030, Case12 Future road network With Maril Expressway)**



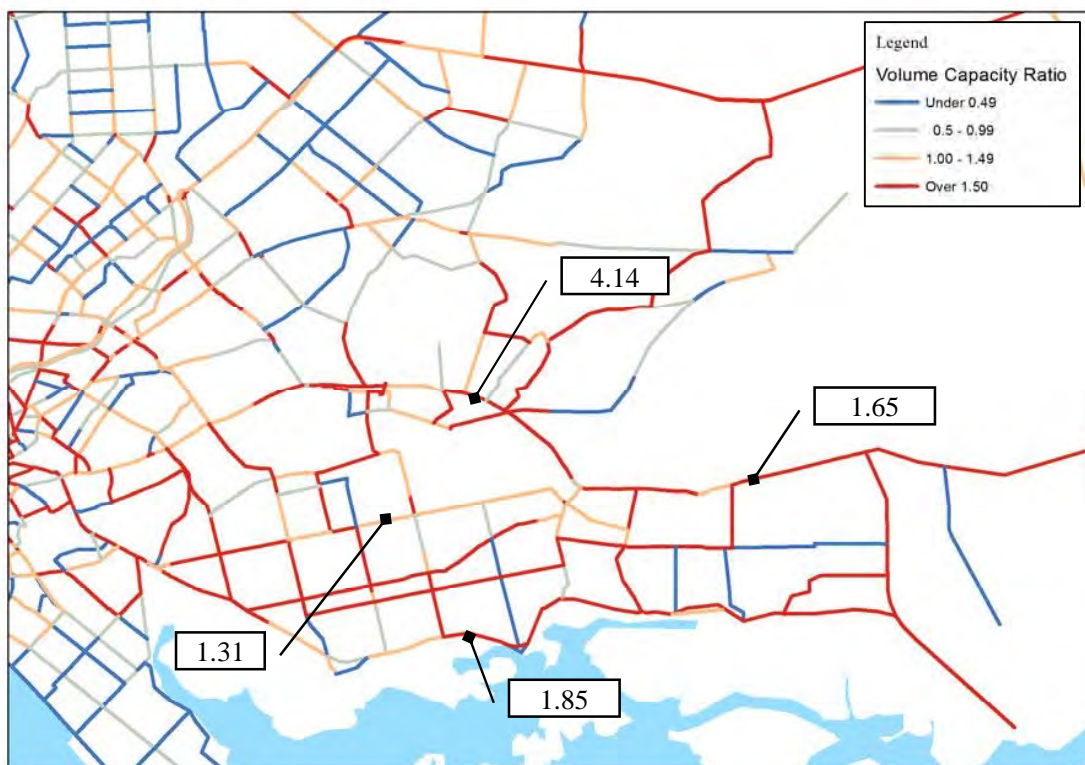
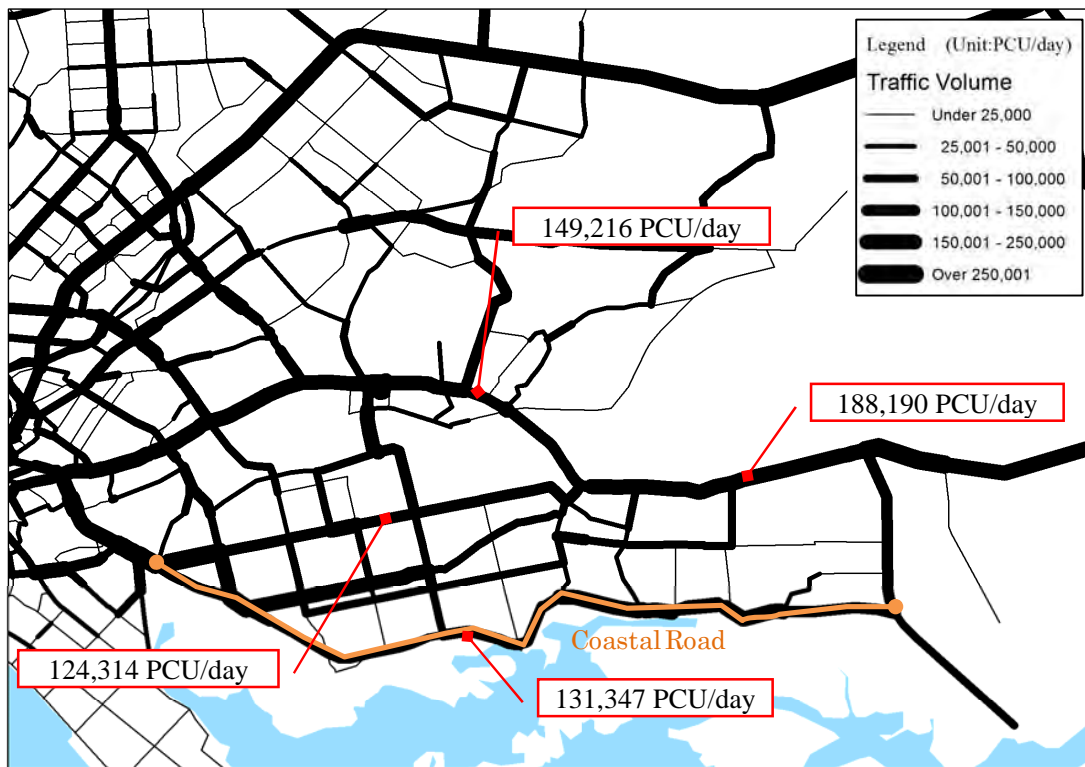
Source: JICA Study Team

