



Ministry of Physical Planning and Works  
Department of Roads



**Data Collection Survey on  
Traffic Improvement in  
Kathmandu Valley**

**2<sup>ND</sup> WORKSHOP**

**Agenda for Workshop**

27<sup>nd</sup> July, 2012  
JICA Survey Team

**AGENDA**

1. Greeting & Explanation of DFR (JICA Survey Team : Mr. Shinkai)
2. Explanation of Draft Final Report by JICA Survey Team (part-1)
  - (1) Road Development Plans & Present Road Condition (Mr. Toriu)
  - (2) Traffic Movement and Issues (Mr. Ohwaki)
  - (3) Future Traffic Demand Forecast (Mr. Nakaseko)
3. 1<sup>st</sup> Discussions
4. Tea Break
5. Explanation of Draft Final Report by JICA Survey Team (part-2)
  - (4) Present Land-use Development and Issues (Mr. Odake)
  - (5) Road Network and Issues & Recommendation to the future M/P (Mr. Shinkai)
6. 2<sup>nd</sup> Discussions
7. Closing Remarks by Representative of DOR

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**Data Collection Survey on Traffic  
Improvement in Kathmandu Valley**

- Greeting & Explanation of DFR
  - Objectives of the Survey
  - Survey Area
  - Schedule and Progress of the Survey
  - Counterpart Agency

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**Objectives of the Survey**

- Terms of Reference of the Survey is:
  - (1) Review of the exiting information, studies, plans and projects
  - (2) Basic data collection of urban plan
  - (3) Traffic survey and road inventory survey
  - (4) Future traffic demand forecast
  - (5) Identification of major traffic related issues and problems in Kathmandu Valley
  - (6) Recommendations to the future M/P
  - (7) Counterpart training in Japan

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**Survey Area**



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**Schedule and Progress of the Survey**

Work Item	Calendar Month											
	FY 2011						FY 2012					
	11	12	1	2	3	4	5	6	7	8	9	
[1] Preparatory Works and Data collection	█											
[2] Traffic Survey & Data Processing		█	█	█	█	█						
[3] Interim Report						█						
[4] Analysis of Survey Results							█					
[5] Identification of Major Traffic Issues								█				
[6] Draft Final Report, Final Report									█	█	█	
Progress of this phase												
Traffic Surveys												
1) Household Interview (18,000HH, sampling rate: 2.8%)												
2) Roadside Interview (OD) Survey (17 places)												
3) Traffic Count Survey (42 places)												
4) Screen Line Survey (13 places)												
5) Traffic Count Survey of Major Intersections (10 places)												
6) Travel Speed Survey (10 routes)												
7) Parking Survey (Along Ring Road)												
8) Bus Traffic Count Survey (2 terminals)												
9) Bus OD Survey (2 terminals)												
10) Bus Passenger Interview Survey (2,500 samples)												
11) Public Transport Firm Interview Survey (100 firms)												
Road Inventory Survey												
Submission of Report (CR, ITR, DFR, FR)												
Workshop												
Technical Committee (To be discussed)												
Technical Tour in Japan (8 C/P personnel)												

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## Counterpart Agency

- Technical Committee was set up under the chair of Director General of DOR:
  - (1) Department of Roads (DOR)
  - (2) Department of Urban Development and Building Construction (DUDBC)
  - (3) Department of Transport Management (DOTM)
  - (4) Metropolitan Traffic Police (MTP)
  - (5) Kathmandu Metropolitan City (KMC)
  - (6) Lalitpur Sub-Metropolitan City (LSMC)
  - (7) Bakhtapur Metropolitan City (BMC)

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Ministry of Physical Planning, Works and Transport Management, Department of Roads



## Data Collection Survey on Traffic Improvement in Kathmandu Valley

### 2<sup>ND</sup> WORKSHOP

## Road Development Plans Present Road Condition

27<sup>th</sup> July, 2012

M. Toriu / JICA Survey Team

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### 1. Road Development Plans

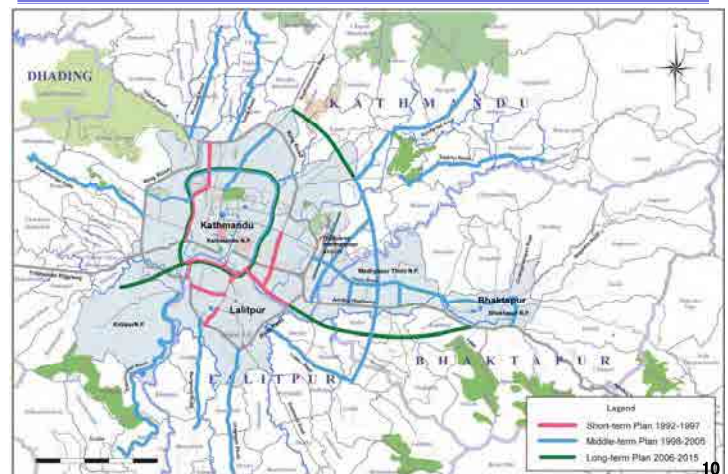
- 1.1 Development Concept of the previous M/P (in 1993)
- 1.2 Implemented Projects after the previous M/P (in 1993)
- 1.3 On-going Major Road Improvement Projects

### 2. Present Road Condition

- 2.1 Outline of Road Inventory Survey
- 2.2 Target Route of the Survey
- 2.3 Survey Results

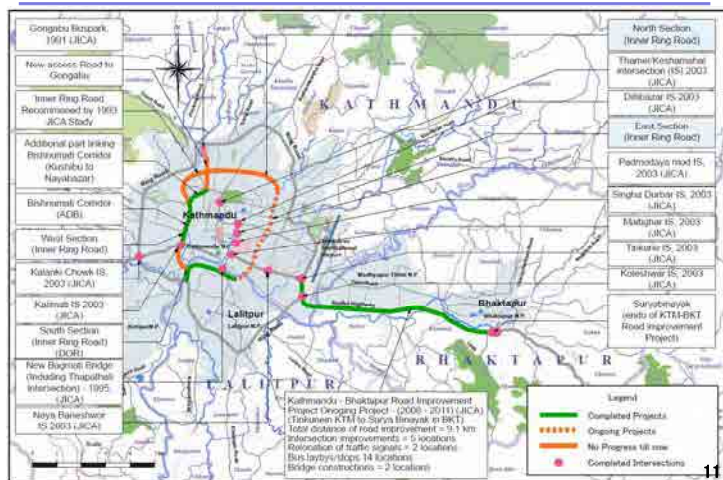
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### 1.1 Development Concept of the previous M/P (in 1993)



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### 1.2 Implemented Projects after the previous M/P (in 1993)



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### 1.3 On-going Major Road Improvement Projects

1. **Bhaktapur – Dhulikel Road Widening Project**  
Widening to 4-lane section designed in 2011 by DOR finance
2. **Kathmandu Sustainable Urban Transport Project (KSUTP)**  
To Rationalize existing fleet of public transport vehicles, pilot routes for public bus operation, Improvement BLR junctions etc proposed by ADB and financed by ADB, GON and GEF (Global Environment Facility)
3. **Ring Road Improvement Project**  
KVTD (KVDA) has initiated and studied the Ring Road Improvement Project comprising widening to 4-lane, improvement of service road, conservation and management of green belts etc in 2003. China is under implementation for re-design works and construction for Ring Road.
4. **Outer Ring Road Development Project**  
Prefeasibility study of Outer Ring Road was conducted by NEPECON in 2000. The proposed alignment of 66 km was evaluated and changed to a new alignment of about 72 km (This is latest alignment) in accordance with the nodal points decided by the cabinet.
5. **Grade Separated Intersections at Five Major Junctions in Kathmandu**  
DOR has planned to develop five major intersections: Old Baneshwor, New Baneshwor, Thapathali, Tripureshwar and Kalimati
6. **Kathmandu Valley Road Widening Projects**  
The actual progress till the end of June 2012 has been reached to 35 km approximately, and another 30 km will be demolished after time by KVTD (KVDA) cooperated with Municipality, MTP and DOR
7. **Railway and Metro Development Project**  
Feasibility Study of Mass Rapid Transit (Underground and Elevated Railway) Systems in Kathmandu Valley on December 28, 2011 by Department of Railways cooperated with consortium of Chung Suk Engineering, Co. Ltd., Korea, Transport Institute, Korea, Korea Rail Network Authority, Korea, ERM (P) Ltd, Nepal, BDA (P) Ltd., Nepal

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## 2.1 Outline of Road Inventory Survey

### 2.1.1 Road Inventory Survey

Road Inventory Survey on major arterial roads, constituting the frame of Kathmandu Valley which includes **National Highways, Feeder Roads and Urban Roads**, was conducted by JICA Survey Team during **December, 2011 to April, 2012** to identify **the existing characteristics, problems and issues on the traffic and road network in Kathmandu Valley**.

### 2.1.2 Roadside Condition Survey

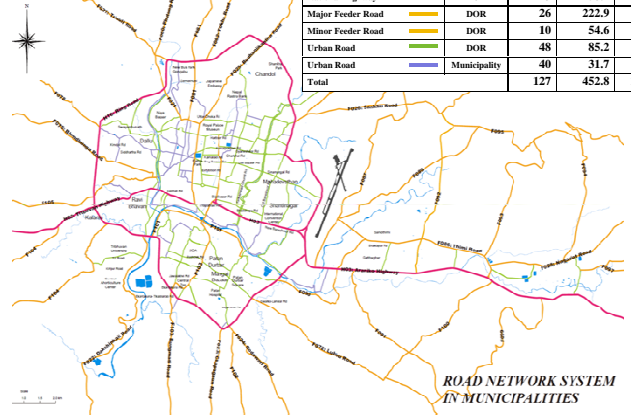
Roadside Condition Survey was conducted on **National Highways, Feeder Roads and Major River Corridors** to clarify the possibility of improvement for future road widening in terms of the difficulty of land acquisition.

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## 2.2 Target Route of the Survey

### 2.2.1 Road Inventory Survey

Class of Roads	Jurisdiction	Number of Routes	Length		Occupancy %
			Target km	Within 2 districts km	
National Highway	DOR	3	58.4	72.0	81.1 %
Major Feeder Road	DOR	26	222.9	319.0	69.9 %
Minor Feeder Road	DOR	10	54.6	72.1	75.7 %
Urban Road	DOR	48	85.2	91.7	92.9 %
Urban Road	Municipality	40	31.7	512.9	6.2 %
<b>Total</b>		<b>127</b>	<b>452.8</b>	<b>1067.7</b>	<b>42.4 %</b>

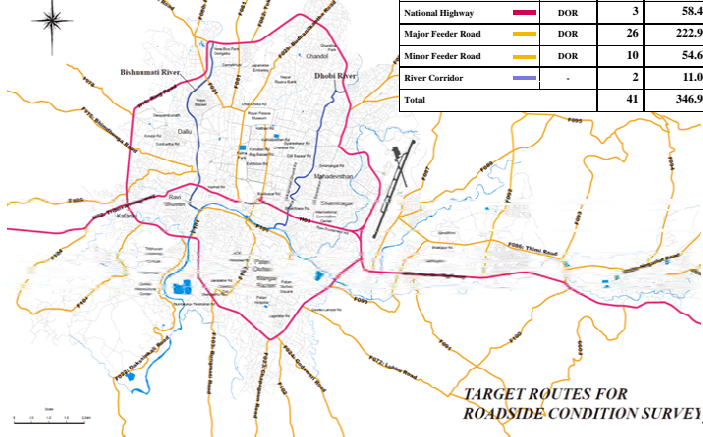


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## 2.2 Target Route of the Survey

