Municipality of Tirana, Government of Albania

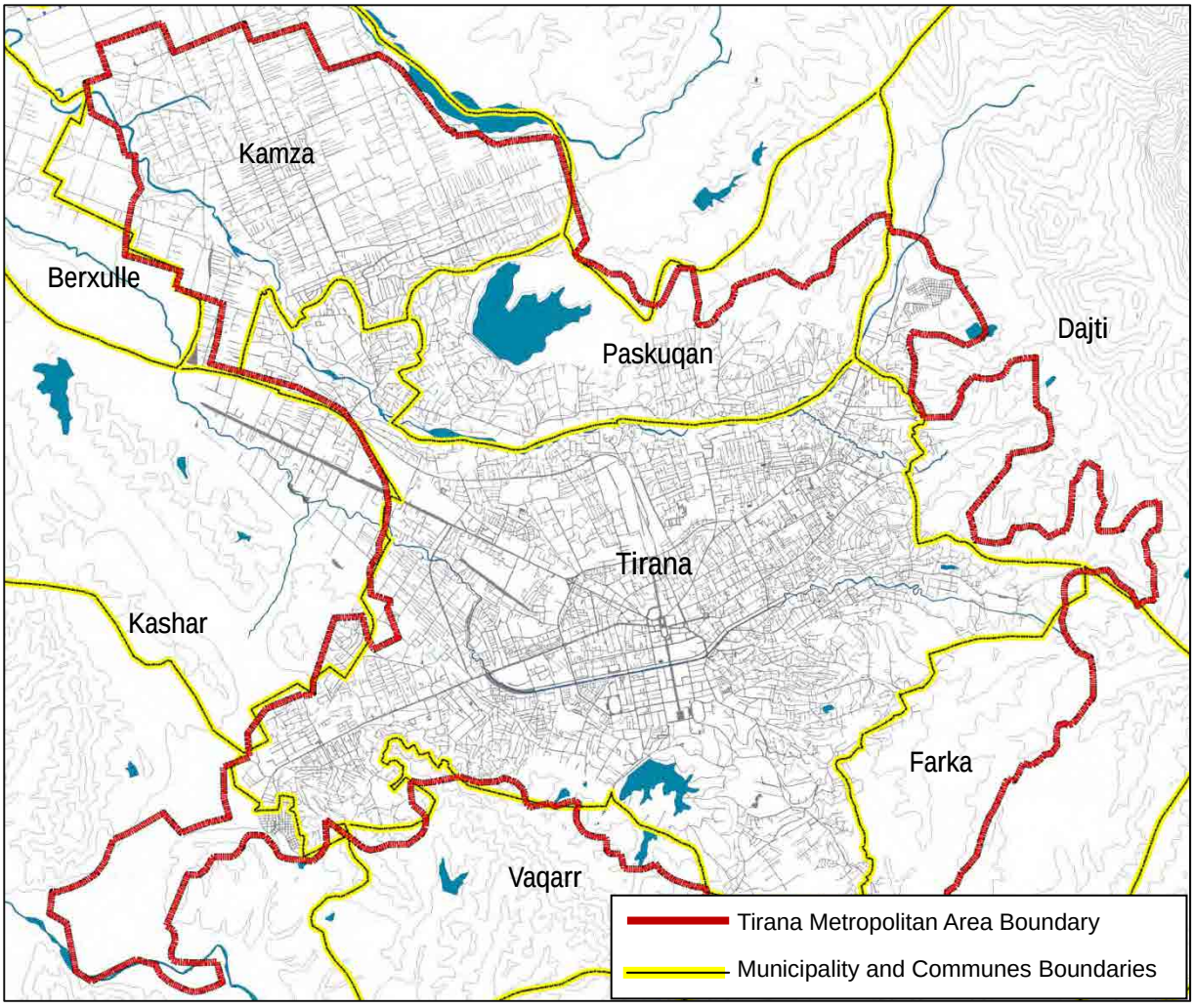
Republic of Albania
The Project for Tirana Thematic Urban Planning

Final Report
Volume 2-1: Main (English)

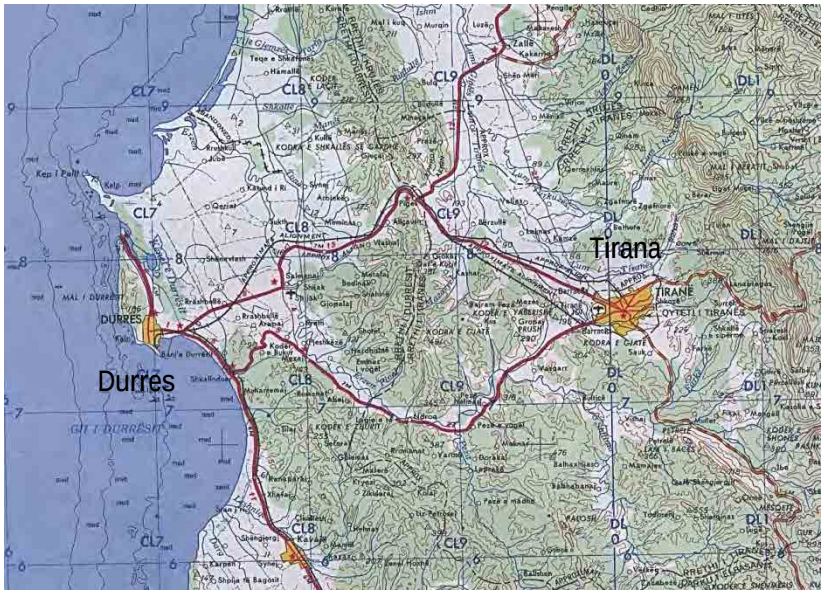
Japan International Cooperation Agency (JICA)

Value Planning International Inc., Tokyo Japan

NJS Consultants Co. Ltd., Tokyo Japan



Project Area Map (Tirana Metropolitan Area)



Preface

This present report is a Final Report of "the Project for Tirana Thematic Urban Planning". This report proposes "Master Plans" on long-term perspectives targeting the year of 2027 and "Action Plans" for priority projects which have been identified in the master plans for thematic four (4) infrastructure sectors, namely, 1) Roads and Urban Transportation; 2) Solid Waste Management; 3) Water Supply; and 4) Sewerage and Drainage Systems. Environmental and institutional discussions are also included to seek for a rational way to the implementation of proposed plans.

This report was prepared under close coordination with the technical team working for Tirana Urban Regulatory Plan in terms of the population framework and economic activities in association with land use strategies to manage sustainable and balanced urban growth in the Tirana Metropolitan Area. Therefore, planning logics and concepts underlying these thematic plans have been coherent with the Regulatory Plan, because these plans are part of the Tirana Regulatory Plan.

Final Report consists of three (3) separate volumes:

- *Main Text (English, Albanian)*
- *Summary (English, Albanian, Japanese)*
- *General Profiles of Priority Projects (English)*

We, JICA Study Team, acknowledge all counterpart personnel of Municipality of Tirana, the members of the Steering Committee and those who kindly extended their supports in the course of this project, and hope Municipality of Tiran make use of this report for further development towards its committed vision, "Modern European City".

Tirana, December 2012

Katsuhide Nagayama, Ph.D.
Leader, JICA Study Team

The Project for Tirana Thematic Urban Planning

Final Report

Main (English)

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Abbreviations

AEF	Agency of Environment and Forestry
ALUIZNI	Agency of Legalization, Urbanization and Integration of Informal Areas
ANTP	Albania National Transport Plan
ARA	Albania Roads Authority
ARA	Albania Recycling Association
ATCS	Area Traffic Control System
B/C ratio	Benefit-Cost Ratio
BOD	Biochemical Oxygen Demand
BOD_5	5 day 5 Day Biochemical Oxygen Demand
BOO	Build Own and Operate
BOT	Build-Operate-Transfer
BPEO	Best Practicable Environmental Option
BPP	Beneficiary Pay Principle
BRT	Bus Rapid Transit
BTO	Build-Transfer-Operate
CARDS	Community Assistance for Reconstruction, Development and Stabilization
CBD	Central Business District
CBO	Community Based Organization
CCTV	Closed-Circuit Television
CEB	The Council of Europe Development Bank
CEDAW	The Convention on the Elimination of All Forms of Discrimination Against Women
CF	Cohesion Fund
CH_4	Methane Gas
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
Cu	Copper
CM	Council of Ministers of the Republic of Albani
C/N	Carbon to Nitrogen
dB	Decibel
D/D	Detailed Design
DN	Deutsches Normen
DMA	District Metering Area
DO	Dissolved Oxygen
DOC	Direct Operational Costs
DSD	Duales System Deutschland AG
DPH	Directorate of Public Health
DPUK	General Directorate of Water Supply and Sewerage, Ministry of Public Works and Transport,
DWA	District Metering Area
EBRD	European Bank for Reconstruction and Development
EC	European Community
EFA	Environment and Forestry Agency
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EMU	Electrified Multiple Units
ENPV	Economic Net Present Value
ERDF	European Regional Development Fund
ERRC	The European Roma Rights Centre
ESC	Environmental and Social Consideration
ESIA	Environmental and Social Impact Assessment
EU	European Union

FAR	Floor Area Ratio
Fe	Iron
FIRR	Financial Internal Rate of Return
GDP	Gross Domestic Product
GHG	Green House Gases
GIS	Geographic Information System
GOA	The Government of the Republic of Albania
GPS	Global Positioning System
GRDP	Gross Regional Domestic Product
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GTZ	German Agency for Technical Cooperation
GZP	General Zoning Plan
HD	High Density Polyethylene
HDPE	High Density Polyethylene
HCI	Hydrogen Chloride
Hg	Mercury
HHs	Households
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
HSH	Albanian Railway (Hekurudha Shqiptare)
H_2S	Hydrogen Sulfide
ICM	The Institute for Cultural Monuments
ICT	Information and Communications Technology
IE	Institute of Environment
IEC	Information-Education-Communication
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IFI	International Financing Institution
IHM	Institute of Hydrometeorology
INPAEL Project	Implementation of National Plan for Approximation of Environmental Legislation Project
INSTAT	Institute of Statistics
IOER	Institute of Ecological and Regional Development
IPA	Instrument for Pre-accession Assistance
IPF	Infrastructure Projects Facility
IPH	Institute of Public Health
IPRO	Immovable Property Registration Office
IST	Institute of Transport Studies
ISWM	Integrated Solid Waste Management
IT	Information Technology
ITS	Intelligent Transport System
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau
LPG	Liquid Propane Gas
LRT	Light Rail Transit
LGA	Local Government Associations
LGU	Local Government Unit
MLIT	Ministry of Land, Infrastructure; Transport and Tourism
MODERATO	Management by Origin-Destination Related Adaptation for Traffic Optimization
MOE	Ministry of Education
MOEFWA	Ministry of Environment, Forestry and Water Administration
MOLSAEO	Ministry of Labour, Social Affairs and Equal Opportunities
MOPWT	Ministry of Public Works, Transportation
MOT	Municipality of Tirana
MRF	Material Recovery Facility
N	Nitrogen

NE	Economic Aid (Ndihma Economike)
NES	National Environment Strategy
NGO	Non-Governmental Organization
NOx	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NPK	Nitrogen, Phosphate and Karium
NPO	Non-Profit Organization
NRW	Non-Revenue Water
NTC	National Territory Council
NTPA	National Territory Planning Agency
O_3	Ozone
OD	Origin and Destination, also O/D
OD	Outside Diameter
ODA	Official Development Service
O&M	Operation and Maintenance
OSI	The Open Society Institute
P	Phosphate
PADCO	Planning and Development Collaborative International, Inc.
Pb	Lead
PCB	Polychlorinated Biphenyl
PCU	Passenger Car Unit
PE	Polyethylene
PET	Polyethylene Terephthalate
pH	potential Hydrogen
PIU	Project Implementation Unit
PM	Particulate Matter
PM_{10}	Particulate Matter 10
PP	Polypropylene
PP	Priority Project
PPP	Public- Private Partnership
PUS	Partial Urban Studies
PS	Pump Station
PVC	Polyvinyle Chloride
PSP	Private Sector Participation
Qark	Region/ Province
QV	Quantity - Velocity
RAP	Resettlement Action Plan
RAMS	Road Asset Management System
REA	Regional Environment Agencies
RGT	Rubber Tired Gantry
ROW	Right of Way
RP	Regulatory Plan
RPT	Regulatory Plan of Tirana
RUT	Road and Urban Transport
RV	Recreational Vehicle
RP	Regulatory Plan
SAP	Stabilization and Association Process
SCAT	Sydney Coordinated Adapted Traffic System
SCOOT	Split Cycle Offset Optimization Technique
SD	Sewer District
SEA	Strategic Environmental Assessment
SHPK	Limited Company (Ltd.)
SME	Small and Medium-sized Enterprise
SO	System Optimization
SOx	Sulfur Oxide
SO_2	Sulfur Dioxide
SPM	Suspended Particulate Matter
SRRS	Sound Resource Recycling Society
SS	Suspended Solids

STP	Sewerage Treatment Plant
SUSTRAFFTIA	Development of Sustainable Traffic in Tirana
SWM	Solid Waste Management
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TA	Technical Assistance
TAC	Territorial Adjustment Council
TACRA	Territorial Adjustment Council of Republic of Albania
TAZ	Traffic Analysis Zone
TCM	Transportation Control Measures
TDM	Transportation Demand Management
TEU	Twenty Foot Equivalent Unit
The Study	The Project for Tirana Thematic Urban Planning
The Team	The JICA Study Team
TIA	Tirana International Airport
TMA	Tirana Metropolitan Area
TOC	Total Operational Costs
TOCC	Transport Operational Control Center
TOD	Transit-Oriented Development
TOR	Terms of Reference
Town MRF	Town Materials Recycling Facility
TUTIS	Tirana Urban Transport Improvement Study
TWS&SE	Tirana Water Supply & Sewage Enterprise
UE	User Equilibrium
UKT	Tirana Water Supply and Sewage Company
ULMP	Urban Land Management Project
UNDP	United Nations Development Programme
URPTM	Urban Regulatory Plan in Tirana Municipality
USAID	United States Agency for International Development
UTC	Urban Traffic Control
VAT	Value Added Tax
VMS	Variable Message Signboards
V/C ratio	Volume to Capacity ratio
WACS	The Solid Waste Amount and Composition Survey
WHO	World Health Organization
WRA	Water Regulatory Authority
WSS	Water Supply and Sewerage
WTP	Water Treatment Plant
WTP	Willingness To Pay
Zn	Zinc
3R	Waste Reduction, Reuse and Recycling

Part 1

Thematic Urban Master Plans

1. Outline of the Project

1.1 Introduction

In 2008, the Republic of Albania launched the National Development Strategies with targets to be achieved by 2013. These targets comprise the following: 1) accession to the European Union; 2) democratization based on the respect for basic civil and political rights; 3) more than 6% economic growth; and 4) poverty reduction. Since then, the government of the Republic of Albania (GOA) has carried out various measures to achieve these targets.

Along with democratization which started in 1991, urbanization has progressed in the capital city, Tirana, which has accommodated a rapid increase in migrants from rural and mountainous areas. In 2008, the population of Tirana reached 640,000, from 250,000 in 1989, or an increase of almost 270% in just nine years. Such an acute urbanization resulted in serious urban problems such as shortages in infrastructure, particularly in housing. Many rural migrants illegally settled in the surrounding areas of the urban center or in protected green areas where no sufficient water and power supply systems are provided, and where solid waste is managed poorly, resulting in significant degradation of the urban environment. Urbanization is still in progress, and it is predicted that the city's population will reach one million by 2025. It is thus urgent for urban developments in the transportation, water/sewerage, and solid waste management sectors, in particular, to keep up with the burgeoning urban population.

In order to respond to such a serious situation, the Municipality of Tirana (MOT), with support from the World Bank, prepared a comprehensive urban development plan entitled "Urban Regulatory Plan in Tirana Municipality" (URPTM) in 2009. URPTM has set the vision, directions, and outlines of future development based on a needs assessment and situation analyses of Tirana. However, no concrete action plans for urban utilities and infrastructure were included in the plan.

GOA, therefore, requested the Government of Japan for technical assistance to conduct a planning study. Given the name "The Project for Tirana Thematic Urban Planning," the Study is expected to formulate short- and medium-term projects and programs on urban infrastructure based on and in line with URPTM. In response to the request, the Japan International Cooperation Agency (JICA), the official implementing arm of Japan's official development assistance, dispatched a preparatory mission to conduct a preliminary survey in Tirana to prepare the scope of work for the Study in November and December 2010. On December 9, 2010, both sides signed the Study's Scope of Work (Appendix 1) which became the basis for JICA to select a consortium to carry out the Study. The consortium is composed of Value Planning International, Inc. and NJS Consultants Co. Ltd., whose headquarters are both located in Tokyo, Japan. Study team members are shown in Appendix 3.

1.2 Objectives

The objectives of this study were as follows:

1. To develop thematic urban plans, based on the New Regulatory Plan which has been

launched by the new municipal administration, and their implementation plans in the form of short- and medium-term action plans; and

2. To transfer relevant skills to the Albanian counterpart personnel in the course of the Study to ensure the continuous implementation of the urban plans to be developed in the Study.

Technical transfer emphasized capacity building among the counterparts to enable them to develop multi-departmental urban infrastructure based on common design standards and carried out through a well-orchestrated coordination mechanism among sectors.

1.3 Study Area

The Study covered the entire Tirana Metropolitan Area (TMA), defined by the New Regulatory Plan, which encompasses urbanized and would-be-urbanized areas of about 88 km^2, including the Municipality of Tirana and seven other municipalities and communes such as the Municipality of Kamza and the Communes of Dajti, Farka, Kashar, Paskuqan, Vaqarr and Berxulle. Those surrounding communes are partially included in the TMA, depending upon the urbanization progress.

1.4 Thematic Infrastructure Subsectors

The Study was focused on three key subsectors for the urban infrastructure development, as follows:

- Roads and Urban Transportation;
- Solid Waste Management;
- Water supply system; and
- Sewerage/drainage system.

1.5 Expected Outcomes

Through the Study, the following was achieved:

- Thematic urban infrastructure development plans in short-term (five years) and medium-term (ten years) perspectives;
- Short-term action plans to implement priority projects; and
- Stronger planning and coordinating capacity of the Tirana municipal government personnel through technical transfer.

1.6 Project Organizations and Counterparts

The Study was directed by the Steering Committee chaired by the Deputy Mayor of MOT. The Steering Committee was organized from the representatives of relevant agencies, as follows:

- Advisors to Territorial Planning;
- General Directorate of Territorial Planning and Development, MOT;
- General Directorate of Strategic Projects and Foreign Investment, MOT;
- General Directorate of Planning and Management of Services, MOT;
- Water Regulatory Authority of Albania, GOA;
- National Territorial Planning Agency, GOA;

- Ministry of Environment, Forestry and Water Administration, GOA;
- Ministry of Public Works and Transport, GOA;
- Experts from Civil Society; and
- JICA Balkan Office.

Under the Steering Committee, thematic technical working groups was formed with counterparts coming from relevant central and municipal government agencies/institutions to collaborate with the JICA Study Team.

1.7 Report Structure

The outcome of the Study is compiled with a set of separated volumes of reports as follows;

- Volume 1-1: Main Text (English)
- Volume 1-2: Main Text (Albanian)
- Volume 2-1: Summary (English)
- Volume 2-2: Summary (Albanian)
- Volume 3: General Profiles of Priority Projects (English).

2. Socioeconomic Framework and Growing Potentials

2.1 Population and Urbanization

(1) Present Population

It was believed that the population in Albania as of January 2011 was around 3.2 million, 1.6 million both for men and women, and that compared to the 2001 datum, the population was growing steadily from 3.06 million in 2001, with a total increase of around 140,000 in 10 years. However, the Population and Housing Census 2011 revealed a new fact that the Albanian population is 2.83 million, which means a decrease of 230,000 during the past decade. According to the report by the Institute of Statistics (INSTAT), the low population growth rate is caused by 1) emigration and 2) continuous decline of the number of live births. Fertility rate also went down from 6.85 in 1960 to 1.4 in 2008.

On the other hand, it was also believed that the population of Municipality of Tirana (MOT) was 720,000 in 2010. The population of the municipality keeps around 20% of national population after 2005, and Tirana is the biggest city in Albania. However, the 2011 Population and Housing Census revealed a shocking fact that the population of MOT is only 421,286, which shows a difference of as much as 300,000 between two statistical sources, the registration record and the Census. As a result of clarification of those different statistical sources, it was estimated that the population of MOT is 622,575 as of 2011.

The population of the Tirana Metropolitan Area (TMA), defined as the integrated urban area with MOT and its surrounding 7 communes, is also estimated to be 880,409 as a whole, out of which 622,575 is that in MOT and 265,834 in the neighboring communes.

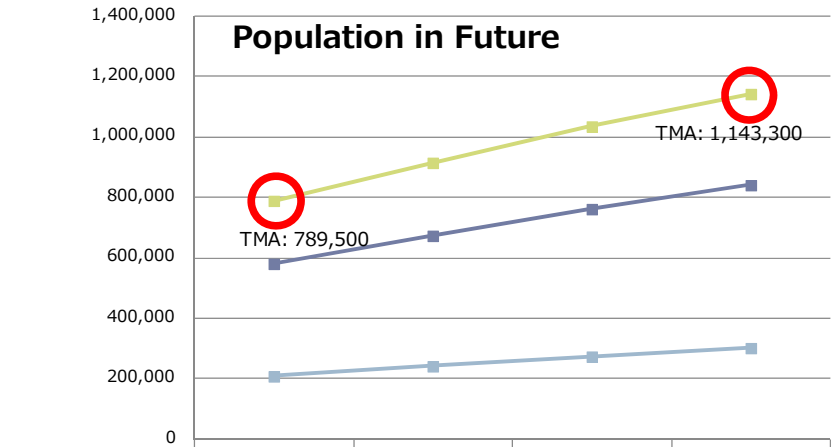
(2) Projection of Future Population

There exists a projection of the future population by INSTAT, based on the Population and Housing Census of 2001, taking into account three main assumptions: migration, fertility and mortality under three scenarios of growth: high, middle and low cases. URPTM adopted the scenario of "middle case," whose population is 735,000 in 2010, 888,000 in 2015, and 1,048,000 in 2020.

On the other hand, a new population projection was made, based on the new figures of TMA as discussed above, taking into account a scenario of urbanization pressure and its momentum, that is, the following average annual growth rates:

- 3.0% p.a. during the period between 2012 and 2017;
- 2.5% p.a. during the period between 2017 and 2022; and
- 2.0% p.a. during the period between 2022 and 2027.

The result of the projection is shown in Figure 2.1.1. In the long-term target year 2027, the population of TMA will be approximately 1,143,300 of which 841,400 is the population in MOT and 301,900, that in the surrounding communes.



	2012	2017	2022	2027
Tirana Muncipality	581,000	673,538	762,047	841,361
Communes	208,500	241,709	273,471	301,934
TMA	789,500	915,247	1,035,518	1,143,295

Source: JICA Study Team

Figure 2.1.1 Population Projections of Tirana Metropolitan Area

2.2 Employment

(1) Labor Force

According to the Labor Force Survey 2009, the total of labor force in Albania is 87.9% of total population aged 15 years and over. Labor force participation rate which includes those who are employed and those looking for work is 61.9%.

(2) Projection of Future Employment

The projection of future employment in the TMA was made, taking into account the economic growth potential and average annual growth rates in the long-term.

As a result, a total of 465,500 employed people will live in TMA in 2027, which is 1.8 times as many as that at present. Meanwhile, the employment numbers in TMA in daytime will be 512,100, or 46,600 more workers than the nighttime figures. The difference between the nighttime and daytime figures is attributed to workers commuting from outside TMA.

Table 2.2.1 Projection of Employment in Tirana Metropolitan Area

	2012	2017	2022	2027
No. of Employments				
Tirana Municipality	189,782	238,900	290,200	342,600
Surrounding Communes	68,106	85,700	104,200	122,900
Tirana Metropolitan Area	257,888	324,600	394,400	465,500
Daytime Employment				
Tirana Municipality	218,249	277,100	339,600	404,300
Surrounding Communes	57,691	73,500	90,300	107,800
Tirana Metropolitan Area	275,940	350,600	429,900	512,100

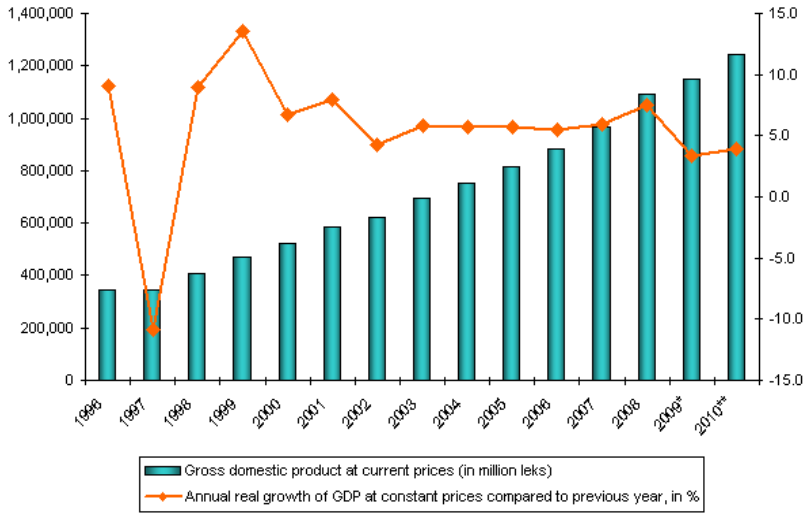
Source: JICA Study Team

2.3 Economic Growth and Industries

(1) Economic Growth

Albania had enjoyed a considerably high economic growth rate of 5- 7 % p.a. since 2000, but its economic growth potential was depressed by the world recession due to the Lehman Shock in 2009. However, the economy has been recently recovered and growing at a moderate rate, more or less 4.0% p.a. Gross Domestic Product (GDP) in 2010 is USD12.9 billion (or ALL1,242 billion), and the per capita GDP in 2010 is USD 3,734, as shown in Table 2.3.1 and Figure 2.3.1.

It is anticipated that the Albanian economy will continue to grow and potentially attain a 3.0 - 4.0% growth in the long term, and TMA shall be the leading engine for such sustainable economic growth, having higher growth than the national average.



Source: INSTAT

Figure 2.3.1 Changes of GDP and Per Capita GDP

(2) Major Industries

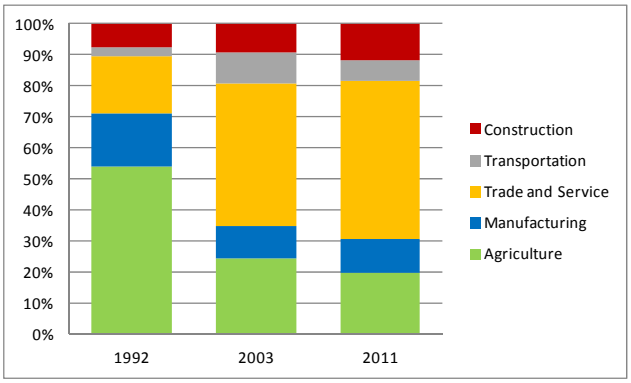
Major industries in terms of GDP are agriculture, manufacturing, trade and service, construction, and communication. Among them, trade and service accounted for 51.0% of the total GDP in 2011 as shown in Table 2.3.1. Looking into changes in the industrial composition during the past two decades (see Table 2.3.1 and Figure 2.3.2), the following are noted:

- Agriculture was the prime sector in 1992 with a share of 54.2%, but it has been losing its position, falling at 19.8% share at present (2011).
- Manufacturing cannot be the leading sector, accounting for only a 10% share, more or less. State-owned factories have not been sufficiently renovated through their privatization process.
- The most predominant sector is "Trade and Service," whose share has drastically increased from 18.3% in 1992 to 51.0% in 2011. Retail and hotel and restaurant businesses have largely contributed to this growth.
- The construction sector also has potential and promise, increasing its share from 7.6% in 1992 to 11.7% in 2011. This sector, which is likely to be encouraged by money remitted from foreign countries, will be a leading sector for the time being.

Table 2.3.1 GDP Composition (%) of Industrial Sector in 1993, 2003 and 2011

Sector	1992	2003	2011
Agriculture	54.2	24.7	19.8
Manufacturing	16.9	10.2	10.9
Trade and Service	18.3	46.1	51.0
Transportation	3.0	10.0	6.6
Construction	7.6	9.1	11.7
Total	100.0%	100.0%	100.0%

Source: IMF, 1992, 2003 and Quarterly Gross Domestic Production, INSTAT, 2011



Source: IMF, 1992, 2003 and Quarterly Gross Domestic Production, INSTAT, 2011

Figure 2.3.2 Changes in Industrial Composition of Albania

2.4 Modernization of People's Living Conditions

(1) Poverty Reduction

According to the Living Standard Measurement Survey which was conducted in 2002, 2006 and 2008, poverty reduction in Albania was realized successfully. The percentage of absolute

poverty decreased from 25.4% in 2002 to 12.4% in 2008, and the population living in poverty has also decreased from 800,000 in 2002 to 370,000 in 2008. As for absolute poverty rate in MOT, the percentage decreased from 17.8 % in 2002 to 8.7 % in 2008. Although these indicators show a decline both in urban and rural areas, the regional divide between Tirana and the Northern mountain region still exists.

(2) Education

Education in Albania has achieved good results in the past 20 years. The literacy rate of the population aged 15-24, both male and female, was 99.4% (United Nations Statics Division, 2007) and Gender Parity Index in primary level enrolment (ratio of girls to boys) is 1.0 (United Nations Statics Division, 2003). In school year 2009-2010, more than 49% of girls had graduated from basic 9th grade education (INSTAT, 2011). Equal access to education is largely attributable to the policy conducted during the communist regime until 1992.

(3) Social Housing Service and Rental Social Housing Service

MOT provides Social Housing where people who need assistance can avail themselves of low housing rental fees. Criteria for service provision differ according to annual income and family status. The Directorate of Social Care decides service recipient in consideration of the criteria and this priority recipient list is submitted to the Ministry of Labor, Social Affairs and Equal Opportunities (MOLSAEO). Two priority recipients are orphans and those who lived in the house owned by others during the communist era. Grants for those who need assistance consist of 1) Pay for rent, 2) House rental, and 3) Housing loan at low interest. MOT provides support for up to 50% of housing loan from bank.

(4) Social Centers

There are 62 centers, 7 are public and 55 are private in 11 mini municipalities under MOT. These 7 centers provide services for the elderly, youth, children, Roma, people with disability, and mother and children. Services differ from each center because each was established based on the needs of the community where it is located. Private centers are funded by the donors such as the United Nations Children's Fund (UNICEF), United Nations Development Programme (UNDP) and Non-Governmental Organizations (NGOs). In addition to these, assistance for funeral and scholarship for family in need are also provided. Social service reform of MOT is currently being conducted and this reform plan will start after getting the approval of the Council of Municipality.

2.5 Spatial Urbanization Process and Land Use

(1) Short history of planning

On January 20, 1920, the Congress of Lushnja proclaimed Tirana as the capital of Albania. This moment in time, besides its historical, political and administrative significance, also signalled a turning point in the transformation of the city from a spontaneous urban agglomeration into a modern city based on urban plans. Tirana, at that time a residential and commercial city (the canter was the bazaar and the residential area occupied 98.2% of the territory), was the subject

of several urban studies. In the years 1923-1939, there were formulated four regulatory plans. These plans straighten the main radial axis and created the grid in the south and west part of the city. The main square with administrative buildings and the boulevard were constructed, based on these plans. Today, city of Tirana, there are still clear traces of these plans.

The noteworthy event in the Tirana's planning history is the formulation of the regulatory plan of 1940. It was the first comprehensive plan and for many aspects it has standards similar with actual ones. The main renovation of the plan was the road network; it was based in three ring roads and in several segments of rings. This plan developed also the concept of the railway.

The development scenario was delineated with a traditional zoning system, with three different densities in the residential zone, and the parks were located in the south east of the city. Industrial zones were located in the northwest and southwest. The expansion of the city was in the north beyond the river Tirana. This plan, in addition to the fact that the plan addressed facilitation of private economic enterprises' activities on private land property, is important because it functioned as the base for the future regulatory plans.

Two regulatory plans have been formulated during the dictatorship period. The first one, formulated in 1957, was based on the redevelopment of existing areas and the creation of new suburban areas, in the form of satellite towns. Those new developments aimed to create shelter for workers of new industries that were located in the limit of the city. This plan, regarding the main development guidelines, followed those of the plan of 1940, especially for the road network and zoning.

During this period new residential quarters were developed. This quarters presented interesting tendencies in the urban layout, however the buildings constructed in this period suffered a bad quality of construction, mainly due to the low quality of materials and to the construction working force that was based on voluntary work from the future occupants of the dwellings.

One of the positive aspects of the totalitarian regime was the creation of parks and some cultural facilities in the city level as well as in neighbourhood levels. Each neighbourhood has its library, cultural centre, sport facilities, parks etc. For the main cultural facilities the location was thought to be the city centre. New representative buildings: the Palace of Culture, the Historic Museum, Hotel Tirana (the first 15-floor building), were constructed in the location of the old bazaar, old municipality, orthodox church etc.

The latest plan prepared during the dictatorship was that of 1990, that basically followed the plan of 1940. The General Regulatory Plan of Tirana City (1990) had a territorial expansion of 3,238 hectares and calculated the hypothetical population of Tirana to be 300,000 inhabitants in 2005, the target year. The plan included residential, industrial, university, hospitals, green areas and a radial road infrastructure together with five ring roads were planned. This plan with an inflexible city zoning was developed in a system where the private property and economic initiatives were almost inexistent, so the political changes of the early nineties found Tirana unprepared in the urban development.

(2) Legalization process

In the aftermath of 1990 the socio-political and economic changes that happened in Albania created a great diversity of complex situations which brought to light new conditions in relation

to:

- Changes in the property of land and restitution to the former owners;
- Decentralization of the economy; and
- Free movement of people.

This era, as the result of a return to the free market economy, was characterized by a chaotic development where the population doubled. The uncontrolled migration caused the sprawling of new settlements both in the existing city and in its peripheries; more than two-thirds of the city was occupied by informal settlements. The informality was observed also in the sporadic interventions in the existing city mainly by extensions or demolition and reconstruction. The lack of visions and of planning policies, accompanied by the idea that everything is possible, as well as the failure of the state in protecting the cultural heritage, led to further demolition of the city.

As mentioned earlier, the base for the planned development was the regulatory plan of 1990. This plan, prepared during a totalitarian regime, was based on the fact that all the land was state-owned under the centralized economy, lacking the land management tools. This fact, and an urban regulation with deficiencies, created the right environment for real estate speculations. In these years, the former parks were transformed in buildable land, illegally and even legally, based on planning instruments.

Tirana was already suffering from lack of residences in the early nineties. Two or three generations were living in an apartment of 50-70 m^2. The demand for apartments was stimulated by increasing migrants from other parts of Albania. This demand-driven construction creates a negative impact that no one cared about the quality of the space. The peripheries of the city were completely occupied by informal settlements, which were offering a quick and cheap solution to the residential demand, because the state and the formal sector of construction failed to manage such a wide range of housing provision.

Regarding the formal sector, areas that have more pressure to develop were the central area, where the infrastructure was existent and properties have no problems such as overlapping registration, inheritance issues etc. However, renewals of existing blocks in the centre weren't based on any land management tools, so the interventions were limited and never include an entire block. While, the informal dwellings within the urban structure of the city were not mapped nor considered during the development, thereby reflecting problems such as lacks of proper access, social infrastructures, green areas, etc.

During the first years of the twenty first century, an important effort to stop the informal expansion was done, demolishing housing structures that occupied public land, namely, parks, gardens and along the banks of Lana River. However, the informal housing within the urban structure and the settlements in peripheries could not be treated with the same drastic approach due to the social problems.

The last decades were also characterized by various attempts to control the urban development. Although the plans were formulated, as listed below, often with international donors and expertise, they have remained only on paper, with the city following a semi-controlled

development.

- Development of Tirana City (Regional Consulting - 1995)
- Zoning Regulation of Tirana (USAID - 1996)
- Tirana-Durres Regional Development (GTZ -2002)
- Strategic Plan for Greater Tirana (PADCO - 2002)
- Regulatory Plan and Zoning Code (Urbaplan – 2008)

In 2004 financed by German Agency for Technical Cooperation (GTZ), the City Center Master Plan was prepared and approved. This master plan is a program for the development of the center of Tirana, providing an instrument for an evolving economic force and creation of jobs. The project aims to strengthen the city through structuring facilities, constructing quality housing, enhancing the public areas and the reconciling the city with its environment. This plan set a new standard in construction, although it was not so well accepted by the land owners and the developers, due to its lower developments parameters as well as land management obligations. This plan was also the first step of a different approach of the MOT, which began to play a more active role in the city planning. For implementing the master plan a set of international architectural competitions was organized both for private and public interventions.

During the late 2000s efforts were done also at the national level to reverse the trend of urban development in Albania, so the new planning law was formulated and approved (2009).

In the same period the law, or the Regulatory Plan and Zoning Code was being formulated by the MOT with financing from the Dutch Government through World Bank. This plan was based on private property and land management instruments. The territory of the study goes beyond the Tirana administrative boundary aiming to create regional guidelines, mainly for environmental protection and to secure land for the major equipment. The plan was based on the idea of creating a polycentric city, enhancing the actual secondary centers and creating new ones. The transport was public-oriented and supported by dedicated bus and bicycle lines as well as the creation of pedestrian areas (City Center). The plan also promoted the mix use of specific areas located mainly in the former industrial zones.

The Municipal Council of Tirana in November 2011 decided to take the initiative to formulate a new regulatory plan. The new plan presents seven potential secondary centers together with a five ring roads concept, following almost the same path of those of the regulatory plan of 1990. This plan is reviewed in Section 3.4 in this report.

(3) Tirana land use today

The land use of Tirana today is a result of the above mentioned processes. From a morphological point in the structure of Tirana, there are several patterns:

- The Rectangular Pattern, mainly in the center (Blloku, Tirana e Re) in the zones that were developed based on the 1940 regulatory plan.
- The Radial Pattern, located mainly in the north of the river, is characterized by a mixture of historic parts with totalitarian buildings and new interventions.
- The Straight Linear Pattern, typical of the informal settlements and new developments that occupied the former agriculture fields. The roads are based on the former canals.

- The Curved Pattern is found mainly in the east part of the city where the terrain is sloppy.
- The Cul-De-Sac Pattern is typical of the old historic city, but is also found in some informal settlements.

The central government offices, as well as the international agencies together with the administration of the big private companies are located in Tirana. Despite this fact more than 50% of the territory is occupied by residences. The low-density residential development (mainly informal) is predominant in Tirana's recent growth. Attributes in residential areas can be characterized by three major periods of time as follows;

- Before 1920: urban villas established within the inner ring-road north of the Lana River
- 1920-1990: apartments and, after 1945, state-sector housing located south of the Lana River, in certain peripheral areas and in outlying neighborhoods such as Kombinat and Lapraka.
- 1990-present: residential densification within the urban core and extensive land occupation and informal development in the periphery. Since 2005, this includes construction of residential areas and high-rise blocks in the hills to the south, south-west and east of Tirana. In the last years (2011-2012) the same phenomena is visible also to the north (Paskuqan commune).

Many new residential areas are developed formally, with approval of local government units neighboring Tirana. However, in many cases, corresponding investments in roads, infrastructure and services have not been forthcoming. The MOT is thus being encircled by poorly planned (or unplanned) residential development which will constrain alternative uses and hinder efficient use of land in the urban region. The clear limits of a rigid zoning are faded by the last decade development. Within the residential areas it is possible to find shops, Small and Medium-sized Enterprise (SME), offices, bars, restaurants, hotels etc. This phenomenon is less diffused in informal settlements and has the highest density along the main axis.

The city center is defined by the boulevard which extends from Polytechnic University in the south, through the central Skanderbeg Square to the train station in the north. The city centre comprises of a distinct land use category due to its historical significance, representative civic design and high mix of uses, including administration and national capital functions. The Central Business District (CBD) includes the east west axis of the Lana river corridor, the Bllok and Radio-Television quarters, the front of the main radials (Durres, Kavaja and M. Shyri road). This extended CBD is characterised by a mix use with a predominance of tertiary activities.

The territory's analysis evidenced the lack of public open space within the residential zones. In the old city the streets that, in most of the cases, follow the cul-de-sac pattern are the only public space. Anyhow, in these zones, the green of the private gardens compensates for this absence. In the urban blocks, developed during the totalitarian regime, the quantity of the public space is higher but the quality still needs improvements. Meanwhile, in the new developments, it is difficult to gauge the state of the public space since the interventions have been sporadic and few zones are completed. Even in those completed areas the open space underground is occupied by parking so the type of greenery even here is limited. The same or even worse situation is found within the informal settlements.

In general, green zones are concentred along the main boulevard. The Lana River is a source of greenery with broad impact on the city; otherwise the greenery is concentrated in the Lake Park and in the hills surrounding Tirana. In recent years, however, informal housing and apartment blocks have invaded most of the hillsides, curtailing these functions.

Sport facilities during the last decades are reduced due to land restitution to previous owners, privatizations etc. There are two main stadiums, some indoor facilities along the inner ring road, public pools located in the north of the lake park. The private sector is playing a leading role in this field creating indoor and outdoor sport fields, pools, etc., albeit this solution doesn't provide accessibility to all the citizens.

Tirana in the early nineties was surrounded with industrial zones. Actually the productive activity has moved outside Tirana, along the Highway Tirana-Durres, creating here the main economic corridor of the region. Most of Tirana's industrial areas now are outside the inner ring road along the major radial road axis and in some of the previous industrial sites. The former industrial areas were located in the periphery and were surrounded by agricultural fields and greenhouses. Today, they are surrounded by informal settlements, and even the former industrial structures are occupied by families with low incomes.

Mostly of the former industrial sites has been privatized. After the privatization some industries maintained the same function or transformed in other types of economic activities, being considered successful privatisation, the other part has been transformed to residential or abandoned and destroyed. There are still former industrial facilities that are state owned (Ministry of Economy, Trade and Energy (METE), some are administrated by the MOT).

Light manufacturing industries, trade and services are the predominant types of economic activity. The main and the most potential economic sector in Tirana is the tertiary one. It is the most rapidly developing economic activity. It consists mainly of offices, banking, insurance, professional studios, media and entertainment. Those activities are spread all over the city with a higher concentration in the central zone.

Within the city of Tirana there is a lot of public facilities (educational and health). Facilities for primary education are located throughout residential areas, albeit with a far higher concentration in the older neighbourhoods than in the new. New informal settlements have serious deficits with regard to schools and kindergartens. During this last decade a lot of education facilities are added by the private sector.

Universities have a high impact on the city structure in Tirana. The public universities of Tirana are located within the structure of the city (along the main boulevard, along the ring road etc.) and are located in 2 distinctive campuses the Kamza University and the Qyteti Studenti (location of the new campus). The public universities actually are suffering from a lack of space and are under expansion; Qyteti Studenti has an on-going project for its expansion providing auditoriums for a maximum of 16,000 students. The private universities are following a trend of moving outside the city along the Tirana-Durres Highway.

There are three main public health centres in Tirana: the Hospital University Centre "Mother Tereza", the Military hospital and the Sanatorium Hospital, located along the major radial road

axis, close to the urban periphery. Health facilities also include smaller specialized hospitals as well as fifteen neighbourhood polyclinics and twenty five public health care centres. Only minor investments have been made in the expansion of public health facilities over the past seventeen years. However, several private health care centers and hospitals have been established.

In the structure of the City, terminals and transportation facilities include the train station, situated in the north of the main boulevard, the terminal of buses and trucks, and the heliport. These facilities, covering a total area of about 8.8 hectares, are not well maintained. Regarding the train station a new area has been assigned to be relocated it in the north west of Tirana outside the MOT jurisdiction. In this area, a new bus terminal is planned to be located.

Electrical power sub-stations, police facilities and military zones comprise of other significant land use categories in Tirana. Actually the military activities are moving outside the city and these territories are becoming an important resource for future developments, such as the Military School "Skanderbeg" that is considered to be an important centre in the new regulatory plan.

(4) The Territorial Planning Law and Implementation

The territorial planning law was approved on September 2009 and has been effective since September 2011. In September 2009 a set of bylaws, regulations and directives were established and approved, but a lot of regulations required by the law still need to be formulated. Some of those legislative acts may be part of the national plan and/or local plan. The actual legislation prioritizes the land pooling, subdivisions and has foreseen some implementation tools:

- Development freeze,
- Public easement,
- Public land reservation,
- Right of transfer,
- Right of preference, and
- Right of require purchase.

The local authorities have the right to apply, through their regulation, additional implementation tools.

According to the law No.10 119 dated April 23, 2009, on Territorial Planning, the planning instruments: plans and regulations are prepared for a period of ten years. During the implementation it is important to monitor the process, and to test if the plan has foreseen the right instruments. The planning register would be the best tool to monitor the plan. In addition, a cross check on the progress should be done with other databases: tax collection, demographic database, Immovable Property Registration Office (IPRO) registers, the address register etc. As these databases require periodical updates, the Municipality must take this commitment, in order to have a coherent urban plan and also to fulfil the law requirements.

Another instrument that must play an important role in the monitoring of the plan is the official inspector of construction activities. With legal enforcement power, they must inspect periodic

controls on the territory in order to stop the informal and illegal constructions in general and to report any type of territorial change.

2.6 Gender and Poverty Issues

(1) Gender Situation in Albania

From the viewpoint of gender equality, education in Albania has achieved good results in the past 20 years. Equal access to education is largely attributable to the policy conducted during the communist regime until 1992.

On the other hand, major gender inequalities are seen in politics (leadership and decision making), economics (employment and income), and marital and family relations. According to the Labor Force Survey (2009), women's labor force participation rate in 2009 is 51.8 % while 73.3 % for men. There are not many women who take on leadership roles or decision making positions. Albanian women spend much more time than men on productive activities (the sum of paid and unpaid work). This tendency is most obvious among the population aged 15-64 years old, where 95% of women and only 39% of men are engaged in housework, child care, food preparation, shopping, and other activities related to unpaid work in the weekdays.