**Figure A2.1.13 Future Traffic Demand and Volume Capacity Ratio
(2020, Case13 Future road network With improvement Shahrah-e-Faisal Road)**



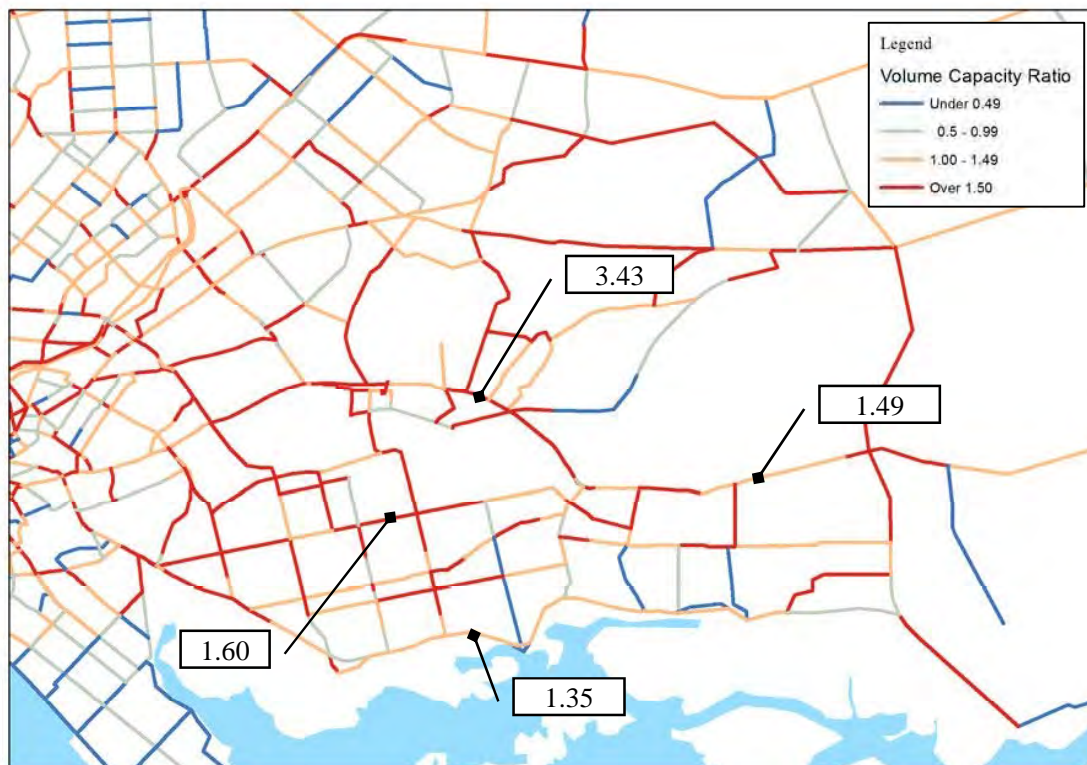
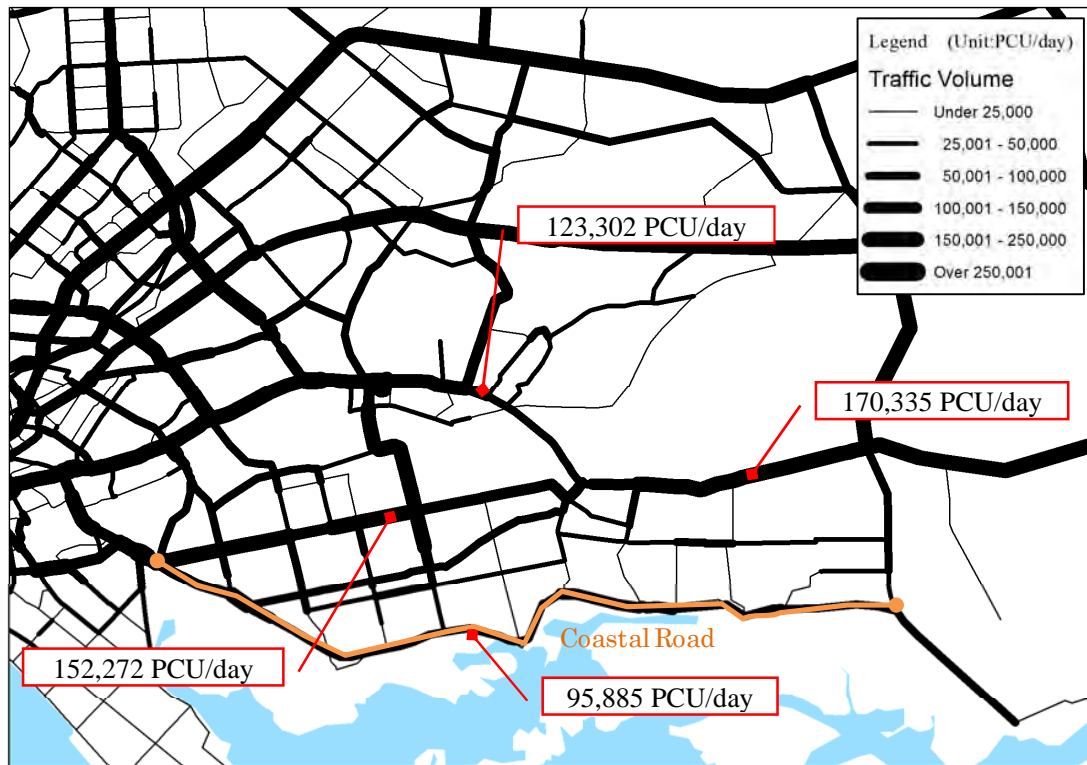
Source: JICA Study Team

**Figure A2.1.14 Future Traffic Demand and Volume Capacity Ratio
(2030, Case14 Future road network With improvement Shahrah-e-Faisal Road)**



Source: JICA Study Team

**Figure A2.1.15 Future Traffic Demand and Volume Capacity Ratio
(2020, Case15 Future road network With Coastal Road)**



Source: JICA Study Team

**Figure A2.1.16 Future Traffic Demand and Volume Capacity Ratio
(2020, Case16 Future road network With Coastal Road)**