### 2.2.2 Roadside Condition Survey

Class of Roads	Jurisdiction	Number of Routes	Length km
National Highway	DOR	3	58.4
Major Feeder Road	DOR	26	222.9
Minor Feeder Road	DOR	10	54.6
River Corridor	-	2	11.0
<b>Total</b>		<b>41</b>	<b>346.9</b>



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## 2.3 Survey Results

### 2.3.1 Pavement Width (Approximate lane Number) (1/2)

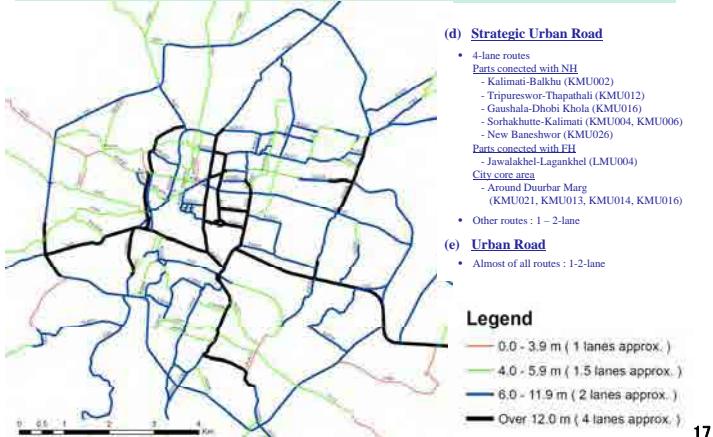


- (a) **National Highway**
- Tribuvan Highway (H02) : Within Ring Road 4-lane Other section 2-lane
  - Arniko Highway (H03) : From Manihigh to Bhaktapur 4-lane Other section 2-lane
  - Ring Road (H16) : Kalanki, Gausaha-Chabahil, Tinkune-Koteswar 4-lane Other section 2-lane
- (b) **Major Feeder Road**
- 4-lane : Bungmati Road (F103) partially
  - 2-lane : Dakshinkali Road (F022), Godawari Road (F024), Budhanikantha Road (F025), Sankhu Road (F026), Thimi Road (F086), Bungmati Road (F103)
  - 1 - 1.5-lane : Trisuli Road (F021), Charapagan Road (F023), Labhu Road (F072), Phuntung Road (F080), Tokha Road (F082), Bhimdhunga Road (F075) and so on
- (c) **Minor Feeder Road**
- Almost of all routes : 1 - 1.5-lane

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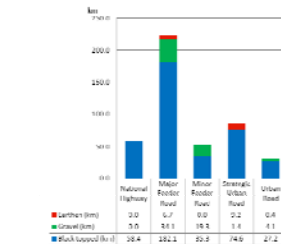
## 2.3 Survey Results

### 2.3.1 Pavement Width (Approximate lane Number) (2/2)

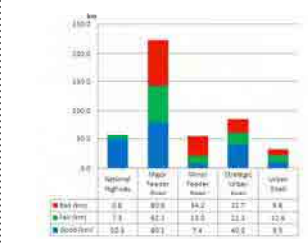


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### 2.3.2 Pavement Type



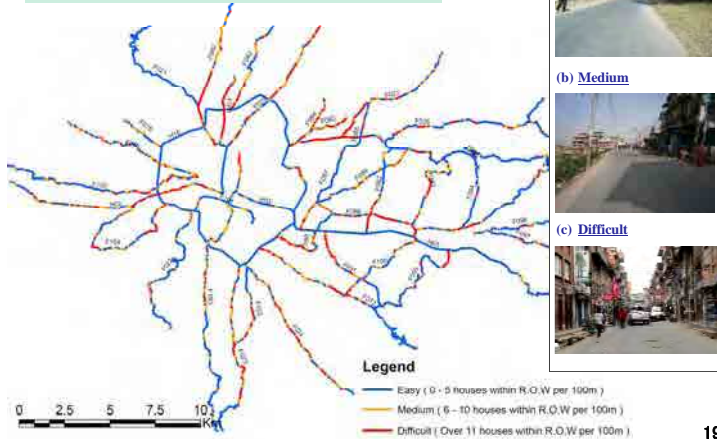
### 2.3.3 Pavement Condition



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### 1.3 Survey Result

#### 1.3.2 Extent of difficulty for road widening



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Department of Roads



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## Traffic Movement and Issues

27<sup>th</sup> July, 2012

Y. Ohwaki / JICA Survey Team

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1. Outline of Traffic Survey
2. Person's Movement
3. Vehicle Movement
4. Bus Operation and Movement
5. Issues from Traffic Survey

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### 1. Outline of Traffic Survey

#### Traffic Survey Items

1. Home Interview Survey
2. Traffic Survey
  - 2.1 Roadside OD Interview Survey
  - 2.2 Traffic Volume Survey
  - 2.3 Screen Line Survey
  - 2.4 Traffic count survey of major intersections
  - 2.5 Vehicle Speed Survey
  - 2.6 Parking Survey
3. Bus Transport Survey
  - 3.1 Bus Traffic Count Survey
  - 3.2 Bus OD Survey
  - 3.3 Bus Passenger Interview Survey
  - 3.4 Public Transport Firm Interview Survey

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### 1. Outline of Traffic Survey

#### 3. Survey Schedule

	2011		2012	
	November	December	January	February
Preparation of traffic Suevwy	Field Survey	Office Work		
Household Interview Survey			Field Survey	Office Work
Traffic Survey				
Roadside Interview (OD) Survey			Field Survey	Office Work
Traffic Count Survey			Field Survey	Office Work
Screen Line Survey			Field Survey	Office Work
Traffic Count of Major Intersection			Field Survey	Office Work
Travel Speed Survey			Field Survey	Office Work
Parking Survey			Field Survey	Office Work
Bus Transport Survey				
Bus Traffic Count Survey			Field Survey	Office Work
Bus OD Sueuey			Field Survey	Office Work
Bus Passenger Survey			Field Survey	Office Work
Public Transport Firm Interview Survey			Field Survey	Office Work
Data Entry and Reporting				Office Work

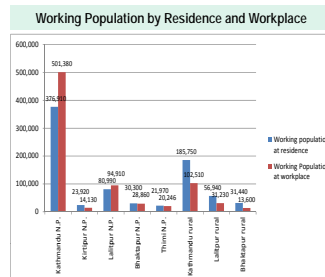
Legend:   
■ Field Survey   
■ Office Work

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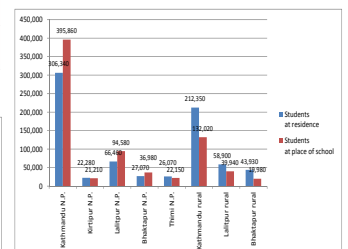
### 2. Person's Movement

#### (1) Workplace, School Place and Residence

About 809 thousand persons are working in survey area. Among them, 501 thousand person are working in Kathmandu N.P.



#### Student by Residence and School Place



	Employer	Employee	Student	Housekee per	Unemploy ed	Total
Population (thousand)	276	533	763	377	496	2,444
Percentage (%)	11.3	21.8	31.2	15.4	20.3	100

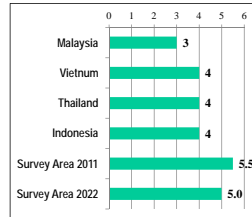
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## (2) Vehicle Ownership

### Vehicles in Survey Area

	Motorcycle	Passenger Car	Truck	Car Total	Vehicle Total
Number of Vehicle	448,600	52,200	4,800	57,000	505,600
Ownership Level (person/1 vehicle)	5.5	46.8	509.2	42.9	4.8
Ownership Level (vehicle/1,000 persons)	183.5	21.4	2.0	23.3	206.9

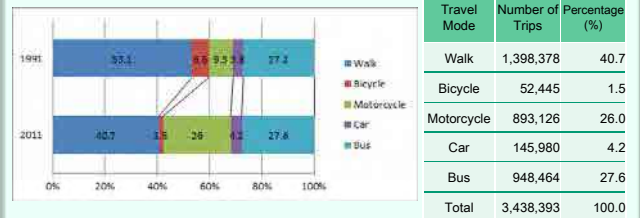
### Motorcycles in Other Country (person / 1 vehicle)



Source: Japan Automobile Manufacturer Association 25

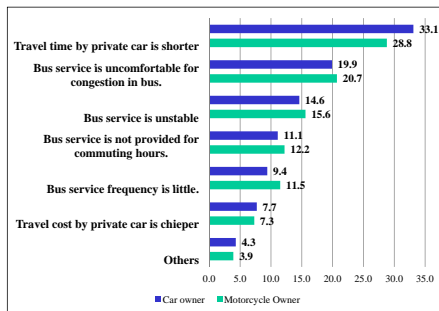
## (3) Travel Mode

- 2.8 times increase of motorcycle. Large part of walking and bicycle was replaced by motorcycle.
- Proportion of car has not almost changed.
- Proportion of Bus remains the same.



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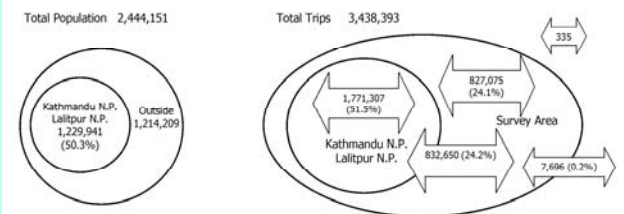
Reason for not to use Bus is 1) Travel time and 2) Uncomfortable. Improvement of Bus Service is Required for the modal shift to public transport.



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## (4) General Movement in the Survey Area

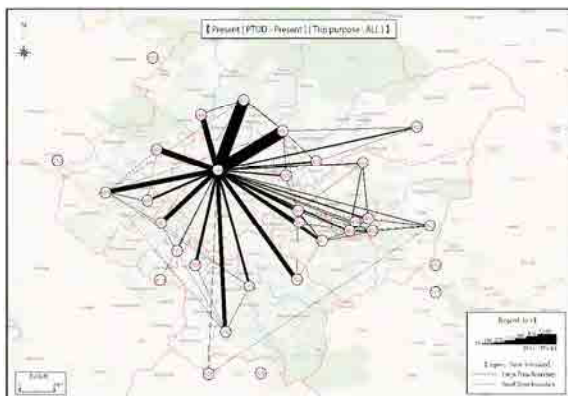
- Trips within Kathmandu N.P. and Lalitpur N.P. occupies around 50% of total trips.
- Trips flow into Kathmandu and Lalitpur N.P. from outside occupies around 25% of total trips.
- Trips moving outside occupies around 25%.



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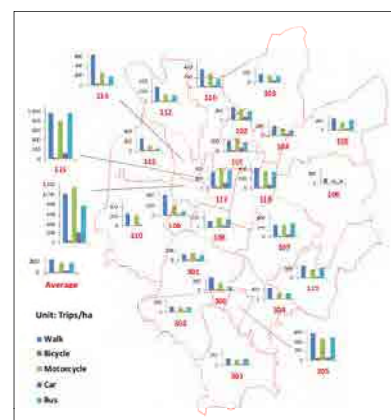
## (5) Desire Line of Person Trip

Kathmandu N.P. and Lalitpur N.P. have large gravity in the person movement.



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## (6) Trip Generation/attraction Density



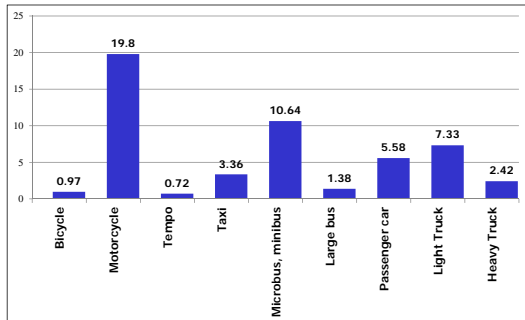
Trip generation/attraction density (trips/ha) is very high in Central area of Kathmandu and Lalitpur. In these areas, pedestrians should be protected from other traffic.