(2) Gender Equality Policy in Albania

In May 1994, Government of Albania (GOA) ratified the Convention for the Elimination of All Forms of Discrimination Against Women (CEDAW), which is often described as an international bill of rights for women adopted in 1979 by the UN General Assembly. Additional Protocol of CEDAW was also ratified in 2002. By accepting this Convention, states commit themselves to undertake a series of measures to end discrimination against women in all forms.

The National Strategy for Development and Integration (2007-2013) (NSDI) is a key strategy for development and integration for the European Union (EU). Gender issue is included in the social policy part of this strategy and the progress is monitored by labor force participation rate of women. National Machinery which is the institution working for gender equality defined by the UN is the Department of Equal Opportunities Policies of the Ministry of Labor, Social Affairs and Equal Opportunities (MOLSAEO). MOLSAEO is working for the strategies, National Strategy for GE and DV (2007-2013), and focusing on increasing the number of women in political leadership positions.

The Gender Balance Office was newly established in 2011 in order to address the gender equality policy in MOT.

(3) Poverty situation in Albania

MOLSAEO is in charge of poverty, ethnic minority and social inclusion issue in Albania. Poverty issues are included in NSDI. As for the ethnic minority such as Roma and Egyptian populations, there is a National Strategy for improving Roma living conditions.

The Office for Social Discrimination and Protection was newly established in 2011 in order to eliminate/ mitigate social discrimination in MOT. A new strategy for poverty reduction in MOT will be developed based on the result of the Tirana City Development Strategy Project which is

conducted under World Bank funding.

(4) Ethnic Minority

Albania's population can be considered as very homogeneous with only 2 to 3% ethnic minorities. Greeks are the largest minorities group followed by Macedonians and Montenegrins in a very low number, while Roma, Egyptian and Arumanian are recognized as "ethno-linguistic" minorities. Roma and Egyptian are currently assumed as the poorest and the most marginalized ethno-linguistic groups. The majority of Roma work in the informal economy and collect herbs, sell blood to hospitals, or sell bottles and scrap metal.

(5) Consultation Meeting with Women

1) Background

Government develops its social infrastructure for their citizens. Social service including infrastructure must be provided equally to all the citizens regardless of social class, gender and race. In this meaning, it is quite important to understand the needs of citizens in diverse situations especially of the vulnerable such as children, women, poor people, ethnic minority groups, disabled people, and so on and try to include their needs as much as possible. Fortunately, MOT established new departments to take charge of social issues – the Gender Balance Office and the Office for Protection from Discrimination in 2011. As an experiment to implement the above mentioned philosophy, the Gender Balance Office, in cooperation with the Team and United Nations Development Programme (UNDP) Albania office, conducted a Consultation Meeting with Women on urban planning in October 2012.

2) Summary of the meeting

The Gender Balance Office of MOT called a meeting on October 11, 2012 at Mini-municipality 11. More than 40 people, 30 women and 10 children, gathered at the library in Mini-municipality 11.

3) Methodology

With technical support from UNDP Albania, a skilled facilitator of the Community Assessment for Governance (CAG), or Community Score Cards (CSC), conducted this meeting. CAG is participatory, community-based monitoring and evaluation tool that enables citizens to assess the quality of public services such as a health centre, school, public transport, waste disposal system, water, sewerage, waste disposal system, and so on. UN Women and UNDP supported local organizations to conduct community assessment by using the tool before the local elections in May, 2011[1].

4) Result of the Meeting

A brief explanation of the Study which included Priority Projects in four sectors, namely, Road and Transport, Solid Waste Management, Water Supply, and Sewerage, was made by the Team and the past results of CSC and focus group discussion of Mini-municipality 11 conducted in 2011 were explained by the UNDP facilitator.

[1] UN Women and UN, Final Draft Manual of Community Assessment for Governance, September 2011.

The meeting proceeded in a participatory manner. In reply to the questions from the facilitator, most of the women participated actively in discussion and raised their urgent needs related to social infrastructure in this area. After the discussion, participants voted for four urgent needs from the list of needs.

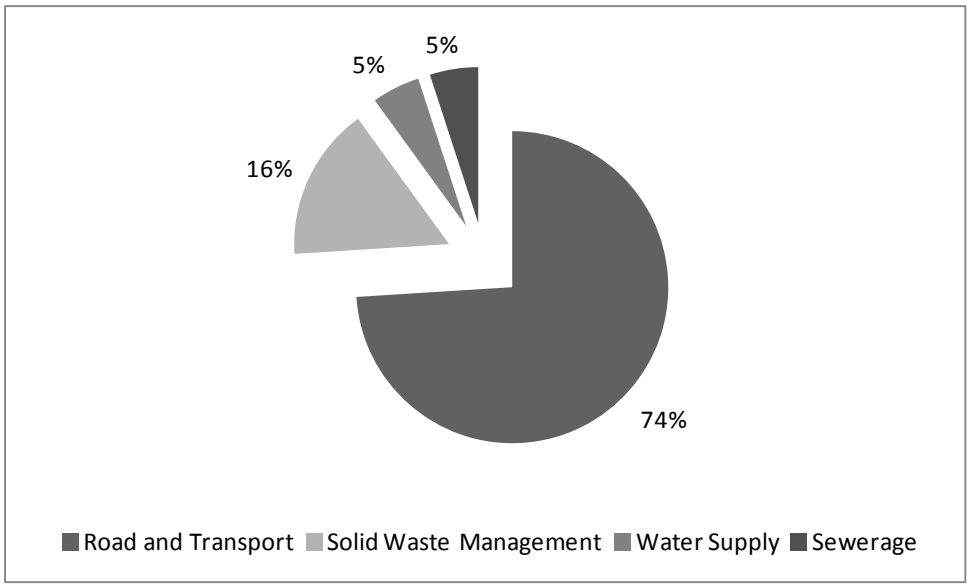
As shown in Table 2.6.1, based on the result of the meeting, the most urgent need of women in Mini-municipality 11 was "Overpass for Rr e madhe Dritan Hoxha," which received 25 votes. Figure 2.6.1 shows the needs raised by sector, and it is seen that 74% of the needs are related to the road and bus service. This result can lead to the conclusion that, on one hand, services of Road and Transport sector leaves room for improvement; on the other hand, other services of wastes, water and sewerage are fulfilled in a way, according to the citizens in this area.

This trial shows CSC is an effective tool to grasp the tendency of the needs of participants in each area though the result may vary by the attribution of participants even in the exact same area. To confirm the needs of women living in Tirana, this kind of meeting can be conducted at the initiatives of the Gender Balance Office in the future.

Table 2.6.1 Discussion Result of Meeting with Women

No.	Description of the Need	Sector	No. of Votes
1	Rr Gjergj Legisi overpass and sidewalk are needed	Road and Transport	13
2	Bus station between the school 28 Nentori and the school Aleks Buda is needed	Road and Transport	15
3	Overpass for Rr e madhe Dritan Hoxha	Road and Transport	25
4	The current bus line needs to be changed to the current track in order to decrease the bus travel time and traffic congestion.	Road and Transport	10
5	No bus line goes through Rr Vangjel Noti. There is a need for streetlighting and a kindergarten in this area.	Road and Transport	7
6	Rr Aleks Buda is without street lights and there are missing manhole covers.	Road and Transport	6
7	Neighborhood Bregu i lumit, has no bus line	Road and Transport	5
8	There is no waste collection in the areas of Bregu i lumit.	Solid Waste Management	3
9	Don Bosko areas and Rr Fatmir Gjata do not have sewerage /drainage system.	Sewerage	6
10	In Lapraka center, the quality of water supply is very poor.	Water Supply	5
11	A playground is needed, and the quality of cleanliness in the schools needs to be improved.	Solid Waste Management	15

Source: JICA Study Team



Source: JICA Study Team

Figure 2.6.1 Urgent Need by Sector

2.7 Informal Settlement and Legalization Process

(1) The background of the informal settlements

The change of the system in Albania in the early 1990s was accompanied by the birth and development of a series of complex mass phenomena, social and economic, which related in particular to the system of ownership, demographic concentration (80% of the country's population lived in rural areas), control over territory, etc.

In particular, the demographic migration from the disadvantaged areas of the country, towards the more developed areas and the trend of abandonment of rural areas to move to the developed urban centers was associated with numerous economic and social consequences.

At the time, vacant land at the periphery of Tirana was mainly in state hands, or it was under the process of restitution to the original owners. Tirana's population grew at a rate of 5%-7% annually during the 1990s, reflecting also a high demand for housing. The formal housing sector was totally incapable of accommodating this massive demand for housing. Furthermore, formally built housing cost much more than informally produced housing. Finally, a necessary condition for the flourishing informal sector housing was the availability of land in spite of the absence of tenure. In fact, Government made vigorous efforts in the early 1990s to control informal development. However, these efforts proved quite ineffective; they were dropped after 1995 in the face of massive – and occasionally violent – public pressure.

Most immigrants squatted on previous state-owned agricultural lands on the urban periphery. The seemingly uncontrolled occupation process was, in fact, discretely organized on the basis of kinship relationships and through "middlemen" who often emerged from the first comers. Many new urban residents "purchased" the land from previous occupants. Access to essential services also required informal solutions – including improvised extensions of the available water supply and electricity networks.

The informal settlements are mainly located on

- Previous agricultural land;
- On the hill slopes south and south-east part of the city;
- Nearby the rivers (cul-de-sac pattern - the main characteristic is that these settlements do not interact with the river);
- Occupation of the former industrial structure (particular case to be considered apart); and
- Another typology is the occupation of the public spaces created within the residential blocks during the communist period (although this case is more related to singular constructions rather than settlements).

Informal housing presently represents about 40% of the residential land area and 70% of the residential population.

(2) Types of informality

Generally, within the informal settlement there are quality buildings, but most of them are not served by the sewage system, creating serious environmental and public health problems. There is a lack of adequate infrastructure, public amenities, and service facilities.

If the informal settlement is considered homogenous based on its location, within the settlement could be found different types of construction as explained below.

Villas based on an architectural design

The condition of the houses is good (concrete and brick), and these are really expensive buildings in themselves but their value goes down owing to the surrounding environment.

Villas “self-made”

The condition of the houses here is of precarious quality since the construction has been developed in phases in accordance with the revenues from those migrating to the area.

These are residential multi-storey buildings, totally without building permits but constructed based on an architectural and constructive design. In the last years, within these territories, some buildings of five floors and above have been built, favored also by the legalization law. A fact that leads toward their construction was also the lack of building permit issuances by MOT.

Roma shacks and barracks

These are the most fragile category of residences since they are considered temporary and are not covered by the legalization law, even in those cases that the vulnerable communities have built a more solid house located nearby the rivers, nearby the landfill, or nearby the railroad. These locations are excluded by law from the legalization process.

The occupation of former industrial buildings or former public institutions

A small category of vulnerable groups have solved their house issues through the occupation of former industrial buildings, factories, storage places, student dormitories, etc. This category is not subject of the legalization law but of the social housing program.

Besides the above categories, there is also a huge portion of informal settlement in new

constructions based on the building permits but with additional square meters to the total floor area. The same additions of square meters had happened to residential buildings under the communist regime. Subject of the informal development are also the villas in the central neighborhoods. In the case of the informal settlements in the central neighborhoods, it is not only a matter of adding floor areas but also demolishing and constructing a new building mainly with a higher Floor Area Ratio (FAR).

Also from the environmental aspect there are several critical issues. There are parts of the informal settlements where investments in the infrastructure, both engineering and social, have occurred in the last years, improving the quality of life. But mostly the informal settlements suffer the lack of infrastructure, or an inadequate one (narrow roads, water supply, sewer and electricity network mainly based on illegal connections, etc). Public health problems are created by an obsolete and underdeveloped sewerage system, and there is an absence of an organized garbage collection and disposal. Another problem of the informal settlement is the construction in risk zone (flooding, erosion, polluted by human activities, etc.). The uncontrolled excavation of the riverbeds, especially Tirana River for extracting building materials, is one of the highest risks the informal settlements face, because it accelerates the erosion of the riverbanks and eventually increase the exposure to natural hazards. Most drainage channels have been unwisely filled up, resulting in inadequate drainage and causing serious problems of water flooding after every episode of heavy rain. Untreated sewage is also being directly discharged into the river.

The informal areas also lacks adequate public open space and recreational facilities that are important for creating a sense of community as they provide physical space for people aggregation.

(3) Legalization process – legal bases/ costs of legalization process

Law No. 9482 dated April 03, 2006 on legalization, urbanization and integration of illegal buildings, as amended, deals with the problems of the informal settlements. The law tries to regularize all forms of informality. The law aims to regularize the tenure issue mainly setting the rules and the values to buy the lands from the actual legitimate owners.

Law No. 9482 classifies informal settlements on the basis of size, distinguished as follows:

- informal zones (areas of more than 5 hectares covered by illegal buildings);
- informal habitation blocks (1-5 hectares); and
- isolated informal buildings (less than 1 hectare).

The objectives of this law are:

- The legalization of the informal settlements and of those constructions based on a building permit, but subject to informal additions.
- The transfer of the ownership of the parcel, where the illegal construction is settled, as defined in Articles 19, 20, 21 and 22 of this law.
- The urbanization of informal zones, blocks and informal construction as well as their integration in the territorial and infrastructural development of the country, improving their living conditions.

The law also defines the organizational responsibilities and procedures for the regularization and integration of informal settlements.

In summary, the main steps in the legalization process are as follows:

- Self-declaration by owners;
- Identification of informal zones and illegal buildings by Agency of Legalization, Urbanization and Integration of Informal Areas (ALUIZNI);
- Fulfillment of the criteria to be legalized;
- Transfer of ownership if the informal tenant is occupying a third party land or a state-owned land;
- Compensation of the original owners, whose property is occupied;
- Payment for legalization according to a fixed level (up to 300 m^2) or market rate (above 300 m^2 plot size), within the yellow line;
- Registration of legalized properties in the Immovable Property Registration Office; and
- "Urbanization" (i.e., upgrading and integration) of legalized informal zone based on partial urban planning studies completed by local government.

An estimate of the costs of remedial infrastructure provision in informal settlements is provided in the following table.

Table 2.7.1 Estimated Costs of Up-grading Informal Settlement in Albania

Cost elements	Per hectare cost (US$)
Urban design	2,000 –3,000
Gravel roads	15,000 –25,000
Water supply (including primary)	15,000 –35,000
Drainage/sewage (including primary)	20,000 –30,000
Electricity (secondary)	15,000 –20,000
Street lights	7,000 –10,000
TOTAL per hectare	74,000 –123,000
Plot size (square meter)	300
Right-of-way allocation	20%
Cost per household	2,664–4,428

Note: Based on actual costs measured under Urban Land Management Project
Source: JICA Project Team

However, in this calculation, the cost for the compensation of the original owners, as well as the expropriation for realizing the required infrastructure, is not considered. In any case, from the payment of the informal tenant only 20% (= 940 US Dollars) will go to cover the cost of the upgrading. Another amount that goes for the upgrading of the informal settlements is the tax for the impact on the infrastructure from the legalization process. But the amount of this tax has been lowered last year to 0.5%, also through amendments of the legal framework.

(4) Actual problems that slow the process and undermine the development

Law No. 9482 also provides for a higher cost on the public investments for the infrastructure in the informal areas. Also the land required for public facilities, actually missing in the informal

areas, is more difficult to acquire.

Based on the law, the legalization process was considered temporary, but this process is still in its infancy. Different amendments of the legalization framework have specified the time schedules for different steps of the process and had also incentivized the process lowering the taxes. However, the legalization process is proceeding at a slow pace.

As it is stated above the legalization process has time limits for the procedural steps and fines for the administration, but unfortunately there is no fine if the process is delayed by the informal tenants.

The main factor that slows the process continues to be the cost of legalization. For the majority of the people that lives in the informal settlement, the cost is more than they can afford. The informal tenants are hoping for a further amendment of the legalization law that will give the occupied land free of charge. The hope for another amnesty has made the informal tenant to continue building; anyhow the amount of new constructions in these last years (2007-2012) is smaller compared with the previous ones. The transfer of the construction police competencies from the central government to the municipality (2007) and also the enforcement of the new planning law (2011), which has higher fines, have slowed down the developments of informal settlements.

Another possibility to cover the legalization costs, taken into account the informal tenants, is to reach agreements with investors to develop their land. In that case, the developer would pay the legalization costs.

The legalization process is also slowed down by the lawsuits of the legitimate owners, who according to this law are going to be compensated. There is no statistical data for the number of such cases.

The legalization process has also a negative impact on the development of the zones. The developer previously had to deal with a single owner of a big property and was just providing apartments for the informal tenants who occupied the land. After the legalization process the developer must deal with several owners that have not always wanted to develop. In principle, the zones need requalification, but it is not clear what role the community is willing to take. If there will not be interest for developers and the community will not contribute for the requalification, it is unclear if the municipality finances will be sufficient to cover the cost of the improvement in the informal areas.

Regarding the development of the informal areas, up to now the statements are hypothetic, because especially in Tirana no development permit is issued in the last years. So the mechanisms of investments in the informal zones must be pilot tested.

3. Visions and Development Framework for Tirana Metropolitan Area

3.1 Time Framework and Defined Target Years

The regulatory plan of Tirana Municipality has a time framework for target years as follows:

- Urgent/Short-term Plan: 2012-2017
- Middle-term Plan: 2017-2022
- Long-term Plan: 2022-2027

This Thematic Planning follows the same target time-framework as above. This means that projects/programs to be identified as the highest priority ones are those whose implementation should be commenced until 2017 at the latest, while, the long-term projects/programs are characterized as those that shall be materialized by 2027.

3.2 Visions for Tirana in Future

Visions for Tirana City have been elaborated by the Working Team for the regulatory planning under the Mayor's initiatives.

The Tirana Regulatory Plan was currently released by the Mayor of MOT on 18th May 2012. The Plan has a subtitle of "**Modern European City**", showing a vision toward which Tirana City shall grow and develop. No other visions to imply basic polices on Tirana development have been presented in the Plan so far.

The Team accepted the visions and basic strategies to be delineated by them, which imply basic directions of sector planning for a sustainable growth.

3.3 SWOT Analysis for Tirana Urban Development

Based on the preliminary surveys, a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis on urban development of Tirana as a whole is made as shown in Figure 3.3.1. The SWOT analysis implies significant potentials and opportunities which should be enhanced, and at the same time, negative factors and elements to be moved and/or solved for further development and/or improvement of Tirana towards the vision of "Tirana: A Modern European City."

Urban management is an important tool to direct the urban development towards a proper orientation implied by the SWOT analysis. A number of critical weaknesses and shortcomings in Tirana's urban management system are as follows:

- The management approach is essentially passive; development is driven and shaped by the relatively short-term interest of private actors.
- Land use and development control functions are operating without the guidance of clear development policy objectives.
- Equipped with out-dated and inappropriate planning and regulatory instruments, Municipal authorities have inadequate capacity to manage the extraordinary development pressures facing Tirana.

- Urban policy formulation, management, and regulatory functions suffer from insufficient coordination and collaboration between central and local government authorities.
- The increasingly urgent metropolitan dimension of urban development in the Greater Tirana region is not being adequately addressed.
- Incomplete fiscal decentralization and the absence of effective mechanisms for sharing the costs and benefits associated with urban development limit the potential for pro-active urban development planning and management.
- The way in which the specific – but very extensive – issue of informal settlements is being managed undermines potential development.

	Helpful **In achieving progress**	**Harmful** **In achieving progress**
Internal in Origin	**Strengths** • Accumulation and concentration of a wide variety of urban economic activities in the Tirana Municipality. • Economic growth at a considerably high rate, being led by the booming construction sector. • Well-developed road network consisting of ring roads and radial roads (if the current physical network extension is completed). • Tirana serving as part of Corridor VIII that links the Adriatic Sea with the western Balkan region. • Great potential to become a unique urban center in the Balkan Region and to attract tourists and investors from EU countries. • Availability of well-educated quality labor force.	**Weaknesses** • Traffic concentrations into the Central Business District (CBD) and congestion on radial roads, thereby leading to increasing economic losses and external diseconomies. • Decreasing road capacity in the CBD, often caused by traffic disorder and/or illegal roadside parking, due to lack of functional traffic management system. • Lack of sufficient infrastructures and utility services to attract new investors for commercial, trading and industrial sectors. • Weak visions on land use management and urban development in the long-term. • Instability of Citizens' trust on the local government administration.
External in Origin	**Opportunities** • Increasing spatial potential to attract new investment opportunities alongside the Outer Ring Road. • Increasing population in and around Tirana, thereby activating the urban economy. • Development of new industrial estates around Tirana. • Close linkage with Durres Port and existence of an efficient port operator for future development • Increasing of the Municipal autonomy due to the decentralization in progress	**Threats** • Losing new business and commercial opportunities in the CBD, due to lack of sufficient infrastructures and utility services as well as congestions in traffic. • Degrading environmental conditions in and along rivers which are significant water resources. • Urban sprawl and deterioration of natural environment and living environment

Source: JICA Study Team

Figure 3.3.1 SWOT Analysis of Development of Tirana Metropolitan Area

3.4 Review of On-going Regulatory Planning

Under the new Tirana government initiatives, the regulatory planning work begun in 2011 and come up with a draft version as of October 2012, and it is actually subject to public hearing prior to its finalization and approval. The following, based on the documents provided to the Team by July 2012, are noteworthy to be coordinated with this JICA Study.

(1) Objectives of the Regulatory Plan

The plan is intended to be a tool that will coordinate the urbanization processes as well as to guide public investment activities in the region, aiming:

- To build a sustainable urban structure in the region of Tirana;
- To lead public investments but also the private ones in the regional urbanization of Tirana;
- To provide a balanced development between public and private interests; and
- To create equal opportunities for the actors and factors of the urban development process of the region.

The population projection defines that the population of the Tirana Metropolitan Area (TMA) will increase from 850,000 in 2012 to over 1 million inhabitants in 2022. Meanwhile, the Tirana city population is expected to increase from 581,000 at present in 2012 to 762,047 inhabitants in 2022. The plan tries to restore a hierarchical urban structure with block (at the bottom), neighbourhood, mini-municipality then municipality/commune. The plan includes 600 blocks (within the Tirana administrative jurisdiction) that are grouped in urban complexes. Each block is given the population existing and proposed that will serve as basis for the future development of these territories. The blocks have not unified urban characteristics, nor similar area, so it is difficult to define selective criteria based on the actual conditions that will imply future visions of spatial development in neighbourhoods.

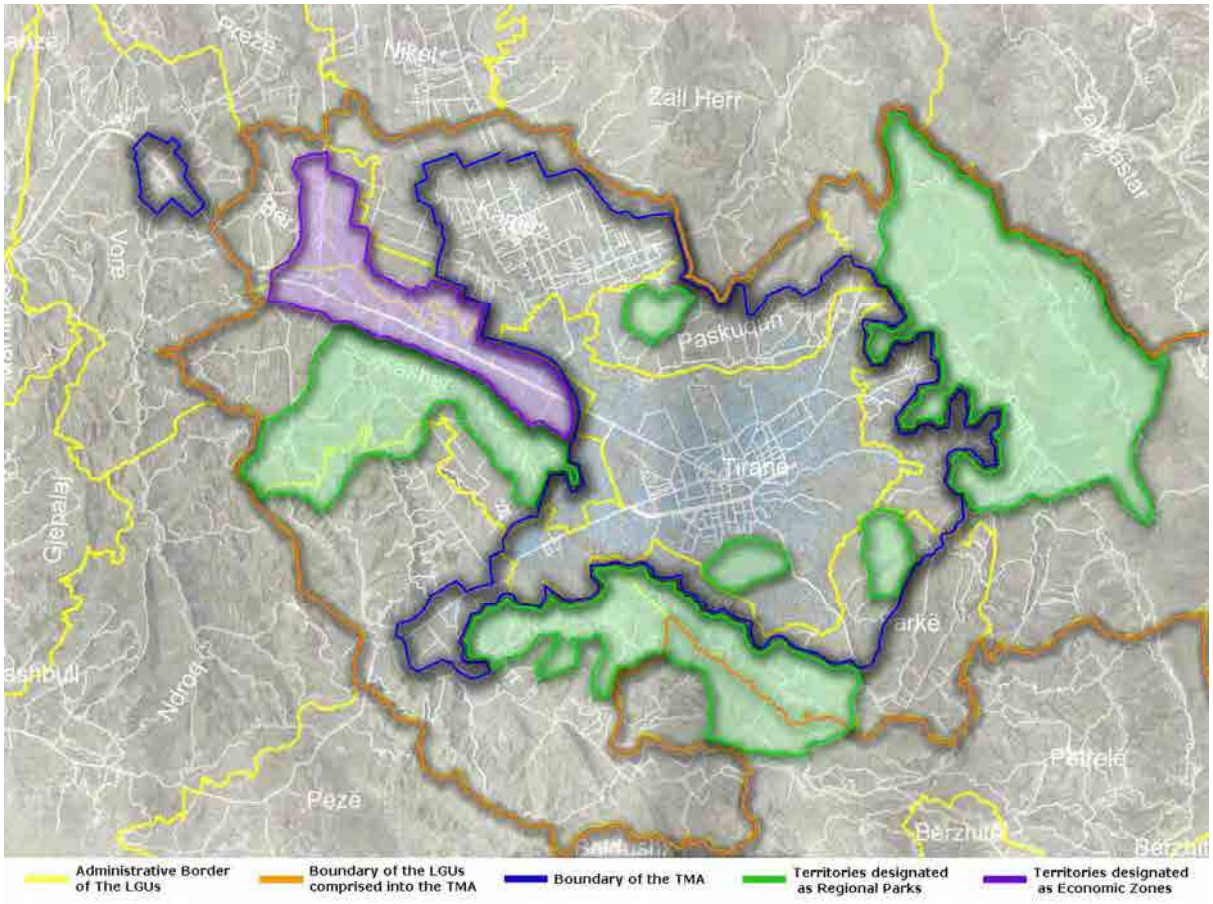
(2) The Local Plan proposed land use

The Local Plan analyses both the regional level and the Tirana administrative territory.

Newly Defined "Tirana Metropolitan Area"

The plan at the regional level proposes that TMA be composed of the existing urban conglomerate with some addition such as the Farka Lake area and the Paskuqan Lake area. The TMA includes MOT and other 7 municipalities and communes that actually have an area of 77.4 km^2, as shown in Figure 3.4.1. The limits of the TMA are mainly the natural elements (limits of the construction), meanwhile in the north-west the limit is the administrative boundary of Kamza, and the beginning of the economic corridor along the Tirana – Durres highway. The economic zone follows the existing Tirana-Durres corridor, with an extension toward the airport.

The plan proposes number of large-scale green facilities such Paskuqan, Farka, Stermasi parks as well as the Protected Natural Zone of Dajti and the Yzberisht hills. For the construction and the management of these parks the plan seeks for contribution of all the relevant local governments by a legal body with members from the concerned Local Government Units (LGUs) , which shall collectively manage those parks.



Source: Tirana regulatory Plan Report, as of July 2012

Figure 3.4.1 Boundaries of TMA and Surroundings

Polycentric Growth Structure for Tirana

The plan within MOT follows a polycentric development concept. The plan suggests the creation of city sub-centers that will accommodate key functions for the development of the city. Besides the existing centre, the plan focuses on creation of seven new development poles:

- The Northern Train Station Pole: This pole was subject of a competition that has stated also the development guidelines together with the project of the new Boulevard and rehabilitation of the Tirana River.
- The Hospital Pole: Its pole accommodates health-related activities mainly, and other services for the citizens. It is proposed that the existing military school will be moved in another location and that this area will be used for needs of the public administration and private business.
- Students City Pole: This area is formed and even in the open spaces the university is developing his headquarters and auditoriums for a maximum of 16,000 students. The biggest part of the area is occupied by the dormitories that actually are not adequate for the needs of the students both in quality and in quantity. Therefore the intervention in this zone may be mainly in requalification due to the lack of space to develop further on the campus, but the plan suggests the enrichment of this area with other services: recreational, social and administrative, in this way the role of this pole will be enriched and enhanced.

- The South-West Pole: This area is located north of the Tirana Lake. In that are located the pool complex, the territory of Dinamo Sport Complex as well as some terrain without a clear function or identity. The zone is surrounded by important axis of the road network of the regulatory plan of 90 as well as of the new proposed road scheme. This area was considered an important priority zone even in the regulatory plan of 2008. It was also subject of an international competition won by the architectural studio named MVRDV, however during the presentation of the new local plan to the citizens it was declared that the proposed complex with towers will not be developed.
- Former Airport Area Pole: The generation of this pole will catalyze also the redevelopment of this area, one of the most neglected in the city. The main part of the zone in the early 90s was subject to a state contract with an Israelite company to develop it. This development is on-going. The north part of the zone is occupied by informal settlements, meanwhile in the east is a private university. The presentation of the plan for this area proposes a change in the already realized park, in order to increase the green, as well as the creation of a commercial centre.
- Kombinat Pole: This territory is situated in the south western part of the city along Kavaja road with is also the main access to the zone. Actually the territory is occupied by abandoned industrial structures; some renovated structures occupied by Small and Medium-sized Enterprise (SME) and car dealers. Within the Kombinat area there are some informal constructions. In the Kombinat pole, the plan foresees the accommodation of some sport activities with an Olympic background.
- The North Western Pole: This area according to the plan comprises the territory of the campus and also the territory of the former military zone, now privatized. In the latest years there have been several attempts to develop this area, but there are conflict between the university and the owners of the land whom have received restitution of the land even within the university boundary. Meanwhile in the north western pole is foreseen the enhancement of the educational functions of Koder Kamez and the enrichment with functions and services of the area.

Economic and Service Centers

Within the city actually there are a number of functional industries, such as wood, food processing etc. Their locations are mainly on the former industrial zones. The plan proposes to allocate mainly public services to these areas that will have a mix of economic functions.

Since 2011, the MOT had begun a Local Economic Development Strategy, which would have set main economic orientations of the city. In line with the strategy, the plan focuses on the main economic zone of the Tirana-Durres Corridor, supported by sub-centres and the Laknas economic zone (Municipality of Kamza).

The plan also launch a concept of “service zones”, some of which already are dedicated to the offering of public services or are occupied by public administrations. Those are:

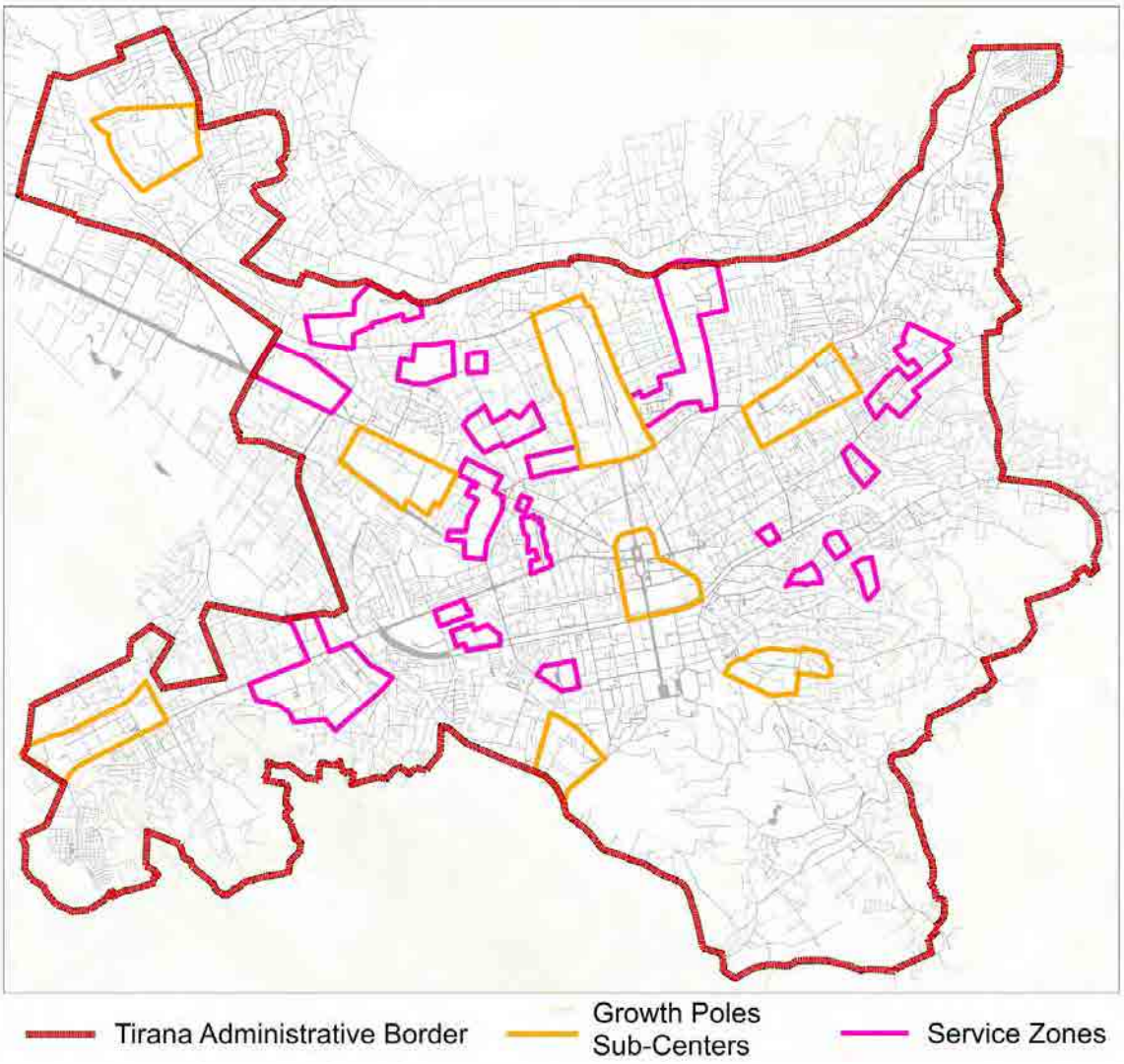
- Military Hospital, including a group of informal buildings as well as a portion of the Former Partizani Factory;
- Don Bosco Centre, a catholic centre, church and professional school. However within the area is included also an existing high rise residential complex;

- Professional school "Harry Fultz" and a series of public administration offices;
- Ministry of Foreign Affairs and Institute of Statistics (INSTAT);
- "Ali Demi" park and Sport fields (private); and
- "Selman Stermasi" Stadium.
- Private universities, along the Lana River (former NPV, clothing manufacturing company,- Ushtarake);
- Western areas of the existing ring road, where Academy of Sports, some sport facilities, the Palace of Sports, the fire station, Faculty of Civil Engineering and some industries are located; and
- Skenderbej road – Location of the main Embassies.

The other areas defined as "service zones" are mainly former industrial zones that actually function with SMEs that are occupying portions of the former factories. Some of them are:

- Former Misto Mame Kombinat/City of Pupils: one of the most active economic zones of Tirana, mainly focused in the wood factories, wholesale, etc. and professional schools and private colleges;
- Former Ali Kelmendi Kombinat: one of the most active economic zones of Tirana, with accumulation of food processing industries;
- Pularia/ Chicken Farm: along the Entrance to the Tirana-Durres Highway, mainly occupied by industrial structures used actually for storages;
- Partizani Factory nearby the Military Hospital: this zoning comprises half of the former factory, used nowadays as storages or SME;
- Josif Pashko Kombinat: used as a construction materials production, where actually the space is used for economic purposes by different companies;
- Storage block- Blloku i Magazinave: a logistic center with many storage places that serves also as wholesale for the electro domestic market sanitary appliances tiles etc. There are also the former chemical factory and other factories, used actually for storage, wholesale, meanwhile the northern part is still used for production, elaboration of construction materials;
- Kinostudio: here is located the State Film Archive as well as some of the television studios that operate in Tirana;
- Porcelan: this area has functioned as industrial area with administrative facilities for military typography, geology and artistic works and also the south part has functioned as industry for the production of porcelain, brick and tile;
- Profarma: this area was oriented toward the production of pharmaceutical products.

The service zone include also some free territories that create room for main public facilities, although the program of each service zone and central pole must be based on an overall social services and economic strategy and distribution of programs.

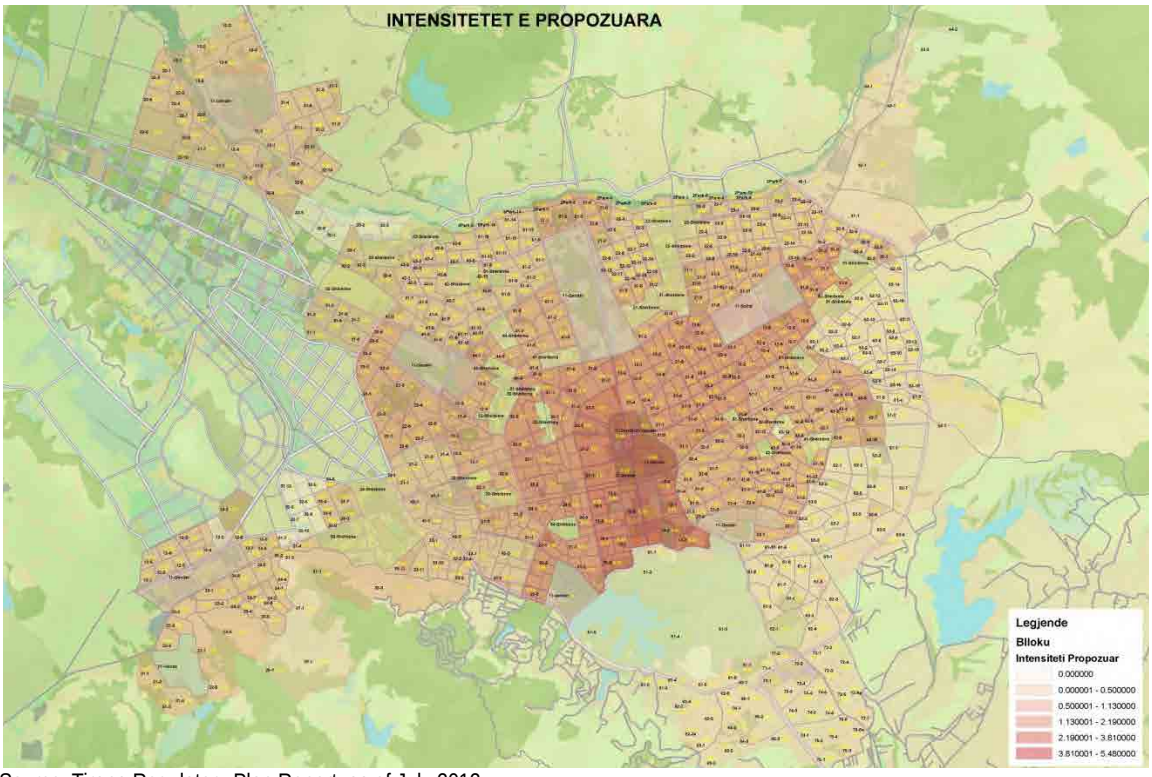


Source: Tirana Regulatory Plan Report, as of July 2012, and JICA Study Team

Figure 3.4.2 Polycentric Structure of TMA with Growth Poles and Service Zones

Residential Zones and Designation of FARs

Observing the residential zones of the plan, it is noted that there are some discrepancies between the existing situations and the proposed ones in future. Residential blocks are planed as homogeneous without considering the different patterns. Only Floor Area Ratios (FARs) for all blocks are proposed to be regulated as a planning parameter to control building density and spatial capacity over the city, as shown in Figure 3.4.3. The distribution pattern of FARs is pyramid-shaped, or higher rates are designated in central areas and lower rates over surrounding sub-urban areas. However, it is also observed that the construction limit under a certain FAR is likely to bring social disputes and/or create obstacles on the practical ground between land owners and developers. Unfortunately in Tirana there are a lot of blocks where are already developed with high densities and already overcrowded. In these cases, it seems tremendously difficult to control every property's re-development activities within a certain FAR, in particular when no possibilities for further densification are allowed. Importantly, the parameter of FAR does not imply quality improvement in living environment in such blocks.



Source: Tirana Regulatory Plan Report, as of July 2012

Figure 3.4.3 Distribution of Proposed FARs in MOT

(3) Proposed Network with Five Ring Roads

Regarding the road network, the plan is based on the road scheme of the former regulatory plan (1990) with five ring roads, but it brings the concept of a public transportation on rails with the introduction of the Tram lines. The plan incorporates also the creation of the new Intermodal Nodes, located outside the MOT borders but administered by the MOT. The proposed tram lines are incorporated in a broader scheme that comprises the public transport on wheel and the bicycle paths. The proposed road network tries to follow existing axis, widening them as well as creates new tracks. These improvements usually occur within the existing urban fabric and inevitably are accompanied by demolitions, albeit this, the plan fails to present the relocation program or the management program for the affected communities.

(4) Remaining Planning Issues on the Regulatory Plan

The plan, accommodating valuable comments from stakeholders, is expected to be well-organized to clear rules and implementation tools for sustainable development in TMA. It is evident that MOT in association with the local government units in TMA must undertake additional studies whose results will facilitate the implementation of the plan and the equitable development in the entire TMA. In this regard, the following are expected to be further explored:

- An important future study will be analyses of the market in housing and residential development. This is a critical issue which affects both the overall economy of the city, and the ability of the Municipality to guide and control development. At present, considerable amount of investment into Albania is being put into apartments projects in TMA. This has several effects: a) the pressure for overdevelopment, b) a lack of a

balanced investment in commercial and neighborhood services, c) imbalance of housing market by over-supply of housing, creating a speculative 'bubble' and d) shortage in affordable housing supply for rental and for lower income groups.

- The second main important issue shall be to realize sustainable economic growth in TMA as a whole under the Local Economic Development Strategy, being pursued by MOT. The old industrial base of Tirana has already been collapsed, therefore, the city should emphasize new directions to ensure sustainable development, taking into account relative advantages in the country with higher-level functions on government, education, business management, banking, medicine, etc., as well as accumulation of the commercial, cultural, entertainment and related activities which shall support new economies and industries. Although the central Tirana has already been densely developed, most of these activities need close proximity to each other and to be within the city. The newly creation of a Central Business District will be a supportive economic facility to this end.
- For the sake of such sustainable economic development as mentioned above, strategic development of "Potential Industrial Corridors" in TMA needs to be further emphasized.
- **The Tirana-Durres Corridor** is accommodating a variety of economic activities, such as industry, warehousing and large retail. However a lack of clear urban and economic policies had made possible for universities and hospitals to be located along this axis.
- The construction of the road to the **Mother Teresa International Airport** has facilitated locations of industrial activities, thereby leading to the expansion of a new axis, although its development is in the beginning. The low density of construction along the Airport road let open the possibility to establish a new economic zone of the region where the development will be controlled with planning parameters and regulations.
- The same attention, economic regional planning, must be given to the area along the new highway to **Elbasan**, actually under construction together with the southern segment of the outer ring road. In this corridor, some processing industries will be potentially located.

In the regional context the economic strategy must take into the consideration in the long term, also the possibilities of an expansion of the economic zone of TMA along the North East Axis-Rruga e Arberit, as well as its connection with the North Segment of Ring Road and the conclusion of an economic loop Tirana-Kamza-Airport-Highway to Durres.

In order to achieve important projects that affect the TMA, it is imperative to create an administrative body with involvement of the concerned local government units and a binding regional plan and regulation. This Study stands along with such policies as above.

3.5 Substantial Issues on Infrastructure Development

(1) Urban Growth Management

"Urban Growth Management" is the most vital issue to orderly accommodate a rapid increase of the urban population due to liberalization of land holding. Unmanageable increase in informal settlements should be strictly controlled and livable environment in those areas should be promoted with a regulatory system for urban growth management.

The following are substantial issues for this purpose, or to achieve a sustainable city of the

capital city, Tirana.

- Urbanization area, or the so-called "**Tirana Metropolitan Area** (TMA)," where intensive efforts to provide sufficient infrastructures are required, shall be rationally delineated, taking into account landuse potentials and environmental preservation. TMA encompasses potentially to-be-urbanized areas in the neighboring seven communes.
- Functional and sustainable infrastructures meeting with the current and increasing demands for the focal subsectors such as roads and urban transportation, solid waste management and water supply, and sewerage/drainage system shall be provided.
- Comprehensive environmental management policies and enforcement should be enhanced to stop ongoing degradation of urban environment. Illegal dumping of solid wastes in rivers and open spaces, in particular, should immediately be controlled, providing a functional solid waste management system for TMA.
- A spatial structure, functional enough to accommodate all kinds of urban activities such as social, consumable, commercial, business, and industrial activities by one million citizens shall be developed. The said structure should be organically composed of functional road and public transport networks, effective land use for urban activities, environmental facilities, and open space/natural resources.

(2) Spatial Development Concept

The newly revealed regulatory plan envisions a spatial development concept with a "Five-Ring Structure" and has identified some strategic development areas for several purposes such as new settlement, accommodation of industrial/economic promotion, transport hubs, and green and recreation, among other things. The Team basically appreciates such a spatial development concept, and follows it, as far as it is identified rational from an urban planning point of view. In this sense, the overall concept is evaluated to be appropriate. Some important elements for the spatial structure are reviewed as follows.

(3) Preservation of Urban Landscape with Rivers and Hills

The main idea is to preserve and strengthen the existing natural features as structuring elements of Tirana's urban landscape. The mountains that surround the city have in recent years become the target for residential development. The proximity of hills to the city center, to the south in particular, makes them desirable and their elevated position provides attractive views over the city.

However, it is necessary to limit construction on high ground in order to preserve this natural profile and the olive tree orchards which are characteristics of the image of Tirana.

Tirana and Lana Rivers, which run through the City, are natural corridors of the geography in which the city of Tirana resides. It is planned to extend and strengthen the Lana River corridor upstream and downstream of the city center, preserving the natural wooded character of the river, and reserving land adjacent to Tirana River for future development of a large uninterrupted east-west green belt in the northern part of the city.

(4) Strengthen the Main North-South Axis as Historical Spine of the City

The North-South Axis is a historical urban spine. It symbolizes the dimension of Tirana as a

capital city and offers a grand perspective. Strengthening the axis is a way to ensure the integration of the northern part of the City. In the first phase, the development of the southern portion of railway station area – which is the largest undeveloped area in the city – is one of the main issues for Tirana in the coming years. It will significantly strengthen the northern pole of the main urban axis.