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## 2. Vehicle Movement

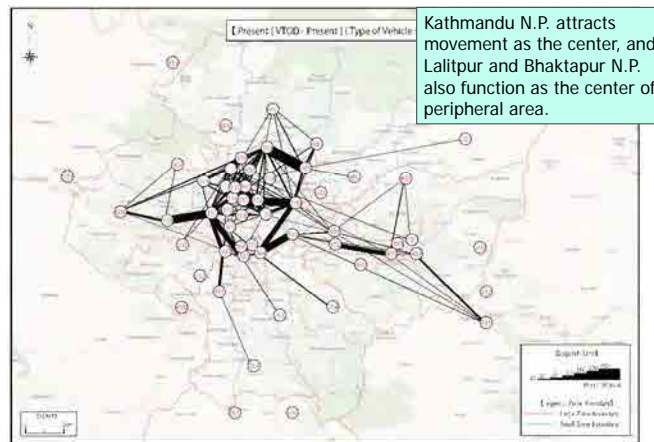
### (1) Comparison between 2011 and 1991

Largest increase is Motorcycle (19.8 times) and Minibus, Micro bus (10.6 times).



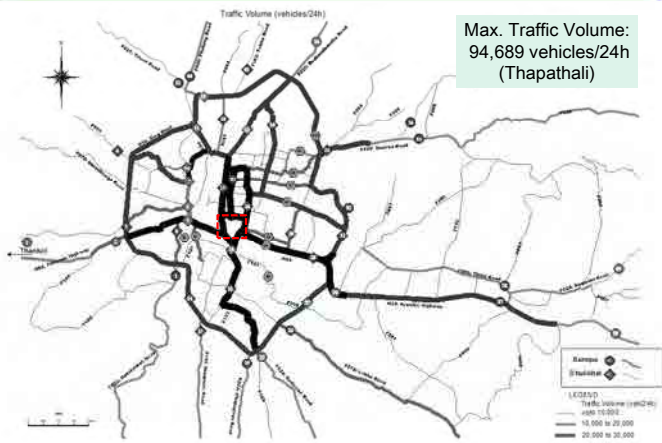
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### (2) Vehicle Trip Desire Line



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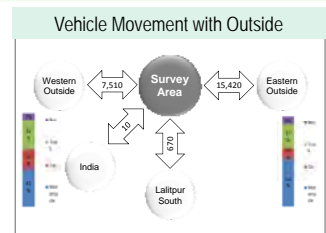
### (3) Traffic Volume



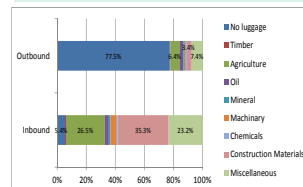
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### (4) Movement with Outside

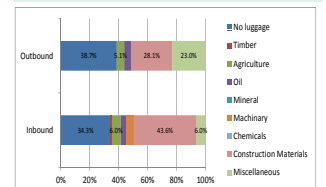
- Movement with east doubles west.
- Major incoming commodity is construction material, agriculture and miscellaneous.
- 78% of outbound truck carries no luggage.



#### Type of Truck Cargo at Thankot

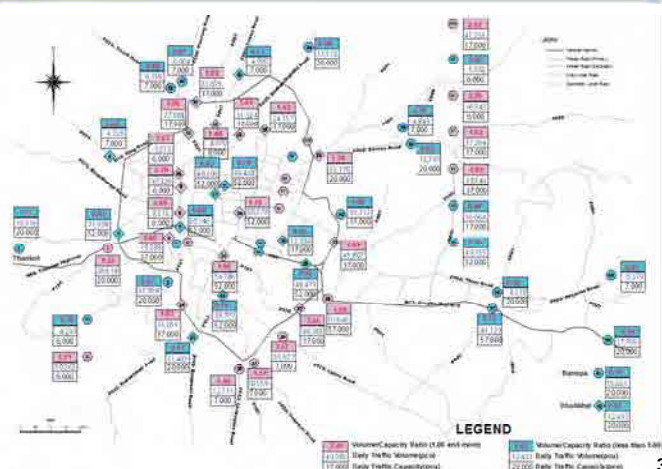


#### Type of Truck Cargo at Nagkhel



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### (5) Traffic Volume / Capacity



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## 3. Bus Operation and Movement

### (1) Bus Operation

- Around 5,300 buses are operating on 220 routes.
- Total operation is 32,800.
- Among them, 12,900 are operating from Kathmandu city center

#### Bus operation in Kathmandu valley

	Number of Operation Route	Number of Operating Bus	Number of Operation
Tempo	21	913	7,749
Micro Bus	90	2,036	14,120
Minibus	107	2,036	9,822
Large Bus	2	320	1,140
Total	220	5,295	32,835

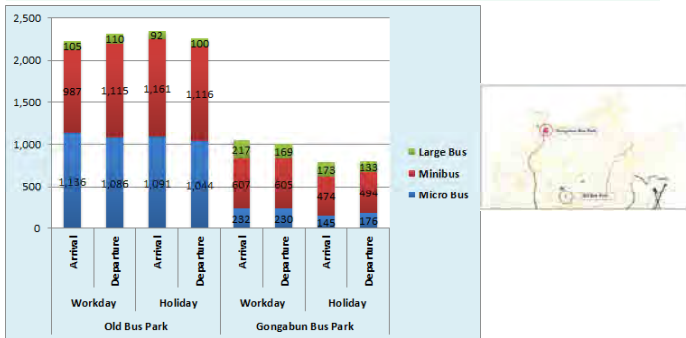
#### Bus operation from terminal

	Large Bus	Minibus	Micro Bus	Tempo	Total
Old Bus Park	110	1,115	1,086	0	2,311
Ratnapark	45	288	3,438	1,025	4,796
NAC	0	367	2,042	2,444	4,853
Sahidgate	0	69	833	0	902
(Kathmandu center total)	155	1,839	7,399	3,469	12,862
Lagankhel	80	1,324	2,584	1,200	5,144
Gongabun Bus Park	169	605	230	0	1,004

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## (2) Bus Operation at Old Bus Park and Gongvuv Bus Park

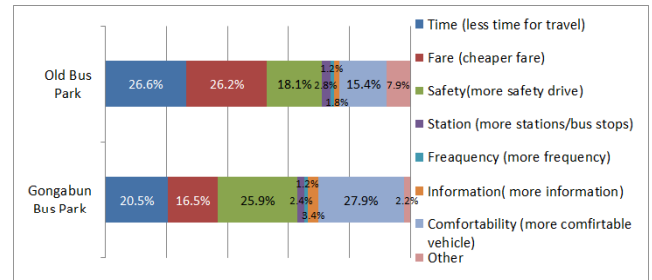
At Old Bus Park, 2,200-2,300 buses depart on every workday and holiday. At Gongabun Bus Park, 1,000 buses depart on workday and the number decreases to 800 on holiday.



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## (3) Bus Passenger's requirement

- Largest requirements by Old Bus Park passenger are time and fare.
- On the other hand, requirements by Gongabun bus park are safety and comfortability.



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## 4. Issues from Traffic Survey

### Improvement of Public Transport System

- ◆ In near future, road traffic will exceed road capacity. Modal shift is inevitable.
- ◆ To promote the use of public transport, rapid and comfortable public transport is required.
- ◆ Introduction of new public transport with exclusive track is recommended for the long term solution.
- ◆ Type of system, route and feasibility should be scrutinized in the envisaged M/P.

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### Example of New Public Transport System

#### Transportation Capacity of New Public Transport System

System	Transportation Capacity (person/hour)	Remark
Subway	40-50 thousand	
MRT	10-20 thousand	Linear Metro, Monorail etc.
LRT	4-9 thousand	Streetcar
BRT	3-9 thousand	Exclusive lane with overtaking lane

#### MRT (Bangkok)



#### BRT (Jakarta)



#### Monorail (Okinawa)



#### LRT (Toyama)



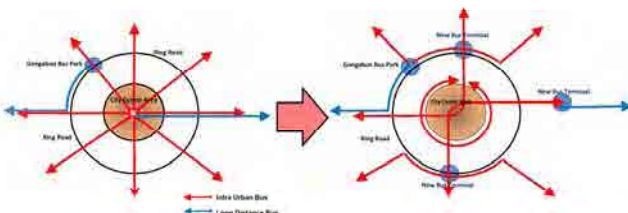
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### Improvement of Bus Terminals

Bus operation is exceeding the capacity of existing bus terminals. Development of new terminals outside the city center is needed.

#### Existing Bus Terminal and Route

#### Proposed Bus Terminal and Route

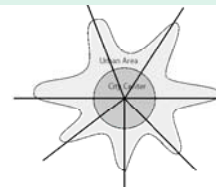


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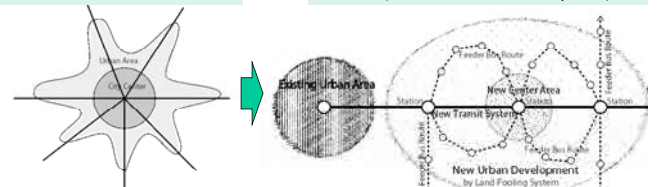
### Land Use in Harmony with Transportation

- Existing dispersing land use is not efficient for development of transport infrastructure.
- Future Land Use Plan shall be established in harmony with transportation system.
- Land development system composed of feeder road development and resident site development is required.

#### Present Land Use Pattern



#### TOD (Transit Oriented Development)



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### Improvement of Pedestrian Environment

- 40% of travel mode is Walk. 30% of "To Work" trip is by Walk.
- Average trip length of Walk is 3km.
- Improvement of pedestrian environment along the arterial road will contribute to alleviate vehicle traffic.
- Improvement and widening of sidewalk and crossing, installation of pedestrian bridge and pedestrian signal, exclusion of parking from sidewalk.



Comfortable pedestrian way (Omotesandou, Tokyo)

### Improvement of Traffic Condition on Road

- Concentration of vehicle trip into the inside of Ring Road will continue in the future. Improvement of roads and intersections shall be continued.
- In order to alleviate the traffic inside the Ring Road, removal of major functions from inside the Ring Road shall be investigated.
- (Candidate Functions)  
Bus terminal, factory, warehouse, garage, university & college, etc.



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## Future Traffic Demand Forecast

27<sup>th</sup> July, 2012

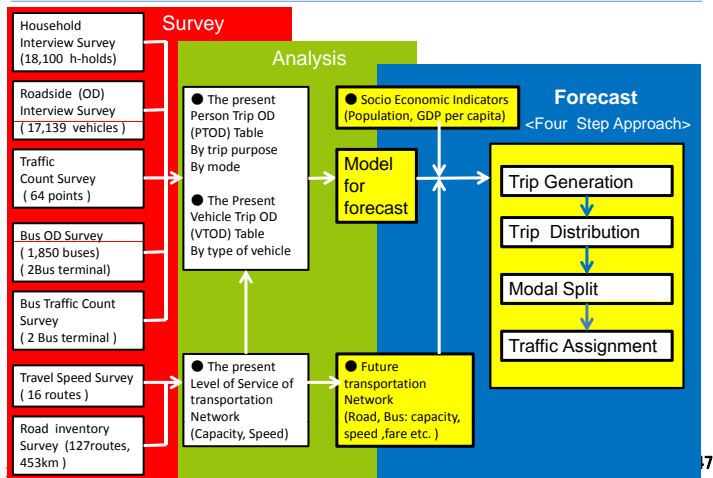
A. Nakaseko / JICA Survey Team

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### Future Traffic Demand Forecast

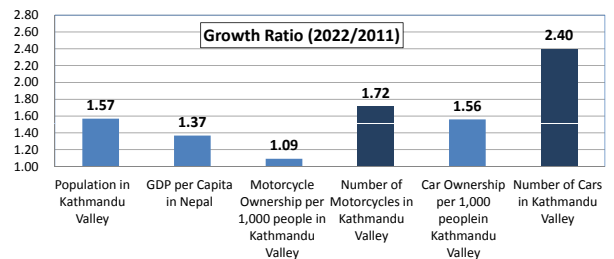
1. Procedure of Traffic Demand Forecast
2. Future Socio Economical Background
3. Result of Traffic Demand Forecast
4. Case study for Sustainable Transport in the long run

### 1. Procedure of Traffic Demand Forecast



### 2. Future Socio Economical Background

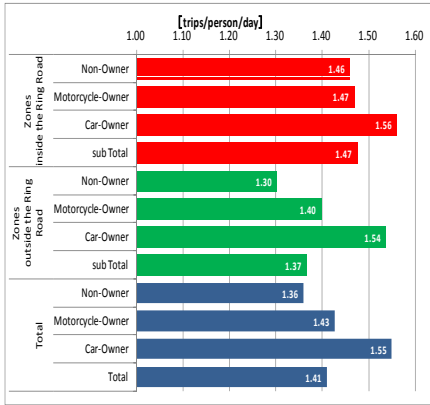
- Future population in the study area is assumed to be **3,835,600 in 2022 with an annual growth rate of 4.18 %** in the duration of **2011- 2022**, which means an increase of 56.9% of the population since 2011.
- Future growth of Vehicle ownership was estimated by JICA study team based on Household interview survey, growth of population and GDP per capita. **Motorcycle and Car ownership** of household in Kathmandu Valley would be increased to **1.72 and 2.40 times** of the present level respectively.





### 3. Result of Traffic Demand Forecast

#### Trip Generation Rate per person in 2011



• Trip generation per person **living inside the Ring Road is higher than the outside by 5-11%.**

• Trip generation per person who is **owner of motorcycle or car is higher than non owner by 1-18%.**

Future Traffic Demand Forecast

#### 1) Trip Generation and Attraction : Trend increase (2011 → 2022 )

● Total trips in the Valley was forecasted to be **5,456 thousand/day in 2022 by 1.59 times of the present in 2011.**

Trips Generation(Trend ) in 2011 and 2022 unit:1,000 trips/day

area	Present in 2011	Future in 2022	Growth Rate (2022/2011 )	Share in 2011	Share in 2022
Area inside the Ring Road	1,772	2,858	1.61	51.5%	52.4%
Area outside the Ring Road	1,667	2,599	1.56	48.5%	47.6%
Total	3,438	5,456	1.59	100.0%	100.0%

Source : JICA Study Team

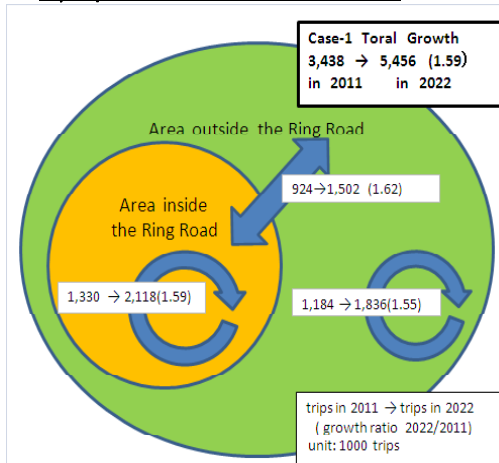
Trips Attraction(Trend ) in 2011 and 2022 unit:1,000 trips/day

area	Present in 2011	Future in 2022	Growth Rate (2022/2011 )	Share in 2011	Share in 2022
Area inside the Ring Road	1,812	2,881	1.59	52.7%	52.8%
Area outside the Ring Road	1,627	2,576	1.58	47.3%	47.2%
Total	3,438	5,456	1.59	100.0%	100.0%

Source : JICA Study Team

Future Traffic Demand Forecast

#### 2) Trip Distribution in 2011 and in 2022



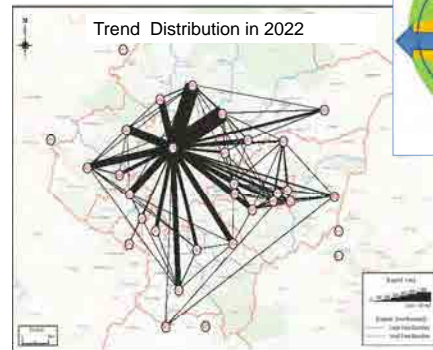
• Trip distribution **between the central and suburb would be increased by 1.62times, more than other areal trips.**

Future Traffic Demand Forecast

● The trend pattern of overall trip flow in Kathmandu Valley shows a typical **mono-concentration structure with rapid population growth in suburbs.**

● On the trend, the pattern becomes stronger for the future without a change of land use pattern.

#### Mono-Concentration Structure

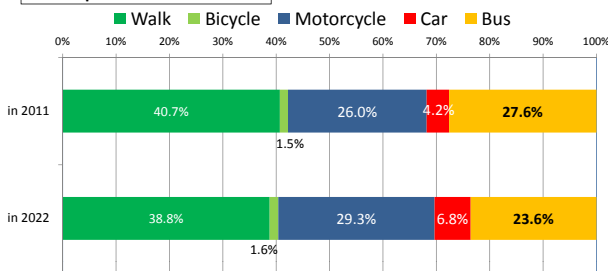


Future Traffic Demand Forecast

#### 3) Modal Split : Trend (2011 → 2022 )

● Based on trend forecasting, Trips of every mode would increase, but  
-Bus share would decrease  
-Motorcycle and Car share would increase

#### Modal Split in 2011 and in 2022

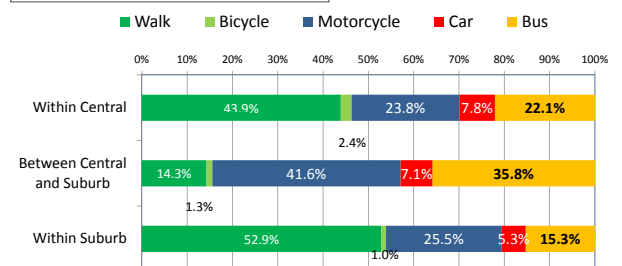


Future Traffic Demand Forecast

#### Modal Split by Areal Distribution

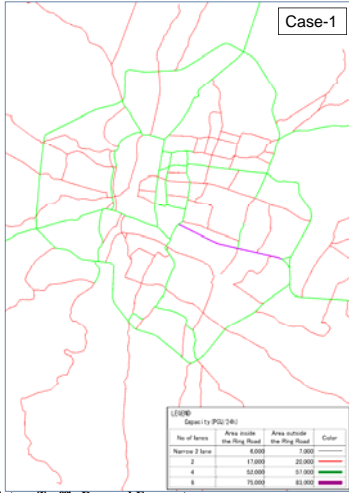
● In central area car share would be relatively higher than the other.  
● Between central and suburb motorcycle and bus would be very competitive  
● In suburb trips of motorcycle and car would increase rapidly at more than 2 times .  
● All type of flow would shift to cars more in the long run due to the increase of car ownership.

#### Modal Split by Areal Distribution in 2022



Future Traffic Demand Forecast

#### 4) Traffic Assignment



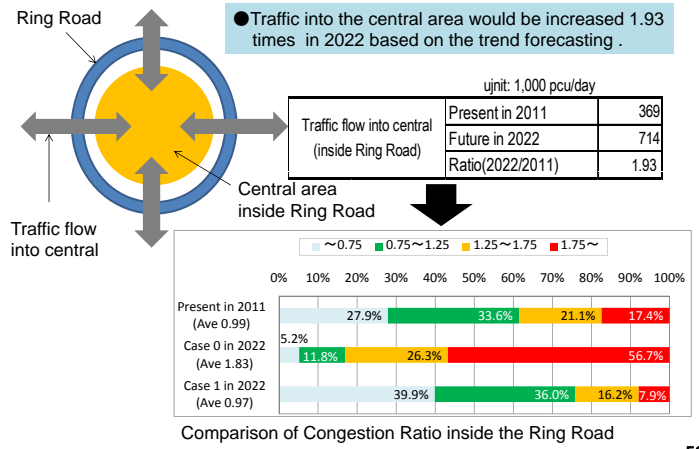
#### The basic case (Case-1)

Land use and population distribution	Land use pattern and population distribution of the Kathmandu Valley will not be changed.
Bus service	the same as the present level of services, such as frequency, speed and fare
<u>Future road network</u>	
-Ongoing major road development projects are assumed to be completed by 2022.	
Expansion :	
1) Ring Road,	
2) Arniko Highway	
3) Tribuvan Highway	
4) Important Feeder and Urban Roads would be improved to have a capacity of at least 2- lane and be improved to be fair surface condition at least.	

Future Traffic Demand Forecast

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#### Traffic Assignment Result : Trend (Case-0,Case-1)



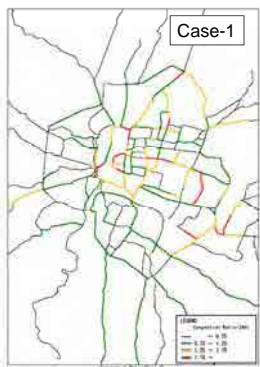
Future Traffic Demand Forecast

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#### Traffic Assignment Result : Trend (Case-0,Case-1) in 2022

●(Case-0: Do nothing scenario) It is fairly said that if do nothing for the future, 10 years later, every activity will be restricted due to sever traffic congestion, particularly in the central area of Kathmandu inside the Ring Road.

●(Case-1) On the other hand, if ongoing projects like the ring road expansion, are completed, it is surely said that the level of mobility in 2022 would be sustained at the same as the existing level



Future Traffic Demand Forecast

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#### 4. Case study for Sustainable Transport in the long term

Based on the Perspective of population growth in the long run, the growth almost as same as that of between 2011 and 2022 would continue after 2022.

#### Population Trend in Kathmandu Valley

District	Area	1991		2001		2011	
		Population	Annual rate	Population	Annual rate	Population	Annual rate
Kathmandu District	Total	668,605	4.93%	1,081,845	4.93%	1,740,977	4.87%
	Urban	414,264	5.58%	712,681	5.58%	1,072,726	4.17%
Bhaktapur District	Total	254,341	3.80%	369,164	3.80%	668,251	6.11%
	Urban	173,097	2.68%	225,461	2.68%	303,027	3.00%
Lalitpur District	Total	111,975	0.63%	105,167	0.63%	134,875	2.52%
	Urban	61,122	7.01%	120,294	7.01%	168,152	3.41%
3 Districts Total	Total	221,570	4.31%	337,785	4.31%	466,284	3.28%
	Urban	117,203	3.35%	162,991	3.35%	225,785	3.17%
Rural	Total	104,317	5.30%	174,794	5.30%	243,499	3.37%
	Urban	1,063,222	4.46%	1,645,091	4.46%	2,510,288	4.32%
Rural	Total	592,589	5.33%	995,966	5.33%	1,463,633	3.92%
	Rural	470,633	3.27%	649,125	3.27%	1,406,625	4.89%

Source: Central Bureau of Statistics

Future Traffic Demand Forecast

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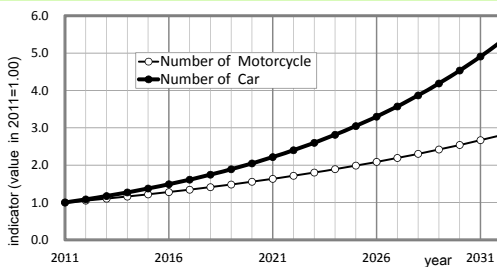
#### Perspective of vehicle ownership growth in the long run

●If cars increase at the same rate between 2011 and 2032, the number would be more than 5 times of the present.