The establishment of a major urban park at the northern end of the axis is a component of the dramatic city of Tirana. It is now considered that new development is focused on the axis that links the two parks - one already existing in the South, and the other is the Paskuqan park to be established in the North. Thus, the North-South axis has been the main structuring element of Tirana's urban structure.

(5) Structured Balanced Urban Development Structure with/along the Outer Ring Road

As the national capital, Tirana needs to find new spaces to accommodate the activities accompanying its growth and development. The city outskirts are endowed with former industrial sites inherited from the communist period. These "brown field" sites are still partially occupied by industrial buildings, but industrial activities have been down in most of the sites.

Today, these brown field sites represent an extremely important, but spatially limited, potential for new development. It is proposed to transform selected sites into subcenters with concentrated development of new activities and places of work in fields such as industrial, commercial, services, and leisure activities. These new subcenters would play an important role in structuring the existing informal areas and integrating them to the city. Their situation along the Outer Ring Road presents valuable opportunities to re-balance the urban structure with/through future developments.

The importance of the Outer Ring Road is particularly apparent in the northern part as well as the south-eastern part of the city. By completion of the south-eastern part, the regional trunk road smoothly connecting Tirana with Durres and Elbasan shall be structured, thereby contributing greatly to its economic integration in the capital region. On the other hand, the northern part of the Outer Ring Road along Tirana River would have considerable potential for development, but presently lacks access or secured access to escape traffic congestion in the center.

Construction of the Outer Ring Road is thus a major issue as to the accommodation of new activities in the city, as well as its evident importance with regard to the inadequacy of road network capacity. This strategic component, based on the ring road, would foster development along the lines of the "Amsterdam" scenario sketch of the preceding chapter, namely, a poly-centric city.

(6) Strengthen the Tirana-Durres Economic Corridor in the Greater Tirana Metropolis

Growth of the metropolitan axis along the Tirana-Durres urban corridor is predestined by the dynamism of the port city as well as by the limited potential for urban expansion to the East because of the mountainous topography. It is further reinforced by the **Airport Link** and will again be strengthened by the new European Highway 8 linking Southern Europe to the Black

Sea region through the Balkans. The availability of undeveloped land along the corridor allows an immediate response to the needs and potentials for new economic and industrial activities.

Taking into account these economically potential areas, a strategic planning concept of "**Greater Tirana Metropolis**" needs to be employed as spatial framework to be integrated with the Tirana economy and its influencing areas.

(7) Improve Public Transport Access

Access to public services and facilities is inadequate for most of Tirana's inhabitants, particularly those living in informal areas of the urban periphery. It is said that informal settlements account for about 70% of urban residential areas.

One of the central objectives of urban planning must be to improve public transport access to quality services and good living conditions through the development of infrastructure and public transport access throughout the urban area, particularly in informal settlements where service is poorest.

(8) Urban Land Use and Development Directions

Analysis of urban development dynamics has revealed the following implications:

- The west of the city still offers good potentials for infilling and densification, particularly in the area of the old airport. Accessibility to these potential development areas is possible from the main network, but requires the creation of a secondary network structure.
- The south of the city offers little space for new development. Nevertheless, given the south section of the Outer Ring Road to be developed in the first stage, this area would have a great potential to locate industrial, commercial, and housing investments. The priority of this section is justified by the need to divert traffic from Elbasan around the city to the south so that it does not pass through the city center.
- The north of the city offers excellent development potential on the site of the station and adjacent areas, along Tirana River, given good accessibility by the completion of the north section of the Outer Ring Road.
- The east of the city still contains undeveloped space. However, given good transport access to the area, major development can be envisaged. Thus, the eastern part of the city is regarded as the most potential to-be-urbanized space, and such an urbanization process will be further encouraged by the completion of the eastern part of the Outer Ring Road. Therefore, strong attention should be placed on growth management and/or landuse control to ensure an environmentally balanced urbanization.

(9) Five Ring Structure

In this study, a transport demand analysis has been made, based on a newly developed transport simulation model in the Road and Urban Transport Sector. The result shows that Fifth Ring Road (the Outer Ring Road) will be significantly important to structure the capable and sustainable urban growth for Tirana, whilst the anticipated traffic demand on Fourth Ring Road will never be sufficient enough to justify the project investment economically. It is an insight into the concept of the Five Ring Structure derived from such a transportation analysis that the implementation of the fourth ring shall be carefully deliberated in terms of its economic viability and its time-schedule beyond the target year 2026.

4. Road and Urban Transportation Sector

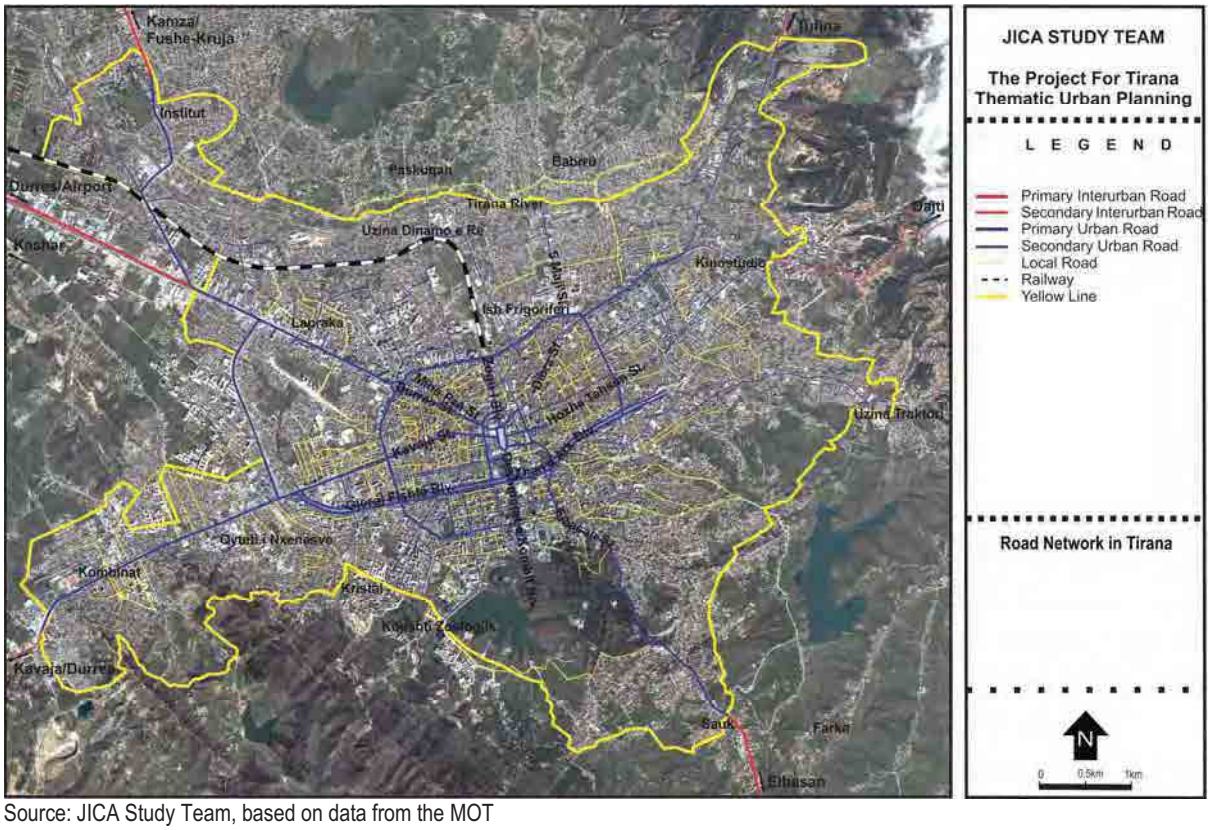
4.1 Current Status and Salient Findings

Information and data on the current condition of the transport sector such as road, bus, and railway in the Tirana metropolitan area were collected and reviewed.

4.1.1 Road

(1) Road Network

Based on the latest data from the MOT, there are about 170 km of urban roads in Tirana as presented in Table 4.1.1, while the main roads outside Tirana connecting with other municipalities/communes are classified as interurban roads. The road network in Figure 4.1.1 shows that Tirana has three ring roads: namely, the Inner Ring Road, the Middle Ring Road, and the Outer Ring Road of which the west section is currently in service. The main radial roads of Tirana's road network extend from Tirana (the Inner Ring Road) west to Durres and the airport via Durres Highway, southwest to Kavaja/Durres, south to Elbasan, northeast to Dajti over the mountains, and northeast to Tufina. In addition to these five primary roads, there are several other radial roads most of which connect up to the construction limit of the MOT (i.e., yellow line). In the northwest of Tirana, there is also a primary road diverting from Durres Highway and extending to Kamza/Fushe-Kruja. There is no national road inside Tirana, and all the roads are under the jurisdiction of the Municipality of Tirana (MOT).



Source: JICA Study Team, based on data from the MOT

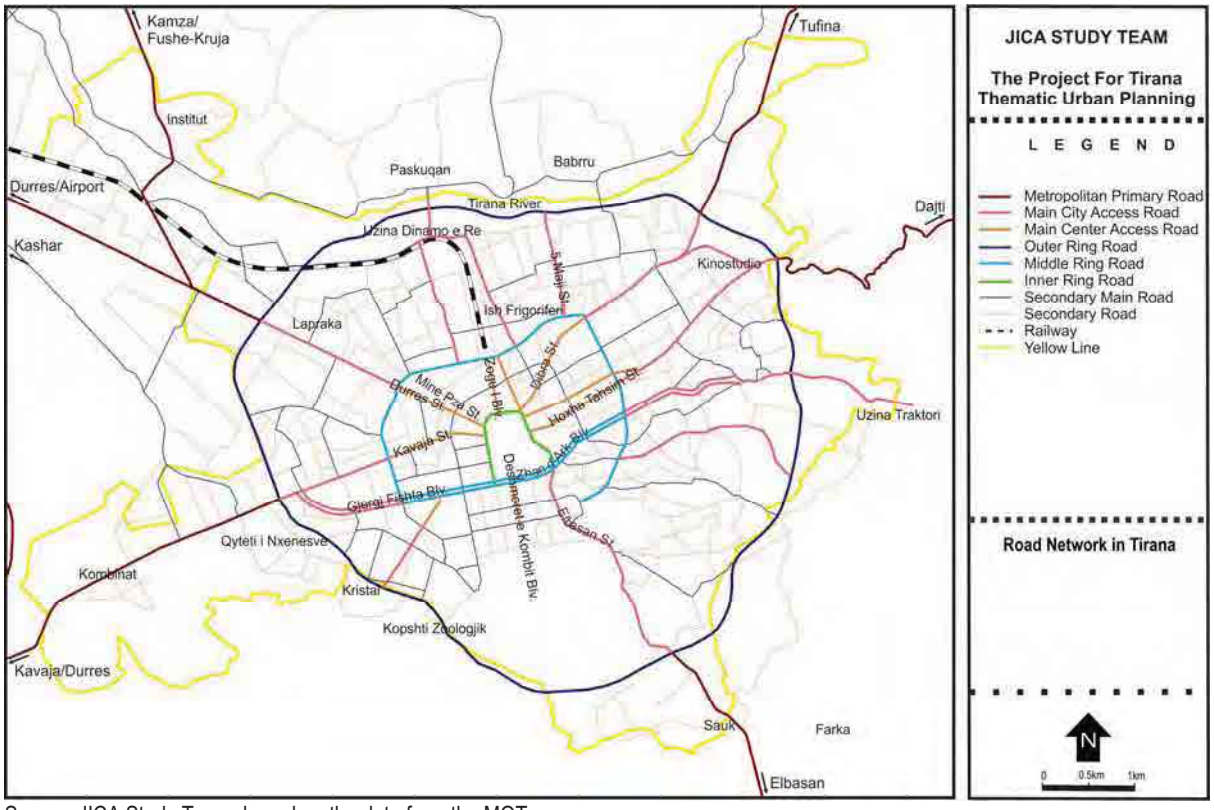
Figure 4.1.1 Road Network in Tirana

Table 4.1.1 Urban Road Length in Tirana

Type	Length (km)	% Share
Primary Road	39	23%
Secondary Road	38	22%
Local Road	93	55%
Total	170	100%

Source: JICA Study Team's calculation based on GIS data from the MOT

Apart from the above road classification, the MOT has revised its own road categories as listed below and shown in Figure 4.1.2, though these road functions are not clearly defined yet.



Source: JICA Study Team, based on the data from the MOT

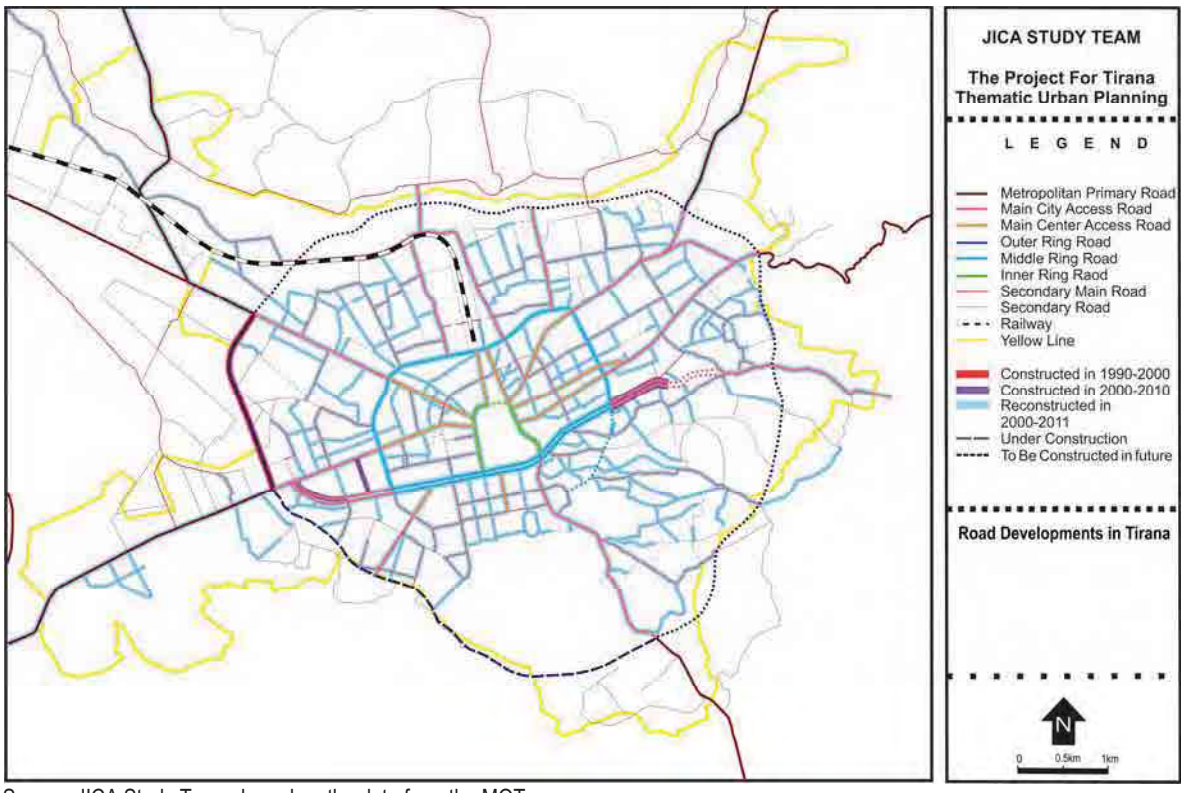
Figure 4.1.2 Roads in Tirana with Different Road Categories

- Metropolitan primary road: urban roads connecting outside Tirana and the Outer Ring Road;
- Main city access road: urban roads connecting the Outer Ring Road and the Middle Ring Road;
- Main center access road: urban roads connecting the Middle Ring Road and the Inner Ring Road;
- Outer Ring Road: a ring road that runs nearly parallel to Tirana's construction limit (yellow line), serving mostly the through traffic between the surrounding cities and communes bypassing Tirana;

- Middle Ring Road: a ring road inside Tirana, serving mostly the traffic of everyday trips of various purposes within Tirana;
- Inner Ring Road: a ring road surrounding the center of Tirana, serving mostly the traffic generating in and around the center of Tirana;
- Secondary main road: major local roads that connect the municipality blocks; and
- Secondary road: all other kinds of local roads serving the municipality blocks.

Past and future road developments in Tirana are presented in Figure 4.1.3. While there were few road developments in the period 1990 – 2000 aside from the new construction of the 2-km west segment of the Outer Ring Road, the situation of the road network in Tirana has been improved and there were so many road developments in the period 2000 – 2010. Most of the primary and secondary roads in Tirana have been reconstructed, and some of them have been widened simultaneously. Apparently there have been an improvement of the traffic and an increase of security for pedestrians as well as for vehicles. Furthermore, underground utilities such as water sewage, water drainage, telephone, and TV cables have also been laid for future development. In the reconstruction, road lighting system, traffic signal lights, and pedestrian sidewalks as well as green public spaces and decorative lining trees have also been provided on the roads.

At present, on the other hand, the south section of the Outer Ring Road is under construction, whereas the north and east sections are still in the planning stage.

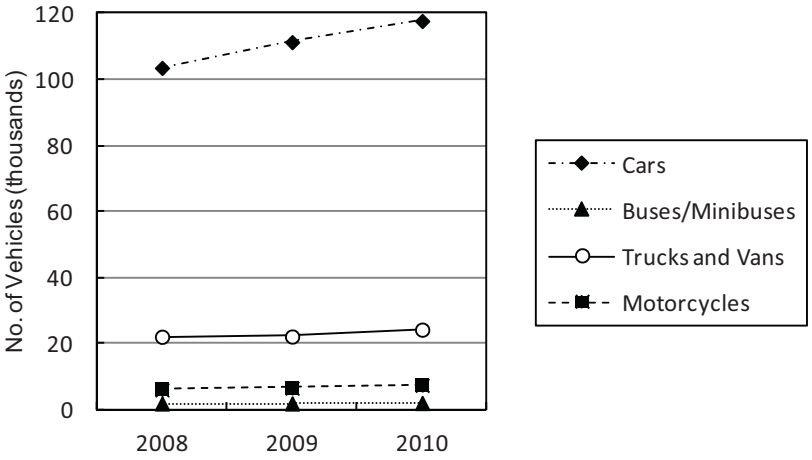


Source: JICA Study Team, based on the data from the MOT

Figure 4.1.3 Road Developments in Tirana

(2) Road Traffic

Motorized traffic consumes a major share of available public space in Tirana. Recent trend of registered vehicles in Tirana is presented in Figure 4.1.4. About 40% of the vehicular traffic in Albania is concentrated in Tirana. Traffic loading is very high and the network is congested most of the day, especially inside the Middle Ring Road. However, the current rate of car ownership in Tirana, about 178 passenger cars per 1,000 inhabitants (as of 2009), is only less than half of the European average and is expected to continue to increase rapidly in coming years.



Source: Institute of Statistics

Figure 4.1.4 Trend of Registered Vehicles in Tirana

This rapid motorization has brought the Tirana metropolitan area many urban problems such as traffic congestion and environmental pollution. Traffic congestion on the roads in the city and the roads connecting with the suburbs is becoming worse year by year. Since the capacity of the roads available to travel from the suburbs to the city center is very limited due to the legal/ illegal parking, there is traffic congestion especially on the radial roads during morning and evening peak hours. Thus, not only additional road space but also reliable public transport including bus rapid transit (BRT) and mass transit of a good level of service needs to be developed.

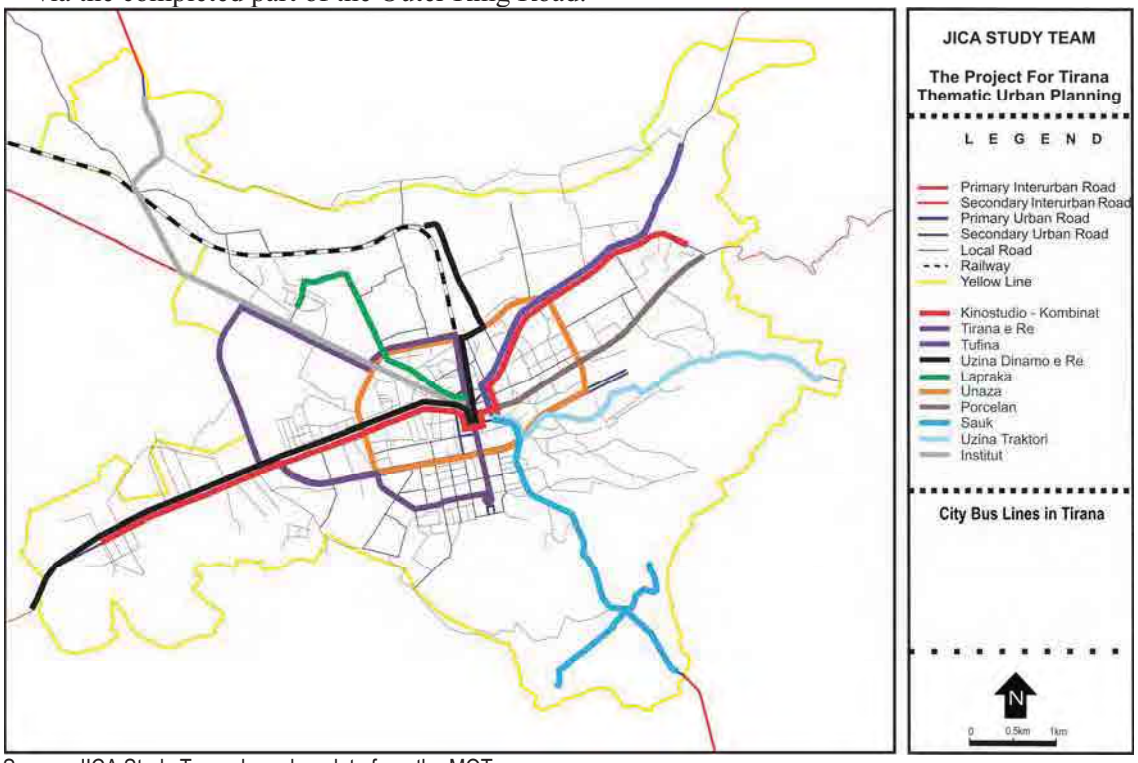
As for freight traffic, the largest freight traffic is generated at and around Durres Port, at which many cargos are transported by sea. In Tirana, there are no truck cargo terminals yet. Trucks (excluding vehicles with a 3.5-ton or lower loading capacity) are prohibited from entering the center of Tirana (i.e., inside the Middle Ring Road) except for nighttime (20:00 – 5:00).

4.1.2 Bus

(1) City Bus Transportation

The map of Tirana city bus lines is presented in Figure 4.1.5. Tirana has total 10 city bus lines. Those existing city bus lines have been organized mainly based on a radial system, by means of which the lines go from the suburbs of the city to the city center. In addition, there are some "through center" lines, such as Kinostudio – Kombinat line and Uzina Dinamo e Re (or Sharra) line. Furthermore, there are two circular lines that do not follow the radial scheme: namely, Unaza line (Ring Road), which goes along the Middle Ring Road around the city center, and

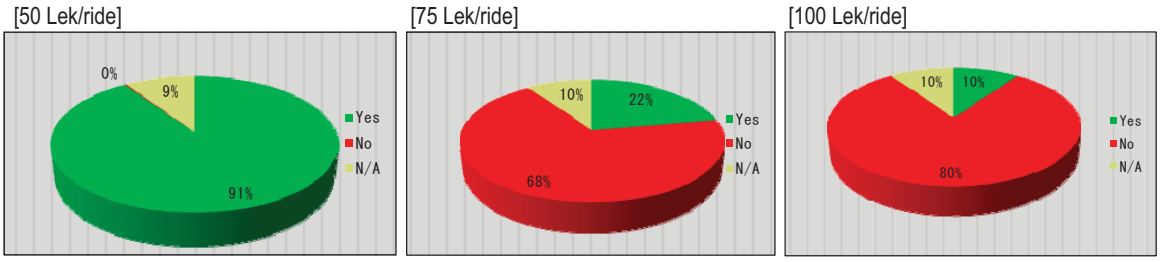
Tirana e Re line, which has a circular route passing the city center and the western part of Tirana via the completed part of the Outer Ring Road.



Source: JICA Study Team, based on data from the MOT

Figure 4.1.5 City Bus Lines in Tirana

The fare of the city bus is 30 Lek per person per ride. City bus lines in Tirana are operated by five private companies based on a five-year contract with specified stops, schedule and fleet standards, except that a state enterprise runs one line, that is, Kinostudio – Kombinat line, of which the passenger demand is quite high as described below. Currently, raising the bus fare is being discussed among the bus operators. However, as shown in Figure 4.1.6, the citizens are opposed to paying 75 Lek or more even for a new mass transit.



Source: 2011 Transportation Survey, JICA Study Team

Figure 4.1.6 Willingness to Use New Mass Transit under Different Fare Levels

Daily passenger volume on each city bus line was surveyed in "Bus Travelers Monitoring" in 2007 by IST. Of the 10 existing city bus lines, Unaza (ring road) line is carrying the largest number of passengers (approx. 54,000 passengers/ day). While the number of boarding and alighting passengers is evenly distributed on the line, the railway station bus stop has a particularly large number of boarding and alighting passengers.

Kinostudio – Kombinat line, which constitutes the axis that links the northeastern and

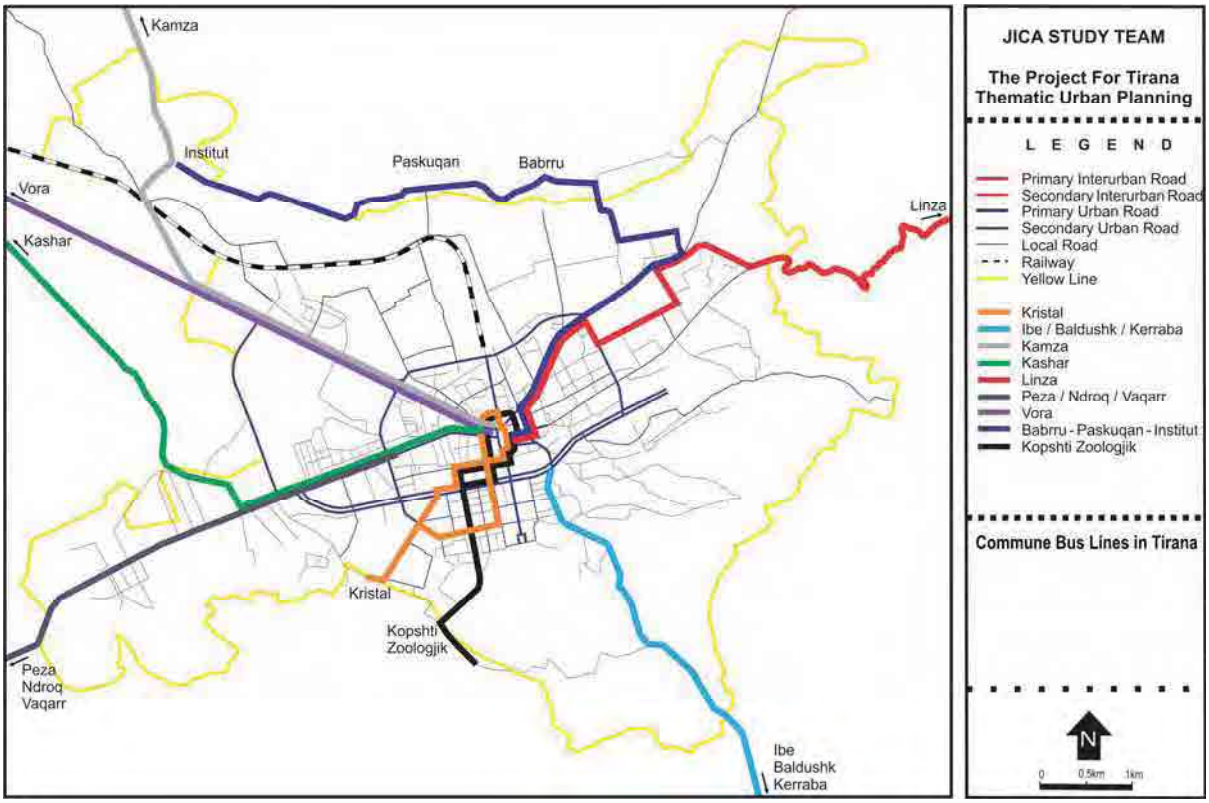
southwestern areas of the city through the center and can be considered a kind of a combination of Uzina Dinamo e Re line and Tufina line, has the second largest number of passengers (approx. 43,000 passengers/day). Then, Tirana e Re line, one of the two circular lines, has the third largest number of passengers (approx. 36,000 passengers/day) in Tirana. The line starts from the railway station, crosses the center north-south until it reaches Polytechnic University, then serves the western part of Tirana, and goes back to the railway station.

In accordance with the drafted URPTM as well as some past studies for the city bus transportation, dedicated bus lanes have been constructed on some of the city bus lines. Some are with physical separators, while others are equipped with only road signs or markings. However, the dedicated bus lanes that are currently provided are limited in both length and in continuity. In some signalized intersections on the Middle Ring Road, just 20 or 30m long dedicated bus lanes have been constructed in order to give the priority to the city buses when the traffic light turns green. In reality, contrary to this expectation, it is often the case that such local dedicated bus lane sections are occupied by illegally parked vehicles and are thus not efficiently utilized.

The MOT is planning to extend the dedicated bus lanes to 31 km in length including the existing ones (about 9 km). The TORs as well as the cost estimation have been prepared for this development.

(2) Commune Bus Transportation

In Tirana, in addition to the above-mentioned 10 city bus lines, there are 9 more commune bus lines that are operated by individual surrounding communes (but actually all by private operators) as presented in Figure 4.1.7. The service frequencies are not fixed, but they are operated at intervals of 3 – 30 minutes. Furthermore, most of the commune lines seem to overlap with the city bus lines. Though the commune bus operators are not officially allowed to transport passengers if both the boarding and alighting bus stops are inside the city of Tirana, it is quite common that passengers utilize the commune bus lines instead of the city bus lines to travel inside Tirana, paying the same fare (i.e., 30 Lek).



Source: JICA Study Team

Figure 4.1.7 Commune Bus Lines in and around Tirana

(3) Intercity Bus Transportation

In Tirana, there is no integrated intercity bus terminal yet. Instead, there are several bus and van stations though they are without toilets, ticket window, waiting room, etc. These bus and van stations are South Bus Station, North and West Bus Station, individual bus station, van stations, and international bus stations.

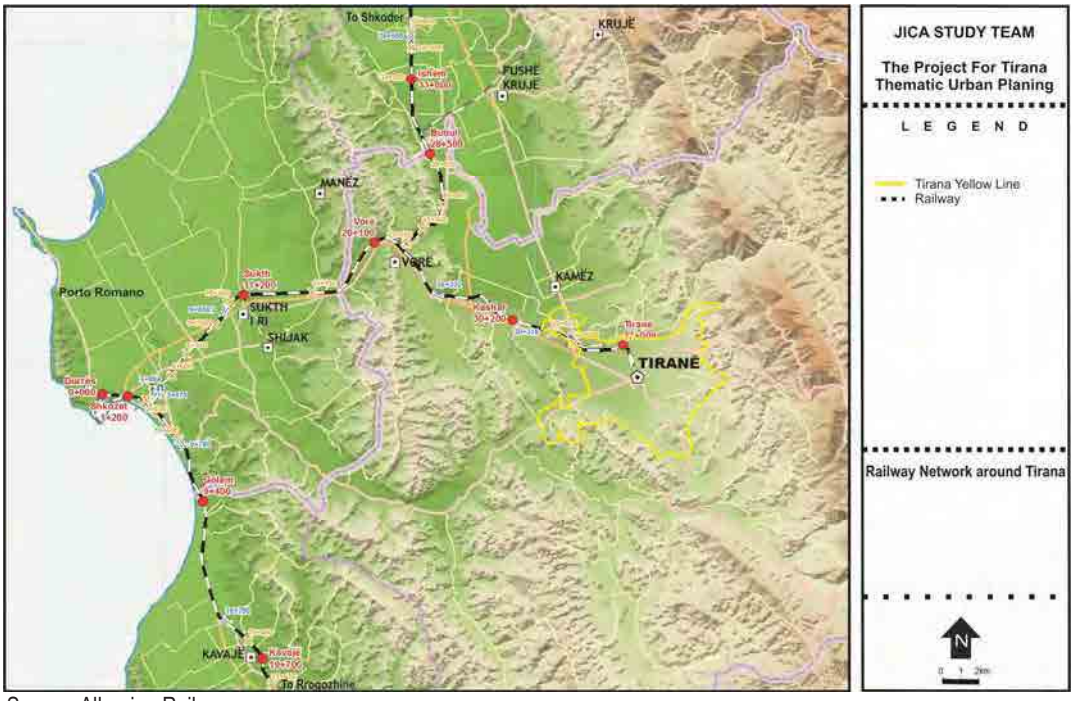
4.1.3 Railway

Albanian Railways (Hekurudha Shqiptare - HSH) is responsible for the railway system in Albania. It is supervised by the Railway Transport Directorate of the General Directorate of Land Transport in the Ministry of Public Works and Transport and is operated to provide service for passengers and freight over the network. Although the system is capable of operating 24 hours a day, there are few trains running in the nighttime at present.

The track on Durres – Tirana was renewed in 1999, financed by an Italian loan. Secondhand Trains were purchased from Italy and refurbished in 2002. The station tracks were not improved at the time.

There has been a long period of low investment, and the maintenance work has been restricted. The track is in workable but poor condition. The structures are generally performing satisfactorily although some relatively minor repairs are required. Rolling stock (wagons, passenger coaches and locomotives) is old and in need of renewal. The core network may be refurbished with the introduction of a modern signaling and communications system to a standard that will permit a normal train service to operate for freight and passengers.

Currently the maximum speed is generally 40 km/hour, with a few sections at 20 km/hour. The track is in poor condition and signaling is practically nonexistent. Trespass is common and many level crossings have been illegally constructed for both pedestrians and road traffic.

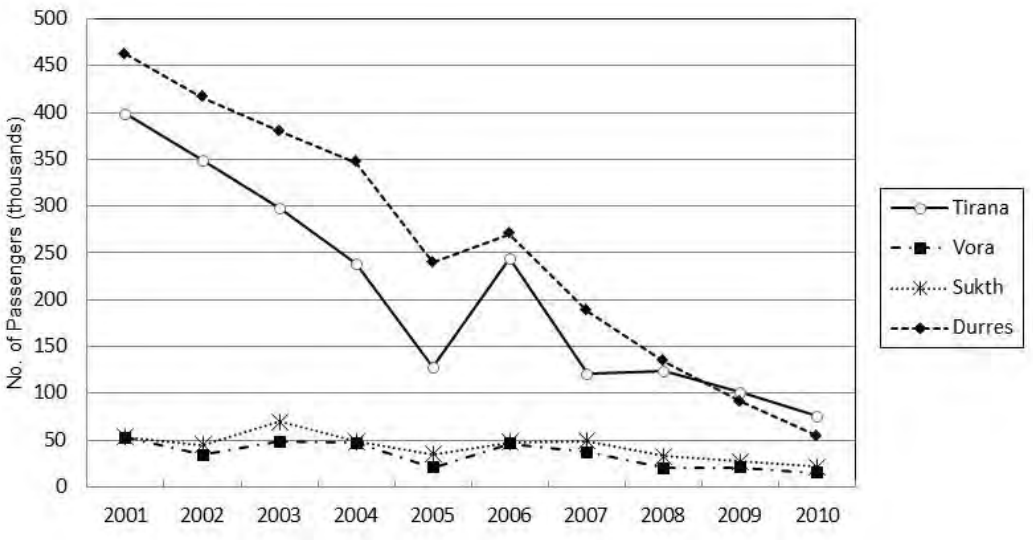


Source: Albanian Railways

Figure 4.1.8 Railway Network around Tirana

Durres – Tirana line has three stations on the way. The first station is in Shkozet village, the second station is in Sukth village, and the third station is in Vora village. Kashar station is planned to be added, but it will be only for freight transportation.

Trend of annual total volume of boarding passengers by station between Durres and Tirana is presented in Figure 4.1.9. A large decrease in the number of railway passengers was observed at all the stations in the last decade due to the above-mentioned poor condition. Competition with intercity bus, minivan and van services (except for fare) may be another cause of the decreasing number of passengers. Great reductions in passenger volumes were observed especially at Durres and Tirana stations while the reductions at other intermediate stations were relatively moderate.



Source: Albanian Railways

Figure 4.1.9 Annual Total Railway Passengers by Station

On the other hand, the annual volume of cargo has been increasing since 2003. There are some commodities that average 25,000 tons/year, namely, scrap and steel product, cement, liquid gas, and food. Scrap and steel products are brought from/to Serbia through the Elbasan - Durres - Vore - Shkoder line. In Elbasan, there is a factory of steel.

4.1.4 Other Related Transport Sector

(1) Port

Durres Port is managed by the Durres Port Authority, which is a state enterprise. The container terminal is operated by a private company, which holds a concession of the berths of the port. Durres Port is centrally located in Albania and is roughly 35 km from Tirana. Its enclosed harbor can accommodate fully loaded vessels up to 9 m draft. The port is entered through a 4 km long access channel. It is reported that considerable maintenance dredging is required each year and about 30 cm of sediment is cleared on average. Plans are under way to increase the depth of the approach channel and portions of the basin to accommodate vessels up to 10 to 10.5 m draft.

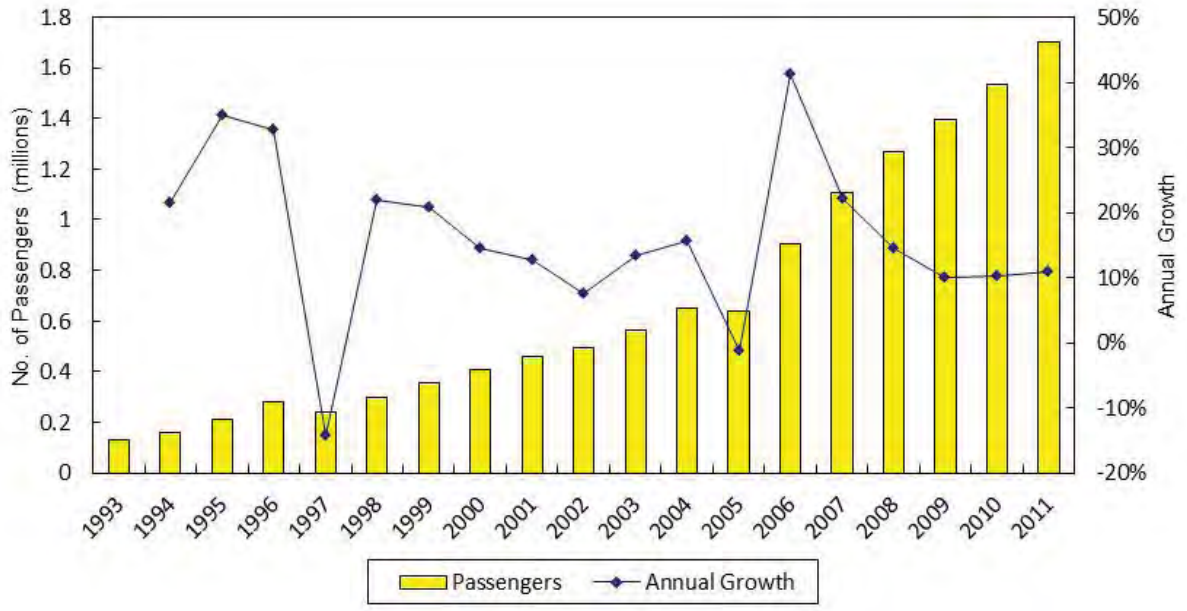
Durres Port is open 24 hours. Except for security reasons, most of vehicles are loaded or unloaded during the day. While Durres Port provides customs clearing services, every major city in Albania has a customs office. Trucks which are loaded in Durres Port can go directly to corresponding city for customs clearance.

Freight trucks coming from the port and heading for East Albania and Macedonia currently take the route via Rogozhina (i.e., not via Tirana). However, in three years' time, there will already be a tunnel constructed between Tirana and Elbasan. The Outer Ring Road is also currently under construction. After these are completed, most of the eastbound trucks will then go through Tirana.

(2) Airport

Tirana International Airport (TIA) or Nënë Tereza is the only international airport located in Albania, providing only international flight services. Airport management is administered by a private company "Tirana International Airport SHPK" from Germany, which took over the former state-owned administration company in April 2005. TIA is managed and operated as PPP (Public-Private Partnership) concession based on a Build-Own-Operate (BOO) scheme. The concession agreement covers a period of 20 years, until 2025. To date, this concession is considered to be one of the most successful PPP agreements in the transport sector.

Recent trend of the volume of passengers is presented in Figure 4.1.10. Although growth leveled out temporarily with the 1997 rebellion in Albania, it has since recovered, and it has been recording annual growth of around 10% up to now. Air transportation is expected to grow on a global basis. Above all, since the visa liberalization in September 2010, the annual growth has greatly increased. Thus, the air transportation demand at TIA is also forecasted to expand in future as well. TIA has been extensively upgraded and will be updating the master plan for the airport shortly to accommodate future growth.



Note: * Annual estimation based on passenger data up to July 2011.
Source: Tirana International Airport SHPK

Figure 4.1.10 Trend of Passenger Volume at Tirana International Airport

4.2 Problems and Planning Issues

4.2.1 Current Road Traffic

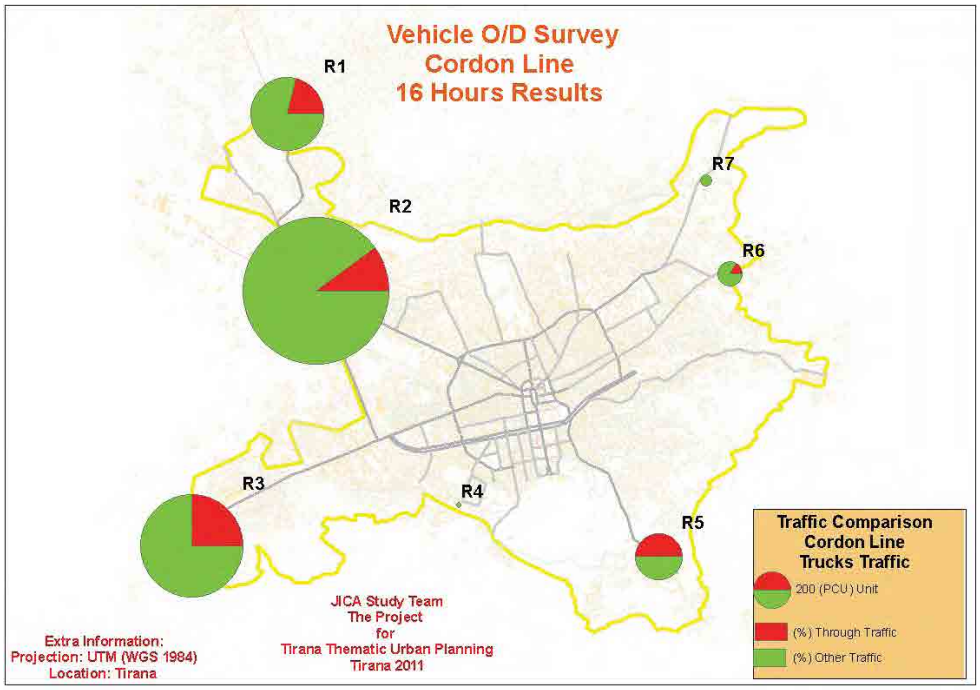
(1) Need for Hierarchical Road Network

Tirana has a well-developed road network structure which consists of three ring roads with different functions and several radial roads, as long as the roads are to fully function and properly perform their parts. For this purpose, however, current road classification based on the Road Code of Albania may not be sufficient, and the classification defined by the MOT based on the actual hierarchical road functions would be more suitable. Moreover, as described in the following items, each Municipal road type does not seem to be performing its function to the full due to the lack of proper road layout and coherent traffic flow management. Official road reclassification and application of the design standard to each road type along with proper traffic management and enforcement of the regulations would be necessary to cater for the increasing motorized traffic.

From a more regional point of view, connectivity with the following three major directions outside the Tirana area should be focused on:

- Durres, Durres Port, Vlora, and south of Albania,
- Shkodra, TIA, and north of Albania, and
- Elbasan, and east of Albania.

Furthermore, the linkage with Tirana Airport and Durres Port should also be improved and included in the above development directions. On the other hand, consideration of the traffic that bypasses Tirana is also important to reduce the traffic burden into the middle of the city. As shown in Figure 4.2.1, it is essential to give commercial traffic, especially trucks, alternative routes to bypass the center of the city.



Source: 2011 Transportation Survey, JICA Study Team

Figure 4.2.1 Volume of Trucks to/from Tirana and Trucks Passing through Tirana

(2) Heavy Burden on Primary Urban Roads

As the main roads with a high capacity, many commuting vehicles take the primary urban roads. Moreover, since the primary urban roads connect the major industrial and warehouse areas in Tirana such as Kombinat, Qyteti i Nxenesve, Ish Frigoriferi, and 5 Maji Road via interurban roads to Durres Port and other major cities in Albania, they also serve as a freight transportation corridor.

For freight trucks, under the situation that the Outer Ring Road has not been completed yet, there are virtually no other routes than to go into Tirana. Although they are banned from entering the central business district (CBD), which is the area inside the Middle Ring Road, except in the nighttime, these conditions result in high traffic generation and mix with many slow, heavy vehicles on the existing primary urban roads. Such a burden on the existing primary urban roads should be alleviated by providing alternative roads for both trucks and passenger vehicles.

(3) Imbalanced Vehicular Traffic into CBD

For this Study, the CBD is defined as the area inside the Middle Ring Road. One of the key issues in urban transportation in Tirana is how to control and manage the traffic demand into the CBD especially during peak hours.

There are some roads that are relatively small with mostly one lane for each direction but the traffic volume per lane is relatively large. On the other hand, there are other roads with multiple lanes for each direction but the traffic volume per lane is very small. There seems to be an imbalance between the traffic demand and the road supply.

(4) Decreasing Road Capacity

The more traffic enters the CBD, the longer the travel time and the lower the travel speed become. In terms of the V/C (volume to capacity) ratios of the radial roads to/from the CBD, they are much less than 1.0, indicating a "very good level of service." However, they are based on theoretical capacities under the ideal condition of the roads without any side frictions. In fact, the road lanes are often occupied by parking or stopping vehicles, seriously reducing the road capacity. Congestion in and around the CBD becomes severe especially during peak hours, as the traffic in Tirana increases and the major signalized intersections become more "saturated." Therefore, it is necessary to secure those ideal road capacities and provide smooth traffic flow especially on the radial roads to/from the CBD.