Between 2011 and 2022, Socio-economical growth was estimated ;

- Population annual growth rate 4.18%, 1.57 times
- GDP per capita annual growth rate 2.89%, 1.37 times
- Number of motorcycles\* annual growth rate 5.05%, 1.72 times
- Number of cars\* annual growth rate 8.28%, 2.40 times

\* this number is for vehicles in household excluding company cars etc



Future Traffic Demand Forecast

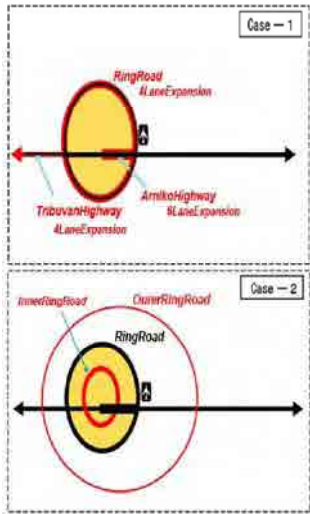
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-Based on the perspective of growth of population, GDP and vehicle ownership, it seems that the growth of traffic demand after the year of 2022 might be higher than that of between 2011 and 2022.

-Therefore, from a view of sustainable transport in the long run, in order to find more effective and efficient way for the continuous increase of traffic demand in Kathmandu Valley, the following four cases were set up and evaluated for the demand in 2022.

Future Traffic Demand Forecast

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**Case-1** is assumed that ongoing road projects would be completed.

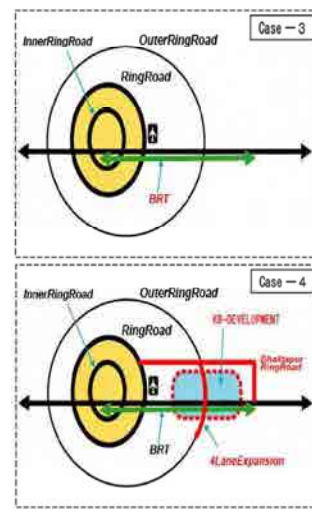
- 1) Ring Road :expansion 4-lane
- 2) Arniko Highway: expansion 6-lane
- 3) Tribuvan Highway expansion 4-lane
- 4) All narrow roads would be improved to have a capacity of at least 2-lane(Feeder, Urban Roads)
- 5) All roads with bad condition of surface would be improved to be fair condition at least.

-Land use pattern is assumed to be same as the present pattern which is expanding to suburbs.

**Case-2** is assumed that Inner Ring road (4-lane) and Outer Ring Road (2-lane) would be added to Case-1 network.

-Land use and distribution pattern of population are as same as Case-1 in Population distribution, PTOD and VTOD.

Future Traffic Demand Forecast



**Case-3** is assumed that BRT (Bus Rapid Transit) between the center of Kathmandu and Bhaktapur would be introduced to Case-2 network.

-Land use pattern and distribution pattern of population are as same as Case-1. But modal choice is different because BRT is introduced. Therefore PTOD by mode and VTOD are different from Case-1 and 2.

**Case-4** is assumed that Bhaktapur Ring Road (4-lane) and a part of Outer Ring Road expansion (4-lane) would be added to Case-3 network.

- As a new sub center, KB-Development (Kathmandu-Bhaktapur Corridor Development) is suggested.

-Land use pattern and distribution pattern of population are different from Case-1, 2 and 3

Future Traffic Demand Forecast

Alternatives of trip distribution pattern for case study

**Over Concentrated and Expanding City with one Center**

(Case - 0,1,2,3)

- Trend pattern
- Land use not changed
- Growing population in suburbs
- Expanding urban area widely to suburb

**Sustainable Compact City with Twin Center**

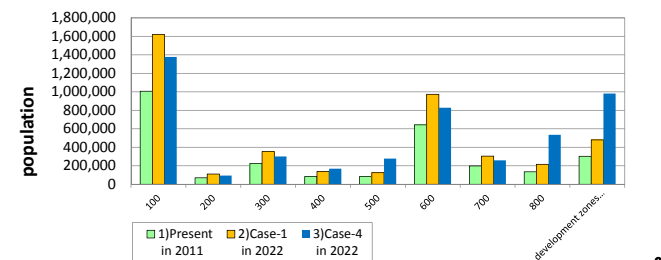
(Case - 4)

- Not Trend pattern
- Land use changed
- Growing population in new development area
- Expanding urban area limited in the new development area

Future Traffic Demand Forecast

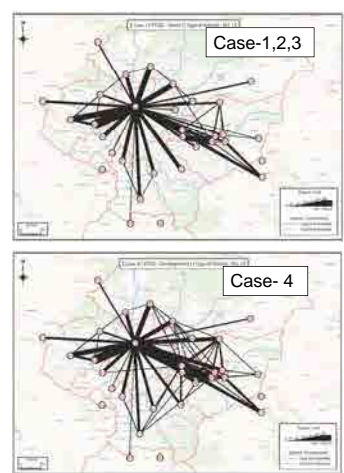
Population setting for traffic demand forecasting

Large Zone	Zone No.	1)Present in 2011	2)Case-1 in 2022	3)Case-4 in 2022	Growth Ratio 2)/1)	Growth Ratio 3)/1)
Kathmandu N.P.	100	1,006,656	1,618,700	1,377,200	1.61	1.37
Kirtipur N.P.	200	70,118	110,800	94,200	1.58	1.34
Lalitpur N.P.	300	223,289	353,300	300,700	1.58	1.33
Bhaktapur N.P.	400	83,893	138,800	168,400	1.65	2.01
Madhyapur N.P.	500	84,259	125,000	277,700	1.48	3.30
Kathmandu Dist.	600	642,856	973,300	827,900	1.51	1.29
Lalitpur Dist.	700	198,209	304,300	259,000	1.54	1.31
Bhaktapur Dist.	800	134,875	216,200	535,300	1.60	3.97
total		2,444,151	3,840,400	3,840,400	1.57	1.57
development zones	400,500,800	303,027	480,000	981,400	1.58	2.04



Future Traffic Demand Forecast

Several Findings through the Case study



●Case-4 might reduce the demand of both within the central area and between the central and suburb by 20%.

Comparison of trip flow 1,000 person trips/day

	a. Case-1 in 2022	b. Case-4 in 2022	b/a
Intra Central Trips	2,118	1,704	80.5%
Inter trips between the central and	1,502	1,205	80.2%
Intra Suburb Trips	1,836	2,522	137.4%
total	5,456	5,431	99.5%

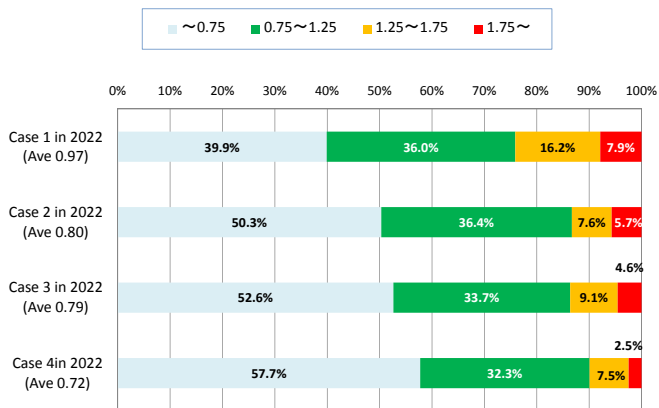
Future Traffic Demand Forecast

Comparison of Four Cases by several indicators

Indicators	Classification	Case 1 in 2022	Case 2 in 2022	Case 3 in 2022	Case 4 in 2022				
Average Congestion Ratio	Area inside The Ring Road	0.97	0.80	0.79	0.73				
	Total	0.70	0.59	0.58	0.58				
Ratio of length by congestion rate inside the Ring Road	Length(km)	Ratio	Length(km)	Ratio	Length(km)	Ratio			
	0-75	41.6	39.9%	57.0	59.3%	59.8	52.6%	65.4	67.2%
	75-125	37.6	36.0%	41.2	36.4%	38.2	33.7%	38.6	32.3%
	125-175	18.8	18.2%	8.8	7.6%	10.3	8.1%	6.5	5.5%
175-	8.2	7.9%	6.5	5.7%	5.2	4.6%	2.8	2.5%	
Vehicle length (thousand vehicle*km)	3,972	100	3,788	95	3,806	96	4,000	102	
	Average Vehicle Trip Length (km)	4.9	100	4.7	96	4.6	94	4.9	100
Congestion of Vehicle	vehicle	Ratio	vehicle	Ratio	vehicle	Ratio	vehicle	Ratio	
	motorcycle	1,106	100	1,196	100	1,116	94	1,022	95
	Car	344	100	346	100	354	97	337	97
	Truck	158	100	158	100	156	99	156	100
	Bus	184	100	184	100	196	107	191	104
	Total	1,874	100	1,874	100	1,800	96	1,801	96
Modal Split of Person Trips in 2022	Share	Share	Share	Share	Share				
	WALK	33.8%	33.2%	33.2%	33.2%	33.2%			
	Bicycle	1.8%	1.6%	1.6%	1.5%	1.5%			
	Motorcycle	29.3%	29.3%	27.6%	27.6%	27.6%			
	Car	8.8%	8.8%	8.8%	8.8%	8.8%			
	Bus	21.5%	23.5%	25.0%	24.5%	24.5%			

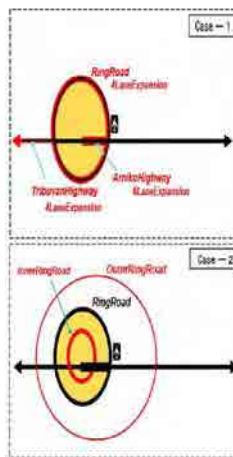
Future Traffic Demand Forecast

Comparison of Congestion Ratio in length inside the Ring Road



Future Traffic Demand Forecast

Comparative Evaluation for Four Cases



**(Case-1)**

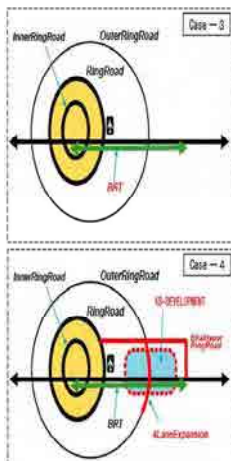
- Against the increase of 59% in traffic demand, several expansion projects such as the Ring Road will be very effective to maintain the mobility in the central Kathmandu.
- In addition, improved feeder roads access to the Ring Road, mobility for working and accessibility to school in suburb will be improved greatly.
- Nevertheless, an increase of population in suburb will continue and the motorization of both families in the central and suburb will progress more rapidly. So, it is difficult for the Case-1 network to deal with the growing demand inside the Ring Road appropriately after 2022 because the network cannot afford to have sufficient capacity.

**(Case-2)**

- Inner and Outer Ring Road construction could improve greatly the whole mobility in the Valley and congestion inside the Ring Road.
- To produce more such effects in the long run, a future M/P to utilize three Ring Roads effectively by all transport modes in conjunction with efficient land use and preserving historical places should be planned.

Future Traffic Demand Forecast

Comparative Evaluation for Four Cases



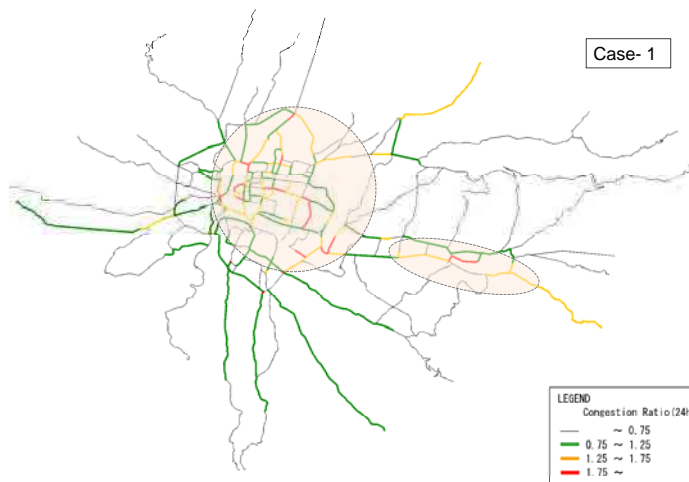
**(Case-3)**

- Case-3 is assumed that BRT (Bus Rapid Transit) between the center of Kathmandu and Bhaktapur would be introduced to Case-2 network.
- In order to avoid becoming stronger dependency on private vehicles, BRT introduction would be one of effective measures.
- Although modal shift from private motorcycle and car to bus could be promoted by BRT, an introduction of BRT without change of urban structure and incentives for modal shift could not be efficient and not sufficient to catch the demand in the long run.

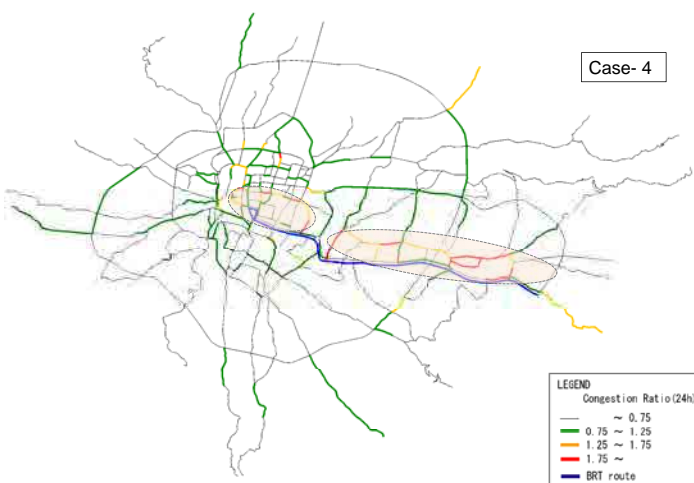
**(Case-4)**

- In order to sustain urban mobility and vitality in the long run, in Case-4 an idea to build compact city with twin centers is recommended as a hopeful one of solutions.
- Case-4 was estimated to reduce the demand of both within the central area and between the central and suburb by 20%. In practice, it is not easy to build a compact city where people could make trips shorter and can move by walk, bicycle and public transport, not too dependent on private vehicles. It is desirable to build, for example, a new industrial park, cargo terminal and office area along Amiko Highway close to new residential towns.

Future Traffic Demand Forecast



Future Traffic Demand Forecast



Future Traffic Demand Forecast



Ministry of Physical Planning and Works  
Department of Roads



Data Collection Survey on  
Traffic Improvement in  
Kathmandu Valley

2nd WORKSHOP

Land-use & Urban Development Issues

27 July 2012  
A. Odake/ JICA Survey Team

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### 1. Land-use & Urban Development Issues

#### 1.1 Situation

#### 1.2 Issues

- (1) Land use and urban development issues
- (2) Population issues
- (3) Regulation and Institutional issues
- (4) Private sector issues
- (5) Housing Issues

### 2. Recommendation

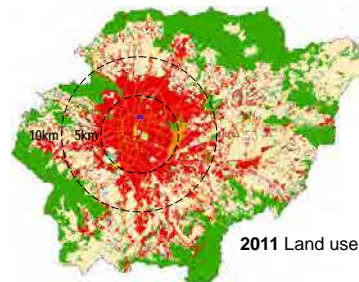
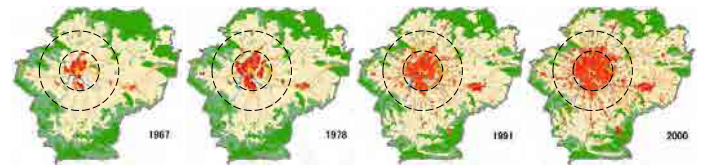
#### 2.1 From the view point of Land-use

- (1) For the future Master Plan Study
- (2) Besides Transportation Master Plan Study

Land-Use and Urban Development

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### 1.1 Situation (1) Land Use



•Unplanned rapid urbanization is the major issue of the development of Kathmandu Valley. The figures shown below clearly show this situation.

Year	Built-up area		Increase rate
	ha	%	%
1967	2,010	2.9	
1978	3,362	4.9	67
1991	6,313	9.2	88
2000	9,717	14.2	54
2011	16,216	24.7	67

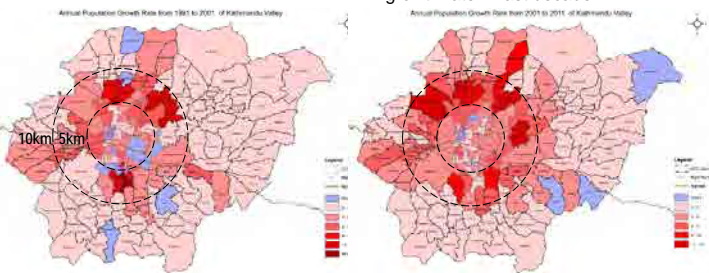
Land-Use and Urban Development

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### 1.1 Situation (2) Population Growth

• Rapid population growth happened just outside the Ring Road during 1991-2001 to north, north-east and south.

• High population growth spread widely outside of the Ring Road, especially in north and east.  
• 4 VDCs shows more than 12% annual growth rate in last decade.



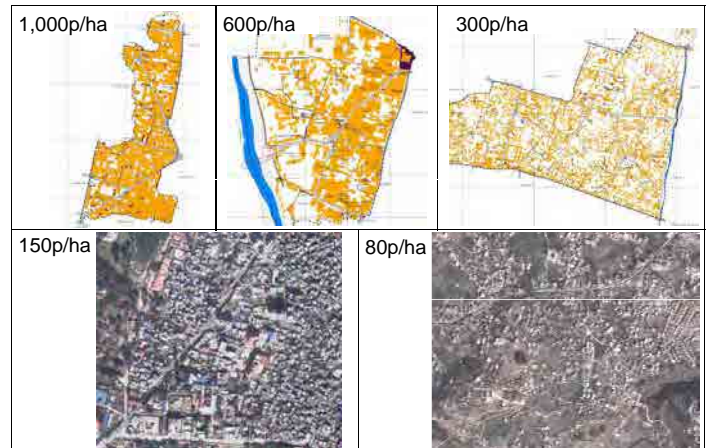
1991-2001

2001-2011

Land-Use and Urban Development

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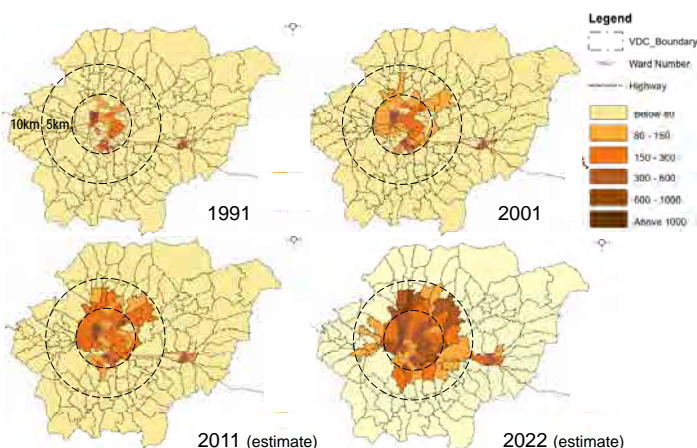
### 1.1 Situation (3) Population Density (Typical Area)



Land-Use and Urban Development

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### 1.1 Situation (3) Population Density



2011 (estimate)

2022 (estimate)

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### 1.2 Issues



Land-Use and Urban Development

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## 1.2 Issues

### (1) Land use and urban development issues

- i) Necessity of Land Use Plan for outside of the Ring Road:** Existing land use definition outside of the Ring Road is just identifying urban VDCs as "Urban Expansion Zone" only. Detailed Land Use Plan is required.
- ii) Need guideline for Land pooling project:** Some of LP projects in the Valley are not contributing much to strengthen road network.
- iii) Necessity of environmental protection measure:** Land use zoning outside the Ring Road is quite rough zoning to control urbanization expansion. Mountain slope, river banks and agricultural fields should be clearly defined as protection or conservation zone.
- iv) Need of cargo terminals and passenger terminals:** In Kathmandu Valley there are no planned cargo terminals. Cargo trucks come from outside of the Valley use road side of the Ring Road as a transshipment yard. This causes traffic congestion along the Ring Road.

Land-Use and Urban Development

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## 1.2 Issues

### (2) Population issues

- i) Necessity of Population density plan:** Northern and southern part of outside of the Ring Road showed higher growth rate during this decade. Gothatar, Kapan, Manmajju, and IchangNarayan reached 12% growth rate, while Dhapasi, Gonggabu, Mahankai, and Chapali Barakali VDC of KTM, Sainbu and Imadoi VDC of Lalitpur over 8%. It is necessary to designate population density plan together with Land Use Plan.
- ii) Necessity of urbanization control:** Built-up area expansion trend until around year 2000 was linearly happened mainly along existing feeder roads. After 2000, built-up area spread over a large area of outside the Ring Road without certain road network expansion. KVBB 2007 has regulation of access road for new development, however this rule does not contribute to strengthen road network in the Valley.

Land-Use and Urban Development

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## 1.2 Issues

### (3) Regulation and Institutional issues

- i) Necessity of any comprehensive guiding framework:** Because of unstable government, Kathmandu Valley does not have a clear comprehensive guiding framework of urban development for all ongoing and proposed future development.
- ii) Need strong urban development management in KV:** KVDA was established as a upgraded institute from TVTDC. However, there are still unclear demarcation.
- iii) Need manpower for building control:** The system is not effective to private individual building.
- iv) Need capacity building for public servants:** Continuous training for governmental staffs is not enough to keep certain level of knowledge to implement projects appropriately.

Land-Use and Urban Development

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## 1.2 Issues

### (4) Private sector issues

- i) Necessity of appropriate control of realty market:** After the earthquake and policy change of housing loan, the realty market was cooled down. But investment from private sector is vital engine of economic growth. Appropriate measure is necessary to guide investment in urban development.

### (5) Housing Issues

- i) Need sufficient supply of housing units and planned housing land:** Although population in the KV has been rapidly increasing, supply of housing unit and planned housing land is not sufficient. Public sector has to have responsibility of housing for disadvantaged people. DUDBC do their effort on this issue, but cannot meet the required target because of manpower and its budget.

Land-Use and Urban Development

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## 2. Recommendation on Urban Sector



OR



Land-Use and Urban Development

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## 2. Recommendation on Urban Sector

### (1) For the future Master Plan Study

- i) Determine Urban Development Scenario in the KV:**
- It is necessary to discuss and determine future development vision of the KV among the related stakeholders of the government. The scenarios should consider the result of case study of future traffic assignment and population distribution by population density planning.
  - The future Master Plan should be planned based on the discussed scenario.
- ii) Determine Concept of the KV Land Use and Zoning Plan :**
- It is necessary to review, discuss and determine direction and outline of revision of KV Land Use and Zoning Plan the Plan. Detailed revision of the Land Use Zoning will be next phase.
- iii) Guideline for Urban Development to Strengthen Road Network :**
- It is necessary to draw-up guideline for large scale urban development to strengthen feeder road and ladder road network by utilizing Land Pooling or other urban development scheme.