(5) Traffic Control and Management

1) Lack of Traffic Monitoring Systems

As the number of automobiles is rapidly increasing in Tirana, traffic congestion is also getting more and more serious. In light of this situation, it has become important to identify the bottlenecks responsible for traffic congestion using intelligent transportation systems (ITS) and to disperse traffic through optimal traffic signal control and the provision of traffic information. While the traffic management and control project is currently under way in Tirana, traffic conditions of the urban roads in Tirana should be comprehensively monitored as well. In addition to traffic monitoring, an efficient and inexpensive way of compiling data and disseminating traffic information through ITS will also be necessary for Tirana.

2) Traffic Regulation

From the viewpoint of a safer and more orderly traffic, current regulations to separate public transportation from other private vehicles need to be maintained. These regulations become more effective if the existing dedicated bus lanes are applied to longer and more continuous road sections. While it is difficult to enforce the regulation of separating public transportation from other private vehicles, extension and stricter implementation of the dedicated bus lanes need to be considered. Furthermore, if the public transportation demand is high enough and there are many buses that need the dedicated bus lanes for smoother public transportation services, it may also be more efficient to provide a rail-based public transport such as trams or Light Rail Transit (LRT) that are more physically separated within the right-of-way (ROW) of the roads and can carry more passengers.

The current truck regulation which is applied to the CBD of Tirana may also need to be reviewed as to whether the area should be expanded to the area inside the Outer Ring Road to prevent the mixed traffic with trucks, especially when the planned Outer Ring Road has been completed.

3) Parking Problems

Under the situation of increasing automobiles and continuing reliance on private vehicles in Tirana, it is essential to increase the parking capacity in Tirana, especially in the CBD (inside the Middle Ring Road). Problems of overflowing parking vehicles are observed everywhere in the CBD. On-street public parking rules such as authorized parking time,

parking fees are determined and enforced by the MOT, but parking is not efficiently managed. Illegal on-street parking outside the designated parking area is reducing the number of available driving lanes. This causes traffic disorder, consequently reducing the road capacity and increasing the travel time and eventually the traffic pollution.

According to the Parking Survey result, the current ratio of the demand to the supply is below 1.0, based on the assumption of 12-hour operation (e.g., 8:00-20:00). However, the parking demand often concentrates causing oversaturation for a certain period of the day. Such an oversaturation period is generally observed from 9:00 to 14:00 in office buildings, from 11:00 to 14:00 in commercial buildings, and from 8:00 to 16:00 in on-street parking.

Thus, parking regulations, especially on on-street parking, need to be reassessed to guarantee a more efficient use of roads and to secure the rightful capacity. Meanwhile, construction of additional parking facilities for 3,200 vehicles at the minimum is urgently necessary in the CBD to clear away the current on-street parking from the primary and secondary roads to utilize the road space for public transport and bicycles while maintaining the same traffic capacity. For this, however, consideration must be given to the fact that business and commercial activities along the roads, especially in the CBD, may also benefit or suffer from any action or decision. It should also be noted that charging higher parking fees will eventually deter private vehicles from entering the CBD and shift them to public transportation.

Construction of parking facilities is also critical for facilitating intermodality between private vehicles and public transit systems throughout the Tirana metropolitan area. As recommended in PADCO study[1], new parking facilities should be developed in the following locations:

- Major intermodal nodes (transfer points between primary roads and public transit (bus or a new mass transit) stops);
- Throughout the CBD of Tirana (inside the Middle Ring Road), especially around the large-scale commercial and office buildings where the parking demand is considerably high; and
- At sub-centers (if any) located in the periphery of Tirana.

4) Traffic Safety for Pedestians and Bicycles

Walk takes about 30% of all the trips in Tirana. According to URPTM, the most preferred mode of transport by Tirana citizens is “on foot.” However, pedestrian facilities, especially along the busy main roads in the CBD, are insufficient in number. In order to reduce accidents involving pedestrians, more pedestrian facilities such as crosswalks, pelican crossings, and pedestrian bridges should be provided. In addition, narrow or poorly maintained sidewalks along the urban roads need to be improved, since sidewalks of good quality will enhance not only pedestrian safety but also the urban amenity and environment.

As for bicycle lanes, though they have been developed to a certain extent in Tirana, it is

[1] Planning and Development Collaborative International (PADCO) (2002). *Strategic Plan for Greater Tirana*. Albania: Prepared for Ministry of Public Works.

often the case that the bicycle lanes are occupied by illegal parking and stopping of private vehicles. Overall, in Tirana, there is a lack of consideration for road user needs of non-motorized transport. Currently underused and fragmented bicycle lanes need to be extended.

Furthermore, traffic education programs/campaigns and enlightenment for better driving manners, as well as stricter traffic law enforcement, should be promoted to reduce the number of traffic accidents and realize a pedestrian-friendly society.

4.2.2 Urban Transportation

(1) Bus Transportation

While bus transportation is currently the only mode of urban transportation in Tirana, there are two important issues to be considered to realize the most effective bus transportation system. One is the reconsideration of the bus route structure, and the other is the provision of more bus priority lanes.

1) Reconsideration of Bus Route Structure

Current bus services in Tirana, especially line-haul bus services connecting the suburban areas and central Tirana are provided not only by the city buses but also by some commune buses connecting Tirana and the surrounding communes. Though the commune buses are not supposed to pick up passengers traveling within Tirana, the commune buses are also serving passengers in Tirana.

Bus routes are generally categorized into three types from a planning point of view, namely, line-haul bus services, CBD circulating bus services, and suburban feeder bus services. As clear demarcation of serving passengers in Tirana and those in the surrounding communes is becoming more complex and difficult, it is necessary to reconsider and rationalize the existing bus route structure, including the possibility of suburban feeder bus services as well as the possibility of a regional transportation management authority which covers the whole Tirana metropolitan area including the surrounding communes.

The existing bus route structure should also be reconsidered in light of existing and future travel demand, trunk public transportation of the city, and coverage of population of the Tirana metropolitan area.

2) Provision of More Dedicated Bus Lanes

In the context of urban transportation, public transportation should be given priority over private vehicles to secure smoother travel for those who use public transportation. Hence, the current partial dedicated bus lanes should be maintained. Moreover, as mentioned in the previous section, the possibility of extension of the dedicated bus lanes more continuously to the main urban roads should be promoted to form a continuous, smooth network for buses, thereby serving as a BRT. By securing a relatively high operating speed, time schedule can also be foreseen, consequently reducing the wait time and attracting more passengers.

3) Need for Intercity Bus Terminals and New Transit Terminals

Since there is no integrated intercity bus terminal yet in Tirana, integration of the intercity and international bus and van lines into one terminal with proper facilities such as toilets,

ticket windows, waiting rooms, shops, restaurants, taxi stands, and parking facilities is highly necessary. A new "Tirana Intercity Bus Terminal" should be located somewhere on the Outer Ring Road to secure enough land and facilitate the vehicular access to/from outside Tirana. It will also help to prevent large vehicles from entering the CBD of Tirana. More importantly, the new terminal needs to be connected to several city bus and other public transportation lines for smooth transfer to central Tirana or to other destinations.

Furthermore, introduction of new transit terminals where many city bus lines as well as intercity bus lines and other public transportation lines meet and passengers can transfer or access by private vehicles should be realized. In the case of a new transit terminal located in the city center, a transit mall could be developed by converting some section of a street to an automobile-free area, allowing only pedestrians and cyclists as well as public transportation vehicles to move more freely, thereby attracting more passengers.

(2) Rail-Based Transportation

Rail-based transportation has a great potential for fast, reliable, and comfortable transportation services regardless of road traffic congestion. Although the existing railway is supposed to serve a relatively longer distance to/from Tirana, rail-based transportation should serve as the core mode of the public transportation system to attract more commuters that are about to shift to private vehicles. To this end, there are two major development projects in the rail sector. One is the renovation of the existing railway system which aims to provide new commuter railway services, and the other is the development of a new rail-based mass transit system such as trams or LRT.

1) Improvement of Existing Railway

As explained earlier, there is still room for improvement in the existing railway system including its infrastructure and facilities such as rolling stock, tracks, signaling/ telecommunication, grade crossings, and electrification. Improving the existing railway has a great advantage in that new land acquisition is not required. Among others, the needed key improvements are as follows:

- Redeveloping Tirana station as an intermodal gateway as well as a commuter rail terminal which will connect the existing bus lines and a planned mass transit;
- Elevating part of the existing railway sections in Tirana to avoid grade crossings;
- Double-tracking the existing railway for commuting services between Tirana and Durres;
- Developing new commuter rail stations on the existing railway lines between Tirana and Vora/Durres; and
- Improving/developing station plazas and approach roads to provide easier access to the stations for all modes of transportation.

After improving the existing railway system, commuter trains and inter-city trains can be provided more effectively especially during peak hours. In order to increase the existing railway passenger demand, it is necessary to provide enough attractive services in terms of frequency, compatibility, comfort, accessibility to stations, and intermodality with bus and private vehicles.

2) Development of a New Rail-based Mass Transit System

After investigating the commuters' travel demand and its forecast, land use plans, and development directions in the Tirana metropolitan area, a new rail-based mass transit system may be recommended to supplement the existing railway system. Whether to develop the new mass transit system as a rail- or a bus-based transportation, such as BRT, will depend on the demand forecast and the service distances on the corresponding transportation corridors. However, it should be noted that the future passenger demand will also vary depending on the attractiveness and convenience of the new mass transit system including its accessibility and inter-modality with other transportation modes.

(3) Integration of Public Transportation

The integration of public transportation should be discussed in the following two aspects.

1) Integration of Rail and Bus Transportation

Even if the existing railway system is renovated and the planned rail-based mass transit system is developed, the rail-based transportation network will not be enough to cover all the travel demand in Tirana. Hence, bus transportation is expected to supplement and complement the rail-based transportation system, especially in areas beyond walking distances from the rail stations. In this case, a reorganization of the bus line structure will be required to provide feeder bus services to provide convenience to potential rail-based transportation users. Above all, sufficient intermodal facilities should be provided at stations where the rail-based mass transit system meets the existing city bus line(s).

In addition, introduction of a common fare system would be convenient to public transportation passengers because they can utilize one ticket for several modes. At present, common fare is not applied even for transfers between the city bus lines. Free, or at least discounted transfers should be realized between different modes of public transportation. Moreover, it would be another incentive for current private vehicle users to shift to public transportation.

2) Integration of Public Transportation and Land Use

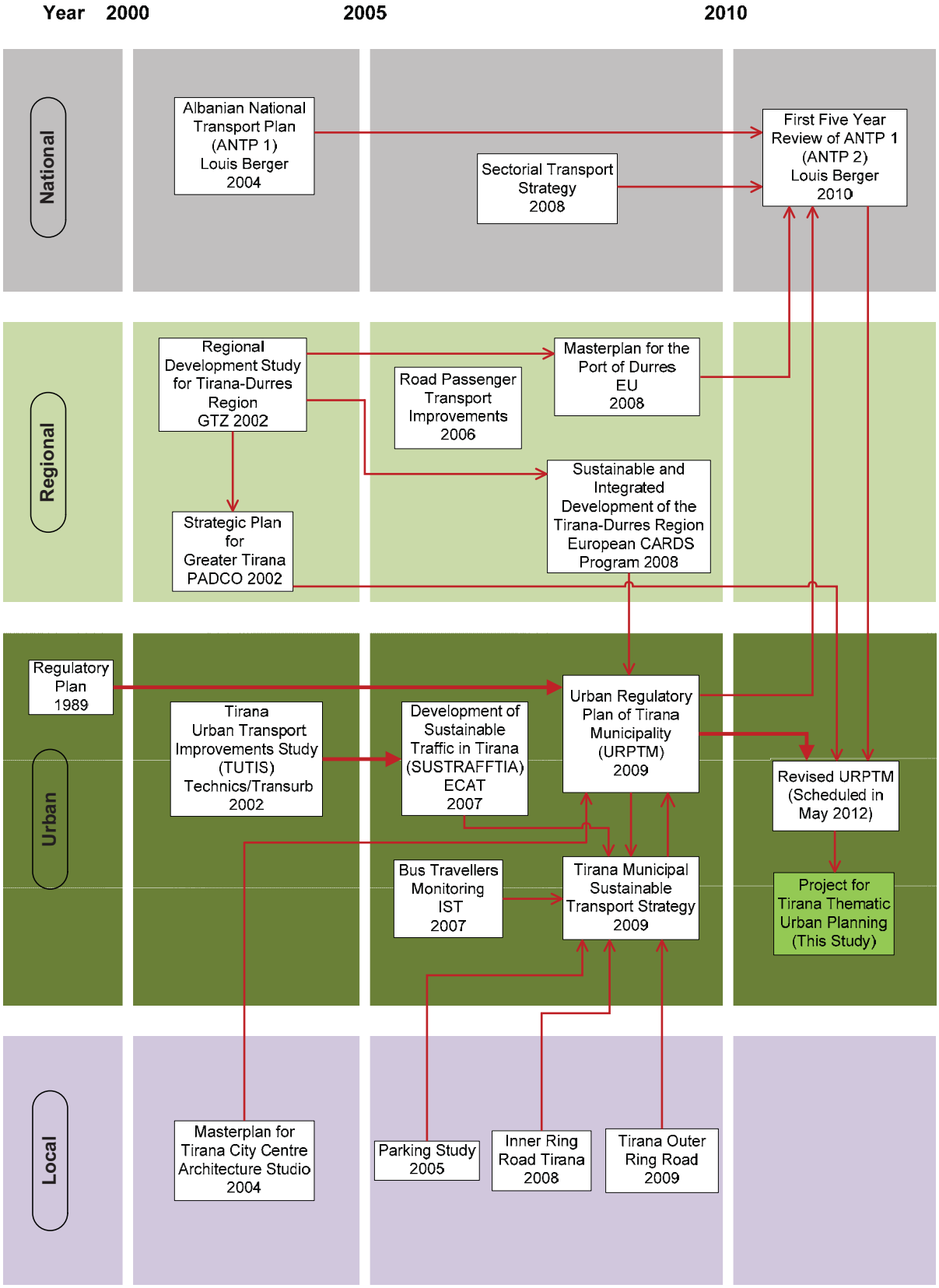
While at present, many large business, commercial, and housing development projects are sprouting all over Tirana and its vicinity, it is of great importance to make the urban structure convenient for public transportation users through appropriate land-use plans. That is, since office buildings and shopping malls are large trip generators, they should not only be provided with enough parking space but also be located within walking distances from rail-based stations or bus stops. Setting high floor area ratios in areas around existing and planned stations will also induce a large amount of generated trips which can easily be served by rail-based transportation systems. After all, both public transportation and land use should be integrated under a concept of transit-oriented development (TOD).

4.3 Review of Existing Policies and Previous Studies

4.3.1 Overview of Previous Studies and Existing Plans

In this section, existing transportation plans and policies are described in the context of road and urban transportation development in Tirana. In addition, recent major individual transportation development studies/projects in Tirana are also presented especially in light of their implementation status. Furthermore, activities of other donors for road and urban transportation development are summarized.

Major existing plans and studies related to roads and urban transportation mainly after 2000 are presented along with types of the target scope in Figure 4.3.1. The Study, though it will refer to the plans and studies listed in the flowchart, will be mainly based on URPTM, which is set to be revised by the new municipal administration in 2012.



Note: Arrows indicate reference to the previous/ongoing plans and studies.
Source: JICA Study Team

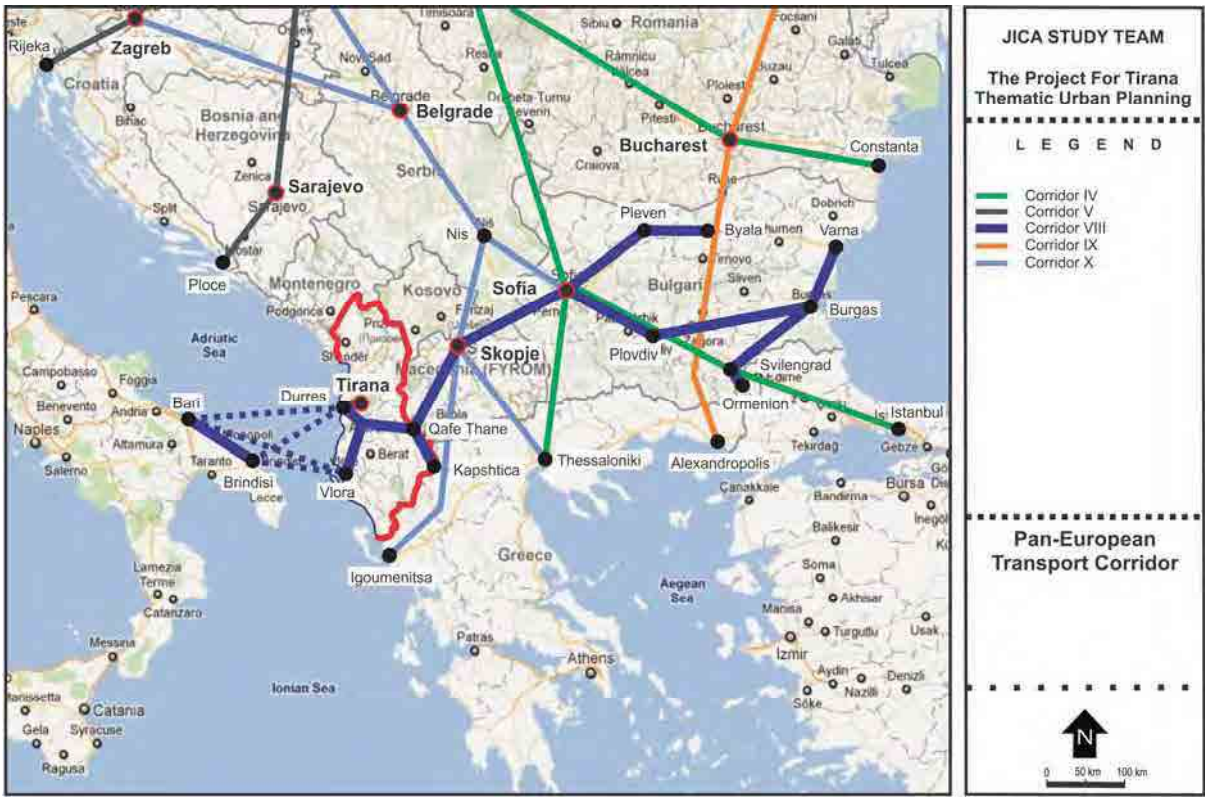
Figure 4.3.1 Flow of Existing Plans and Studies Related to Roads and Urban Transportation

4.3.2 First Five-Year Review of Albanian National Transport Plan (ANTP) (2010)

(1) Background

The objective of this study (or ANTP2), funded by EU (European Union) and conducted by Louis Berger, was to update the first Albania National Transport Plan (ANTP1), which was made in 2004 for the purpose of providing a safe, reliable, efficient and fully integrated transport system and infrastructure in Albania, which would best meet the needs of freight and passenger customers, whilst being environmentally and economically sustainable. This study aimed at sub-sector development for the next 20 years.

In ANTP2, a strategy for development and coordination of the transport sub-sectors was provided along with investment and action plans. Specifically, it was ensured that the Albanian transport network should be integrated into the Balkan region and the Pan-European network (Figure 4.3.2), reflecting economic development and traffic forecasts. Above all, Corridor VIII is of utmost importance for Albania as it links the following main cities: Durres - Tirana - Skopje - Sofia - Plovdiv - Burgas - Varna- Constanta over a total length of 1,500 km, increasingly extending industrial and commercial cooperation in South Eastern Europe.



Source: JICA Study Team, based on Pan-European Corridor VIII Secretariat

Figure 4.3.2 Pan-European Transport Corridor in Balkan Region

(2) Major Output

While a number of reforms were undertaken in the road sub-sector since completion of ANTP1 in 2005 such as the establishment of the Albania Roads Authority (ARA) and the introduction of the Road Asset Management System (RAMS), ANTP2 recommends that the classification of the roads in the road code be revised with some minor modifications of the road design

standards and road design manual. It also recommends that the master plan be prepared in accordance with the national port strategy.

In the context of Tirana, congested roads and air pollution were becoming common elements of urban life in this city. Tirana's needs for transport and other infrastructure were intensely studied over the past years in order to meet the rapidly growing demand for urban services. After reviewing a recent transport study, the "Municipal Roads Sustainable Transport Strategy," completed in June 2009, and the new "Urban Regulatory Plan of Tirana Municipality" (URPTM) for 2021, also completed in 2009, ANTP2 proposed Investment Plan for 2021, which amounts to 383 million Euros consisting of:

- Fleet renewal: 95 million Euros;
- Bus land implementation: 150 million Euros at 2.5 million Euros/km with a bus lane length of 53.2 km;
- Construction of new rail urban links: 100 million Euros at 20 million Euros/km with a length of 4.4 km and additional tram stations; and
- Rolling stock for train-tram service: 38 million Euros at 2.5 million Euros per unit for 15 units.

4.3.3 Urban Regulatory Plan of Tirana Municipality (URPTM) (2009)

(1) Background

The purpose of the Urban Regulatory Plan is to support the realization of the urban development policy objectives and the concept of spatial development for Tirana. Specifically, URPTM aims at facilitating improvement of the existing urban structure and development to a polycentric city.

In the previous Regulatory Plan of 1989, the industrial sites were originally located along the planned Outer Ring Road, which would ensure their accessibility. While these sites became extremely important, the urban area of Tirana expanded and became spatially limited; hence, the MOT was seeking potential for new development.

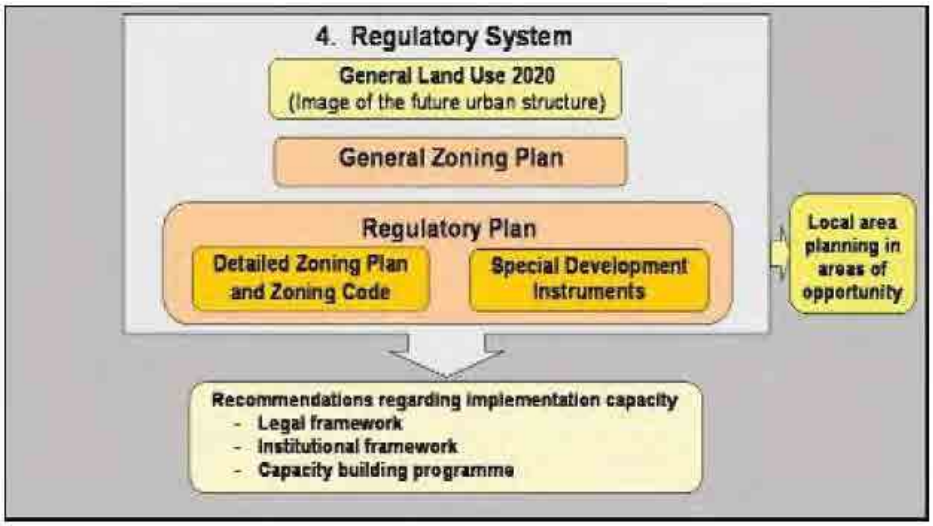
Among others, access to public services and facilities became inadequate for most of Tirana's inhabitants, particularly for those living in informal areas of the urban periphery. Informal settlements accounted for about 70% of the urban residential areas. Thus, one of the main objectives of urban planning was to improve transport access to services and living conditions through the development of infrastructure and service facilities throughout the urban area, particularly in the informal settlements in which the service was the poorest. Though planning was not only for new inhabitants, the first task was to improve the conditions for the existing population.

Another main objective of URPTM was to organize the urban corridor that would focus on the creation of sub-centers located at existing and emerging nodes: the airport, the port of Durres, and crossroads and interchanges of the transportation systems. Mobility in the urban corridor should be based on the railway and highway networks.

(2) Methodology

The methodology that was used to bridge the gap between diagnosis and concept development, and the required Regulatory Plan involved the following three steps (Figure 4.3.3). At each of these steps, the central question concerned the modes of intervention in territorial development that would be effective in promoting the above objectives.

1. Elaboration of Land Use 2020
2. Elaboration of a General Zoning Plan (GZP)
3. Formulation of the detailed Regulatory Plan (RP)



Source: URPTM (2009)

Figure 4.3.3 Components of the Regulatory System

(3) Major Output

1) Transportation Network

Transportation network includes major road and rail connections at international, regional, and local scales. Road networks refer to major highways and main roads as well as public and private bus services, minibus services, and private automobile traffic. Railway network should include railroad, tram, and regional mass transit links.

a) Road Network

- Highway from Montenegro to Greece
- Major roads to connect Tirana to Shkodra, Elbasan, Durres, etc.
- Ring roads to bypass Tirana (outer, inner, and central ring roads)

b) Railway

- Railway line from Durres to Tirana Station
- Railway line from Berxull Hub to Kombinat Hub
- Railway line from Berxull Hub to the airport (TIA)
- Public transport line from Nene Teresa Square University to Paskuqan City Park
- Tramway line from Kamza University to Tufina University

2) Transportation Hubs

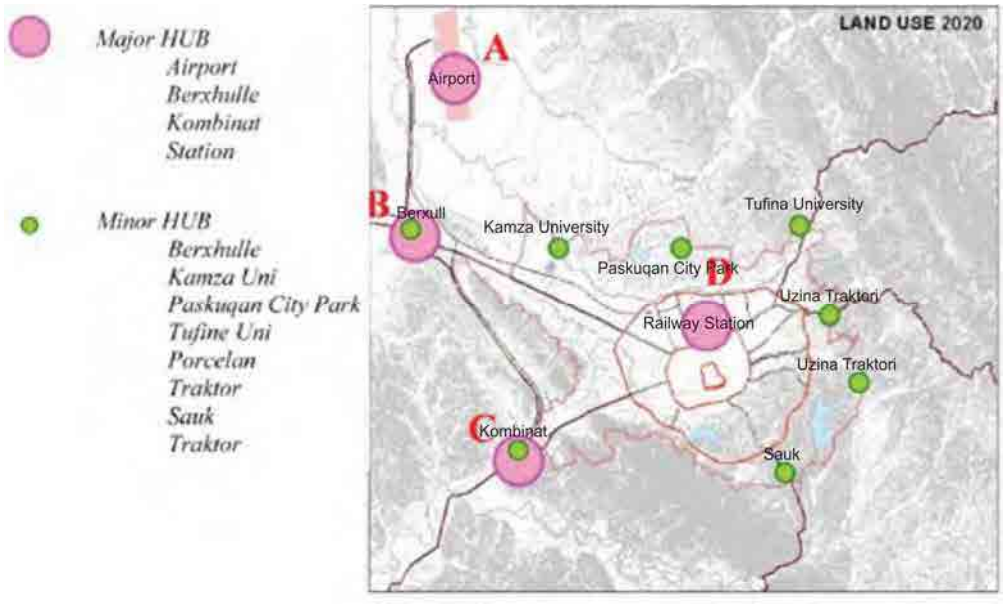
A hub may be defined as an intermodal node which is a strategic point for transport organization and comprises favorable conditions for high density urban development with a high level of centrality. As shown in Figure 4.3.4, Land Use 2020 locates several major transportation hubs which will also structure the Tirana - Durres urban region.

a) Major Hubs

- TIA Hub, encompassing important air, rail and road networks.
- Berxull Crossroads Hub: encompassing rail and road networks
- Kombinat Crossroad Hub: encompassing rail and road networks
- Tirana Railway Station Hub: a major inner-city rail and road crossroads.

b) Minor Hubs

Minor hubs comprise all important metropolitan and municipal level rail and road crossroads and terminals. They would include public transport facilities of Municipal and national level services.



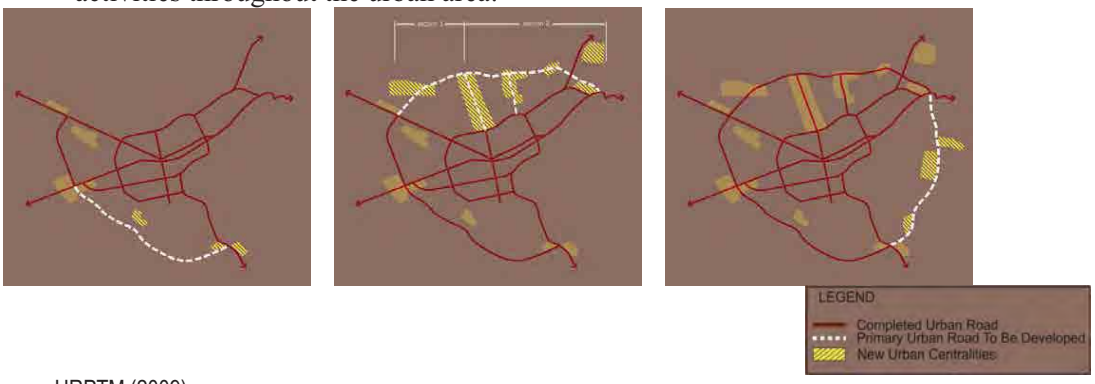
Source: General Land Use 2020

Figure 4.3.4 Location of Main Transportation Hubs and Networks

3) Outer RingRoad Development

The Outer Ring Road was proposed as strategic vector for developing new areas for the city. Construction of the western section of the Outer Ring Road, which is a logical step that reduces transit traffic in central Tirana, has already reinforced the existing development potentials in the western part of the city, i.e., the former airport area and the informal settlements of Kashar. The remaining sections are to be developed as follows (Figure 4.3.5).

- Construction of the southern section of the ring road has already been decided and programmed; it will assure the connection from the West to Farka while fostering and structuring development of this area.
- Construction of the northern section of the ring road would bring an opportunity to develop the northern part of the city along the Tirana River, enhancing its image and integration into the urban structure, while significantly expanding the supply of land that is suitable for development.
- The third step would promote upgrading of the eastern part of the city, partially re-balancing urban development and promoting a better mix of residential and other activities throughout the urban area.



Source: URPTM (2009)

Figure 4.3.5 Outer Ring Road Development

4) Sustainable Mobility

The proposed strategic aims for sustainable mobility were as follows:

- To reinforce public transport by bus while holding the existing rail right-of-way from central Tirana to Durres in reserve,
- To promote "soft" mobility, which is particularly appropriate for a city of Tirana's size,
- To develop strategically placed public parking facilities and establish regulations that limit the number of parking places to be provided by apartments or places of work in order to control the growth of automobile traffic in the center of the city, and
- To manage traffic through the definition of a hierarchical road network with clearly defined functions for each road link.

Even in the absence of an explicit policy decision, URPTM regarded this general transport strategy as inevitable for Tirana for the following two main reasons: 1) because the alternative of considerably expanding the road network is simply not feasible due to the shortage of space in the city; and 2) because the international institutions with which Albania is collaborating for the funding of essential investments will inevitably insist on broadly accepted standards of sustainable development, which, in turn, imply the outlined transport policies.

4.3.4 Strategic Projects by the MOT

The following strategic projects have been implemented by the MOT. Though the details are not clear yet, those projects need to be treated as given for planning the public transport development in this Study.

- Development of an intermodal transportation terminal along with relocation of Tirana railway station
- Extension to the north of Tirana Main Boulevard and rehabilitation of Tirana River
- Development of two tramlines: east-west (Kinostudio – Kombinat) and north-south (Intermodal Transportation Terminal – Student City)
- Development of Urban Traffic Control (UTC)
- Industrial Development and Research Park (Tirana Techno - Park)

4.3.5 Activities of Other Donors for Roads and Urban Transportation

The involvement of several donors to finance the past studies and the implementation of projects dealing with different aspects of Tirana's transportation system are playing a major role in the achievement of the proposed policies.

(1) World Bank

The Strategic Plan for Greater Tirana (2002) was prepared in Urban Land Management Project (ULMP), which was financed by the World Bank.

Furthermore, the World Bank will invest 20 million dollars in the expansion of the port of Durres to modernize handling capacities and introduce new types of transport which would shorten the handling time.

(2) EBRD

Parts of the Middle Ring Road, in a total length of 3.3 km, were reconstructed with an EBRD (European Bank for Reconstruction and Development) loan in the period of 2000 – 2010.

The "Tirana Municipal Sustainable Transport Strategy" (2009), which was funded by EBRD, was an important study which helped to make URPTM (2009). In this study, a prototype tender dossier for a full-option Urban Traffic Control (UTC) was also prepared, and Tirana is now developing the first traffic management control room in Albania.

The study on Tirana Outer Ring Road, the south section of which is currently under construction, was also funded by EBRD in 2009.

(3) EU

Since 1991 the EU has committed, through various assistance programs, 6.8 billion Euros to the Western Balkans. In 2000, aid to the region was streamlined through a new program called Community Assistance for Reconstruction, Development and Stabilization (CARDS) adopted with the Council Regulation (EC) No. 2666/2000 of 5 December 2000.

The CARDS program's wider objective is to support the participation of the countries of the Western Balkans (Albania, Bosnia and Herzegovina, Croatia, Serbia, Kosovo, Montenegro, and the Former Yugoslav Republic of Macedonia) in the Stabilization and Association Process (SAP). In the transportation sector, under the CARDS program for Albania, there was a study called "Albanian Railway Network: Infrastructure and Signaling Improvement Project" in 2009. In addition, specifically for Tirana, an extensive study of the Tirana - Durres region has recently been completed ("Sustainable and Integrated development of the Tirana - Durres Region," 2008), which intends to assist authorities to achieve "sustainable and integrated" development of the urban region.

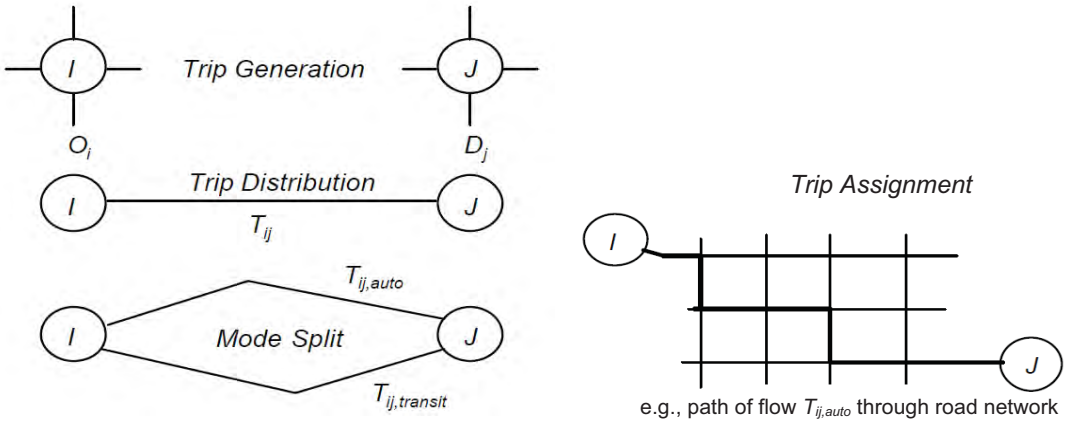
Besides the CARDS program, SUSTRAFFTIA (2007) was conducted for Tirana and funded by the EU. Furthermore, at the national level, recent First Five-Year Review of ANTP 1, (ANTP 2) in 2010 was also funded by the EU.

4.4 Transportation Demand Forecast

4.4.1 Development of Forecast Models

(1) General

Basically, forecasting future traffic demand is done by applying the conventional four-step methodology, namely, trip generation and attraction model, trip distribution model, modal split model, and trip assignment model. These steps can be grouped into two, steps to build models for estimating future origin-destination (OD) matrix and for estimating traffic volumes on the network. The former step consists of the trip generation and attraction model, trip distribution model, and modal split model; and the latter step is the trip assignment model. Both steps can be done by using JICA STRADA, which is an integrated software developed by JICA as a tool for transportation demand forecast model development based on the four-step methodology as illustrated in Figure 4.4.1.



Source: JICA Study Team

Note: i = Subscript, used to denote origin zones
j = Subscript, used to denote destination zones
O_i = Number of trips originating in zone i
D_j = Number of trips destined for zone j
T_{ij} = Number of trips ("flow") from origin zone i to destination zone j
$T_{ij,m}$ = Number of trips from i to j using mode m

Figure 4.4.1 Four Steps of Transportation Demand Modeling

1) Trip Generation Model

This model is used to calculate the total number of trips produced from and attracted to each transportation analysis zone (TAZ). This model can be described by a set of linear regression models of the trip generations and attractions for each trip purpose with socioeconomic indicators per TAZ as explanatory variables.

2) Trip Distribution Model

The objective in a distribution model is to estimate the "most likely" OD trip (or flow) matrix between TAZs, given known trip origin and destination total for each TAZ (plus any additional relevant, known information). Several models exist for a distribution model. The most popular one is a gravity model, which consists of trip generation and attraction, and the impedance which can be expressed as distance, cost, time, or generalized cost (in

which travel time is converted to a monetary value using a "value of time") between TAZs.

3) Modal Split Model

Modal split models are applied after trip distribution. That is, the OD flows computed by the trip distribution model are split into several modes of transport. Since OD flows are known, impedances such as travel times and costs for the competing modes between TAZs can be computed. Furthermore, since modal split models are sensitive to impedances, they can be used to assess the impacts of a broad range of transportation policies such as improved transit services (frequency, coverage, travel times, etc.), road pricing, gasoline taxes, transit fare policy, and parking pricing policy.

In general, all trips are first divided into walk trips and motorized trips. Then, the motorized trips are divided into public transport and private vehicle of which majority is private car. At a minimum, some representation of the competition between private car and public transport is usually required.

4) Assignment Model

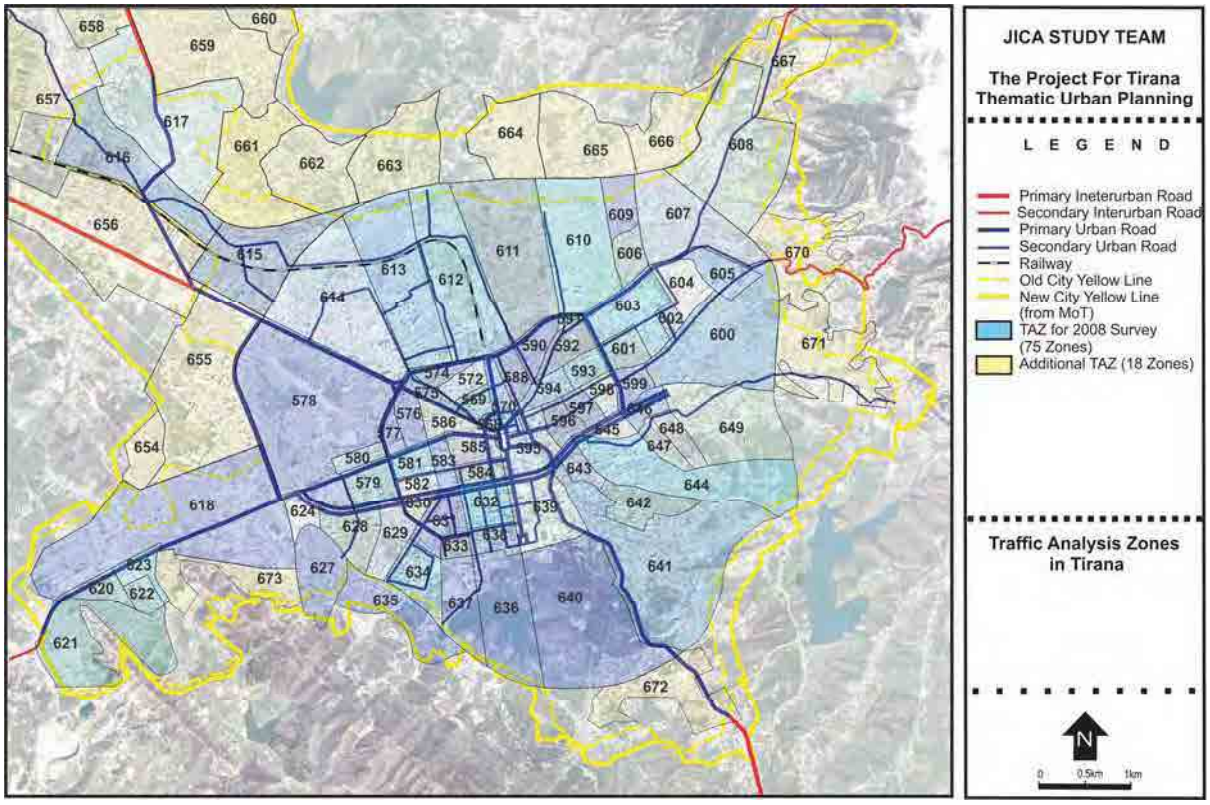
In forecasting, aggregate, zone-to-zone flows are the required output. A trip assignment model is one that assigns the OD matrix for each mode generated by a modal split model on a transportation network and calculates the traffic volume on each link of the network. The transportation network is represented by a connected set of links and nodes as a simplification and an abstraction of the real network. Links generally correspond to major streets, transit lines, etc., while nodes generally correspond to intersections, transit stops or stations, etc. The network database developed for this Study consists of two categories, namely, a road network (generally called highway network) and a public transport network (generally called transit network).

Every road link in the network has attributes about transportation facilities and service levels such as link speeds, capacities, directions, and public transport frequencies. The attributes are specified according to functional classes of road: primary urban road, secondary urban road, and local road. The travel speed on every link varies depending on the changes in traffic volume, based on its QV equation or volume-delay curve which predicts link travel time or speed (V: velocity) as a function of link volume (Q: quantity). Then, the model finds the path(s) through the network which trips from *i* to *j* are most likely to take and determines the shortest time between OD zones, and the trip volume between OD zones is assigned on the shortest route as well as on the corresponding links.

(2) Demand Forecast Models

To develop the demand forecast models for Tirana, the Household Survey conducted from the end of September to October 2008, which includes both trip and socioeconomic information of 7,000 persons taken from 75 TAZs (Figure 4.4.2), has been utilized as the only dataset that is available. Since the survey asked the interviewees about their trips made only for three hours between 6:00 and 9:00 a.m., the demand forecast models have also been developed for the morning peak hours only. Furthermore, because it is modeled only for the morning peak hours, it has been assumed that all purposes of the generated trips are from home to work, school, and other places only. Hence, non-home based trips such as business trips which normally take a

considerable share were not included in the demand forecast models.



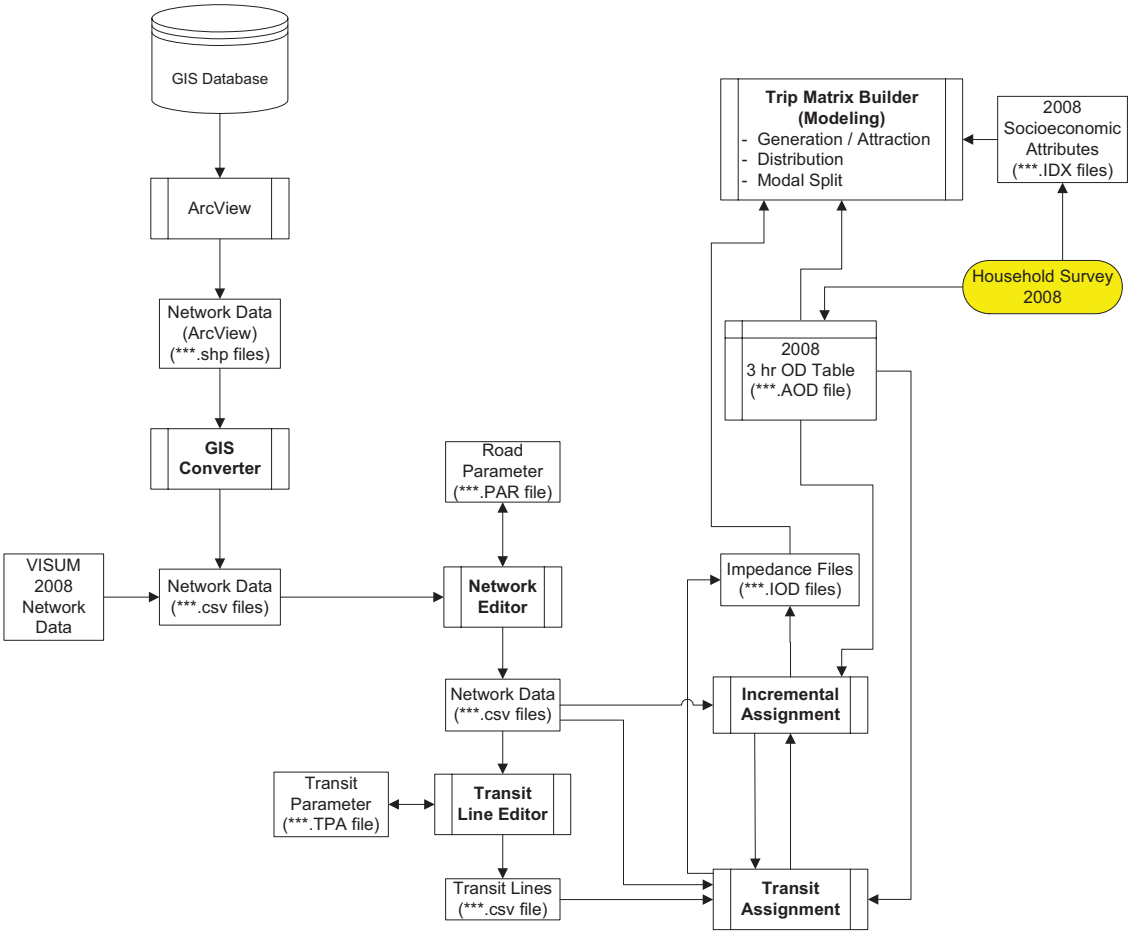
Source: JICA Study Team

Figure 4.4.2 Transportation Analysis Zones (TAZs) in Tirana

Though it has been a while since this person trip survey was conducted, it is believed that the travel demand forecast models should remain unchanged with fixed parameters over a period of time, so long as the context of the society will not change. However, a full-scale person trip survey by which a more comprehensive daily travel demand can be modeled is essential for actual transportation planning of Tirana, and it should be regularly conducted at intervals of five to ten years, especially in an urban area that is developing and expanding in scale.

Workflow for travel demand modeling using the trip and socioeconomic information in 2008 is depicted in Figure 4.4.3. For trip assignment, network development is required. Though the basic network developed for the modeling could be made by converting the GIS network data to STRADA format data, the 2008 network data from the previous study[2] that was formatted for another commercial modeling program (VISUM) has been utilized in this Study. As for developing the four-step demand forecast models, the above-mentioned Household Survey dataset plays a key role as inputs of zonal socioeconomic attributes and OD trip matrices.

[2] APRI Spa and T Bridge (2009), *Municipal Roads Sustainable Transport Strategy*, Funded by EBRD.



Note: **Bold** letters indicate program modules of JICA STRADA.

Source: JICA Study Team

Figure 4.4.3 Workflow for 2008 Travel Demand Modeling

1) Trip Generation Model

The trip production and attraction of each TAZ can be modeled by estimating the "best fit" linear relationships between the number of current observed trips for each purpose and the socioeconomic indicators of each zone. In further detail, trip production and attraction can be estimated by inputting the explanatory variables (i.e., socioeconomic indicators) of each zone into the following formulas:

$$P_i^k = \beta_0 + \sum_n \beta_i x_i$$

$$A_j^k = c_0 + \sum_n c_i x_i$$

where,

P_i^k : Trip production of zone i with purpose k

A_j^k : Trip attraction of zone j with purpose k

x_i : Variable such as population of zone i

β, c : Coefficients

The following table shows the parameters of these models. Distance has been used to express the impedance between TAZs for modeling the trip distribution.

Table 4.4.1 Trip Production and Attraction Model Parameters

Production/ Attraction	Trip Purpose		Constant	Population	No. of Workers at Residential Place	No. of Workers (Jobs) at Work Place	No. of Students at Residential Place	No. of Students at School Place	Correlation Coefficient
Production	Home-To-Work	Coefficient	22.12		0.8250				0.991
		t-value			*61.2*				
	Home-To-School	Coefficient	24.07				0.7514		0.992
		t-value					*66.3*		
	Home-To-Other	Coefficient	120.85	0.0623					0.692
		t-value		*8.1*					
Attraction	Home-To-Work	Coefficient	64.90			0.9592			0.999
		t-value				*187.4*			
	Home-To-School	Coefficient	25.39					0.8317	0.999
		t-value						*209.0*	
	Home-To-Other	Coefficient	264.01			0.1042			0.415
		t-value				*3.8*			

Source: JICA Study Team

2) Trip Distribution Model

The trip distribution model estimates the number of distributed trips for a combination of origin and destination zones, i.e., OD matrices, based on the trip production and attraction of each TAZ obtained from the previous step. While several models exist for a distribution model, the most popular one is a gravity model, which can be expressed as shown below:

$$T_{ij} = k \cdot \frac{P_i^a \cdot A_j^b}{d_{ij}^c}$$

where,

T_{ij} : Trip distribution between zones i and j

P_i : Trip production of zone i

A_j : Trip attraction of zone j

d_{ij} : Impedance between zones of i and j

a, b, c: Parameters

k : Constant

The following table shows the parameters of these models. The impedance for the trip distribution model is expressed by the minimum distances between OD pairs on the network, namely, the distance matrix.

Table 4.4.2 Trip Distribution Model Parameters

Trip Purpose	Variables	Production	Attraction	Impedance	Constant	Correlation Coefficient
		a	*b*	*c*	*k*	
Home-To-Work	Coefficient	0.4509	0.3058	-0.0033	0.1998	0.5130
	t-value	*22.7*	*14.8*	*-1.7*		
Home-To-School	Coefficient	0.4018	0.2415	-0.1460	0.9636	0.5721
	t-value	*13.2*	*11.6*	*-4.6*		
Home-To-Other	Coefficient	0.3072	0.2704	-0.2249	1.3366	0.4739
	t-value	*8.9*	*7.6*	*-4.9*		

Source: JICA Study Team

3) Modal Split Model

The previous trip distribution model calculates the number of trips that will be made between TAZs. The modal split model estimates the transportation modes that will be used in traveling between TAZs.

Tirana is a compact city, and based on the transportation survey conducted in 2011, the walk mode takes about 25% of all trips between central Tirana and the suburbs. Hence, three main modes have been assumed: namely, auto (i.e., private car), transit (i.e., public transport), and walk.

Current state of practice in modeling modal split is to use the logit mode choice model, which is derived from basic principles of random utility developed in economics and psychology. It is expressed as follows:

$$P_{mt} = \frac{\exp(V_{mt})}{\sum_{j} \exp(V_{jt})}$$

where,

P_{mt} : Probability that person t will choose mode m

j: Available mode

V_{mt} : Systematic utility of person t for mode m, which is generally assumed as:

$$V_{mt} = c_0 + \sum_{n} c_i x_i$$

x_i : Variable indicating attribute i (such as impedance) of mode m

c : Coefficient

As mentioned earlier, three different split models have been established for the three trip purposes in this study. Furthermore, generalized cost, in which travel time is converted to a monetary value and is included using a "value of time," has been utilized to express the impedances by auto and transit between TAZs. The following table shows the parameters of these models.

Table 4.4.3 Modal Split Model Parameters

Trip Purpose	Variable	Impedance		
		auto	transit	walk
Home-To-Work	Coefficient	-2.8101	-0.6220	-0.7558
	t-value	*-1.3*	*-1.9*	*-6.2*
Home-To-School	Coefficient	-12.3343	-0.0145	-0.3360
	t-value	*-2.4*	*-0.3*	*-2.2*
Home-To-Other	Coefficient	-17.6609	-0.0419	-0.3169
	t-value	*-2.4*	*-1.0*	*-1.4*

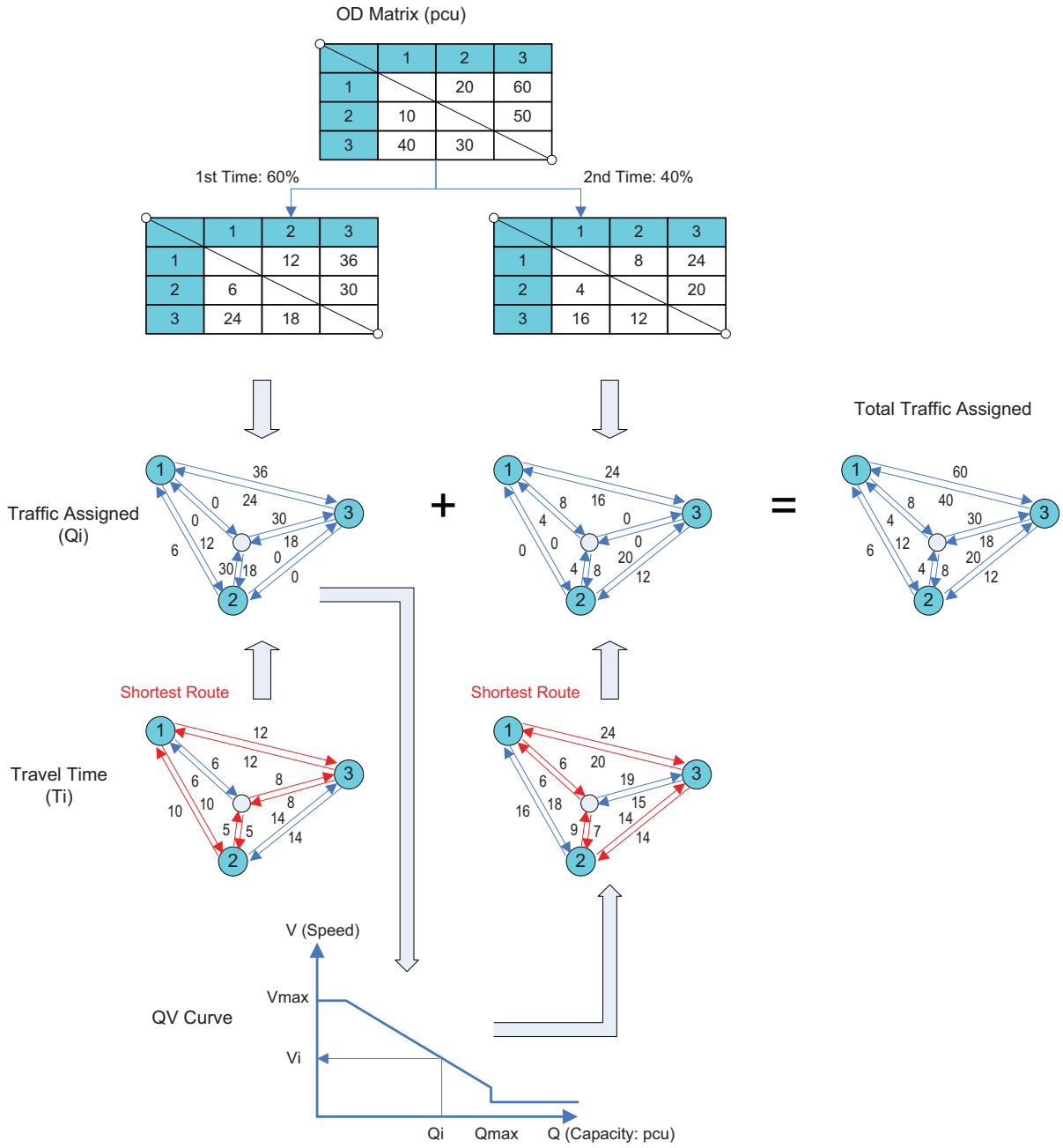
Note: Constant is assumed as 0.
Source: JICA Study Team

4) Trip Assignment

There are two fundamental approaches to the trip assignment, namely, System Optimization (SO), which assigns OD flows to paths so as to minimize the total travel time in the system; and User Equilibrium (UE), which assigns OD flows so that no user of the system can unilaterally change routes thereby improving his/her travel time. The former, SO works for many freight applications; however, it does not well describe human route choice. Meanwhile, the latter, UE is an equilibrium condition, and so, no user will switch the routes voluntarily because no user can improve his/her travel time.

In this Study, for assigning traffic on the highway network, the traditional incremental assignment module in JICA STRADA was applied. The incremental assignment divides the OD trips in the matrix into appropriate increments and assigns each increment to the shortest route with the least generalized cost.

An example of incremental assignment is illustrated in Figure 4.4.4. In this example, the OD matrix was divided into two, i.e., 60% for the first time and 40% for the second time. First, travel time with free flow speeds on each link was calculated and the routes of the shortest travel times between zones are found, as shown by red lines in the figure. Second, the trips in the first OD matrix are assigned on the shortest routes, and travel time on each link is re-calculated with the traffic volume based on the volume-delay function (or QV curve) pre-defined on each link. This iteration is repeatedly done until the designated calculation times, two times in this example, have been achieved and all the flows of the OD pairs have been assigned to the network.



Source: JICA Study Team

Figure 4.4.4 Example of Incremental Assignment

On the other hand, transit network assignment is usually not subject to congestion, though conventional buses may be influenced by congestion. Thus, the typically used procedure is an all-or-nothing method. That is, if there are no congestion effects, it basically takes UE, implying that there will be a single best path for each transit user, and that each transit user will use that path and no other. Alternatively, a stochastic, multi-path method could be taken though it is more computationally burdensome. In any case, factors such as walk access/egress times, to the transit network, waiting times (as a function of frequency), and transfer times should be accounted for in the transit assignment.

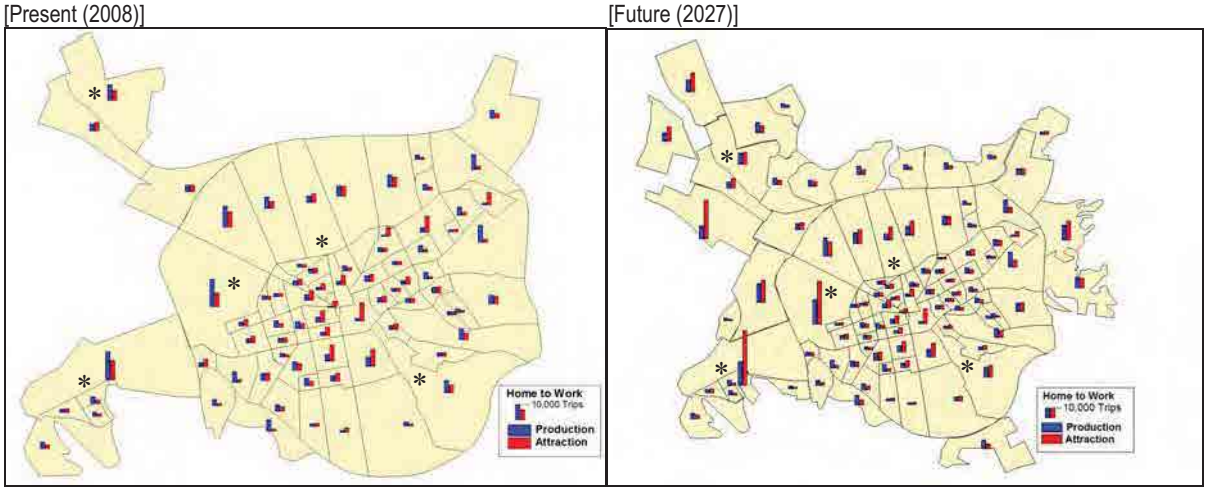
4.4.2 Demand Forecasting

(1) Estimation of Future Total Trips and OD Matrix

The target year for forecasting demand is set as 2027, which is also the same as the long-term target year in this Study. First, the trips produced from and attracted to each TAZ are calculated through the trip generation model, which takes socioeconomic zonal attributes projected in the previous chapter as inputs. The trip generations of home-to-work, home-to-school, and home-to-other trips in the morning peak hours (6:00-9:00 a.m.) by TAZ are presented in Figure 4.4.5, Figure 4.4.6, and Figure 4.4.7, respectively.

Overall, large zones have a large number of trip generations accordingly. However, for home-to-work and home-to-other trips zones where the attraction exceeds the production can be seen inside the CBD as well as the sub-centers designated by the MOT, such as, Ex-Railway Station, Tirana University Hospital Area, Student City, Aviation field, Kombinat, and Kamza hill (Koder Kamza); and the area along the Durres highway. There are many trips coming into these zones. Meanwhile, home-to-school trips show a different tendency, and zones with universities have large trip attractions.

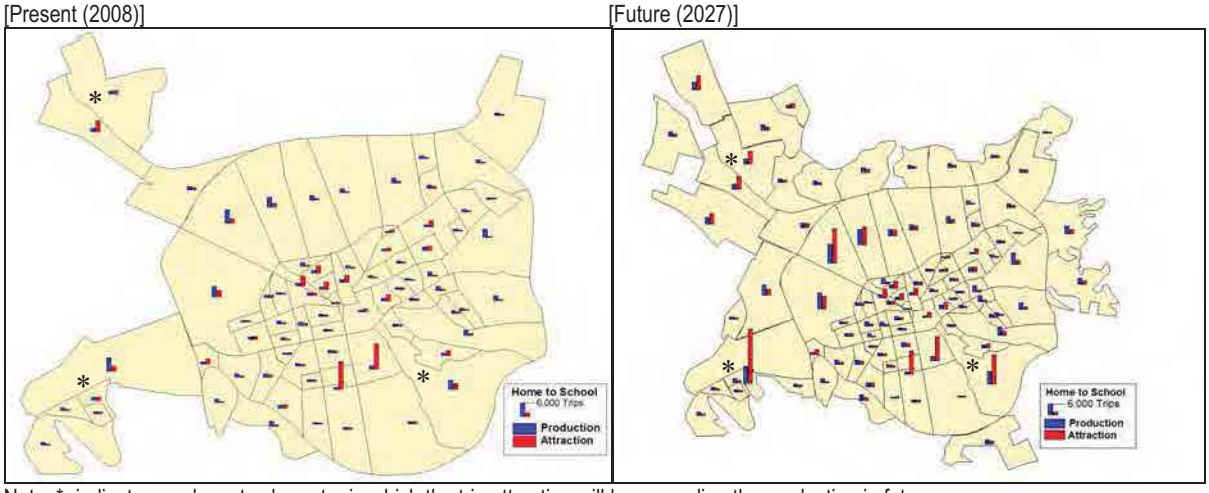
[Present (2008)] [Future (2027)]



Note: * indicates a relevant sub-center in which the trip atttraction will be exceeding the production in future.
Source: JICA Study Team

Figure 4.4.5 Home-to-Work Trip Generation by TAZ

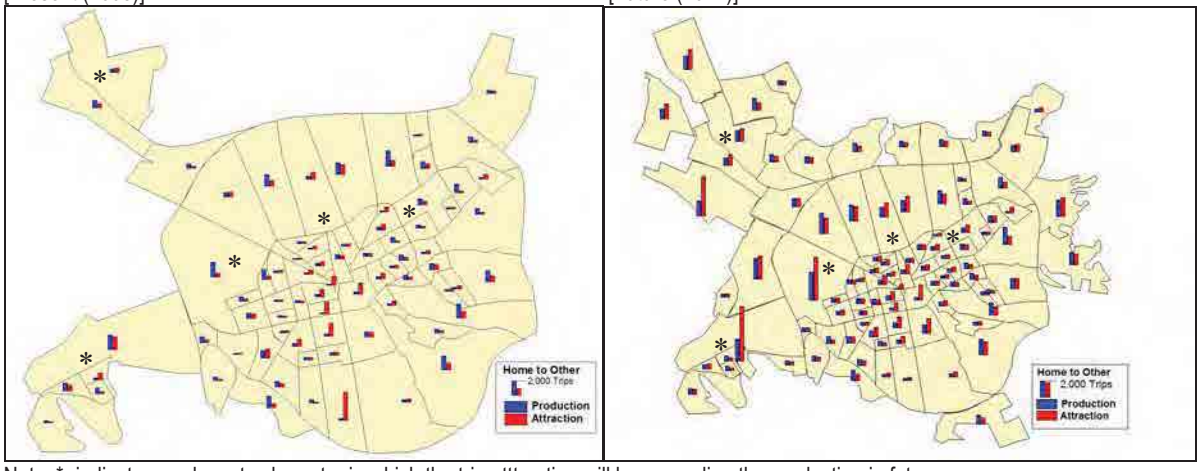
[Present (2008)] [Future (2027)]



Note: * indicates a relevant sub-center in which the trip attraction will be exceeding the production in future.
Source: JICA Study Team

Figure 4.4.6 Home-to-School Trip Generation by TAZ

[Present (2008)] [Future (2027)]

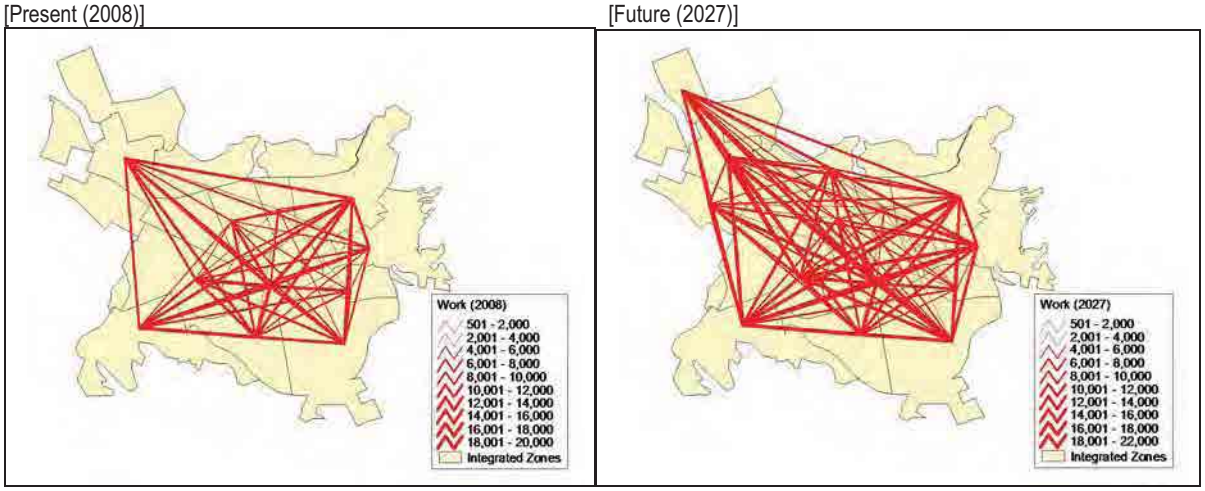


Note: * indicates a relevant sub-center in which the trip atttraction will be exceeding the production in future.
Source: JICA Study Team

Figure 4.4.7 Home-to-Other Trip Generation by TAZ

Then, the above total number of trips generated was distributed to each zone in proportion to the total trips calculated from the trip production and attraction models. The present and future distributions of home-to-work, home-to-school, and home-to-other trips in the morning peak hours (6:00-9:00 a.m.) between the integrated zones (11 zones for 2008 and 14 zones for 2027 based on the existing commune and mini-municipality boundaries except for the CBD) are illustrated in Figure 4.4.8, Figure 4.4.9, and Figure 4.4.10, respectively. Overall, most trips concentrate into the CBD. In the future, heavy movements between the integrated zones are observed all over Tirana and its vicinities, and the growth of trips toward the future is also remarkable for all the three purposes.

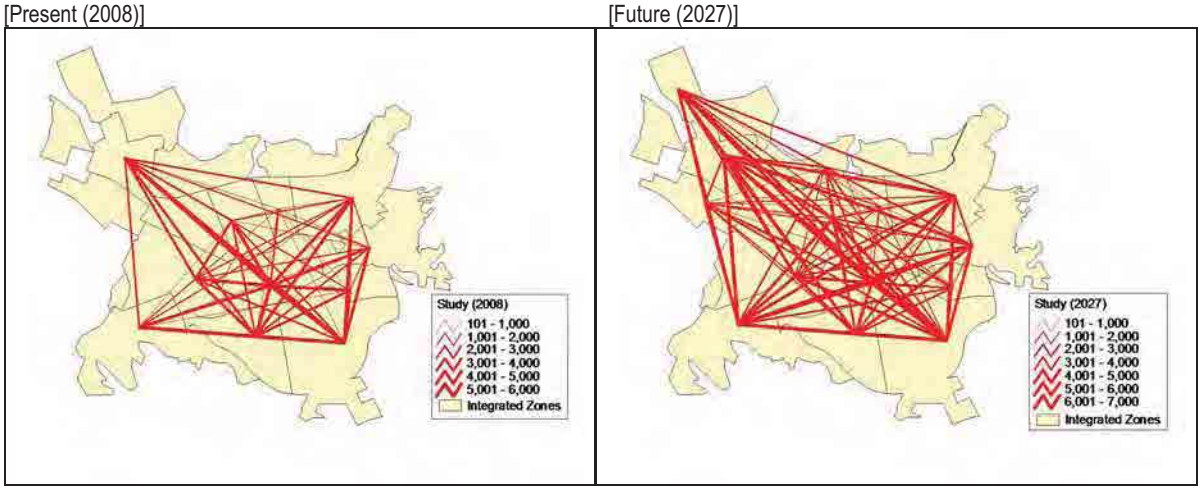
[Present (2008)] [Future (2027)]



Note: Unit: person trips per 3 hours (6:00-9:00 a.m.). Lines of less than 500 trips are filtered.
Source: JICA Study Team

Figure 4.4.8 Home-to-Work Trip Desire Lines between Integrated Zones

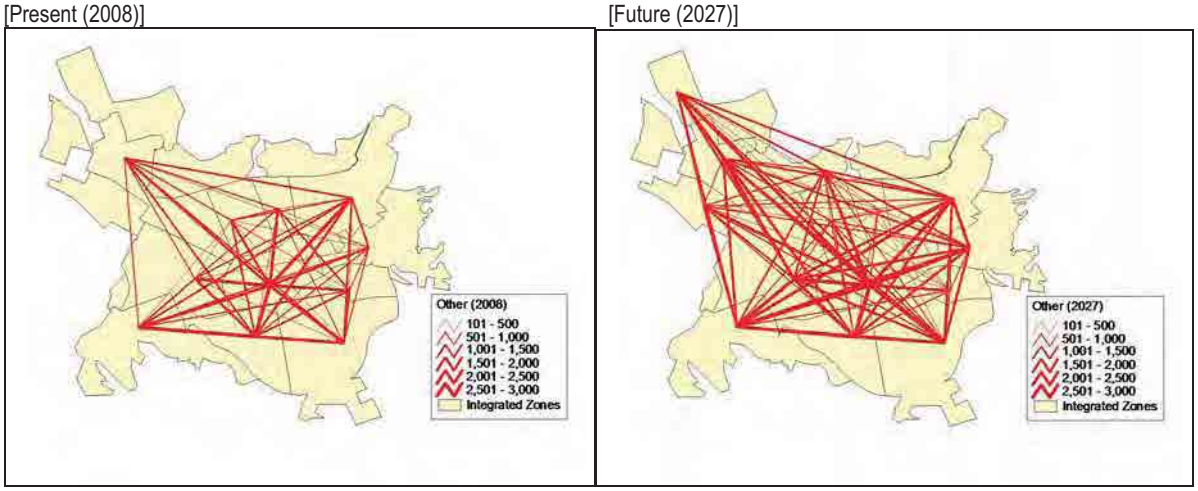
[Present (2008)] [Future (2027)]



Note: Unit: person trips per 3 hours (6:00-9:00 a.m.). Lines of less than 100 trips are filtered.
Source: JICA Study Team

Figure 4.4.9 Home-to-School Trip Desire Lines between Integrated Zones

[Present (2008)] [Future (2027)]



Note: Unit: person trips per 3 hours (6:00-9:00 a.m.). Lines of less than 100 trips are filtered.
Source: JICA Study Team

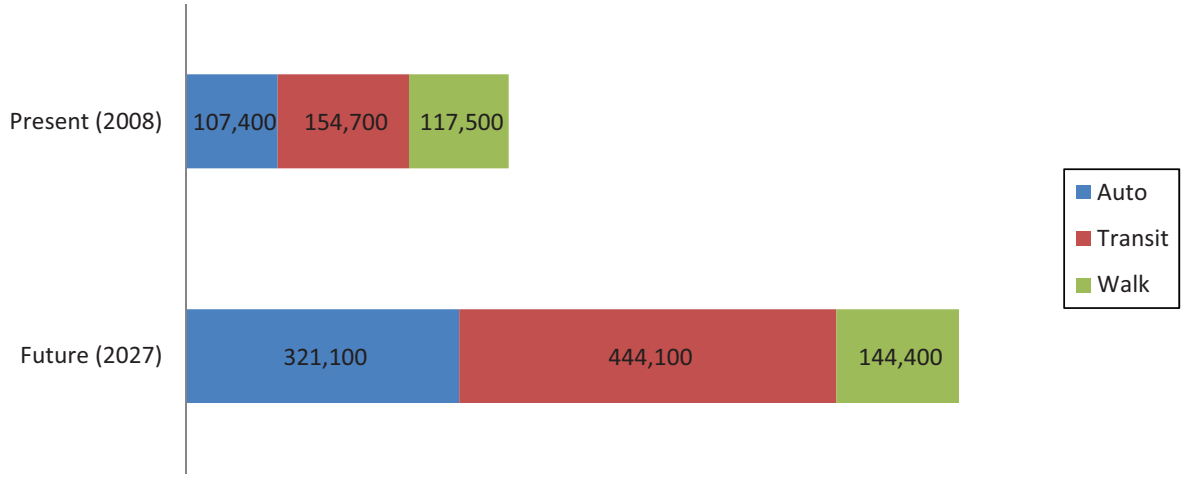
Figure 4.4.10 Home-to-Other Trip Desire Lines between Integrated Zones

Then, the above OD matrices by trip purpose have been split into the auto, transit, and walk modes through the modal split model. Total present and future trips by purpose and by mode in the morning peak are presented in Table 4.4.4. Overall, the total number of trips in Tirana in the morning peak hours (6:00-9:00 a.m.) will significantly increase in future. The growth from 2008 to 2027 is estimated to be about 2.4 times. In terms of mode shares, both auto and transit modes will gain shares; whereas the walk mode will be losing its share while the total number itself will be increasing. This may be because the average travel distance is expected to be longer as the Tirana metropolitan area will expand along with additional surrounding development zones in future. Additional trips will be made either by auto or by transit. Thus, significant increase in both auto and transit trips is expected in future, and the growth is estimated to be nearly three times.

Table 4.4.4 Total Present and Future Trips in Morning Peak (6-9 a.m.) by Purpose and by Mode

Trip Purpose	Present Person Trips (2008)				Future Person Trips (2027): Do Nothing Case			
	Auto	Transit	Walk	All Modes	Auto	Transit	Walk	All Modes
Home-To-Work	97,000 (37%)	103,500 (40%)	60,400 (23%)	260,900 (100%)	295,300 (47%)	265,300 (42%)	72,900 (12%)	633,600 (100%)
Home-To-School	5,600 (8%)	39,900 (55%)	27,000 (37%)	72,500 (100%)	20,900 (11%)	119,300 (64%)	45,900 (25%)	186,100 (100%)
Home-To-Other	4,800 (10%)	11,300 (24%)	30,200 (65%)	46,300 (100%)	4,900 (5%)	59,500 (66%)	25,600 (28%)	89,900 (100%)
Total	107,400 (28%)	154,700 (41%)	117,500 (31%)	379,700 (100%)	321,100 (35%)	444,100 (49%)	144,400 (16%)	909,600 (100%)

Source: JICA Study Team



Source: JICA Study Team

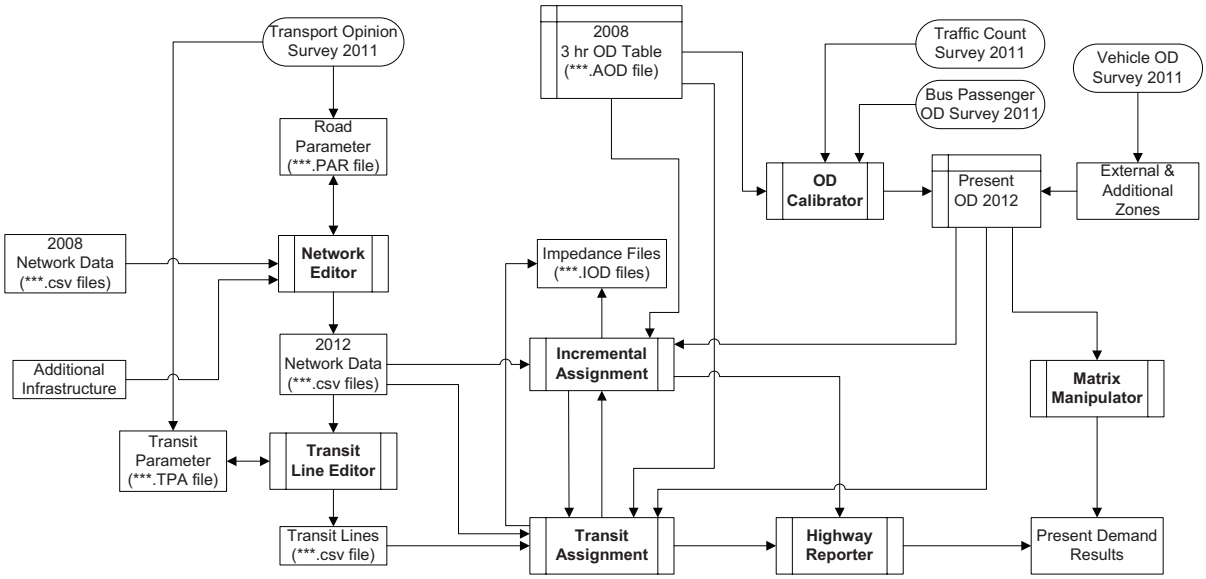
Figure 4.4.11 Total Present and Future Trips in Morning Peak by Mode

(2) Trip Assignment

When travel demand, which is called an OD matrix, is estimated and a network is developed, the traffic demand on the network can be forecast. This section shows the results of an estimation of the following cases:

- Base Year Case: Assigns the current travel demand on the base year (i.e., 2012) highway network. This will be the basis for evaluating alternatives.
- Do-nothing Case: Assigns the future travel demand on the base year highway network. This is an imaginary case and it can reveal the necessity of road construction and improvement to meet the future demand.

As for development of the base year case, the OD matrices from the Household Survey in 2008 have been updated to 2012 based on the observation data from Traffic Count Survey, Vehicle OD Survey, and Bus Passenger OD Survey conducted in 2011 as illustrated in Figure 4.4.12. Furthermore, additional TAZs around the city of Tirana have been added in the network, which now consists of 93 TAZs in total. Travel cost information from Transport Opinion Survey has also become an input to the highway and transit network parameters in JICA STRADA.



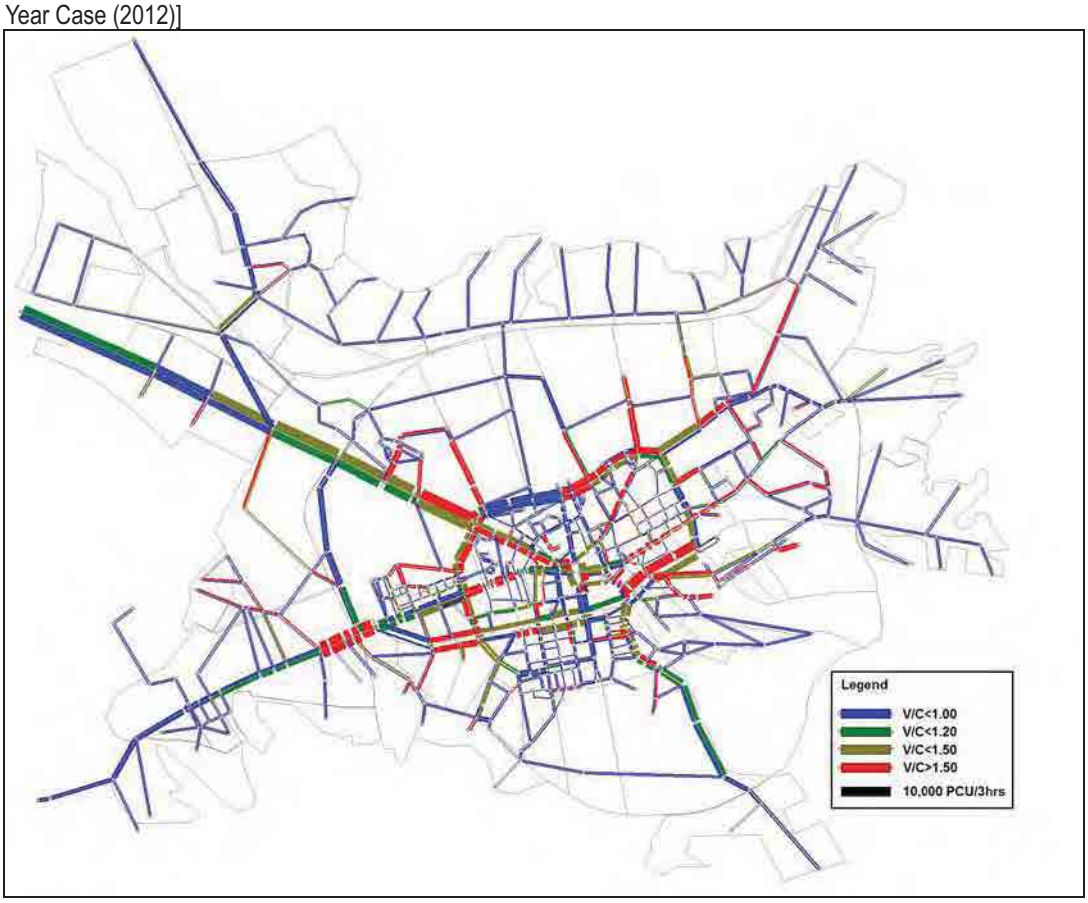
Note: **Bold** letters indicate program modules of JICA STRADA.

Source: JICA Study Team

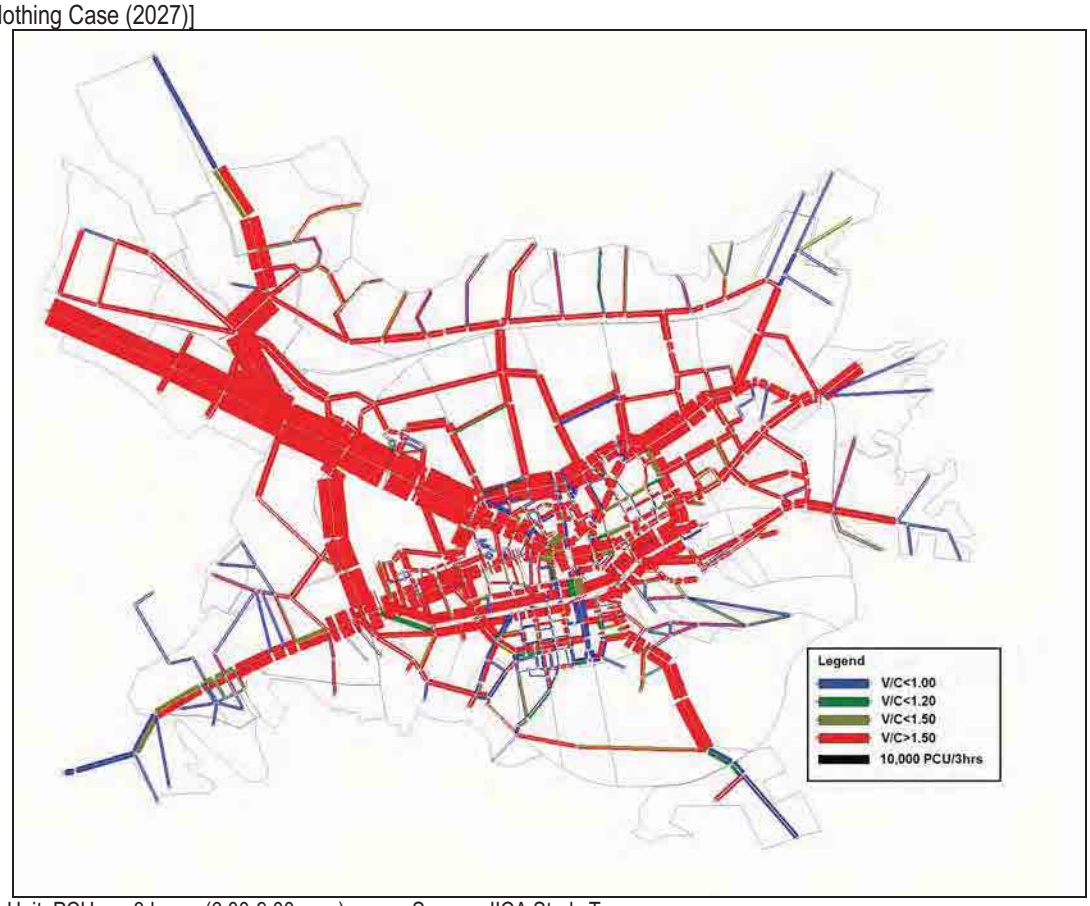
Figure 4.4.12 Workflow for Development of the Base-Year (2012) Travel Demand Case

The result of the trip assignment in the above two cases are presented in Figure 4.4.13. As of 2012, there seem to be no major problems regarding the traffic condition in the road network in the morning peak hours except for some radial primary roads. However, if no action is taken, traffic concentration with a V/C ratio over 1.5 is forecast to occur on so many roads connecting the center and the suburban areas. This "do-nothing" case scenario may be an extreme case; hence, in reality, many private car users may shift to transit due to this severe traffic congestion. In any case, it implies that significant improvement on the road network capacity will be necessary to accommodate the increasing vehicular traffic in future.

[Base Year Case (2012)]



[Do-Nothing Case (2027)]



Note: Unit: PCU per 3 hours (6:00-9:00 a.m.). Source: JICA Study Team

Figure 4.4.13 Estimated Traffic Volume in Present and Future

On the other hand, if the transportation network proposed in the subsequent sections has been developed, traffic congestion for the target year 2027 will improve as shown in the subsequent sections (Figure 4.6.14). In addition to the developed road network in future, since significant traffic demand management (TDM) policies such as parking pricing will shift private vehicle users to public transportation, traffic concentration will be alleviated with a V/C ratio of less than 1.0 on many roads.

4.5 Planning Objectives and Strategies

4.5.1 Goals of Transportation System Development

Based on the visions and planning objectives for developing Tirana as well as the planning issues of the road and urban transportation sector, the following three main goals of transportation system development in Tirana have been identified:

- Efficiency,
- Equity, and
- Better Environment.

Each of the above goals is explained below.

(1) Efficiency

An efficient transportation system should be developed to strengthen urban functions, to enhance people's quality of life, to facilitate economic activities, and to sustain stable economic growth in Tirana. It is of great significance to achieve efficiency by decreasing negative externalities such as economic loss of travel time caused by increasing traffic. The efficiency in transportation can be achieved by balancing the growing travel demand and the transportation infrastructure supply or innate capacity.

There are three ways to balance the demand and the supply: 1) by increasing and recovering the infrastructure capacity to meet the demand; 2) by optimizing utilization of the existing transport infrastructure through efficient transportation control measures (TCMs); and 3) by decreasing excessive vehicular traffic demand through transportation demand management (TDM) and diverting private vehicle users to public transport.

(2) Equity

Equity means that a certain minimum level of mobility should be assured and provided for all members of the society. Not only automobiles but also all modes of transport should have a right to share the public space and travel around the city freely and safely in order.

On the other hand, some low-income people cannot afford to pay expensive transportation costs. Some socially vulnerable people including the aged and the handicapped have difficulties in their mobility. Affordable and sufficient level of transportation services should be provided for those people especially by improving the public transport system.

(3) Better Environment

As implied in the visions of Tirana, for the low-pollution and low-carbon "environment-friendly livable city," air pollution and noises caused by automobiles should be minimized by promoting public transport use and controlling the traffic demand. At the same time, air pollution and noises should be reduced by applying stricter vehicle emission standards. The above-mentioned TCMs were originally designed to reduce air pollutant emissions. [3]

In addition, traffic safety should be enhanced and the number of accident victims should be

[3] *1990 Clean Air Act Amendments (Section 176(c))*. Public Law 101-549. The United States of America.

minimized through the enforcement of laws and regulations, intensive public campaigns, and training and education of drivers as well as the general public. Improvement of traffic facilities through engineering design would also contribute to the reduction of traffic accidents.

4.5.2 Urban Transportation Objectives

In order to achieve the above-mentioned three main goals of transportation system development in Tirana, four major urban transportation objectives have been listed as described below along with more specific policies.

(1) Enhancement of Road Network Capacity that Supports Economic Activities

- To structure a hierarchical road network to support multi-core, integrated urban sub-centers and to meet the growing future travel demand
- To increase road capacity through development and improvement of road network
- To make the most of the existing capacity through efficient TCMs and avoid excessive traffic concentration through TDM
- To structure a functional goods distribution system

(2) Promotion of Public Transport Use

- To improve the route structure and the level of service of the existing bus transport
- To introduce new mass transit systems, preferably tram systems
- To facilitate more effective dedicated bus lanes as a base of BRT (bus rapid transit) and organize intercity bus terminals
- To keep the affordable public transport fare under supervision of one managerial body

(3) Intermodal Development/Transit Oriented Development

- To enhance intermodality through development and improvement of transfer facilities
- To apply functional transit-oriented development for major public transport corridors with a balanced urban spatial structure

(4) Realization of An Environmentally Sound Transportation System

- To apply TCMs to reduce air pollution
- To enhance traffic safety and environment through law enforcement and public campaigns as well as through user-friendly transportation facilities for all travel modes

4.5.3 Road Development Corridors

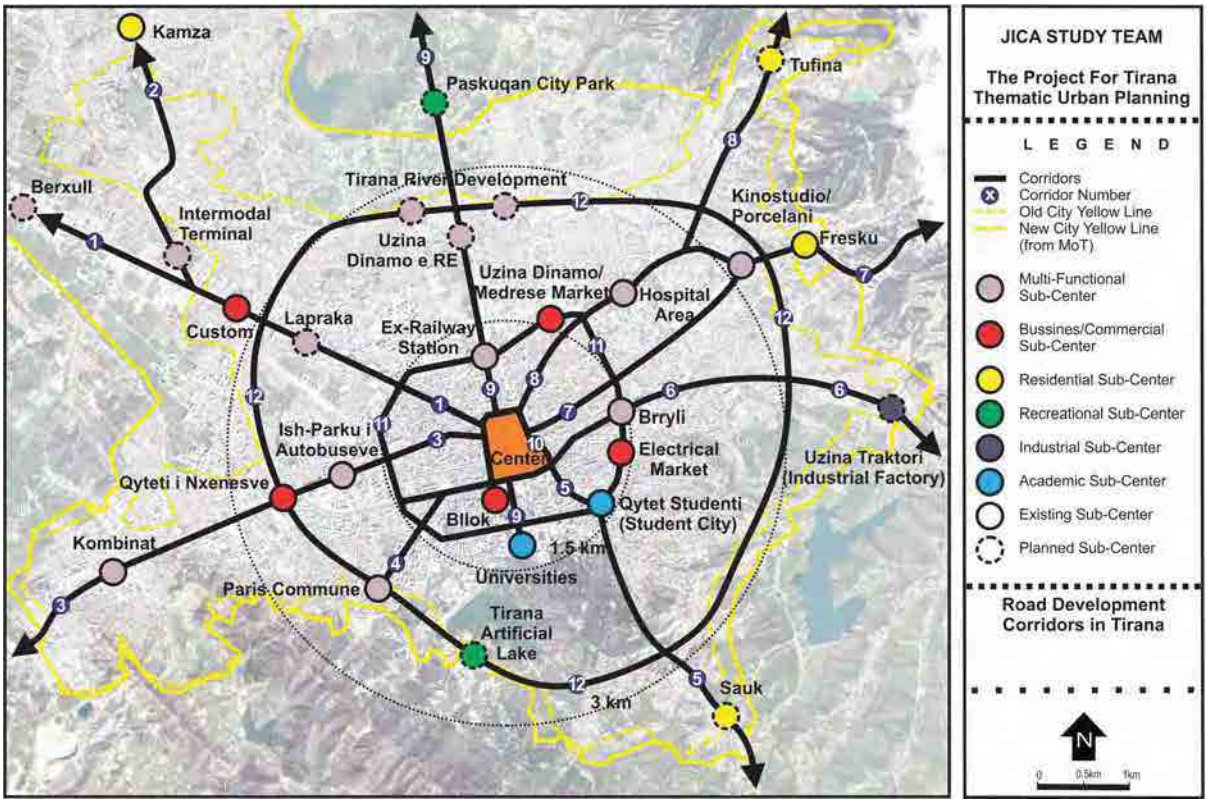
Historically, radial roads were first developed in Tirana, while ring roads were then constructed as the city expanded outwards. Since the pattern indicates a concentric development, traffic concentrates in the city center. It is necessary, therefore, to disperse traffic demands in the city center by providing sub-centers around it.