Land-Use and Urban Development

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## 2. Recommendation on Urban Sector

### (1) For the future Master Plan Study–cont.

#### iv) Plan Passenger Terminals :

- There are two bus terminals developed, which planned in 1993 Master Plan. However spreading out of bus stops shows necessity for more space of planned transportation terminals in the Valley.
- Although it is needed to secure certain land for terminals to develop transportation terminal, it is difficult to find open space for the terminals. It is necessary to develop surrounding area with the terminals. Urban re-development scheme should be introduced.

#### v) Plan Logistic Center and Industrial park :

- Logistic Centers and logistic centers are necessary and should be determined its location, function and size in the Master Plan to encourage economic and social development. Industrial park also considered in the Master Plan together with cargo terminals.

Land-Use and Urban Development

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## 2. Recommendation on Urban Sector

### (2) Besides Transportation Master Plan Study

#### i) Institutional Strengthening, Capacity Building & Training :

- It is necessary to enhancement of Planning Skills for young staffs of DUDBC, KVDA and Municipalities.
- OJT type technical cooperation through on-going project such as Land Pooling project and Outer Ring Road project is necessary to strengthen knowledge and experience of younger staffs.

#### ii) Formulate Draft Rule and Regulation on Urban Development to Strengthen Road Network :

- There is not enough guidance or instruction to draw appropriate development plan.
- It is necessary to draw-up guideline for large scale urban development to strengthen feeder road and ladder road network by utilizing Land Pooling or other urban development scheme.

Land-Use and Urban Development

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## 2. Recommendation on Urban Sector

### (2) Besides Transportation Master Plan Study–cont.

#### iii) Prepare a Comprehensive Development Plan for the KV including update the Land Use, Zoning Plan, Development Control Regulations & Building Byelaws :

- It is necessary to draw-up guideline for large scale urban development to strengthen feeder road and ladder road network by utilizing Land Pooling or other urban development scheme.

Land-Use and Urban Development

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Ministry of Physical Planning, Works and Transport  
Management, Department of Roads



Data Collection Survey on  
Traffic Improvement in  
Kathmandu Valley

2<sup>ND</sup> WORKSHOP

## Road Network and Issues & Recommendation to the future M/P

27th July, 2012  
H. Shinkai / JICA Survey Team

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- 1 Road Network and Issues
  - 1-1 Overall Observation of the Existing Road Network
  - 1-2 Specific Issues of Existing Road Network
  - 1-3 Issues on Road Structure and Design
- 2 Recommendations to the future M/P

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### 1-1 Overall Observation of the Existing Road Network (1/5)

#### (1) Need of road network reinforcement

Kathmandu Valley is fairly well provided with road network.

However, problem is the quality of those roads.

Most of roads, except some major roads, do not meet the requirement of increasing traffic demand due to low substandard geometry and lack of the connector roads



Road Network System in Kathmandu valley

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## 1-1 Overall Observation of the Existing Road Network (2/5)

### (2) Need of the Connector Road like Outer Ring Road

- At the moment, there is no connector road linking feeder roads radiating from the Ring Road.
- As the result, driver is forced into the excessive driving which one of the causes of traffic jam on the existing Ring Road.
- The construction of ORR will contribute not only to reduce the traffic flow on the existing Ring Road but also to facilitate the urban expansion and guide the development of land-use.
- It should be discussed in the future M/P giving a high priority.



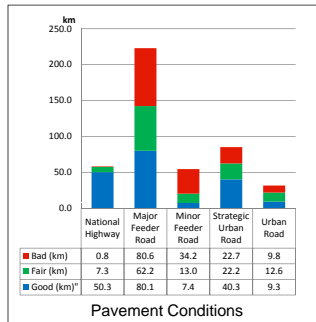
Proposed Outer Ring Road by ORRD  
Proposed by KVTC in 2007

91

## 1-1 Overall Observation of the Existing Road Network (4/5)

### (4) Low standard of feeder roads:

- Although the feeder road network is fairly developed, the quality of feeder road is still far below standard as shown in the figure.
- Since the feeder roads are an important infrastructure supporting the social and economic activities in the rural areas, future M/P should discuss the improvement measures for those feeder roads.



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## 1-1 Overall Observation of the Existing Road Network (3/5)

### (3) Necessity of additional links between Kathmandu – Bhaktapur Corridor

Since the current urban expansion continues along the Kathmandu - Bhaktapur corridor, the city of Bhaktapur would be integrated into the scarf of Kathmandu and Laritpur cities in the near future.

Future M/P should examine the necessity of those additional links as shown in the figure to enhance the development of the areas between Kathmandu and Bhaktapur taking into consideration the impact of the new road K-B road completed last year.



Additional Links between Kathmandu and Bhaktapur Corridor

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## 1-1 Overall Observation of the Existing Road Network (5/5)

### (5) Weakness of north-south axis inside the Ring Road

- Traffic survey revealed that north-south axis consisting of Kanthipass (F025) and Pulchouk (F103) is one of the most busy roads inside the Ring Road carrying daily traffic of 50,000 - 94,000.
- However, the traffic capacities of this axis, particularly north and south sections, is extremely short because of narrow road having only two lanes.
- KVTC is currently undertaking the widening of ROW for those road therefore, the road will be upgraded to be 4 lane-road in near future .



North-south axis to be improved

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## 1-2 Specific issues of the Existing Road Network (1/7)

### (1) Issue of Tribuvan National Highway

- The Tribuvan Highway is gateway to the Kathmandu Valley and one of the most important roads carrying large traffic .
- Widening of Kathmandu - Thankhot is necessary however, it would be difficult due to the location of many buildings encroaching on the ROW.
- Many alternative route studies for the Kathmandu-Naubise were conducted in the past including JICA study.
- The survey team recognized the need of alternative route and earlier implementation is expected.



Various alternative plans between Kathmandu and Naubise

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## 1-2 Specific issues of the Existing Road Network (2/7)

### (2) Need of upgrading Bhaktapur – Dhulikhel (Arniko Highway)

- Since Banepa and Dhulikhel are located within the influence area of Kathmandu Valley, traffic demand in between Kathmandu and Dhulikhel will increase rapidly in the future, especially after full opening of Sindhuli Road.
- The survey team identified the need of upgrading Bhaktapur–Dhulikhel road applying the same standard of Kathmandu-Bhaktapur Road.



Proposed Upgrading Plan of Bhaktapur-Dhulikhel

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### 1-3 Issues on Road Structure and Design

The following is the issues on road structure and design:

- (1) Need of excessive use lane for increasing motorcycle  
The motorcycle becomes the main means of commuting to the people nowadays, therefore, the provision of exclusive use motorcycle lane should be standardized for the development of urban road.
- (2) Need of bicycle lane and bicycle road.  
The provision of bicycle lane or bicycle road will contribute to the improvement of air pollution as well as to the development of tourism in the Valley. M/P should discuss the development of bicycle road.
- (3) Need of safety measure for the Pedestrian  
The walking is still main means of the commuting in Kathmandu Valley. MP should discuss the safety measures, such as standardization of sidewalk on the urban road, pedestrian bridge, etc.

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### 2. Recommendation to the future M/P (1/4)

#### 2-1 Necessity of future Master Plan Study (M/P)

As the result of data collection survey, it became clear that there is a serious traffic problem with the Katumandu Valley as follows :

- Traffic congestion occurs everywhere on major roads and becomes chronic condition in the Kathmandu Valley
- Public transport services is not sufficient and cannot support the increase of traffic demand
- Urbanization is proceeding disorderly due to lack of proper land-use policy and road network.

Based on the above, the survey team concluded that the future traffic M/P is indispensable for the Kathmandu Valley and should be implemented as soon as possible.

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### 2. Recommendation to the future M/P (2/4)

#### 2-2 Issues to be considered in the future M/P

- (1) To establish the **balanced M/P unifying with road development, traffic management and public transport including the introduction of mass transit**
- (2) To consider **the "Greater Kathmandu" covering Banepa and Dhulikhel**
- (3) To keep **close coordination with the study on mass transit system of BRT, LRT or Metro** which is under implementation by Department of Railway
- (4) To study **evacuation system to the inhabitants living in the core area of the city assuming an earthquake** which might hit to the Kathmandu Valley in the near future.
- (5) To examine **the utilization of river bed for the road construction inside the Ring Road**, particularly along the **Dhobhi Khola**. However, it is necessary to receive a check of the Nepalese River Act about the use of river bed for road construction and environment impact assessment as well.

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### 2. Recommendation to the future M/P (3/4)

- (6) To conduct the following four (4) supplemental road and traffic surveys in the future M/P:
  - 1) **Re-survey on urban roads** where KVTD is now performing the widening of ROW
  - 2) **Parking survey** at the central area of Kathmandu to clarify the parking condition.
  - 3) **Preference survey (PS)** to capture the factor for promotion of envisaged traffic mode from existing bus service to BLT or LRT
  - 4) **Survey for goods movement** between survey area and outside to identify proper location of cargo terminal and logistic center
- (7) To **review the role and function of Bhaktapur city from the view point of land-use and urban planning** in order to encourage the economic activities on those areas considering the impact of K-B road project completed last year.
- (8) To **review the direction and outline of existing Kathmandu Valley Land Use and Zoning Plan (2007) from the view point of urban planning** paying attention to the location of residential, commercial, industrial areas, etc.

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### 2. Recommendation to the future M/P (4/4)

- (9) To **discuss the development of new bus and cargo terminals** in the future M/P to enhance the social and economic activities of Kathmandu Valley.
- (10) To **conduct the study of traffic management** considering the following measures:
  - Engineering measures (provision of traffic signal, pedestrian bridge and crossing, etc)
  - Physical measures (more parking space, zebra crossing, safety fence, etc)
  - Legal measures (traffic regulation, penalty system, etc)
  - Administrative measures (one-way system, parking control, etc)
  - Educational measures (awareness program to better driving, TV, etc)
- (11) To **conduct the environment and social consideration** in the future M/P in accordance with the regulation of JICA Guideline

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The End  
Thank You for Your Attention

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**DATA COLLECTION SURVEY  
 ON  
 TRAFFIC IMPROVEMENT  
 IN  
 KATHMANDU VALLEY  
 2<sup>ND</sup> WORKSHOP  
 DRAFT FINAL REPORT**

**ATENDANCE LIST**

Date : July 27<sup>th</sup>, 2012  
 Time : 13:30 – 16:30 (3 hours)  
 Venue : Everest Hotel (1<sup>st</sup> Floor)

No.	NAME	ORGANIZATION	POSITION	SIGNATURE
1	Mishra Malik	Comp.	DTL	
2	Ravi Rana	Nepal Police	SSP	
3	Ishtwar Man Shrestha	KSUT	Public Transport sp.	
4	Sang Bahadur	Road Safety	Secretary	
5	Ram Pr. Silwal	MULTI	Highway Engineer	
6	Dhruv Raj Regmi	KSUT	DTL	
7	NIRAJ SHARMA	KSUTP	D-PD	
8	Hisashi Hoshino	EOJ	secretary	
9	Karlach Man Pradhan	EOJ	Program Manager	
10	Dhiru Basnyal	Nepal Police Pro.	Subtd.	
11	Prashant Manand	CENICANN		
12	P.S Joshi	UN-Habitat	HIPM	
13	Kapil Dangol	MOLRM	U.Sec.	