Metropolitan spatial structures in Tirana are formed through major road corridors that have formed radials and rings. In principle, ring and radial corridors should be composed of primary roads in which the capacity should be secured to the maximum while the right-of-way (ROW)

should be provided for public transport. A proposal for a future road development network in Tirana is shown in this section.

(1) Radial Corridors

As shown in Figure 4.5.1, the road network in Tirana will have nine radial corridors: (1) Durres Corridor; (2) Kamza Corridor; (3) Kavaja Corridor; (4) Paris Commune Corridor; (5) Elbasan Corridor; (6) Uzina Traktori Corridor; (7) Dajti Corridor; (8) Tufina Corridor; and (9) Paskuqan Corridor. Each corridor is served by at least one primary road. Ideally, fundamental ring roads and radial roads are composed of primary roads, serving major existing and planned sub-centers in Tirana. In addition, secondary roads, which complement the fundamental road network, should also be constructed.



Source: JICA Study Team

Figure 4.5.1 Road Development Corridors in Tirana

Among the nine radial corridors, (9) Paskuqan Corridor, which runs straight to the north from the center along the existing boulevard (Zogu I Boulevard), should be extended north toward Paskuqan as a major road network corridor. Large housing and other developments are planned on this corridor, which will match with the development directions of the MOT. Furthermore, (4) Paris Commune Corridor, which runs southwestward from the center to Paris Commune; (6) Uzina Traktori Corridor, which connects to the old and planned industrial area in the east of Tirana; and (7) Dajti Corridor, which connects to Kinostudio/Porcelani in Tirana and Fresku, a new residential center in Dajti Commune, should be added as major road network corridors.

(2) Ring Corridors

A ring road system has a variety of functions which are roughly classified into those for handling traffic flow and for supporting urban structures as described below. Though it depends on the topography and conditions of the city, generally speaking, the scale of a city which needs a ring road system to handle increasing traffic volume is considered to be a city with a population of 200,000 or more. It should also be noted that a (primary) ring road system becomes the most effective only after the road becomes fully available for service.

1) Functions for Handling Traffic Flow

- To protect an urban center from excessive traffic concentration, a ring road system smoothly disperses and induces external and internal trips to recover urban functions in the urban center, as a function of an internal road; and
- To make through traffic, which has neither origin nor destination in the city, detour the city. Hence, the through traffic is eliminated from the urban area, resulting in relieving traffic congestion in the urban area and improving the urban environment.

2) Functions for Supporting Urban Structures

- To connect key urban sub-centers such as industrial development in the suburban areas where arterial roads are less available and to induce appropriate urbanization, as a function of an external ring road; and
- To convert a current mono-centric city into a multi-core dispersed one in an urban zone where most traffic passes through, as a function of an external ring road.

If a new ring road is to be constructed in an already developed urban area, it will be subject to many social restrictions such as environmental factors and land uses. Hence, due consideration should be given to these factors in planning the ring road system so that it would become more practical. The following table indicates the standards of locations and structural requirements of ring roads by scales of cities.

Table 4.5.1 Locations and Structural Requirements of Ring Roads by Scale of Cities

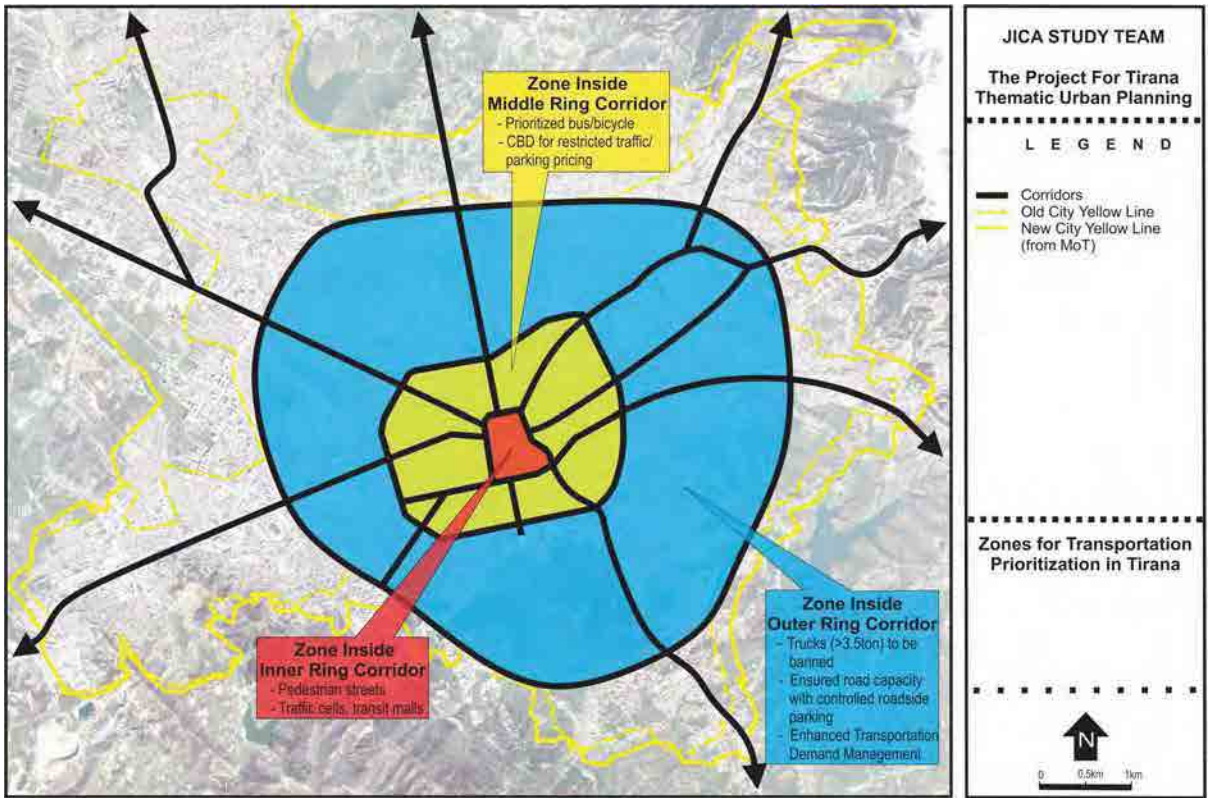
Location	Metropolitan City (Population: 2 million or more)	Regional Core City (Population: 500,000 to 2 million)	Local Main City (Population: Less than 500,000)
Internal Ring Road	Highway with partial grade separation or at-grade road	At-grade road	(no definite ring roads required)
External Ring Road	Expressway	Expressway or highway with partial grade separation	Highway with partial grade separation or at-grade road

Source: "Road Network Planning," JICA Highway Seminar, 1993-1996.

In the case of Tirana, while it is classified as a "regional core city" from a viewpoint of the population scale, it should have a road network that could support many more functions as a "metropolitan city." Hence, following the ongoing ring road and multi-core urban developments, a structure of three major ring corridors has been proposed: (10) Inner Ring Corridor; (11) Middle Ring Corridor; and (12) Outer Ring Corridor. All those three corridors should be served by primary roads with a sufficient capacity to meet the demand of growing vehicular and passenger traffic. The three major ring corridors should also help to define the concept of transportation prioritization plans that are explained in the subsequent subsection.

4.5.4 Priority of Transportation Modes by Zone

The above road development corridors can clearly indicate the road functions along with what transportation modes need to be prioritized. The principal policy measures for transportation prioritization by zones that are separated by the three major ring corridors in Figure 4.5.2 are described below.



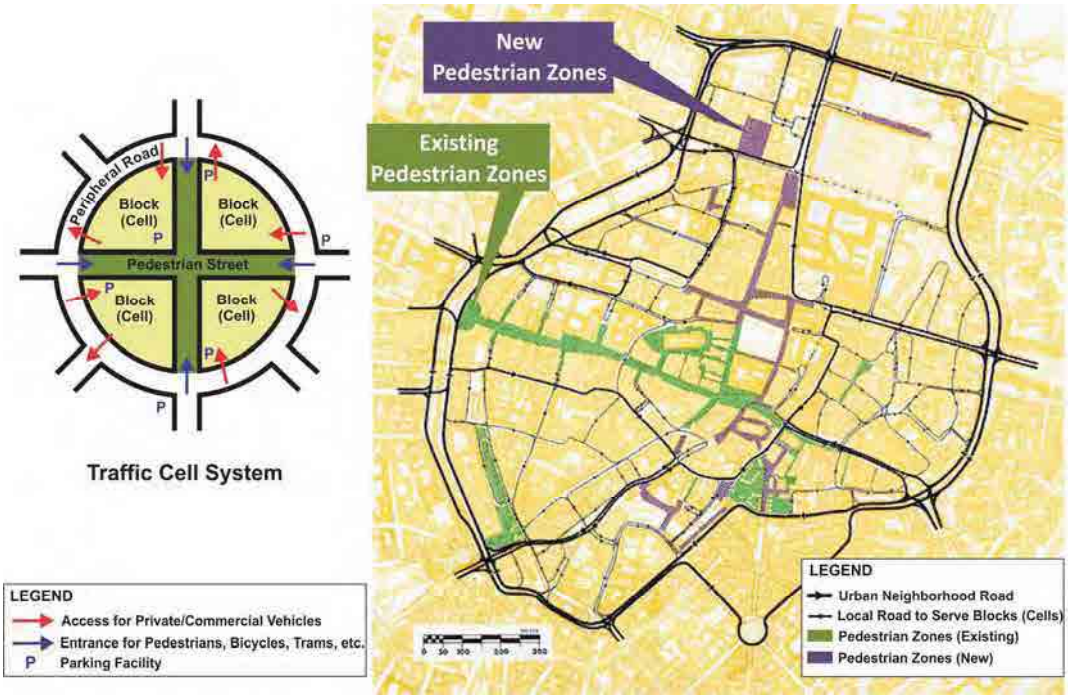
Source: JICA Study Team

Figure 4.5.2 Zones for Transportation Prioritization

(1) Zone inside Inner Ring Corridor

In the zone inside the inner ring corridor, pedestrians should be given priority, and thus the private vehicle traffic should be greatly reduced in order to realize a public transport user-friendly environment and to introduce transit malls as a center of the city. Thus, several roads in this zone should be converted to pedestrian streets that are closed to private vehicles except for public transport.

Inside the inner ring corridor, pedestrian streets could be realized through a concept of "traffic cell" system. As illustrated in Figure 4.5.3, the basic concept is that, while only pedestrians, bicycles, and selected public transport vehicles are allowed to enter the pedestrian streets, all the blocks (traffic cells) that are divided by the pedestrian streets can still be accessed by private and commercial vehicles from the peripheral roads. Some other roads may remain as ordinary roads as an exception to serve some block with vehicular traffic in case it is difficult to access. Operation for a limited time period of the day may be an option. Meanwhile, some pedestrian streets could be developed as "transit malls." It should also be noted that parking facilities should be provided at nearby places on and around the inner ring corridor.



Source: JICA Study Team

Figure 4.5.3 Traffic Cell System: An Example of Munich

(2) Zone inside Middle Ring Corridor

In the zone inside the middle ring corridor, which is also defined as the CBD, public transport and bicycles should be prioritized over private vehicles. On-street parking should be basically prohibited especially on the primary roads inside this zone to secure enough space for ROW of public transport (i.e., dedicated bus lanes or tramlines) and bicycles (i.e., bicycle lanes). Though on-street parking could remain on some secondary and local roads, efficient TDM such as a parking pricing scheme along its enforcement should be applied in this zone to restrict the vehicular traffic. Needless to say, provision of enough off-street parking facilities in this zone is essential for this purpose.

(3) Zone inside Outer Ring Corridor

In the zone outside the outer ring corridor, which covers most of the city of Tirana, both public transport/bicycle and private vehicles should be equally prioritized. For this, the roads capacity in this zone should be secured with controlled on-street parking. While private vehicles can freely run on the roads, enhanced TDM measures such as a parking pricing scheme should also be applied in this zone to restrict the private vehicle traffic.

Furthermore, the area where trucks (excluding vehicles with a 3.5-ton or lower loading capacity) should be banned from passing should be expanded from the current zone inside the middle ring corridor to the zone inside the outer ring corridor in order to ensure a better living environment for the citizens. Certain hours of the day such as nighttime may be reserved to be excluded from this operation for larger trucks to directly serve the area inside the outer ring corridor. In the daytime, it could be served by smaller trucks dispatched from a metropolitan logistic center that is planned along the primary road on or outside the outer ring corridor.

4.6 Road Development Plan

4.6.1 Road Network Hierarchies

There is no national road inside Tirana, and all the roads are under the jurisdiction of the MOT. Based on the Road Code of the Republic of Albania (Law No. 8378, dated 22.7.1998), there are three main road categories:

1) Primary Road

Primary roads are main roads with a high capacity, with a separate carriageway, or divided by traffic separators, each with at least two moving lanes, with one lane reserved for public vehicles, and with at-grade intersections equipped with traffic signals. There are also sidewalks provided. Stopping areas or side belts to access the carriageway are also to be provided. Primary roads should serve the following three functions:

- To connect the city center with main rural roads which lead to Tirana;
- To bypass the city center; and
- To connect different sub-centers of the city.

2) Secondary Road

Secondary roads are urban roads of medium high capacity with a carriageway having at least two moving lanes, paved shoulders and sidewalks. Stopping areas or side belts to access the carriageway are also to be provided. Secondary roads should serve the following two functions:

- To collect/disperse traffic between primary roads and lower-capacity roads of the network; and
- To interconnect blocks of the MOT.

3) Local Road

These are all other kinds of connecting roads with a low capacity designated for local entrances of the municipality blocks.

There are other minor roads that are not classified at all because they serve only for parking or for interconnection between a few buildings in the residential blocks.

Urban road function definitions in the context of Tirana are presented in Table 4.6.1. The primary road system mainly serves traffic between urban sub-centers. In effect, the primary system has relatively longer distance trips. It also should serve the public transport (i.e., bus or tram), and hence should reserve the ROW on the road especially in the CBD.

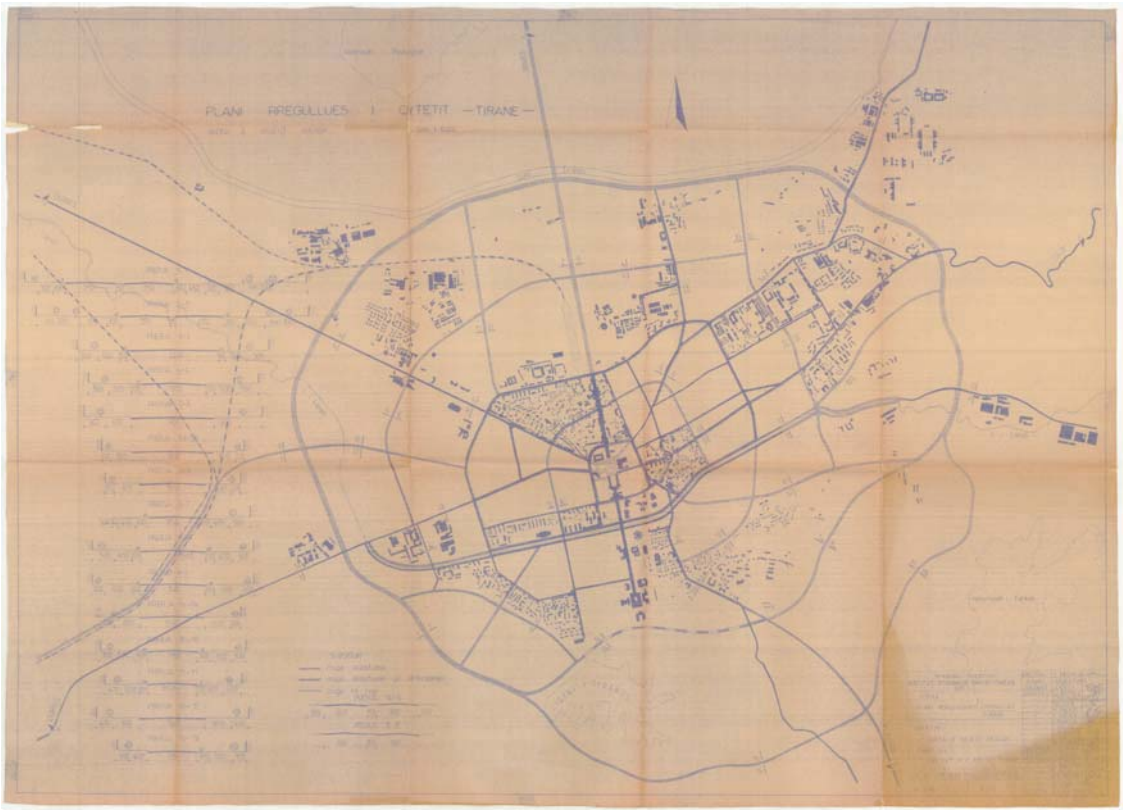
Table 4.6.1 Definition of Urban Road Functions

Road Type	Function	Trip Distance	Access Control	ROW for Public Transport	On-Street Parking	Standard Capacity (4 lanes)	Required Road Width
Primary Road	Linking the center with interurban roads outside Tirana Bypassing the center/CBD Linking urban sub-centers	Longer	Partial access control with traffic separators	Reserved in CBD	Prohibited	5,300 (pcu/hour)	Minimum 25m
Secondary Road	Collecting/dispersing traffic between primary roads and other roads Interconnection between blocks	Medium	No access control	Not reserved	Controlled	3,500 (pcu/hour)	Minimum 17m
Local Road	Local entrances of blocks	Shorter	No access control	Not reserved	Controlled	2,200 (pcu/hour)	Minimum 12m

Source : JICA Study Team, based on the Road Code of the Republic of Albania (Law No. 8378, dated 22.7.1998).

While some primary roads are designed usually with partial access control, the secondary road system has no access control at all. These two road systems should be smoothly integrated with each other. For development of secondary roads, some road sections should be widened and reconstructed, while some missing links should be newly constructed. It should also be noted that both land acquisitions and environmental issues should be settled before actual implementation starts, because these tend to be serious obstacles in realizing the plan.

In order to minimize the difficulties of land acquisitions and to make the plans more realistic, the proposed road development should follow the road alignments in the previous Regulatory Plan of 1989 (Figure 4.6.1) as much as possible, because those road alignments have already been widely recognized by the public and thus have been the only basis for development control such as building permission by the MOT, even though the roads have not been constructed yet.



Source: Regulatory Plan (1989)

Figure 4.6.1 Previous Regulatory Plan of 1989

4.6.2 Principal Policy Measures for Road Development

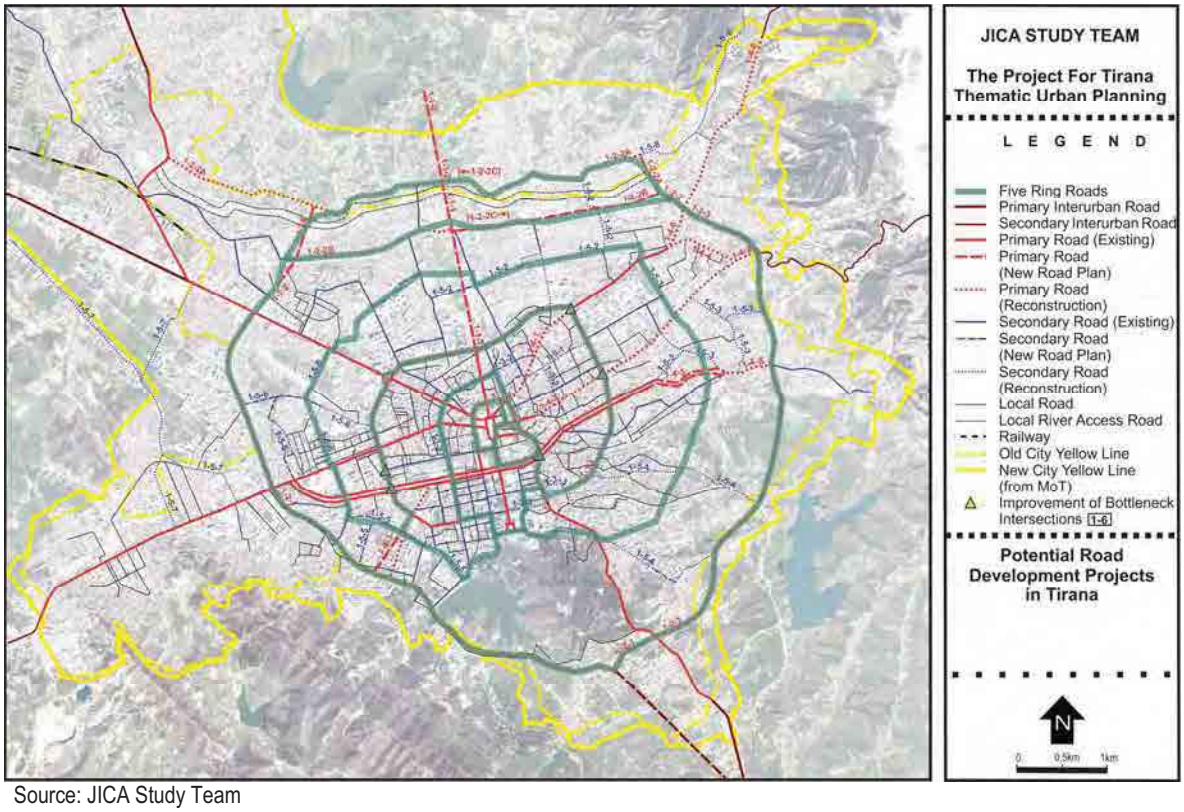
Taking the road development corridors explained in the previous section into account, the principal policy measures for road network development and public transport prioritization are described below:

- Formulation of road network through proper classes of roads so that the whole network will function efficiently and effectively. This includes developing new roads that will especially complete the current missing links, reconstructing existing roads that will often involve road widening, improving the current bottleneck intersections that may involve grade separation, developing full or partial access control that will physically separate through-traffic from local traffic, etc.;
- Increasing road capacities to fulfill the traffic demands and to minimize the demand and capacity gap especially in the CBD, while reserving the ROW for public transport and bicycles through efficient TCMs;
- Road development should aim not only to cope with the traffic congestion issues but also to lead to a desirable multi-core urban structure;
- Following the general city planning, primary and secondary roads should be placed at intervals of 400 to 700 m in the CBD, while, for other residential areas, they should be placed at intervals of 700 to 900 m, which will also enable easy access to the public transport lines; and

- As mentioned earlier, the proposed road development should follow the road alignments in the previous Regulatory Plan of 1989 as much as possible for better and more realistic implementation of the plans.

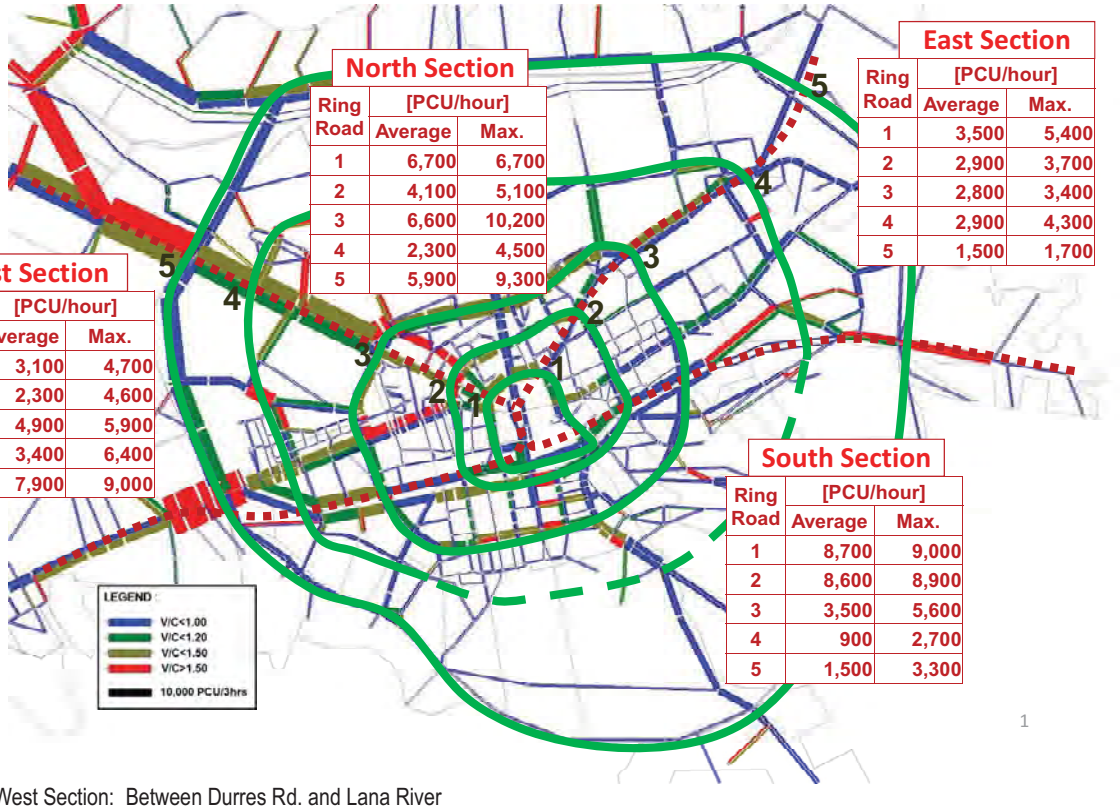
4.6.3 Testing Potential Road Development Projects

The potential road development projects to be tested in light of the future demand and feasibility include the "five ring roads" that was tentatively planned by the MOT as shown in Figure 4.6.2. Based on the future travel patterns and volumes, the future traffic demand on the "five ring roads" is extracted from the approximately corresponding links in the demand forecast result. The average and maximum volumes on each section (i.e., north, east, south, and west) of the five ring roads are summarized by section and presented in Figure 4.6.3. These projects, especially the five ring roads, were studied further in terms of the future demand forecasts as well as the feasibility as discussed below. Furthermore, based on the future demand which stands for the population of beneficiaries, some road projects with extremely little future traffic volume could be removed from the original proposal.



Source: JICA Study Team

Figure 4.6.2 Potential Road Development Projects with Tentative "Five Ring Roads" in Tirana



Note: West Section: Between Durres Rd. and Lana River
North Section: Between Durres Rd. and Dibra (Arber) Rd.
East Section: Between Dibra (Arber) Rd. and Lana River
South Section: South of Lana River
Source: JICA Study Team

Figure 4.6.3 Hourly Traffic Volumes on "Five Ring Roads" by Section (2027)

(1) Ring Road 1 (Inner Ring Road)

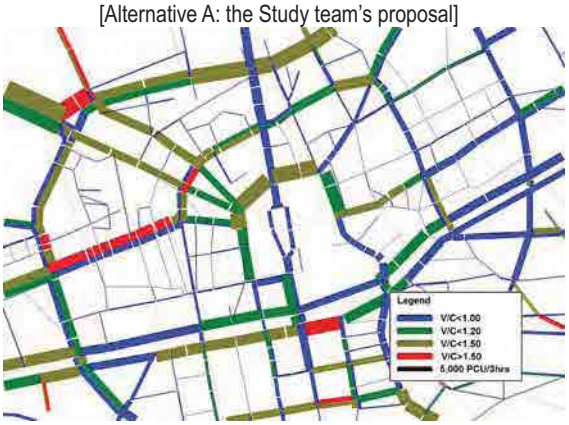
For completion of Ring Road 1, or the Inner Ring Road, the northeast corner (about 130 m in length) is yet to be constructed as shown in Figure 4.6.4. Meanwhile, in the MOT's new plan, this missing link development is no longer included, and the existing roads are to be utilized to form a "twin rings" structure instead. However, as explained earlier, the inner ring corridor is important to serve as a zone that is basically closed to private vehicles except for public transport as one of the important TCMs.

Source: JICA Study Team

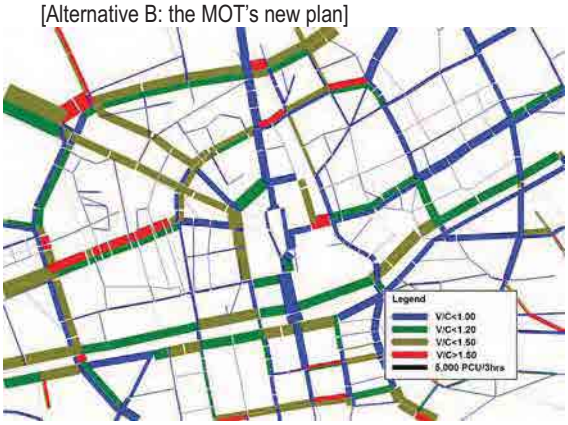
Figure 4.6.4 Comparison of Two Routes of Ring Road 1 (Inner Ring Road)

To analyze the benefit of developing the missing link, the above two alternative routes were tested for the future demand forecast. Results of the future demand forecasts are presented in Figure 4.6.5. In Alternative A, which includes development of the missing link as proposed by the Study team, there is no major traffic congestion observed around the Inner Ring Road though some roads inside the ring road are converted into pedestrian streets and thus are removed from the road network. On the other hand, in Alternative B, namely, the MOT's new plan, considerable traffic congestion is observed on Ring Roads 1, 2, and 3.

[Alternative A: the Study team's proposal]



[Alternative B: the MOT's new plan]



Note: Unit: PCU per 3 hours (6:00-9:00 a.m.). Source: JICA Study Team

Figure 4.6.5 Traffic Demand Forecast of Alternative Routes for Inner Ring Road (2027)

Development of the missing link may also be justified in terms of its economic feasibility. Result of a preliminary economic evaluation of the missing link construction project, of which

project cost is estimated at around 627 million Lek, is presented in Table 4.6.2. The economic internal rate of return (EIRR) value, which is derived from the savings of the total travel time and vehicle operation cost, is approximately 92%, which is considered to fulfill the evaluation criteria of the EIRR (i.e., target of 10%) very well, with a benefit-cost ratio of around 24.4.

Table 4.6.2 Preliminary Economic Evaluation Results of Missing Link Construction Project

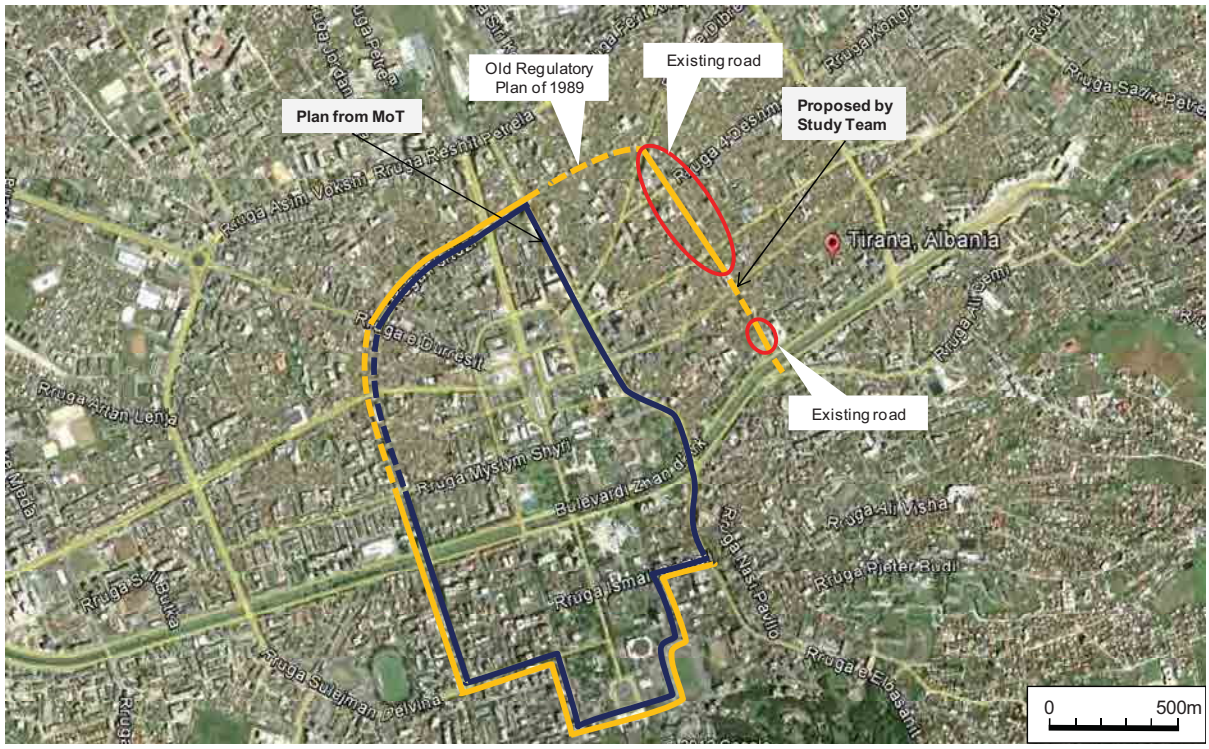
EIRR	B/C (discount rate: 10%)
92.1%	24.39

Source: JICA Study Team

Thus, the Study team recommends development of the missing link on the Inner Ring Road, which is expected to be more effective not only in alleviating the traffic congestion but also in serving as a pedestrian zone to enhance the public transport usage as one of the important TCMs that are to be described later.

(2) Ring Road 2 (Intermediate Ring Road)

In the MOT's new plan, the east section of Ring Road 2, or the Intermediate Ring Road, is not following the original route planned in the old Regulatory Plan of 1989, but it utilizes the existing road (Barricades Road), as shown in Figure 4.6.6. The peak-hour traffic demand forecast on this section is approximately 2,900 PCU per hour; hence, development of a secondary road should be sufficient. Since building permission was relatively strictly controlled along the originally planned route of the Intermediate Ring Road based on the old Regulatory Plan of 1989, there are only informal houses that may be relocated for expropriation for this road. Thus, the Study team considers that the development of the east section of the Intermediate Ring Road could be realized by avoiding buildings with permissions and utilizing the existing roads in part.

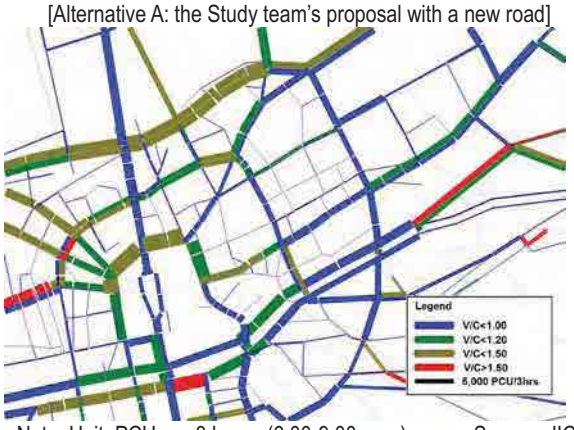


Source: JICA Study Team

Figure 4.6.6 Comparison of Two Routes of Ring Road 2 (Intermediate Ring Road)

To analyze the benefit of developing the east section of the Intermediate Ring Road, the above two alternative routes were tested for the future demand forecast. Results of the future demand forecasts are presented in Figure 4.6.7. In Alternative A, which includes development of the east section of the Intermediate Ring Road as proposed by the Study team, there is no major traffic congestion observed around the east section of the Intermediate Ring Road. On the other hand, in Alternative B, namely, the MOT's plan without a new road, considerable traffic congestion is observed especially on the Middle Ring Road (i.e., Ring Road 3).

[Alternative A: the Study team's proposal with a new road]



[Alternative B: the MOT's plan without a new road]

Note: Unit: PCU per 3 hours (6:00-9:00 a.m.). Source: JICA Study Team

Figure 4.6.7 Traffic Demand Forecast of Alternative Routes for Intermediate Ring Road (2027)

Development of the east section of the Intermediate Ring Road may also be justified in terms of its economic feasibility. Result of a preliminary economic evaluation of the east section project, of which project cost is estimated at around 3.9 billion Lek, is presented in Table 4.6.3. The EIRR value, which is derived from the savings of the total travel time and vehicle operation cost,

is approximately 12%, which is considered to fulfill the evaluation criteria of the EIRR (i.e., target of 10%), with a benefit-cost ratio of around 2.7.

Table 4.6.3 Preliminary Economic Evaluation Results of Intermediate Ring Project

EIRR	B/C (discount rate: 10%)
11.9%	2.65

Source: JICA Study Team

Thus, the Study team recommends development of the east section of the Intermediate Ring Road, which is expected to be more effective in alleviation of the traffic congestion by smoothly collecting and dispersing traffic in the urban area.

(3) Ring Road 3 (Middle Ring Road)

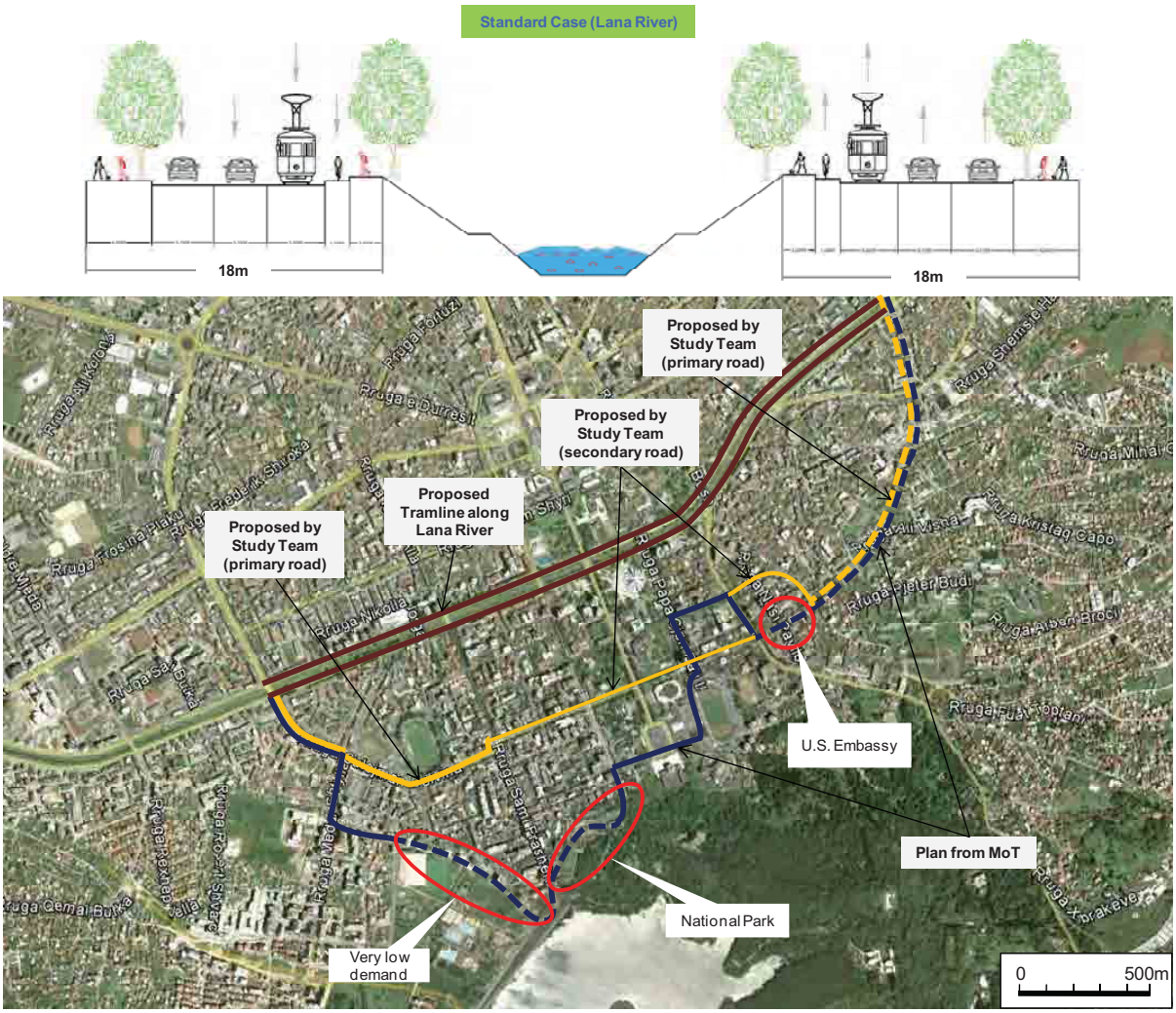
Ring Road 3, or the Middle Ring Road, has important functions for handling the traffic flow as the main internal ring road of the city. That is, it serves to protect the city center from excessive traffic concentration by smoothly collecting and dispersing traffic in the urban area. Moreover, it serves to make through traffic detour the city. Hence, the through traffic is eliminated from the CBD, resulting in relieving traffic congestion in the CBD and improving the urban environment. It should also be noted that traffic includes not only private vehicles but also traffic of public transport passengers and non-motorized transport (bicycles).

The Middle Ring Road is also important for development of an additional tramline proposed by the Study team. Each section is studied further in light of the tramline development as well.

1) South Section

The south section of Ring Road 3, or the Middle Ring Road, is not continuous even in the old Regulatory Plan of 1989. As shown in Figure 4.6.8, in the MOT's new plan, the road is taking a complex route which goes through the national park and a section of which traffic demand is estimated to be low except for some residential local traffic. Meanwhile, the Study team proposes completing the ring road as much as possible by utilizing the existing secondary road while detouring around the existing U.S. Embassy. The peak-hour traffic demand forecast on this section is approximately 2,400 to 3,100 PCU per hour in future; hence, development of a combination of a primary road and a secondary road in part should be sufficient.

On the other hand, the boulevard (Gjergj Fishta, Zhan d'Ark, and Bajram Curri), in which Unaza tramline is proposed along the Lana River, will have a large traffic volume of 2,200 to 10,700 PCU per hour in future, and thus it should remain as a primary road. Since this section is relatively spacious, it could be developed with tramlines and bicycle lanes, as shown in Figure 4.6.8.

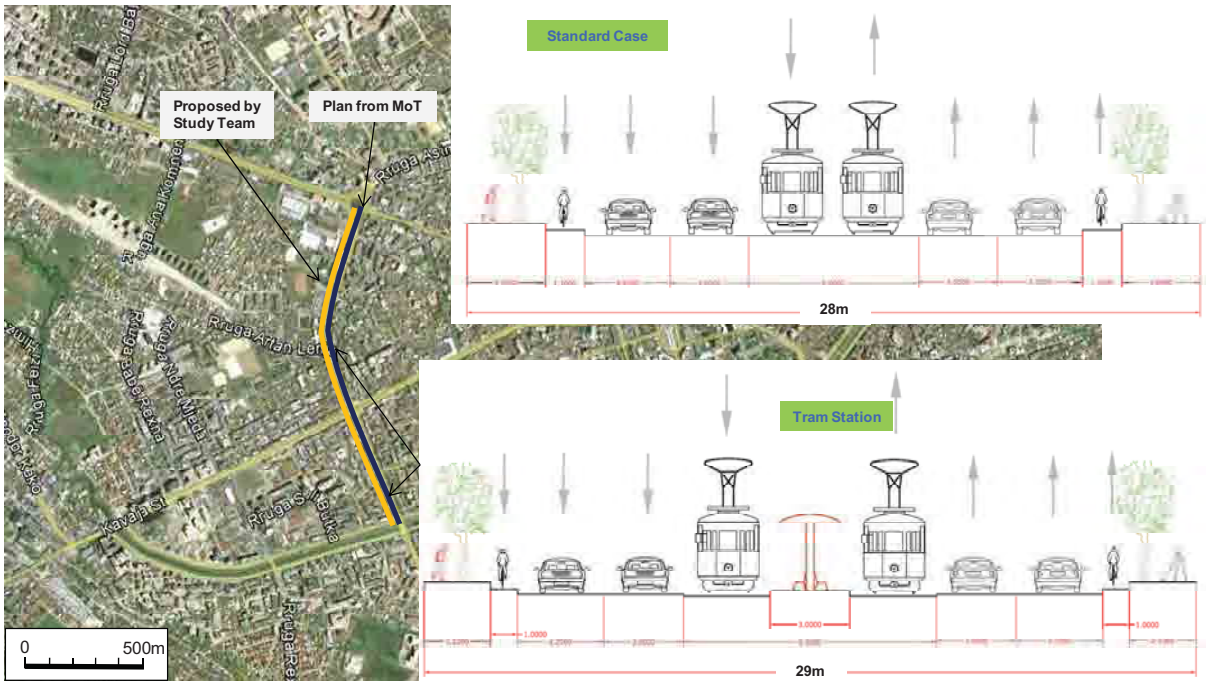


Source: JICA Study Team

Figure 4.6.8 Comparison of Two Routes of Ring Road 3 (Middle Ring Road): South Section

2) West Section

On the west section of the Middle Ring Road, the proposed Unaza tramlines and bicycle lanes could be developed within the existing ROW of 28-29 meters on average, including two tram stations planned on this section (Figure 4.6.9).