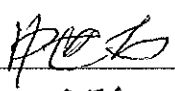
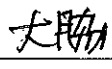
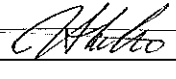
Data Collection Survey on Traffic Improvement in Kathmandu Valley  
2<sup>nd</sup> Workshop for Draft Final Report on 27<sup>th</sup> July, 2012  
Attendance List

No.	NAME	ORGANIZATION	POSITION	SIGNATURE
14	Saraj k Boudha	DOR	SDE	
15	Ayodhya Shrestha	DOR	D.C	
16	Sudarshan R Bhandari	DOR	S.E.	
17	Shyam B. Khand	DOR	DE	
18	Narayan pd. Niture	DOR	Ev.	
19	Hiroyuki Katsuto	NK	Ev	
20	Modhus Kati	DOR	DDG	
21	Fujii Satoru	JLVA	SR	
22	IRUBA Kenichi	JLVA	Regrm	
23	TAJIMA Hirosaki	JLVA	Regrm	
24	Padma bdr Shah	Pokhara Unives	Profeser	
25	Thusitha Shahi	NEC	Ass prof.	
26	Ramesh N. Bastola	RBD	BD	
27	Sonu K. C.	Smiler Medical	MD	
28	Nava Raj Shrestha	NEC	Engineer	
29	Suresh Shrestha	KEC	Engineer	
30	GUJARAJ BHATTARAI	Freelancer	consumer activist	
31	Anil Marsani	IOE	Lecturer	
32	Chandra Man Stha	DOTM	DG	
33	Don Kri. Shrestha	DOR	Engineer	
34	Hripendra Pandey	NEC, CPB	Engineer.	
35	Krishna Thapa	DOR	Eng.	
36	Bijay Bdr. Swar.	FNUTE	S.V.P.	
37	Gagan Raj Kari	RAP	OTL	
38	Suraj Sigdel	DOR	SDE	

No.	NAME	ORGANIZATION	POSITION	SIGNATURE
39	Suresh Poudel	Department of Road	Engineer.	
40	Suresh Neupane	Ministry of Physical Planning, works & S&M	Engineer	
41	Karuna Ratna Shakya	KVDA	SDE	
42	Hemant Tiwari	IOE, Pulchowk	MSc Transport Student	
43	Pushpa R. Neupane	IOE, Pulchowk	"	
44	Tomoyuki Nishikawa	Nippon Koei	Engineer	
45	Abhishek Pradhan	Marushin Shitaka	"	
46	Subarna Joshi	GEOTE	M.O	
47	Pradyumn K.C.	PMP	Engineer	
48	Mena Joshi	DOR	Eng <sup>r</sup> expert	
49	Rama Shrestha	"	Biologist	
50	Chandra Subedi	DOR	RTU Chf	
51	Devendra Karki	DOR/CRD	RD	
52	Mina Gyawali	DUDBC	S-DE	
53	G.P. Lakshmin	"	DDA	
54	Ramkrishna Bhattarai	Bhaktapur Municipality	CEO	
55	Bishnu Deo Bala	DOR	DDA	
56	Shiva Adhikari	SDE/DOR		
57	Nyameela Shrestha	EVAM		
58	Hem Kumar Shrestha	EVAM		
59	Suman Pandey	Student /		
60	Bindu Adhikari	DoR	Sub-Engineer	
61	Krishna B. Panga	DWIDP	En.	
62	Sourabh Rana	JICA	PO	
63	Tagdish Dhungana	NEC	Engineer	

No.	NAME	ORGANIZATION	POSITION	SIGNATURE
64	L. S. Dhakel	MPPW/TM	D.D	
65	Hare Ram Shrestha	SCAEP	President	
66	Santosh K Gupta	ASBC	Engineer	
67	Sonjosh Chlepori	JICA		
68	B/M.D. S. Narva	JICA, SP/W	JICA, Export K/M	
69	T. R. Bhuwal	MUB (MUSP)	JS	
70	S. D. Pant.	MWSPB	SDE	
71	Maresh pd. Yadav	Dolidar	Engineer	
72	Pramila Bajracharya	DOR	S.E.	
73	Zafach Andrianto	CEN		
74	Kamal Pandey			
75	M. ETO	NK		
76	H. Tanchu	NK		
77	Padam L. Maharjan	Sajhyatrayal	Exe. Officer	
78	Raj/Kaji Ranjit	Edu. Com	Advisor	
79	Mukund Raj Adhikari	DOR - div. km	Engineer	
80	H. Katagiri	NK	PM	
81	Devendra Banskota	RMC	Dept Head	
82	Bhushon Tulachin	UN-Habitat	Key Tech Advisor sub-lead	
83	Y. Yamashita	NK		
84	Hiroshi Fujisawa	Nippon/Koei	Project Manager	
85	Sushil Pracharya	NBIA + Press	ANALYST	
86	Tulasi P. Sitala	Moppw/TM	Secretary	
87	Masahiro TORIU	JICA Survey Team	Road Planning	
88	Akiro ODAKE	"	Town Planner	

Data Collection Survey on Traffic Improvement in Kathmandu Valley  
 2<sup>nd</sup> Workshop for Draft Final Report on 27<sup>th</sup> July, 2012  
 Attendance List

No.	NAME	ORGANIZATION	POSITION	SIGNATURE
89	Atsuyuki NAKASEKO	JICA Survey Team	Traffic Demand Forecast	
90	Yasushi OHWAKI	JICA Survey Team	Traffic Survey	
91	Hiroki SHINKAI	JICA Survey Team	Team Leader	
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**APPENDIX7    COUNTERPART    TRAINING    IN  
JAPAN**



## Technical Tour of Data Collection Survey on Traffic Improvement in Kathmandu Valley

13 - 26 May, 2012

13-May	~		Departure TKM 13:30 - BKK 18:15/TG320			
14-May	~		BKK 00:05 - NGO 08:00/TG644	Nagoya		JICA Chubu International Center
Mon	13:30 ~ 17:00		Breafing		Mr. Goro Goto	JICA Chubu
	17:30 ~ 18:30		Course orientation		Mr. Akio Odake	Nippon Koei
	~					JICA CIC
15-May	10:00 ~ 12:30	Lecture	Outline fo urban traffic and transport policy in Japan	Nagoya	Prof. Katsutoshi Ohta	Prof. emeritus of Univ. of Tokyo & Director of TTRI
Tue	13:30 ~ 16:30		Issues on urban traffic and transport policy, and urban planning in Kathmandu Valley		Participants	
	~					JICA CIC
16-May	10:00 ~ 12:00	Lecture	History of urban planning and urban development in Nagoya	Nagoya	Mr. Masao Sugiyama	Nagoya Urban Institute
Wed	12:00 ~ 12:30		Tour at Nagoya Urban Center			Nagoya Urban Institute
	13:30 ~ 14:00		Tour at Asunaru Kanayama at Kanayama Station			
	14:30 ~ 16:00	Lecture	Tour at Sasashima Live 24 area (Land Readjustment Project site)		Mr. Noboru Inagaki	
	~					JICA CIC
17-May	10:00 ~ 10:45	Lecture	Traffic infrastructure and transportation policy in Nagoya	Nagoya	Ms. Satomi Shioya	Dept of Housing and Urban, Nagoya City LG
Thu	10:45 ~ 11:30	Lecture	Current Status and Issues of bus transport in Nagoya		Mr. Yu Yoshimura	Dept of Traffic Nagoya City LG
	13:30 ~ 13:50	Tour	Tour at Guideway bus station at Ozone			Dept of Housing and Urban, Nagoya City LG
	13:50 ~ 14:10	Tour	Tour ride on Guideway bus			
	14:10 ~ 14:40	Lecture	Background and history of introduction of Guideway bus system		Mr. Ryosuke Okumiya	Nagoya Guideway Bus Co Ltd.
	14:40 ~ 15:10	Tour	Tour at operation room for the Guideway			ditto
	15:10 ~ 15:40	Tour	Tour of guide mevhanism of the Guideway			ditto
	16:10 ~ 17:00	Tour	Tour on Linimo (Magnetic levitation train line) and town development along the			
	17:00 ~ 17:30		Return to JICA CIC			JICA CIC
	~					JICA CIC
18-May	9:00 ~ 11:00	Lecture	Transportation challenge in provincial city and activities of Toyota Transportation Institute	Toyota	Mr. Ryosuke Ando	Head of Research Dept., Toyota Transportation Research Institute
Fri	11:00 ~ 11:20	Tour	Tour at ITS (Intelligent Transport Systems) Information Center			
	13:30 ~ 14:45	Lecture	Traffic safety education and the facility construction by PFI		Mr. Keisuke Takada	Toyota City Traffic Safety Learning Center
	14:45 ~ 15:30	Tour	Tour at Toyota City Traffic Safety Learning Center			
	~		move to Sakae			
	17:00 ~	Tour	Sakae, City Center of Nagoya			
	18:00 ~		Meeting with Mr. Ishibashi and others			
	~					JICA CIC
19-May	~		Off			
Sat	~					JICA CIC
	~					JICA CIC
20-May	~		Nagoya -> Takayama			
Sun	~	Tour	Tour at historical building conservation area in Takayama	Takayama		
	~	Tour	Takayama -> Furukawa			
	~	Tour	Sight visit for "Michi no eki"			
	~		Furukawa -> Toyama			
	~					Hotel at Toyama city
21-May	9:30 ~ 11:30	Lecture	Environmental friendly urban planning and public transport in Toyama	Toyama	Mr. Nagahito Takamori and Mr. Masaharu Nishinaka	Toyama City LG
Mon	11:45 ~ 12:09	Tour	Toyama LRT (Toyama station north-> Iwasehama)			
	12:09 ~ 12:14	Tour	Observation of Feader route bus			
	12:19 ~ 12:44	Tour	Tour at Iwase-Omachi street historical landscape control			
	13:09 ~ 13:19	Tour	Tour on bicycle share system			
	14:19 ~ 18:05		Toyama -> Nara			
	~					Hotel at Nara city
22-May	10:00 ~ 12:00	Lecture	Tourism city development and transportation plan in Nara	Nara	Mr. Hiroshi Kiuchi	Tourism strategy Dept., Nara City LG
Tue	13:00 ~ 15:00	Tour	Tour on historical building conservation activities			
	~		Nara -> Hiroshima			Hotel at Hiroshima city
23-May	10:00 ~ 12:30	Lecture	Urban development strategy and urban transportation policy in Hiroshima	Hiroshim a	Mr. Akihiko Fujita	Hiroshima City LG
Wed	13:45 ~ 14:30	Lecture & Tour	Tour on Astramline and town development along the line		Mr. toshihiko Nakamura	
	14:30 ~ 15:00	Tour	Tour at Hiroshima city transportation museum			
	~					Hotel at Hiroshima city
24-May	10:20 ~ 11:15	Tour	Tour on World Heritage Sea Route between The atomic bomb memorial dome and	Hiroshim a		
Thu	11:15 ~ 13:30	Tour	Tour at historical building conservation area in Miyajima			
	13:30 ~ 14:45	Tour	Urban development along Miyajima Line			
	15:00 ~ 16:20		Hiroshima city -> JICA Chugoku Center			
	16:30 ~		Preparation of Report			
	16:30 ~					JICA Chugoku Center
25-May	13:00 ~ 14:30		Report presentation	Hiroshim	Participants	
Fri	14:30 ~ 15:30		Evaluation meeting		Prof. Katsutoshi Ohta	Prof. emeritus of Univ. of Tokyo Director of TTRI
	15:30 ~ 16:00		Closong Celemony			
	~		Hiroshima -> Haneda, Tokyo			
26-May	~		Haneda -> Bangkok -> Kathmandu			