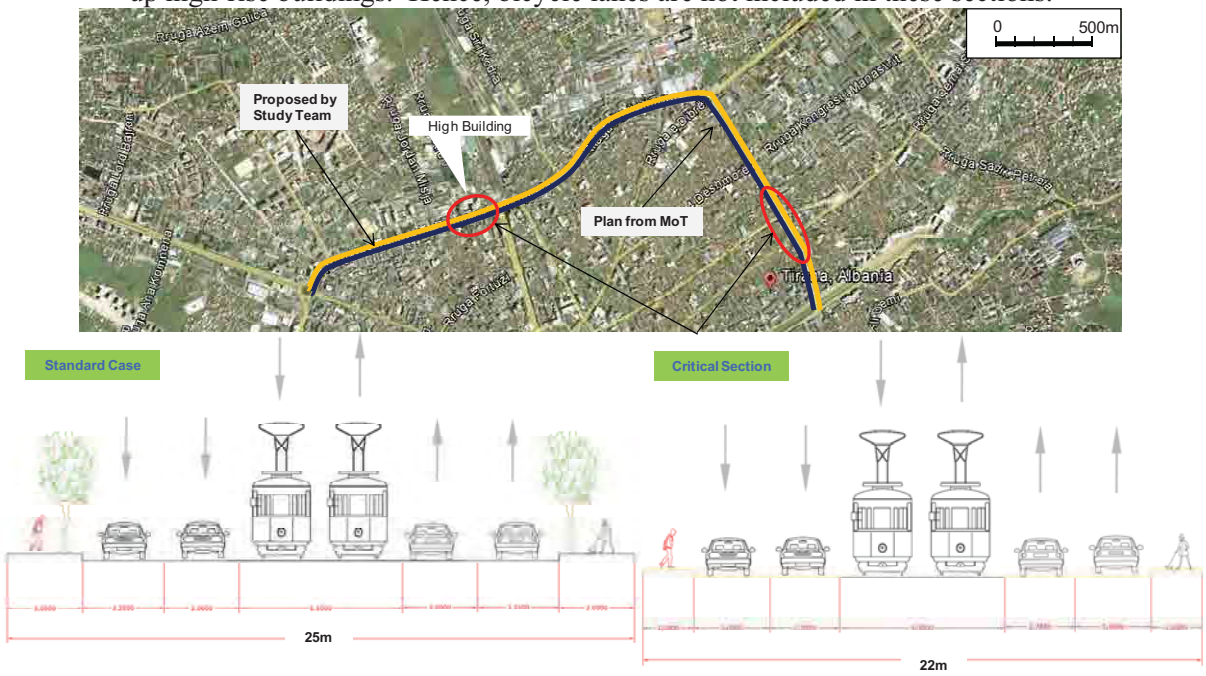


Source: JICA Study Team

Figure 4.6.9 Typical Cross Sections of Ring Road 3 (Middle Ring Road): West Section

3) North and East Sections

In some sections of the north and east of the Middle Ring Road, the ROW may not be enough to design both tramlines and bicycle lanes while keeping a minimum of four lanes for general traffic, and widening of the road seems very difficult because of already built-up high-rise buildings. Hence, bicycle lanes are not included in these sections.



Source: JICA Study Team

Figure 4.6.10 Typical Cross Sections of Ring Road 3 (Middle Ring Road): North & East Sections

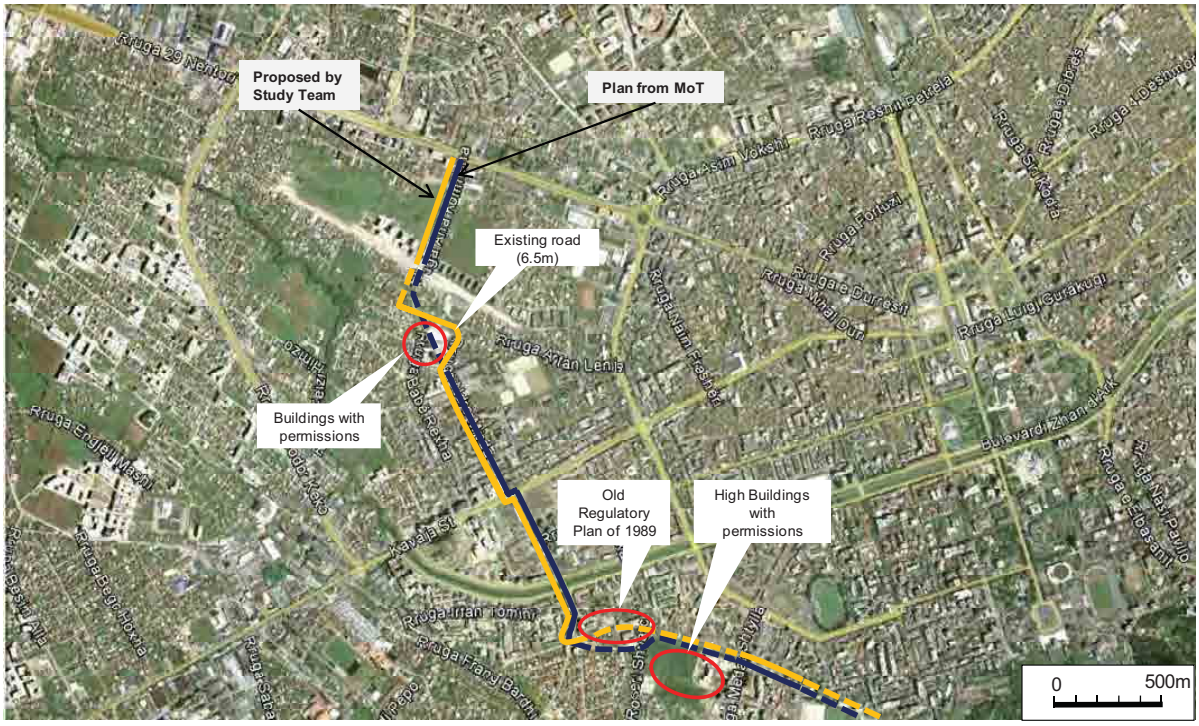
(4) Ring Road 4

Ring Road 4 was originally proposed in the old Regulatory Plan of 1989. As mentioned earlier, following the general city planning, primary and secondary roads should be placed at intervals of 700 to 900 meters in residential areas, which will also enable easy access to the public transport lines. Though it does not always need to be a ring road, planning of Ring Road 4, which is placed at a distance of 700 to 900 meters from the Middle Ring Road and the Outer Ring Road, can be justified. Each section of Ring Road 4 is studied further to apply it in practice.

Apart from Ring Road 5, which is the Outer Ring Road and has already been implemented as a national strategic project, a relatively small traffic demand on Ring Road 4 was forecast compared to the other three ring roads (i.e., Inner, Intermediate, and Middle Ring Roads). Thus, from a future demand forecast point of view, development of a secondary road may be sufficient for Ring Road 4.

1) West Section

As the Study team investigated the site further, there are some differences from the original alignment in the MOT's new plan regarding the west section of Ring Road 4. As shown in Figure 4.6.11, the Study team proposes the route which detours the area with buildings with permissions and utilizes the existing roads. Meanwhile, on the southern section, the Study team proposes the route which follows the old Regulatory Plan of 1989 and thus goes through the buildings without permissions.



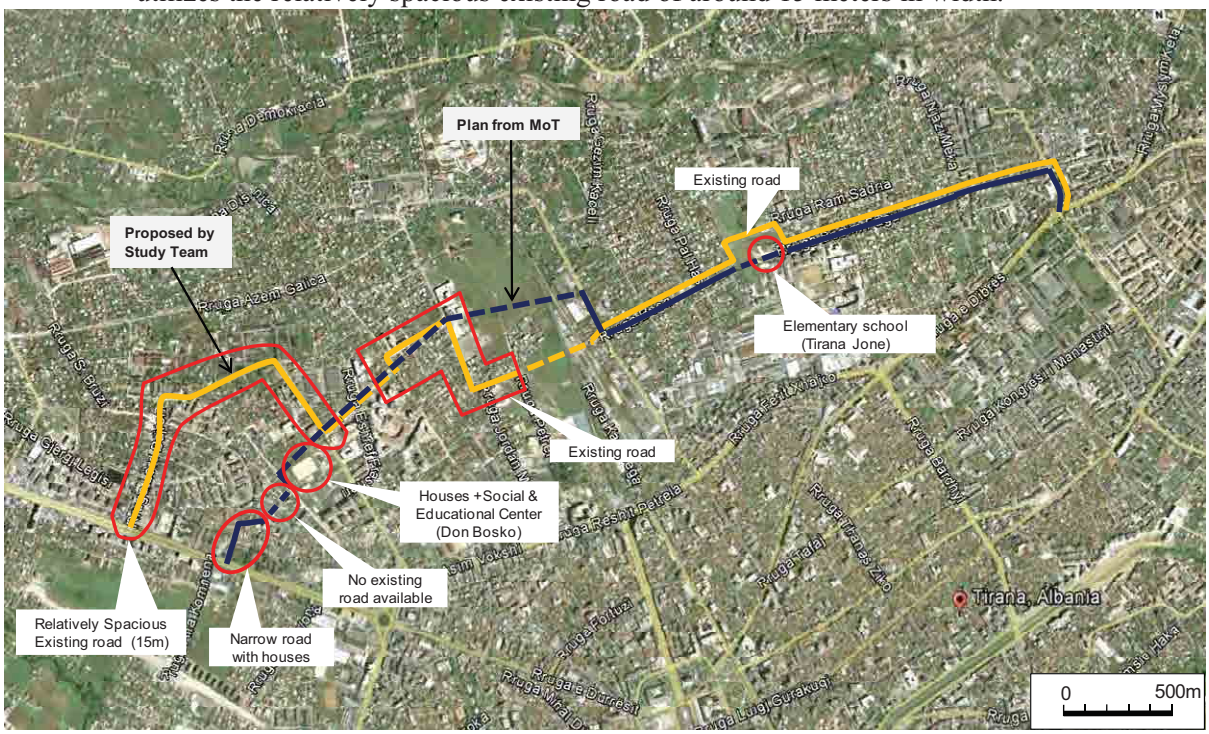
Source: JICA Study Team

Figure 4.6.11 Result of Site Investigation of Ring Road 4: West Section

2) North Section

Overall, for the north section of Ring Road 4, the Study team proposes the route which

utilizes the existing roads as efficiently and smoothly as possible, as shown in Figure 4.6.12. The major difference from the MOT's new plan is seen in the northwestern area. Considering the reality for implementation, the Study team has proposed the route which utilizes the relatively spacious existing road of around 15 meters in width.

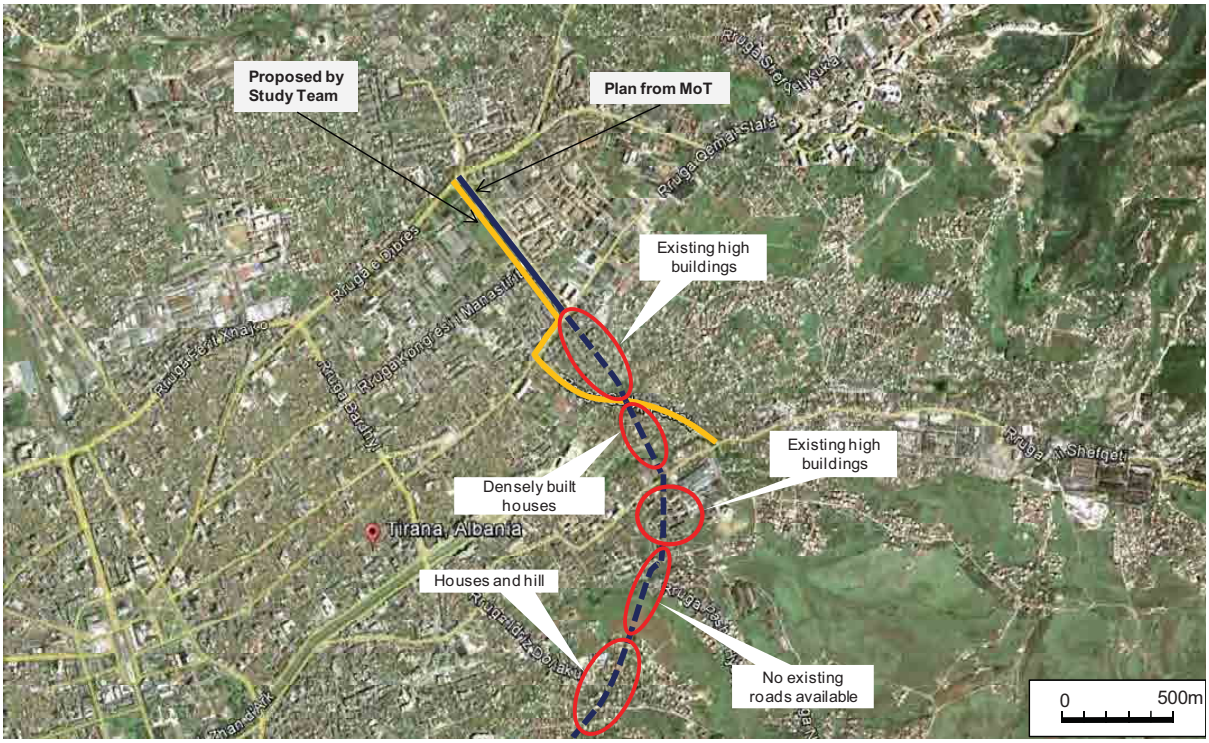


Source: JICA Study Team

Figure 4.6.12 Result of Site Investigation of Ring Road 4: North Section

3) East Section

In the middle of the east section of Ring Road 4, since there are existing high-rise buildings and densely built houses on the route in the MOT's new plan, the Study team has proposed an alternative route which utilizes the existing roads as shown in Figure 4.6.13. Furthermore, in the southward section in the east of Ring Road 4, there are existing high-rise buildings, and there are no existing roads in the north-south direction that are available to be utilized as an alternative route. In addition, since low traffic volume (approx. less than 100 PCU per hour) is forecast in this section for future, it may be better to make Ring Roads 3 and 5 (the Middle and Outer Ring Roads) take over the function of Ring Road 4. Thus, the Study team's plan did not include the southward section in the east of Ring Road 4.



Source: JICA Study Team

Figure 4.6.13 Result of Site Investigation of Ring Road 4: East Section

(5) Ring Road 5 (Outer Ring Road)

From a strategic road network point of view for Tirana, Ring Road 5, or the Outer Ring Road, has important functions for handling traffic flow as well as for supporting urban structures. Functions for handling traffic flow include making through traffic, which has neither origin nor destination in the city, detour the city. Hence, the through traffic is eliminated from the urban area, resulting in relieving traffic congestion in the urban area and improving the urban environment. Among others, the Outer Ring Road is very important as a future freight corridor. That is, as explained earlier, the area where trucks (excluding vehicles with a 3.5-ton or lower loading capacity) should be banned from passing should be expanded from the current zone inside the Middle Ring Road to the zone inside the Outer Ring Road (Figure 4.5.2) in order to ensure a better living environment for the citizens.

Meanwhile, with regard to functions for supporting urban structures, the Outer Ring Road serves to connect key urban sub-centers such as industrial development in the suburban areas where arterial roads are less available, inducing appropriate urbanization. Moreover, it also should serve to convert a current mono-centric city into a multi-core dispersed one in an urban zone where most traffic passes through while limiting excessive growth/development of the city as a function of an external ring road.

According to the standards of locations and structural requirements of external ring roads by scales of cities (Table 4.5.1), the Outer Ring Road should be developed at least as a highway with partial grade separation. Hence, either overpasses or underpasses should be constructed at intersections with other primary roads where considerable volume of traffic is projected for

future.

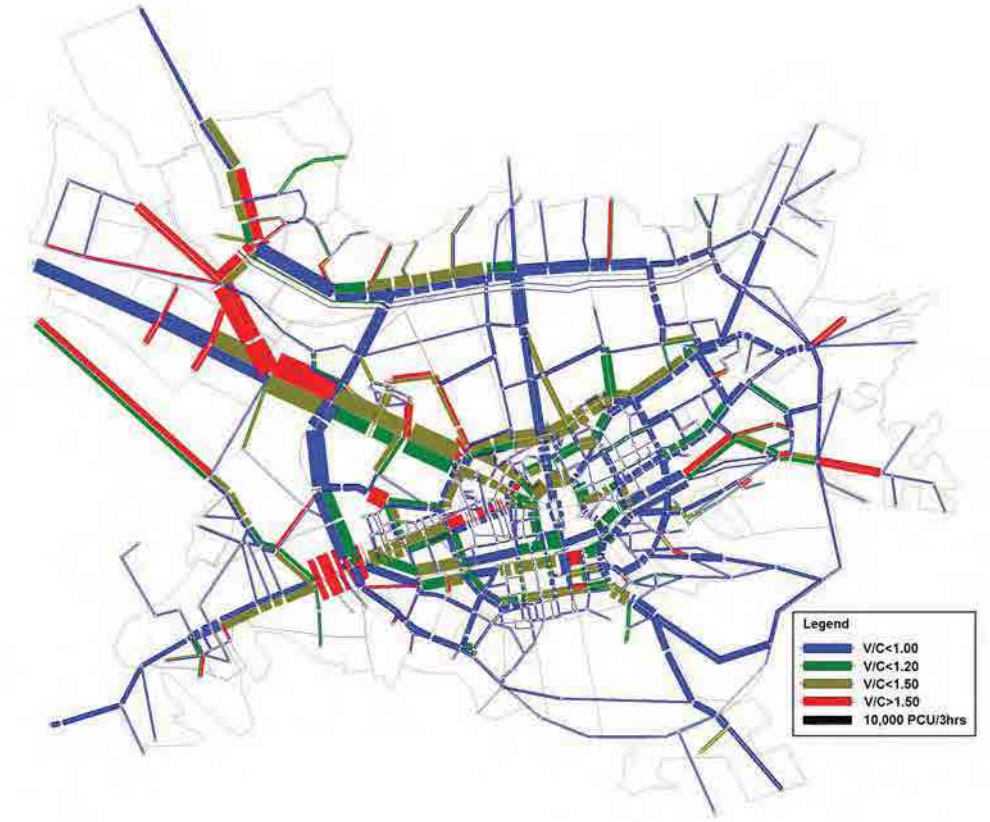
At present, the west section of the Outer Ring Road between Durres Road and Kavaja Road has been complete and in use since 1998. Meanwhile, the south section of Ring Road 5 between Kavaja Road and Elbasan Road is currently under construction with funding from EBRD, and it is planned to be completed in 2013.

As for development of the north section of the Outer Ring Road, three alternative routes were tested for the future demand forecast, namely:

- [1-2-2A] a route in the north side of the Tirana River, along Demokracia Road (Figure 4.6.14);
- [1-2-2B] a route in the south side of the Tirana River, partly along the railway to be demolished (Figure 4.6.15); and
- [1-2-2C] two one-way routes on both sides of the Tirana River, composing the Outer Ring Road (Figure 4.6.16).

Results of the future demand forecasts are presented in Figure 4.6.14, Figure 4.6.15, and Figure 4.6.16, and a comparison is made and summarized in Table 4.6.4. The Study team recommends the north section of the Outer Ring Road in the north side of the Tirana River [1-2-2A] (i.e., Demokracia Road), which is expected to be the most effective in the dispersion of traffic over the entire road network of Tirana, thus contributing to the alleviation of traffic congestion. In addition, along with the rehabilitation of the Tirana River, it is also preferred to provide local access roads utilizing the embankment of the river under this project of the construction of the northern section of the Outer Ring Road that is located about 150 meters from the river.

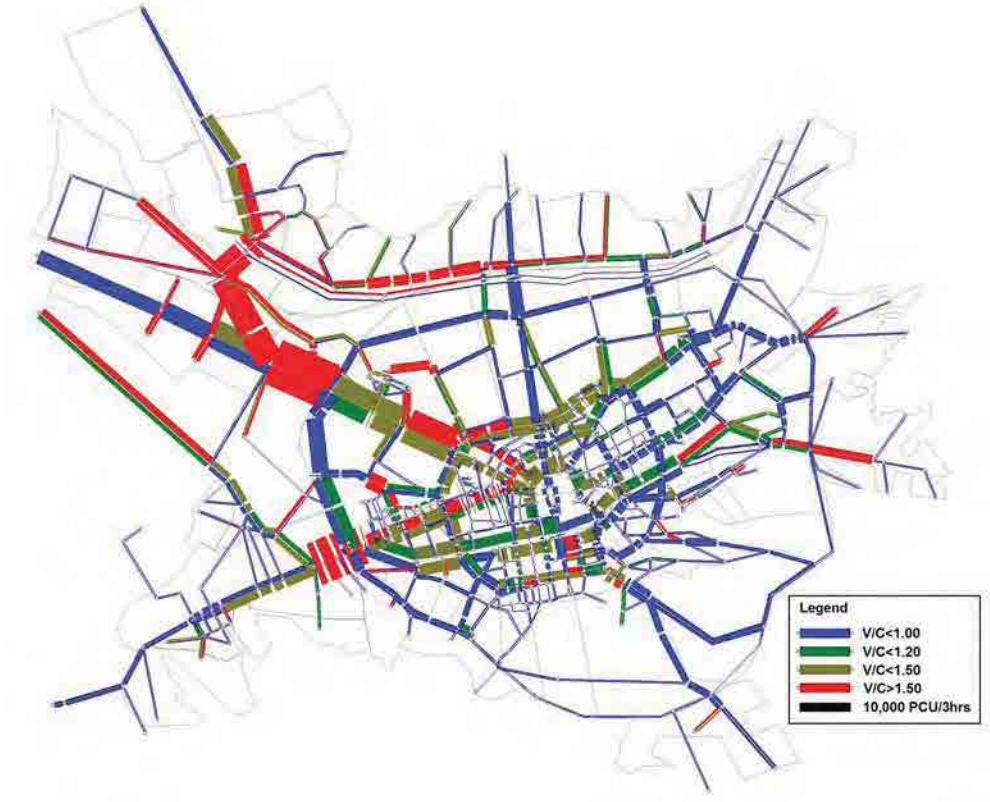
[Alternative A: Outer Ring Road in the North Side of the Tirana River]



Note: Unit: PCU per 3 hours (6:00-9:00 a.m.). Source: JICA Study Team

Figure 4.6.14 Traffic Demand Forecast of Ring Road 5: Alternative A (2027)

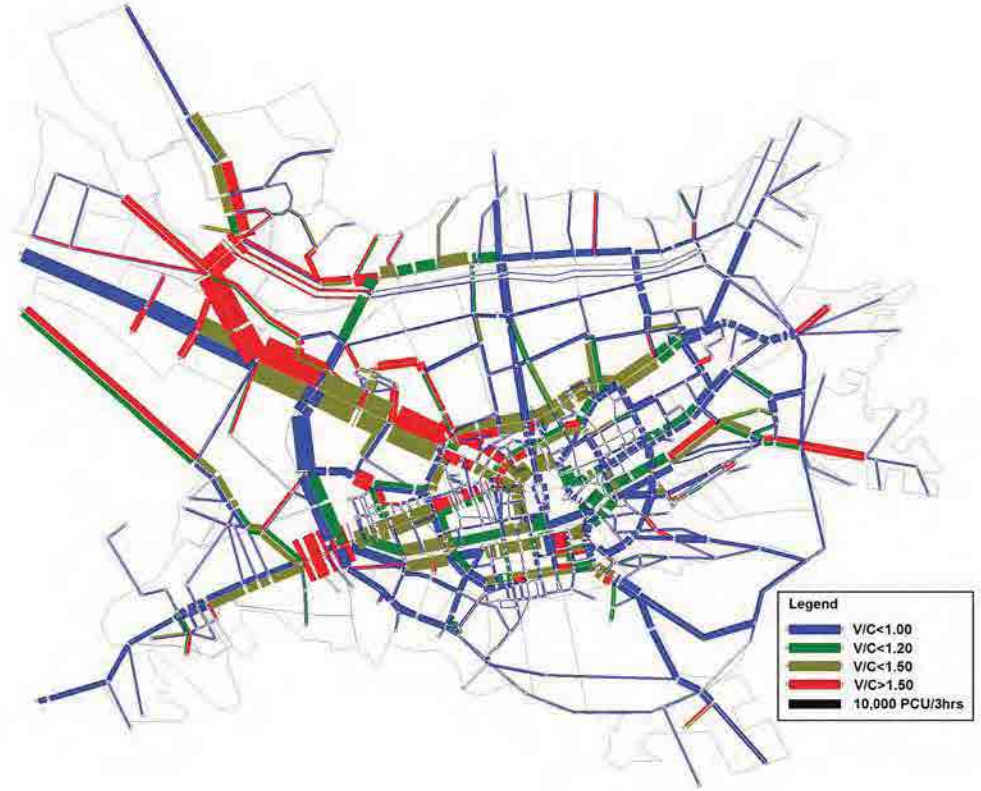
[Alternative B: Outer Ring Road in the South Side of the Tirana River]



Note: Unit: PCU per 3 hours (6:00-9:00 a.m.). Source: JICA Study Team

Figure 4.6.15 Traffic Demand Forecast of Ring Road 5: Alternative B (2027)

[Alternative C: Two One-Way Routes on Both Sides of the Tirana River]



Note: Unit: PCU per 3 hours (6:00-9:00 a.m.). Source: JICA Study Team

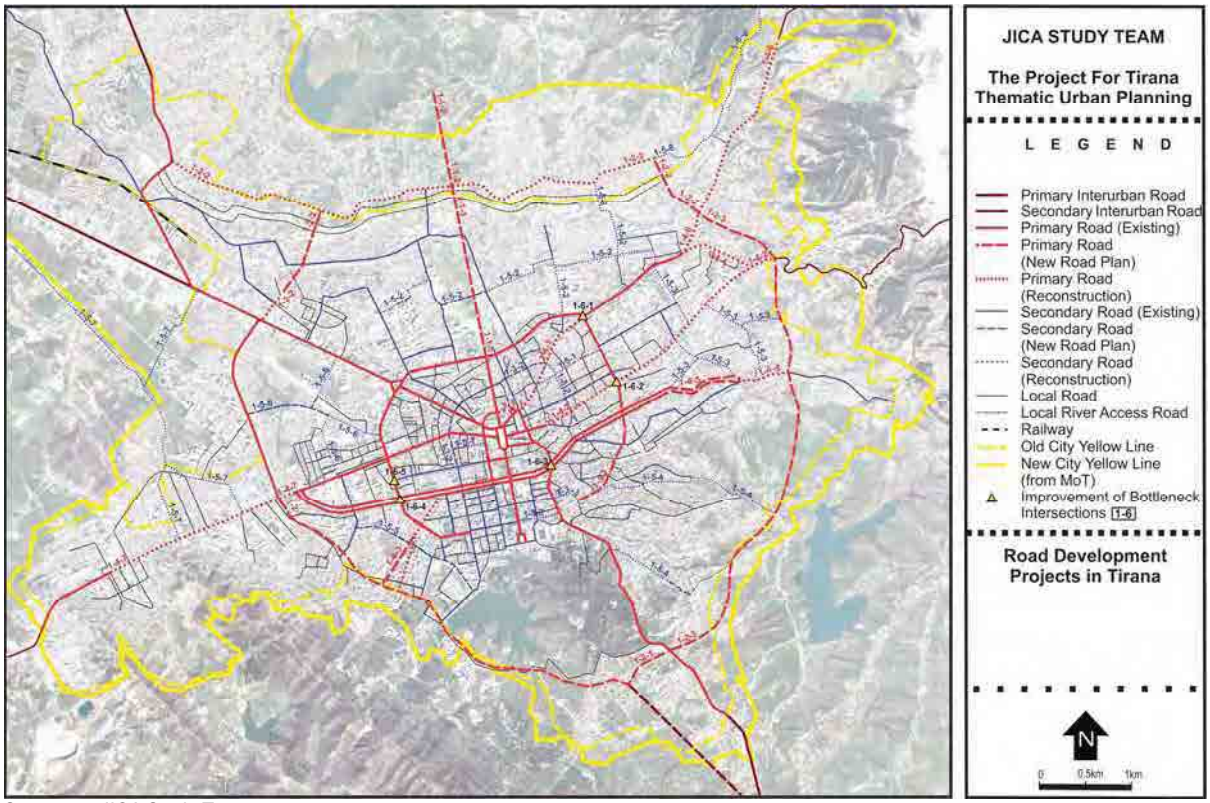
Figure 4.6.16 Traffic Demand Forecast of Ring Road 5: Alternative C (2027)

Table 4.6.4 Comparison of Demand Forecast between Outer Ring Road Alternatives

Road Section	Alternative A (north side of Tirana River, Demokracia Road)	Alternative B (south side of Tirana River)	Alternative C (both sides of Tirana River, one way)
Northeast section of Outer Ring Road [Primary road]	More traffic (effective in traffic dispersion) (4,600 PCU/3hrs/direction, V/C = 0.44)	Less traffic (1,500 PCU/3hrs/direction, V/C = 0.14)	Less traffic (4,000 PCU/3hrs/direction, V/C = 0.39)
Northwest section of Outer Ring Road [Primary road]	More traffic (effective in traffic dispersion) (10,500 PCU/3hrs/direction, V/C = 1.02)	Less traffic (3,700 PCU/3hrs/direction, V/C = 0.36)	Less traffic (7,300 PCU/3hrs/direction, V/C = 0.71)
North section of Main Boulevard between the existing railway track and Demokracia road [Primary road]	More traffic (effective in traffic dispersion) (6,600 PCU/3hrs/direction, V/C = 0.65)	Less traffic (6,100 PCU/3hrs/direction, V/C = 0.59)	Less traffic (4,600 PCU/3hrs/direction, V/C = 0.44)
West section of Demokracia road (Paskuqan commune)	Not congested (10,500 PCU/3hrs/direction, V/C = 1.02) [Primary road & part of Outer Ring Road]	Congested (4,600 PCU/3hrs/direction, V/C = 2.02) [Secondary road]	Congested (11,800 PCU/3hrs/direction, V/C = 1.15) [Primary road & part of Outer Ring Road]
South section of Kastriotet road [Primary road]	Less congested (12,200 PCU/3hrs/direction, V/C = 1.77)	More congested (15,600 PCU/3hrs/direction, V/C = 2.27)	More congested (14,300 PCU/3hrs/direction, V/C = 2.08)
29 Nentori road between Casa Italia and the roundabout [Primary road]	Less congested (23,500 PCU/3hrs/direction, V/C = 1.70)	More Congested (24,800 PCU/3hrs/direction, V/C = 1.80)	More Congested (24,400 PCU/3hrs/direction, V/C = 1.77)
Northwest section of Middle Ring Road [Primary road]	Less congested (8,900 PCU/3hrs/direction, V/C = 1.30)	More Congested (10,000 PCU/3hrs/direction, V/C = 1.46)	More congested (10,100 PCU/3hrs/direction, V/C = 1.47)
Dibra road between Middle Ring Road and Ring Road 4 [Primary road]	Less congested (8,200 PCU/3hrs/direction, V/C = 1.20)	More Congested (8,800 PCU/3hrs/direction, V/C = 1.27)	More Congested (9,100 PCU/3hrs/direction, V/C = 1.32)
Dritan Hoxha road between Outer Ring Road & Middle Ring Road [Primary road]	Less congested (17,200 PCU/3hrs/direction, V/C = 1.25)	More Congested (17,800 PCU/3hrs/direction, V/C = 1.29)	More Congested (19,000 PCU/3hrs/direction, V/C = 1.38)

Note: Demand forecast is for 2027.
Source: JICA Study Team

Through the above investigations of the potential road development projects with "Five Ring Roads," the Study Team initially proposed the road development projects as shown in Figure 4.6.17.

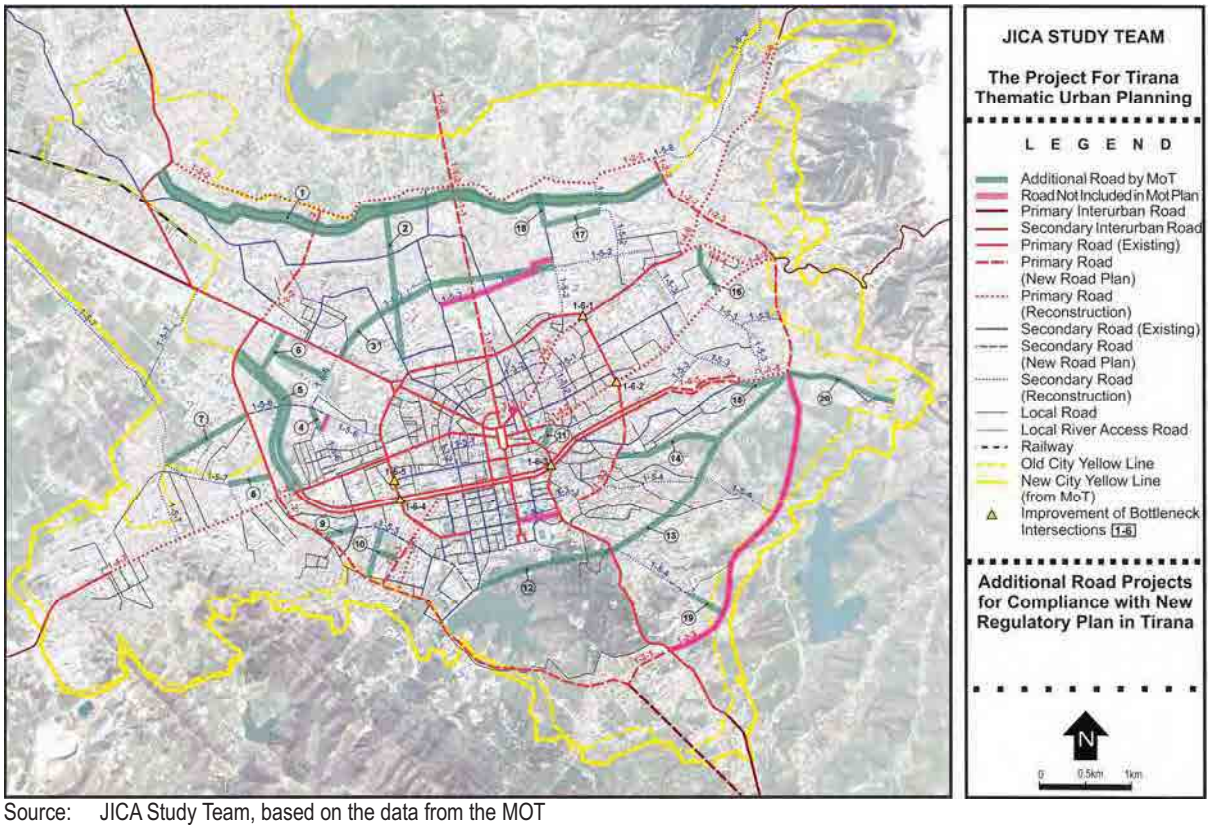


Source: JICA Study Team

Figure 4.6.17 Road Development Projects Initially Proposed by the Study Team

4.6.4 Compliance with Tirana New Urban Regulatory Plan

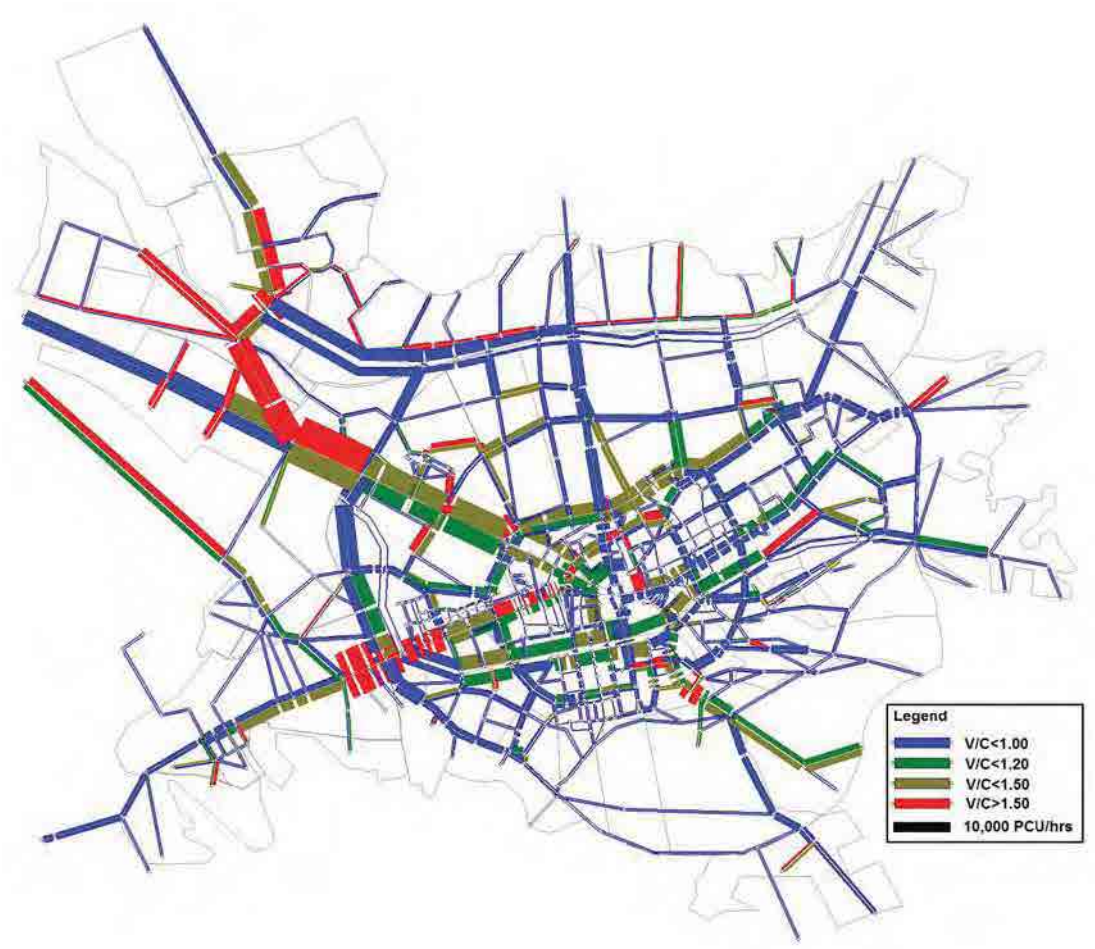
After the presentation of the Draft Final Report of the Study, the road network of Tirana New Urban Regulatory Plan was made and confirmed by the MOT for finalization. In order to comply with the New Urban Regulatory Plan, the road development projects that were initially proposed in the previous section by the Study team were investigated for comparison. Thus, 20 "additional" road projects have been indicated as shown in Figure 4.6.18. Some road development projects, such as part of the east section of the Outer Ring Road, also do not exist in the New Urban Regulatory Plan.



Source: JICA Study Team, based on the data from the MOT

Figure 4.6.18 "Additional" Road Projects for Compliance with New Regulatory Plan

All these changes in the road network are reflected for project viability including the future traffic volume and the project cost. Result of the future demand forecast is presented in Figure 4.6.19. As an indicator showing the project viability, the EIRR with a benefit-cost ratio is estimated along with the traffic volume as presented in Table 4.6.5. Furthermore, projects of which EIRRs are over the target of 10% have been integrated into the road development projects in the Study for project prioritization. On the other hand, while projects that do not fulfill this evaluation criterion have also been included in the road development plan in this Study for compliance with the New Urban Regulatory Plan, implementation of these projects could be recommended on condition that enough traffic demand is expected in future. As for the north section of the Outer Ring Road along both embankments of the Tirana River, since the EIRR of the option of the north side of the river (Demokracia Road) (i.e., 52% as estimated in Section 11.5.2) is greater than that of the option of development along both embankments of the river (i.e., 31%), the option of the development on Demokracia Road has been proposed by the Study team.



Note: Unit: PCU per 3 hours (6:00-9:00 a.m.). Source: JICA Study Team

Figure 4.6.19 Demand Forecast on the Network with "Additional" Roads from New Regulatory Plan

Table 4.6.5 Project Viability Investigation of "Additional" Roads from New Regulatory Plan

	Additional Road Projects	Project Cost (mil.Lek)	O&M Cost (mil.Lek)	Future Demand*	Future V/C	EIRR (%)	B/C Ratio	Remark
1	Outer Ring Road - North Section along Tirana River	26,508	36.2	5,200	0.30	**30.9%**	**11.25**	Demokracia Road option is taken.
2	Eshtref Frasheri Road	4,678	4.9	1,600	0.36	2.3%	0.48	Conditional on enough demand.
3	4th Ring Road - North Section	3,878	7.2	3,900	1.04	**17.6%**	**3.77**	Included for further prioritization.
4	4th Ring Road - Part of West Section	583	1.0	4,000	0.88	**16.5%**	**3.47**	Included for further prioritization.
5	Northwestern Lana River Roads	5,880	9.8	400	0.02	-	-0.03	Conditional on enough demand.
6	Beniamin Kruta Road	1,004	3.0	300	0.13	-	-0.10	Conditional on enough demand.
7	Road in Kashar Commune	1,192	2.7	500	0.11	4.6%	0.66	Conditional on enough demand.
8	Krist Maloki Road	576	1.4	1,200	0.26	**25.3%**	**7.55**	Included for further prioritization.
9	Fadil Bodinaku Road	306	0.9	2,200	0.99	**21.2%**	**5.40**	Included for further prioritization.
10	Robert Shvarc Road	493	0.9	100	0.05	8.3%	1.27	Conditional on enough demand.
11	Myrtezim Kelliçi Roads	463	0.7	600	0.27	**13.0%**	**2.32**	Included for further prioritization.
12	4th Ring Road - South Section (Tunnel)	1,796	31.1	0	0.00	-	0.00	Conditional on enough demand.
13	4th Ring Road - Southeast Section	4,069	7.8	400	0.10	4.7%	0.72	Conditional on enough demand.
14	Kole Popa Road	1,551	3.5	700	0.16	-	0.24	Conditional on enough demand.
15	Between Ali Shefqeti and Outer Ring Roads	1,580	3.3	3,200	0.48	3.3%	0.52	Conditional on enough demand.
16	Kahreman Ylli Road	263	0.6	500	0.21	**16.9%**	**3.62**	Included for further prioritization.
17	Sadaudin Bekteshi Road	830	1.7	200	0.07	-	0.18	Conditional on enough demand.
18	Northern 5 Maji Road	1,338	1.3	400	0.09	9.7%	**1.55**	Conditional on enough demand.
19	3 Vellezerit Kondi Road	382	1.1	0	0.00	-	0.00	Conditional on enough demand.
20	Alternative Outer Ring Road - East Section inside Tirana	23,015	21.5	1,500	0.33	-	0.33	Conditional on enough demand.

Note: Demand forecast is for 2027. Bold figures indicate viable results (i.e., EIRR > 10%, B/C > 1.0).
Shaded projects indicate that they have been integrated into the road development projects in the Study for project prioritization.
Source: JICA Study Team

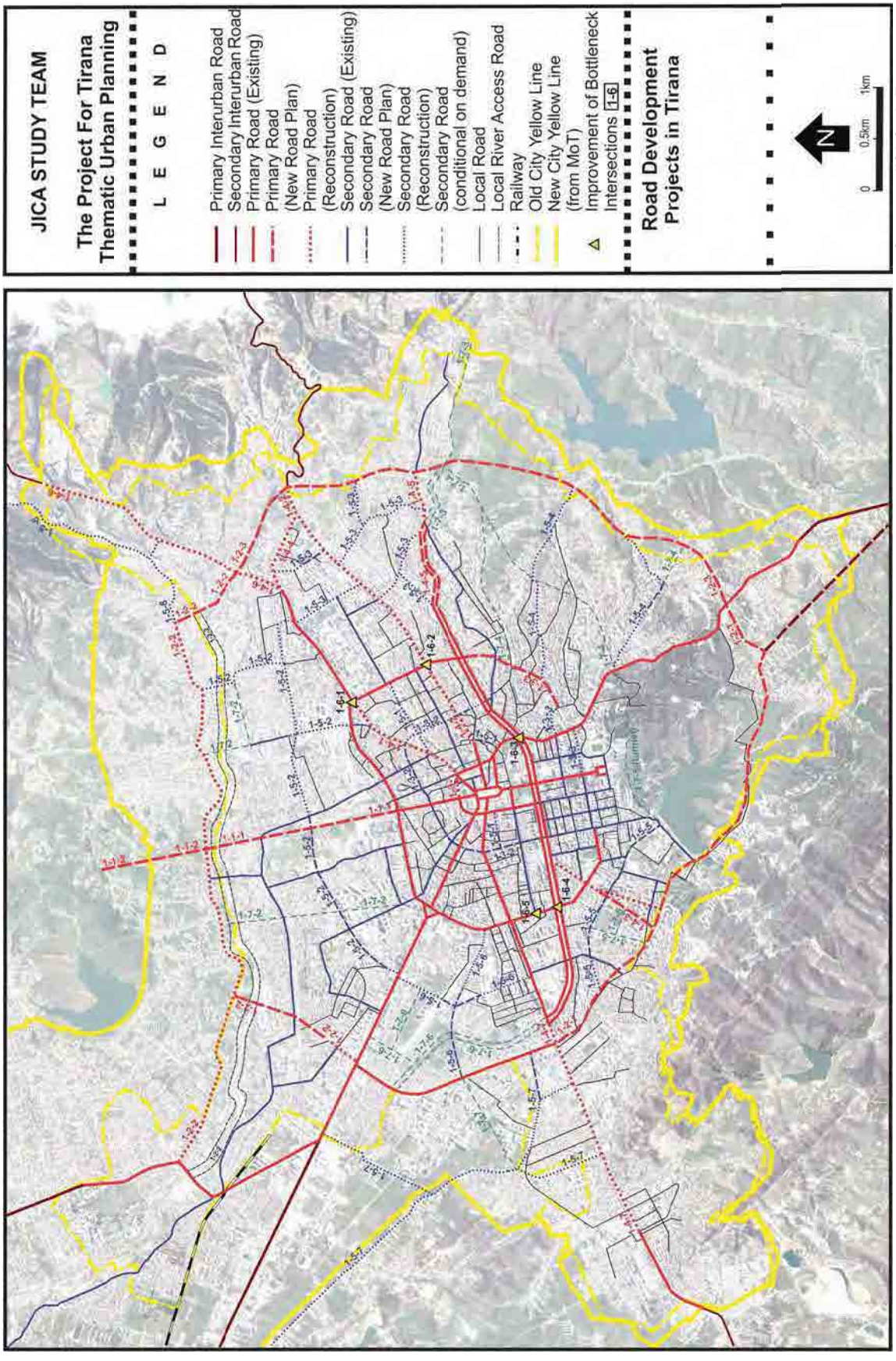
4.6.5 Road Development Projects

As discussed in Section 4.11, overall evaluation of the road projects integrated with the additional viable projects from the New Urban Regulatory Plan was made along with other criteria such as coherence with visions, urgency, implicit feasibility, and social acceptance, to sort them into projects to be implemented in the short term (i.e., 2017), medium term (i.e., 2022), and long term (i.e., 2027). In other words, the road development projects are evaluated not only by quantitative measures such as traffic volumes and V/C ratios but also by other qualitative measures through a multi-criteria analysis. The final road development projects proposed by the Study Team are shown in Figure 4.6.20 and listed in Table 4.6.6. Result of the future demand forecast based on this final road is presented in Figure 4.6.21.

Table 4.6.6 List of Road Development Projects

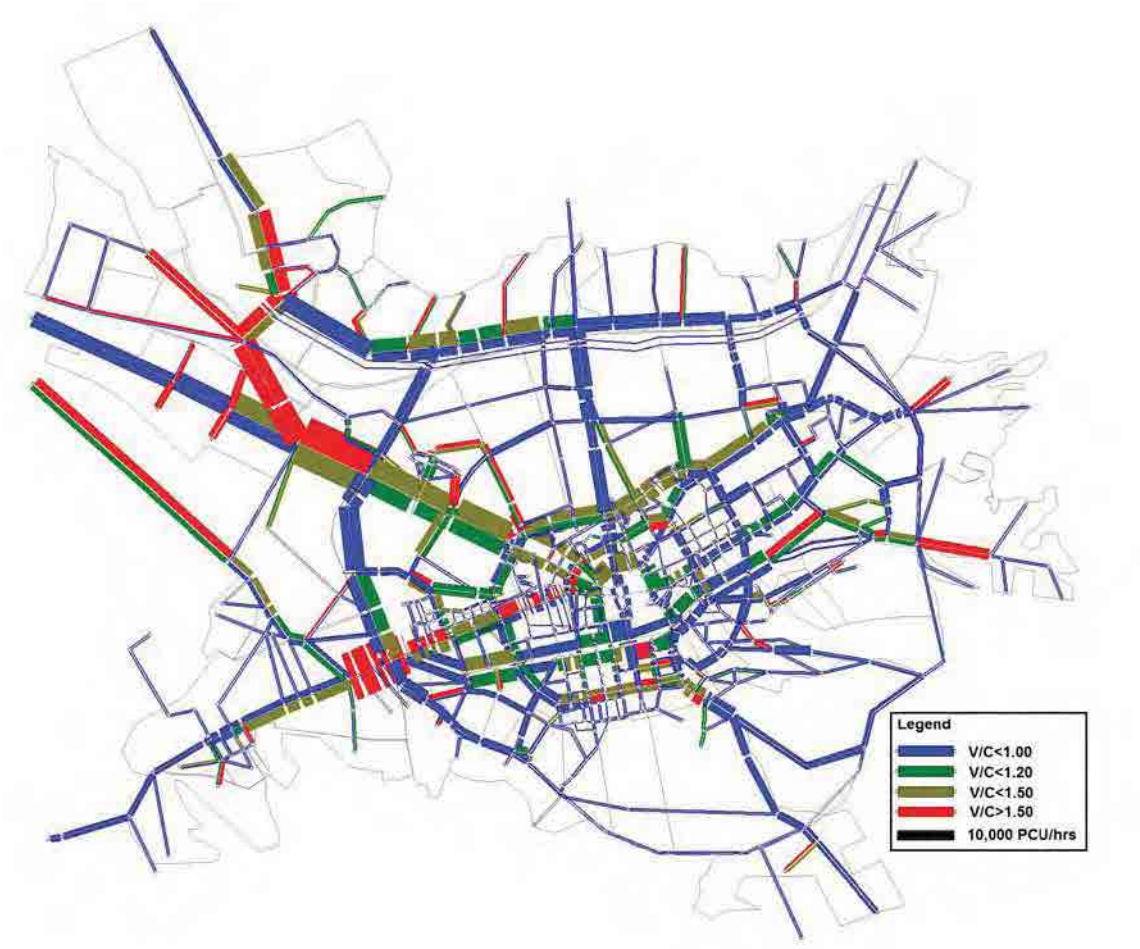
Proposed Projects			Future Demand*	Future V/C Ratio	Project Schedule		
					Short	Medium	Long
RUT-1	Road Development Plan						
RUT-1-1	Northern Extension of the Main Boulevard						
RUT-1-1-1		Northern Extension of the Main Boulevard - Part 1	4,800	0.46	●		
RUT-1-1-2		Northern Extension of the Main Boulevard - Part 2	1,600	0.16		●	
RUT-1-2	Development of Outer Ring Road						
RUT-1-2-1		Development of Outer Ring Road - South Section	2,600	0.25	●		
RUT-1-2-2		Development of Outer Ring Road - North Section	1,500	0.98	●		
RUT-1-2-3		Development of Outer Ring Road - East Section	500	0.05		●	
RUT-1-3	Development of Inner/Middle Ring Roads						
RUT-1-3-1		Development of Inner Ring Road	12,000	0.87	●		
RUT-1-3-2		Development of Intermediate Ring Road	4,100	0.90		●	
RUT-1-3-3		Development of Middle Ring Road	2,400	0.39	●		
RUT-1-4	Development of Radial Roads						
RUT-1-4-1		Development of Radial Road: Dibra Road	2,600	0.37	●		
RUT-1-4-2		Development of Radial Road: Hoxha Tahsim & Xhanfize Keko Road	5,800	0.85	●		
RUT-1-4-3		Development of Radial Road: Komuna e Parisit & Medar Shtylla Road	2,100	0.31	●		
RUT-1-4-4		Development of Radial Road: Aleksander Moisiu Road	3,800	0.55	●		
RUT-1-4-5		Development of Radial Road: Ali Shefqeti Road	2,500	0.26		●	
RUT-1-4-6		Development of Radial Road: Myslym Keta Road	2,100	0.36		●	
RUT-1-4-7		Development of Radial Road: Kavaja Road	12,700	1.41	●		
RUT-1-5	Development of Other Secondary Roads						
RUT-1-5-1		Development of Secondary Roads: CBD Area	1,100	0.48		●	
RUT-1-5-2		Development of Secondary Roads: Northern Area	3,200	0.74	●		
RUT-1-5-3		Development of Secondary Roads: Eastern Area	3,000	0.60		●	
RUT-1-5-4		Development of Secondary Roads: Southeastern Area	1,900	0.42		●	
RUT-1-5-5		Development of Secondary Roads: Southwestern Area	1,400	0.30		●	
RUT-1-5-6		Development of Secondary Roads: Western Area	4,000	0.89		●	
RUT-1-5-7		Development of Secondary Roads: Outer Western Area	3,400	0.75		●	
RUT-1-5-8		Development of Secondary Roads: Northeastern Area	600	0.18			●
RUT-1-6	Improvement of Bottleneck Intersections						
RUT-1-6-1		Improvement of Bottleneck Intersection: Dibra Road	4,200	1.22	●		
RUT-1-6-2		Improvement of Bottleneck Intersection: Hoxha Tahsim Road	3,700	1.07	●		
RUT-1-6-3		Improvement of Bottleneck Intersection: Elbasan Bridge	5,200	1.02	●		
RUT-1-6-4		Improvement of Bottleneck Intersection: Vasil Shanto Bridge	6,000	1.17	●		
RUT-1-6-5		Improvement of Bottleneck Intersection: Myslym Shyri Road	3,500	1.02	●		
RUT-1-7	Additional Roads Proposed by MoT						
RUT-1-7-2		Additional Secondary Roads: Northern Area	1,000	0.22			
RUT-1-7-3		Additional Secondary Roads: Eastern Area	1,900	0.37			
RUT-1-7-4		Additional Secondary Roads: Southeastern Area	500	0.10			
RUT-1-7-5		Additional Secondary Roads: Southern and Southwestern Area	100	0.05			
RUT-1-7-6		Additional Secondary Roads: Western Area	400	0.10			
RUT-1-7-7		Additional Secondary Roads: Outer Western Area	500	0.11			

Note: * Unit is PCU/3 hours/direction in 2027.
Source: JICA Study Team



Source: JICA Study Team

Figure 4.6.20 Road Development Projects in Tirana



Note: Unit: PCU per 3 hours (6:00-9:00 a.m.). Source: JICA Study Team

Figure 4.6.21 Traffic Demand Forecast on the Final Road Network

(1) Short Term (2017)

For the short term, two major new road development projects have been proposed. One is the northern extension of the main north-south boulevard (Zogu I Boulevard) up to the road on the north side of the Tirana River (Demokracia Road). The other is the development of the north section of the Outer Ring Road in addition to the south section which is currently under construction and to be completed in 2013. In addition, completion of the Middle and Inner Ring Roads to form the basic road development corridors is one of the short-term priorities. As for the radial primary roads, reconstruction and widening of the five existing roads (i.e., Dibra Road, Hoxha Tahsim & Xhanfize Keko Road, Komuna e Parisit & Medar Shtylla Road, Aleksander Moisiu Road, and Kavaja Road) to secure the ROW of public transport and bicycles while keeping the current traffic capacity has been prioritized as short-term projects.

Development of secondary roads in the northern area in Tirana has also been proposed as short-term projects to complete the basic road network structure that has long been recognized in the old Regulatory Plan of 1989. Furthermore, improvement of bottleneck intersections on the Middle Ring Road has also been included in the short-term projects.

(2) Medium Term (2022)

One of the main road development projects for the medium term is northern extension of the main north-south boulevard (Zogu I Boulevard) from the road on the north side of the Tirana River (Demokracia Road) to Paskuqan Park (i.e., the second stage). Road development projects for the medium term also include the development of the east section of the Outer Ring Road, which will complete the whole ring road. Since this road will go through the existing developments and some hilly area, enough attention should be paid to natural and social environment. In addition, it should be studied and planned well in advance including locations of junctions with other major roads as well as nearby developments.

For radial primary roads, reconstruction and widening of the two existing roads (i.e., Ali Shefqeti Road and Myslym Keta Road) are proposed to support the developments around the eastern periphery of Tirana. Among others, Ali Shefqeti Road will be another important gateway from/to Tirana through Arber Road, which will be developed as a national interurban road with eventually four lanes. Currently the section from Brari to Vasha Bridge is under construction, and it will be completed in 2015. Development of secondary roads in the CBD, eastern, southeastern, southwestern, western, and outer western areas in Tirana has also been proposed as medium-term projects. As described in the public transport development, those short-term and medium-term secondary roads shall also serve the bus lines that will be restructured to support the core public transport network.

(3) Long Term (2027)

All the road development corridors that form metropolitan spatial structures in Tirana will be developed by the medium term. As the remaining projects, development of secondary roads in the northeastern area in Tirana has been proposed as long-term projects.

Total future trips by purpose and by mode in the morning peak in the “do-nothing” case and in the case including the above-mentioned phased road developments (i.e., master plan case) are presented in Table 4.6.7. The total number of future trips in Tirana in the morning peak hours (6:00-9:00 a.m.) is the same for each purpose. In terms of mode shares, total trips by transit will slightly gain the share; whereas the auto and walk modes will be slightly losing the shares accordingly. This may be because the master plan case includes not only the road developments but also urban transportation developments that are explained in the subsequent sections. It implies that urban transportation developments may have more potential to attract more trips, bringing about a modal shift toward public transport, even though traffic congestion will be significantly alleviated by the road developments as shown in Figure 4.6.14.

Table 4.6.7 Comparison of Total Future Trips: Do-Nothing and Master Plan Cases

Trip Purpose	Future Person Trips (2027): Do-Nothing Case				Future Person Trips (2027): Master Plan Case (without Parking Pricing)			
	Auto	Transit	Walk	All Modes	Auto	Transit	Walk	All Modes
Home-To-Work	295,300 (47%)	265,300 (42%)	72,900 (12%)	633,600 (100%)	279,600 (44 %)	289,100 (46%)	64,900 (10%)	633,600 (100%)
Home-To-School	20,900 (11%)	119,300 (64%)	45,900 (25%)	186,100 (100%)	25,400 (14%)	116,100 (62%)	44,600 (24%)	186,100 (100%)
Home-To-Other	4,900 (5%)	59,500 (66%)	25,600 (28%)	89,900 (100%)	7,900 (9%)	57,600 (64%)	24,400 (27%)	89,900 (100%)
Total	321,100 (35%)	444,100 (49%)	144,400 (16%)	909,600 (100%)	312,900 (34%)	462,800 (51%)	133,900 (15%)	909,600 (100%)

Note: Unit: trips per 3 hours (6:00-9:00 a.m.).
A common tariff of 60 Lek per trip is applied in the Master Plan case.
Source: JICA Study Team

4.7 Transportation Control Measures (TCMs)

In order to make the most of the existing capacity of the transport infrastructure as well as to achieve a better transportation environment in Tirana, the following TCMs have been proposed:

1. Development of "traffic cell system" and pedestrian facilities,
2. Development of bus/bicycle priority system,
3. Parking system development including development of parking facilities/parking information system and parking pricing system in the CBD, and
4. Development of UTC Center.

Among the above TCMs, parking pricing, which is listed in the third item, can be considered as one of the TDM policies in that it will decrease excessive vehicular traffic concentration and will shift private vehicle users to public transport. All the above TCMs should be prioritized as short-term projects as they are designed to optimize utilization of the existing transport infrastructure at a relatively lower cost.

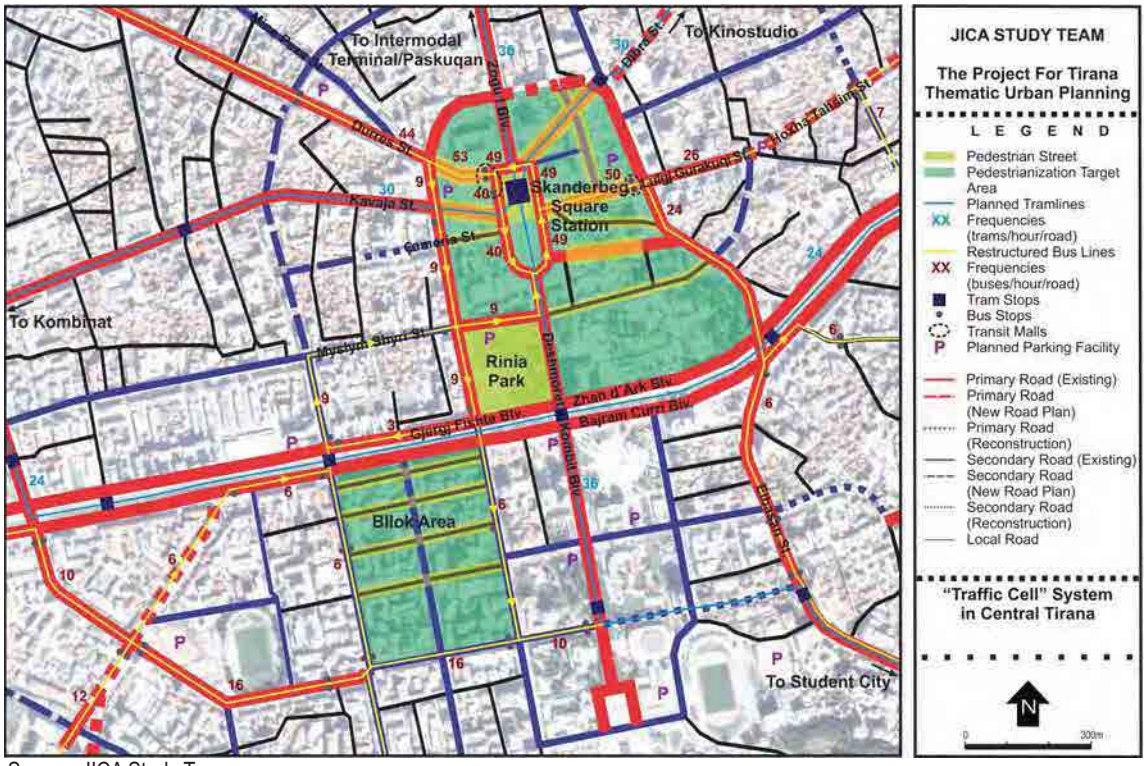
4.7.1 "Traffic Cell" System and Pedestrian Facilities

(1) "Traffic Cell" System in Central Tirana

As mentioned earlier, in the zone inside the inner ring corridor, pedestrians should be given priority, and thus the private vehicle traffic should be greatly reduced in order to realize a public transport user-friendly environment and to introduce transit malls as a center of the city. Thus, several roads in this zone should be converted to pedestrian streets that are closed to private vehicles except for public transport.

Though further study is necessary for this, an example of the above-mentioned "traffic cell" system for this zone is illustrated in Figure 4.7.1. While only pedestrians, bicycles, and selected public transport vehicles are allowed to enter the pedestrian streets, all the blocks (traffic cells) that are divided by the pedestrian streets can still be accessed by private and commercial vehicles from the peripheral roads. Only the main north-south boulevard (Zogu I Boulevard) and Myslym Shyri Road may remain as ordinary roads as an exception to serve the through traffic. Meanwhile, some pedestrian streets could be developed as "transit malls" to make an easy access to buses, taxis, or trams. Frequencies of buses and trams around central Tirana that are presumed based on the public transport development plans in the next section are also presented in Figure 4.7.1.

Furthermore, another "traffic cell" system has also been proposed in Bllok district, in which the east-west roads are to be converted into pedestrian streets while the north-south roads are to be left accessible for private and commercial vehicles. It should also be noted that parking facilities should be provided at nearby places around these areas.

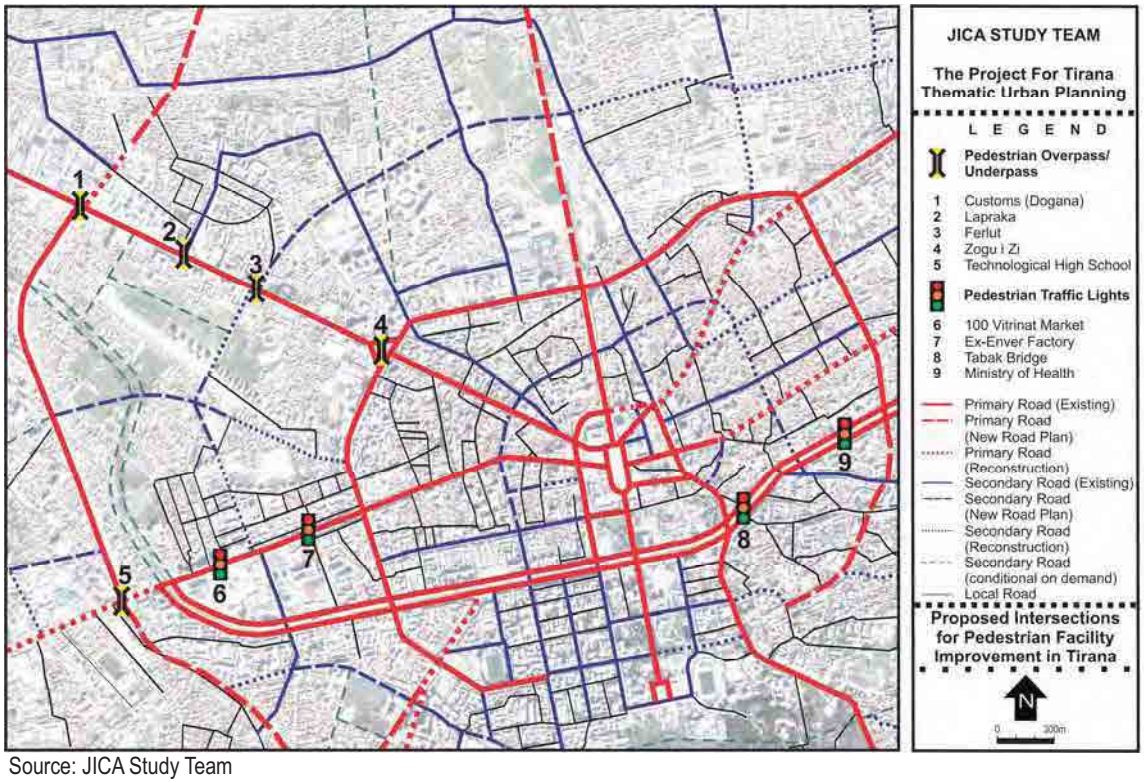


Source: JICA Study Team

Figure 4.7.1 Example of a "Traffic Cell" System in Central Tirana

(2) Pedestrian Facilities for Better Environment

According to URPTM, the most preferred mode of transport by Tirana citizens is "on foot." However, pedestrian facilities, especially along the busy main roads in the CBD, are insufficient in number. In order to reduce accidents involving pedestrians and to ensure safety, more pedestrian facilities such as crosswalks, pelican crossings, and pedestrian bridges/underpasses should be provided. Proposed intersections that need improvement for pedestrians especially for safe crossing are presented in Figure 4.7.2. In addition, narrow or poorly maintained sidewalks along the urban roads need to be improved, since sidewalks of good quality will enhance not only pedestrian safety but also the urban amenity and environment.



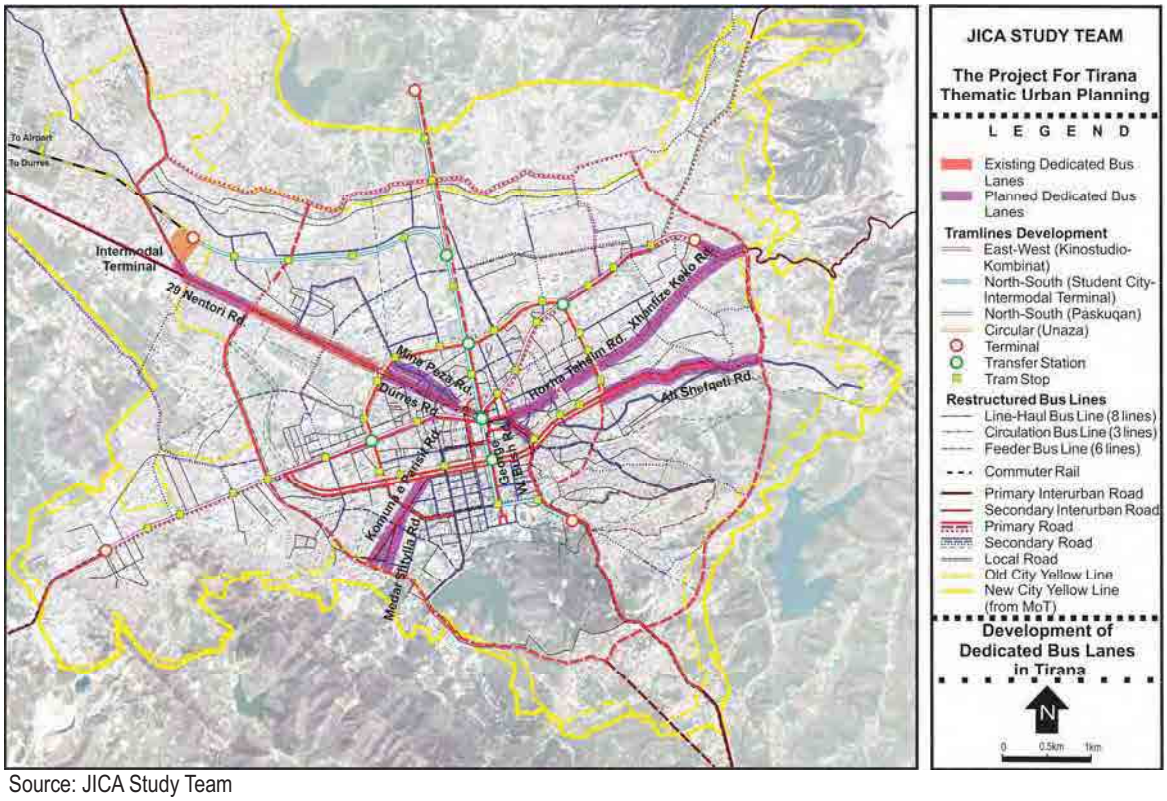
Source: JICA Study Team

Figure 4.7.2 Proposed Locations for Pedestrian Facility Improvement

4.7.2 Bus and Bicycle Lanes

(1) Dedicated Bus Lanes

In the context of urban transportation, public transport is given priority over private vehicles to secure smoother travel for those who use public transport within the limited road space. Hence, the current partial dedicated bus lanes should be extended more continuously on the urban primary roads to form a continuous, smooth network for buses, thereby serving as a BRT, as presented in Figure 4.7.3. It should be noted that the dedicated bus lane development is mainly for the line-haul type bus lines connecting the city center to the suburbs through the radial roads. By securing a relatively high operating speed, the time schedule can also be foreseen, consequently reducing the waiting time thereby attracting more passengers. It should also be noted that the dedicated bus line network will be a prototype of rail-based mass transit such as tramlines by converting the dedicated bus lanes to rail tracks when the demand grows in a longer term.

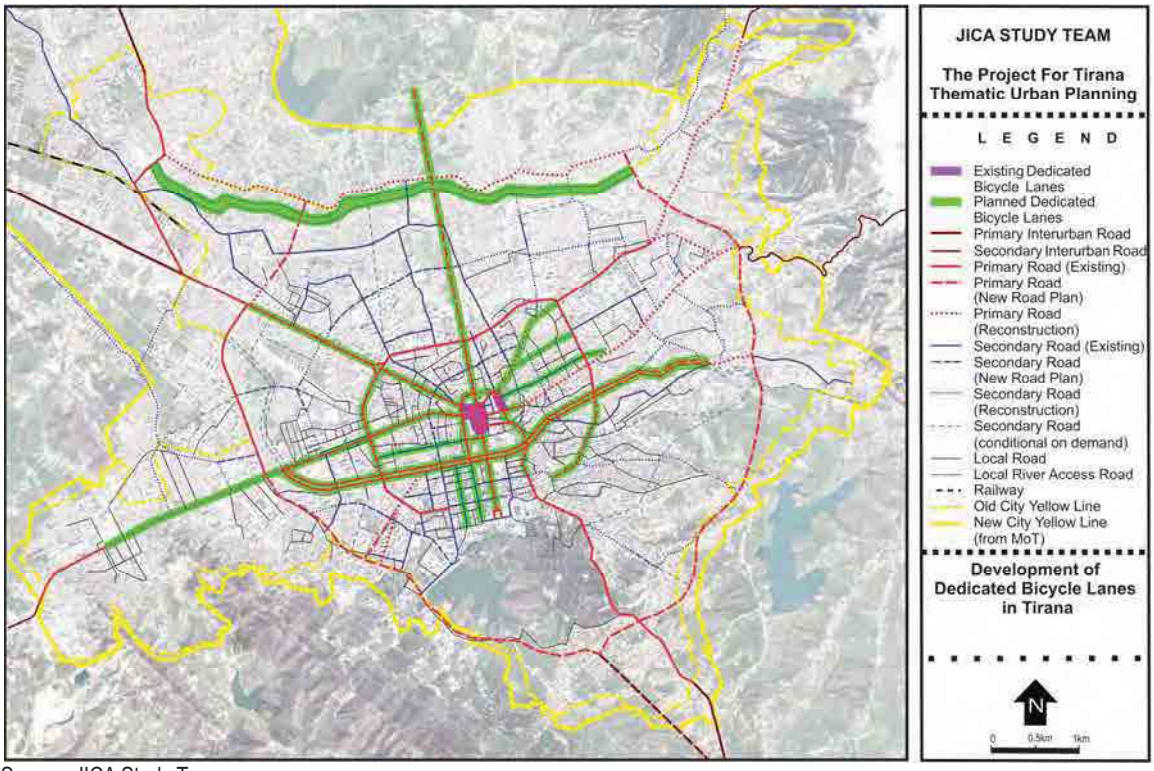


Source: JICA Study Team

Figure 4.7.3 Development of Dedicated Bus Lanes in Tirana

(2) Dedicated Bicycle Lanes

As for bicycle lanes, though they have been developed to a certain extent in Tirana, it is often the case that those bicycle lanes are occupied by illegal parking and stopping of private vehicles. Generally, in Tirana, there is a lack of consideration for the needs of non-motorized transport as a major road user. Currently underused and fragmented bicycle lanes with physical separators need to be extended as dedicated bicycle lanes as shown in Figure 4.7.4.



Source: JICA Study Team

Figure 4.7.4 Development of Dedicated Bicycle Lanes in Tirana

4.7.3 Parking System Development

(1) Additional Parking Facilities/Parking Information System

Under the situation of increasing automobiles and continuing reliance on private vehicles in Tirana, it is essential to increase the parking capacity in Tirana, especially in the CBD (inside the Middle Ring Road). Problems of overflowing parking vehicles are observed everywhere in the CBD. With on-street public parking rules such as authorized parking time, parking fees are determined and managed by the MOT, but parking is not efficiently enforced. Illegal on-street parking outside the designated parking area is reducing the number of available driving lanes. This causes traffic disorder, consequently reducing the road capacity and increasing the travel time and eventually the traffic pollution.

In the proposed primary and secondary road network that is presented earlier, on-street parking should be removed or tightly controlled to be replaced by the space for ROW of public transport and bicycles. A rough analysis of the total parking demand and supply in the CBD of Tirana based on the findings from the Parking Survey is presented in Table 4.7.1 and Table 4.7.2. The current ratio of the demand to the supply is below 1.0, based on the assumption of 8-hour operation (e.g., 8:00-16:00). However, the parking demand often concentrates causing oversaturation for a certain period of the day. According to the Parking Survey result, such an oversaturation period is generally observed from 9:00 to 14:00 in office buildings, from 11:00 to 14:00 in commercial buildings, and from 8:00 to 16:00 in on-street parking. If parking is to be controlled as explained later, it should be applied in those hours.

Meanwhile, if all the on-street parking is to be removed from the primary and secondary roads,

the total parking capacity will be reduced by 3,200 vehicles and, consequently, the ratio of the demand to the supply will exceed 1.0. Thus, construction of additional parking facilities for 3,200 vehicles at the minimum is urgently necessary in the CBD to clear away the current on-street parking from the primary and secondary roads to utilize the road space for public transport and bicycles while maintaining the same traffic capacity. Particularly around the inner ring corridor area in which most of the roads are proposed to be pedestrian streets, additional parking facilities are proposed mostly as underground parking and the locations are presented in Figure 4.7.5. Total additional capacity of those parking facilities is estimated at some 7,500 vehicles, which will well cover the existing parking capacity to be removed from the primary and secondary roads in the CBD.

Table 4.7.1 Estimation of Parking Demand in CBD

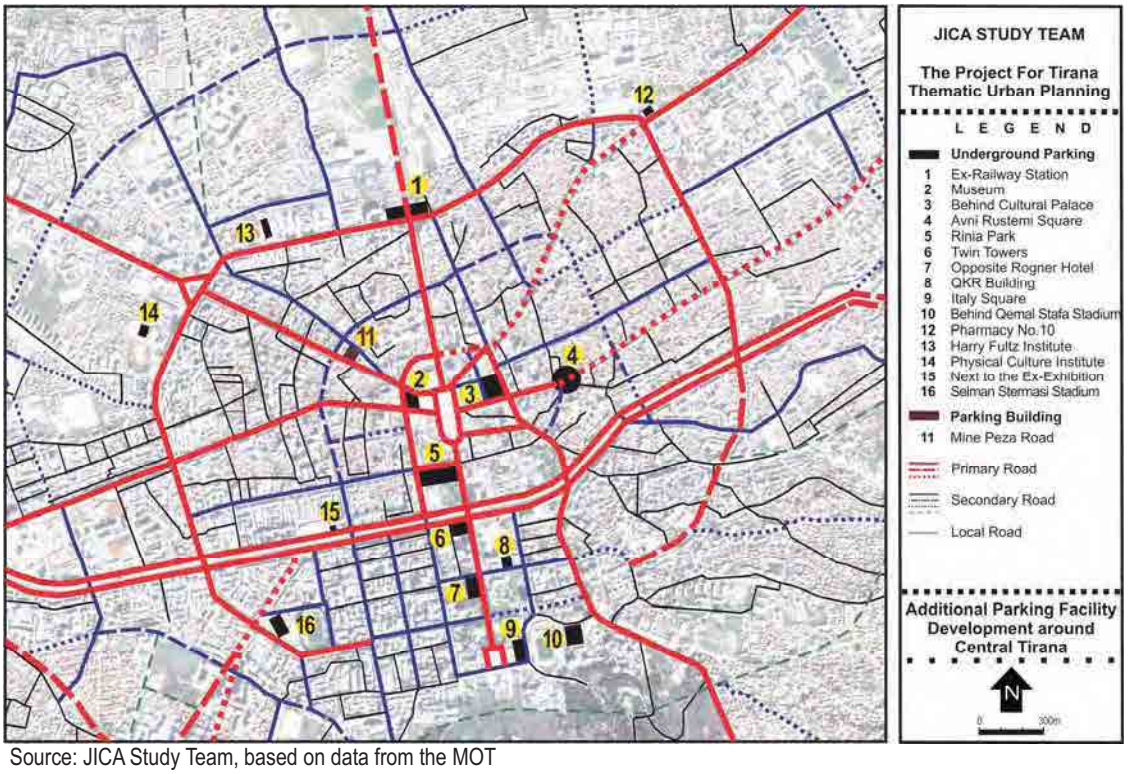
Building Type	Total Floor Area (m^2)	Daily Parking Vehicle Trip Rate (veh/m^2)	Average Duration (hours)	Total Daily Parking Demand (veh-hour)
Government office buildings	87,400	0.017	4.0	5,900
Private office buildings	111,300	0.021	3.9	9,100
Commercial buildings	34,600	0.017	3.9	2,300
Other buildings* (on-street parking)	2,752,400	0.009	5.0	126,800
Total	2,985,700	-	-	144,200

Note: *Assuming total buildings that are located within 30 meters from the road with on-street parking.
Source: JICA Study Team, based on Parking Facility Survey

Table 4.7.2 Estimation of Parking Supply in CBD

Parking Type	Total Capacity (veh)	Total Supply* (veh-hour)
Off-street parking	11,500	91,800
On-street parking (primary & secondary roads)	3,200 [0]	25,600 [0]
On-street parking (local & other roads)	5,400	43,200
Total	20,100 [16,900]	160,600 [135,000]
Demand/Supply Ratio	-	0.90 [1.07]

Note: *Assuming 8-hour operation from 8:00 to 16:00.
'[ ]' indicates the case excluding on-street parking on the primary and secondary roads.
Source: JICA Study Team, based on Parking Facility Survey



Source: JICA Study Team, based on data from the MOT

Figure 4.7.5 Additional Parking Facility Development around Central Tirana

When those additional parking facilities have been developed, a parking information system will be necessary, guiding car users to the most appropriate public and private parking lots along with parking availability information through information devices such as parking information signboards (Figure 4.7.6). It will also help to reduce on-street parking vehicles and queues waiting to enter parking facilities in the central area.

[Yeovil Town, England]

[Istanbul, Turkey]

Source: JICA Study Team

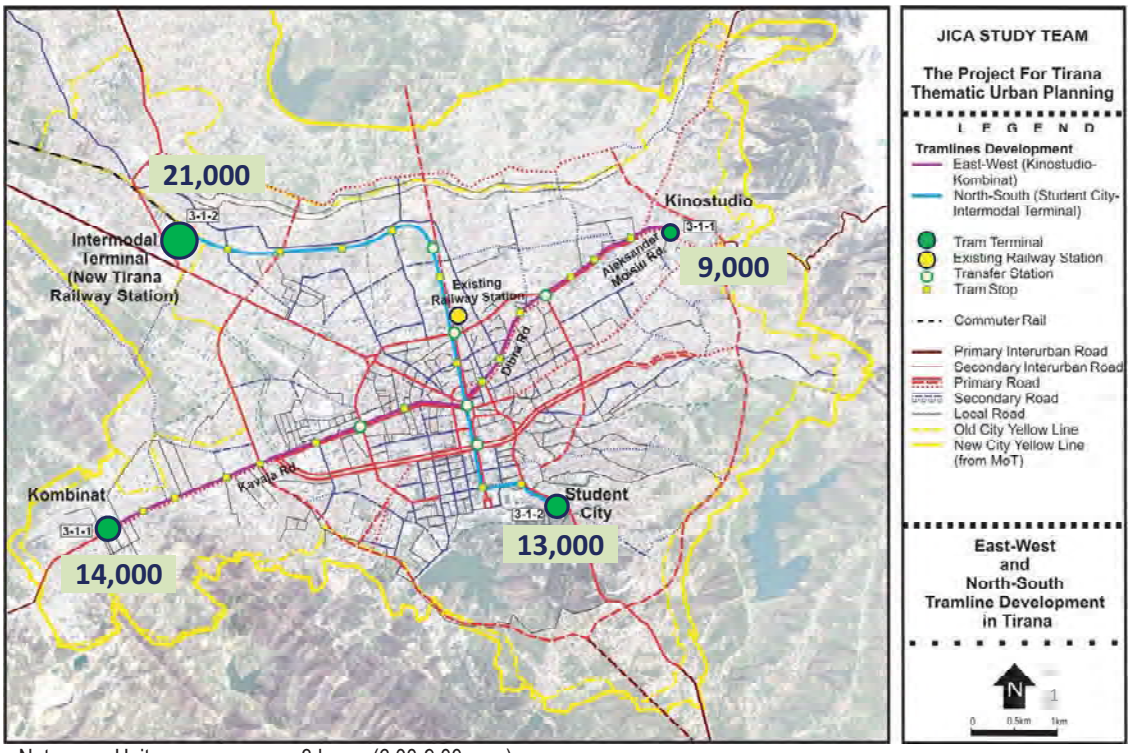
Figure 4.7.6 Examples of Parking Information Board

(2) Park & Ride System

Construction of parking facilities is also critical for facilitating intermodality between private vehicles and public transport systems throughout the Tirana metropolitan area. New parking facilities should be developed in the major intermodal nodes (transfer points between primary

roads and public transit (bus or tram) stops to promote Park & Ride, which provides parking lots for private car users to transfer to public transport, especially at the proposed intermodal transportation terminal.

While a further study is necessary to estimate the scale of the parking facilities to be used for the Park & Ride system, Figure 4.7.7 shows the expected number of passengers at each tram terminal that is described later. The potential demand of parking facilities for Park & Ride will be proportional to the number of passengers. That is, a certain percentage of the tram users are assumed to utilize the Park & Ride system.



Note: Unit: passengers per 3 hours (6:00-9:00 a.m.).
Source: JICA Study Team

Figure 4.7.7 Projected Number of Passengers at Each Tram Terminal (2027)

(3) Parking Pricing System

Current parking regulations, especially on on-street parking, need to be reassessed more drastically to guarantee a more efficient use of roads and to secure the rightful capacity of the proposed road network. Parking vehicles, whether they may be located on or off street, should be charged a fee, which is also expected to bring about considerable revenue for infrastructure investment. Furthermore, as the parking fees become higher, it will eventually deter private vehicles from entering the CBD and shift to public transportation, and this situation can be relatively easily controlled. This concept is called parking pricing and is often utilized as an effective TDM policy. However, consideration must be given to the fact that business and commercial activities along the roads, especially in the CBD, may also benefit or suffer from any action or decision. Providing sufficient nearby off-street parking facilities (as mentioned above) as well as common on-street loading/unloading zones (to be explained later) should be

the basis for this system.

Total future trips by purpose and by mode in the morning peak in the cases (including the phased road and urban transportation developments) with and without the parking pricing system are presented in Table 4.7.3. A parking fee of 500 Lek per trip (based on the commonly implemented parking fee of 100 Lek per hour and the average parking duration of 5 hours which are derived from the Parking Facility Survey) was assumed for this estimation and applied to all auto trips to/from the CBD. For all purposes, total trips by transit will be gaining a significant share; whereas the auto mode will be losing share accordingly. Thus, parking pricing is expected to have a direct effect in shifting auto users to public transportation.

Table 4.7.3 Comparison of Total Future Trips: Cases With and Without Parking Pricing

Trip Purpose	Future Person Trips (2027): Master Plan Case (without Parking Pricing)				Future Person Trips (2027): Master Plan Case (with Parking Pricing)			
	Auto	Transit	Walk	All Modes	Auto	Transit	Walk	All Modes
Home-To-Work	279,600 (44%)	289,100 (46%)	64,900 (10%)	633,600 (100%)	245,500 (39%)	314,600 (50%)	73,600 (12%)	633,600 (100%)
Home-To-School	25,400 (14%)	116,100 (62 %)	44,600 (24%)	186,100 (100%)	20,400 (11%)	119,300 (64%)	46,400 (25%)	186,100 (100%)
Home-To-Other	7,900 (9%)	57,600 (64%)	24,400 (27%)	89,900 (100%)	6,000 (7%)	58,800 (65%)	25,100 (28%)	89,900 (100%)
Total	312,900 (34%)	462,800 (51%)	133,900 (15%)	909,600 (100%)	271,900 (30%)	492,700 (54%)	145,100 (16%)	909,600 (100%)

Note: Unit: trips per 3 hours (6:00-9:00 a.m.).
A common tariff of 60 Lek per trip is applied in both cases.
A parking fee of 500 Lek per trip is assumed in the case with parking pricing.
Source : JICA Study Team

Focusing on the CBD, the Study team estimates that, as of 2012, approximately 38,000 vehicles travel to/from CBD in the morning peak hours. In future, for example in 2027, if no parking pricing is applied, the Study team forecasts that about 102,000 vehicles, which is about 2.7 times as many as the current level, will travel to/from CBD in the morning peak hours. On the other hand, the Study team forecasts that, with parking pricing of 500 Lek per trip, total vehicles that will be traveling to/from CBD in the morning peak hours will be some 38,000 vehicles, which will keep more or less the same situation as the current level.

(4) Other Measures for Parking Problems

In a longer term, parking problems should be solved through some regulations related with parking. First, as is already applied in Tirana, there should be a building code in which new high-rise buildings of five stories or more, for example, must be constructed with sufficient parking space to accommodate parking vehicles. Another regulation would require residents in the CBD to secure an off-street parking space before obtaining a car. This regulation is directly effective in reducing the on-street parking, and it has been applied in some cities in the world.

Meanwhile, in a shorter term, there are some intermediate measures for parking on the existing arterial roads in commercial areas even outside the CBD, where there seems to be no clue for solving the parking problems, such as

- (Metered) on-street parking on the nearby local streets instead of the arterial roads with high traffic demand;
- Utilization/sharing of backyard parking space, or wherever there is some space available;

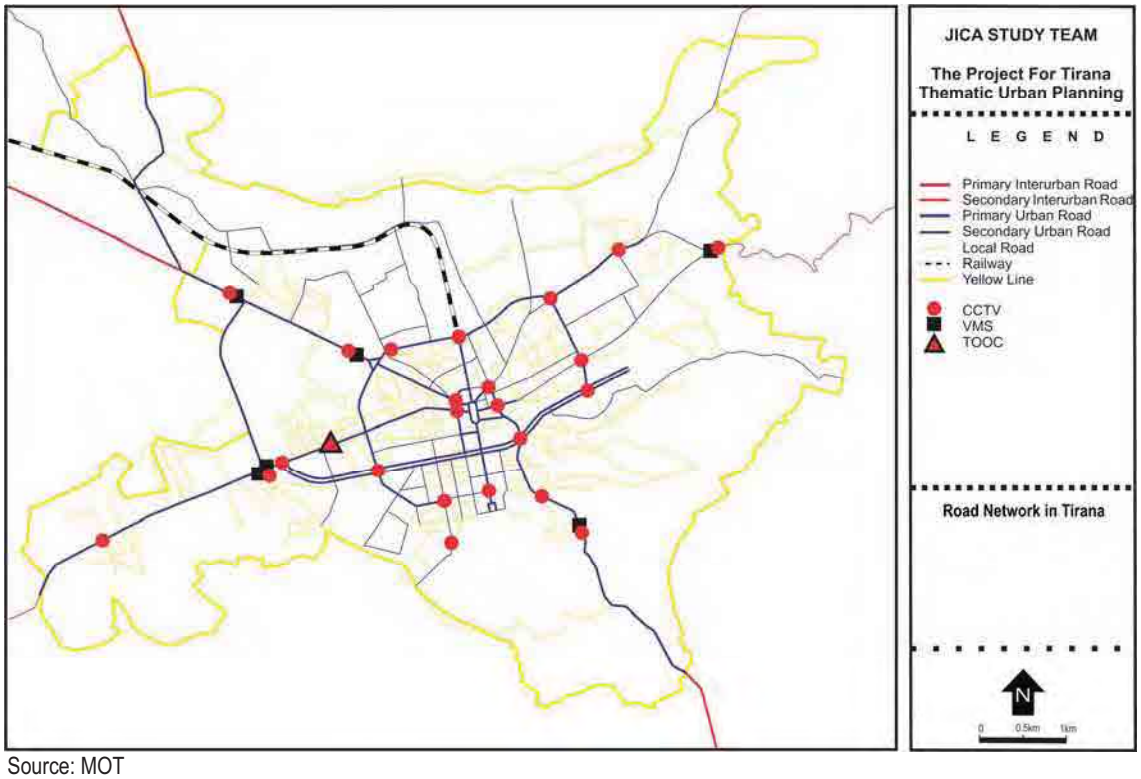
- Provision of common loading/unloading area for commercial trucks; and
- (Metered) on-street parking allowed only in the daytime off-peak, if the above measures seem to be insufficient for solving the parking problems.

However, it should be noted that the above measures are just temporary solutions. That is, customers coming to such commercial areas by private car should eventually shift to public transport to create a transit-oriented urban environment.

4.7.4 Urban Traffic Control (UTC) Center

As the number of automobiles is rapidly increasing in Tirana, traffic congestion is also getting more and more serious. In light of this situation, it has become important to identify the bottlenecks responsible for traffic congestion using intelligent transportation systems (ITS), and to disperse traffic through optimal traffic signal control and the provision of traffic information.

For traffic management and control, Tirana is now proceeding with the "Tirana Operational Control Center (TOCC)" project financed by EBRD. The first step, which is currently under way, includes installation of closed-circuit television (CCTV) cameras at 23 locations and variable message signboards (VMS) at 6 locations as well as development of a traffic management control room (TOCC), as shown in Figure 4.7.8.



Source: MOT

Figure 4.7.8 First Step of Tirana Operational Control Center Project

Meanwhile, the second step is planned to include development of an Area Traffic Control System (ATCS) and installation of signals with vehicle detectors/sensors. Traffic conditions of the urban roads in Tirana should be comprehensively monitored as well. A comparison of the three major traffic signal control systems is presented in Table 4.7.4.

Table 4.7.4 Comparison of the Three Major Traffic Signal Control Systems

System	Strategy	Demand Prediction	Vehicle Detection
SCATS (Sydney Coordinated Adapted Traffic System)	Green time adjustment	No	Near stop lines at intersections
SCOOT (Split Cycle Offset Optimization Technique)	Delay minimization	Yes	At exits of intersections in the upper stream
MODERATO (Management by Origin-DEstination Related Adaptation for Traffic Optimization)	Queue length minimization in heavy traffic	Yes (focusing on major intersections)	At 150m, 300m, 500m, 1km upstream from stop lines at major intersections

Source: Institute of Industrial Science, the University of Tokyo