

I. Introduction

1. Introduction

(1) Background of the Study

Since her declaration of independence from the former Soviet Union (FSU) in 1991, the Azerbaijan economy stagnated and its unfavorable consequences can be observed in socio-economic sector. In the transport sector in Baku, operation and management problems of public transport, difficulty of new investment for transport facilities and insufficient rehabilitation and maintenance works are identified as such consequences. Although the rate of car ownership is not so high, some congested sections of road have already emerged in Baku. In the near future, the expansion and strengthening of the national economy is likely due to the rapid resource development programs implemented by the Government with very active private sector participation. In tandem with the growth of the economy, the expansion of car ownership rate is also expected.

High dependency on vehicle traffic in the urban transport system will duly lead to undesirable road and environmental conditions of the city and inactivate urban activities through traffic congestion and parking problems.

In many countries great efforts were exerted to cope with urban transport problems as a result of the high dependency on private vehicles.

In Baku, the formulation of urban transport plan and efforts for its implementation is required at this moment to avoid similar urban transport problems occurring in many developed countries and to develop social and economic activities in harmony with the environment.

Under these circumstances, the Japan International Cooperation Agency implemented "Project Formation Study" in the transport infrastructure sector in Baku in October 1998. On the basis of this study, the government of Azerbaijan requested to the government of Japan, the implementation of the Study on Urban Transport Improvement including the feasibility study on the selected projects in the City of Baku. In response to the said request, the government of Japan dispatched a preliminary study group to Baku in June 2000 and signed and exchanged the Scope of Work (S/W). Thus this Study is to be implemented.

(2) Objectives of the Study

The objectives of this Study in accordance with the background mentioned above are shown below:

- (i) To formulate an Urban Transport Improvement Plan for Baku City (M/P) with target year of 2020;
- (ii) To conduct a feasibility study on priority projects (F/S); and
- (iii) To carry out technology transfer through the implementation of the Study.

(3) Planning Area

The Study area covers Baku City comprising of 11 districts. The Planning Area consists of six (6) districts (Sabail, Yasama, Nasimi, Narimanov, Nizami and Khatail) within Central Baku and the adjacent densely populated area of the Binagadi, Sabunchi, and Surakhan district. This Area is 285.4 km² and has a population of 1.342 million persons (if refugees and internally displaced persons are included, 1.450 million persons).

(4) Organization of the Study

To conduct the Study, JICA has organized a Study Team, headed by Mr. Akio NAKAMURA and the Advisory Committee, chaired by Dr. Ryuichi KITAMURA to give advice for the Study. The Government of Azerbaijan has formed a Steering Committee and Counterpart Team comprising of relevant organizations to facilitate the progress of the Study.

(5) Reports

The final reports consist of Main Report (English and Russian), Summary (English, Russian and Japanese), and Appendix (English).

(6) Technology Transfer

The Study Team tried to transfer the planning technology by working together with the counterparts. Two workshops and one seminar were held in an effort to inform the specialists and all those concerned of what the Study was about and to transfer the planning technology. In particular the lectures given by the Advisory Committee members and documents and brochures distributed in the workshops and seminar greatly contributed to enhancing the understanding of the Study.

Recently, ADB, EBRD and other international organization have exerted development assistances mainly focusing on the formulation of international transport corridor, which is related to the regional transport network of Baku. In the course of the Study, the Study Team made technology transfer to the counterpart organizations of regional transport concept formation and transport demand forecast. Therefore, such technology transfer is of great use for the counterpart organization to carry out the collaboration with these organizations.

(7) List of Participants

Steering Committee/Counterpart

Mr. Rauv Panakhov	Deputy Mayor, Baku Municipality
Mr. Aliyev Vahid	Head, State Road Police Department
Mr. Muradov Elbrus	Chief Engineer, Baku Subway
Mr. Nazirov Kurban	Head, Industrial Union of Passengers Transit, Azerbaijan State Railway
Mr. Kazimov Soltan	Chief Engineer, Baku Sea Harbor
Mr. Asadov Adishirin	Chief, Engineering Department, Baku Sea Harbour
Mr. Abdullayev Kavuz	Vice President, State Concern "Azeravtonaghiyat"
Mr. Guliyev Feyzula	Author of the General Plan, Project Institute of Baku
Mr. Faradov Latif	Senior Specialist, Town Planning Department, Baku Municipality
Mr. Gafarov Farhad	Deputy Head, Town Planning Department, Baku Municipality
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Mr. Sadigov Yashar	Head, Road Operation Department, Baku Municipality
Mr. Rustamov Hidayat	Deputy, Traffic Department, Baku Municipality
Mr. Saleh Badalov	Deputy Chairman, Transport Department, Baku Municipality
Mr. Rustamov Zakir	Deputy Chairman, Transport Department, Baku Municipality
Mr. Haydar Ibragimov	Traffic Police of Baku
Mr. Guliyev Iskender	Traffic Police of Baku
Mr. Manafov Anver	Deputy Chief, City Economic Department, Cabinet of Ministers
Mr. Babayev Telman	Advisor, Transport and Communication Department, Cabinet of Ministers

Mr. Suleymanov Rovshan	Senior Advisor, Economy and Financial Credit Department, Cabinet of Ministers
Mr. Godjayeve Adil	Head, State Concern “Azeravtoyol”
Mr. Mirjavatov Miri	Head, State Concern “Azeravtoyol”
Mr. Eyvazov Fuad	Senior Specialist, Ministry of Economic Development

Others

Mr. Hasanov Mirgasan	Transport Inspector, City Economic Department, Baku Municipality
Mr. Kerimov Hagani	Head, State Concern “Azeravtonaglyiat”
Mr. Askerov Nazim	Chairman, Transport Department, Baku Municipality

JICA Study Team

Mr. Nakamura Akio	Team Leader
Mr. Honma Masahito	Deputy Team Leader/Public Transport Specialist
Mr. Gencaga Hasan	City Planner/Land Use Planner
Mr. Yamakawa Hirotoshi	Traffic Survey/Traffic Forecast Specialist
Mr. Chua Mok You	Traffic Survey/Traffic Forecast Specialist
Mr. Ono Masazumi	Traffic Survey/Traffic Forecast Specialist
Mr. Yamane Takao	Institution/Management Specialist
Mr. Okano Yoshimi	Road Planner
Mr. Higuchi Yoshitaka	Traffic Management Specialist
Mr. Hara Takayuki	Transport Facility Planner
Mr. Naganuma Kengo	Environmental Specialist
Mr. Yanagisawa Masatoshi	Design/Cost Estimate Specialist
Mr. Kotani Hiroyuki	Economist/Financial Analyst
Mr. Uchida Syogo	Road Planner/Traffic Forecast Specialist
Mr. Nidaira Masato	Administrator
Mr. Murai Yoshiyuki	Interpreter
Mr. Akasaka Yoshio	Interpreter
Mr. Goto Yukichi	Interpreter

JICA Advisory Committee

Dr. Kitamura Ryuichi	Professor, Kyoto University
Mr. Kimura Yoshiharu	Ministry of Land, Transport, and Infrastructure
Mr. Nagano Shoichi	Ministry of Land, Transport, and Infrastructure
Mr. Inooka Hideo	Ministry of Land, Transport, and Infrastructure

JICA Headquarters

Mr. Hirai Toshio	Director, 1st Social Development Study Division, Social Development Study Department
Mr. Umenaga Tetsu	Deputy Director, 1st Social Development Study Division, Social Development Study Department
Ms. Honda Eri	Deputy Director, 1st Social Development Study Division, Social Development Study Department
Mr. Konya Kenichi	Staff, 1st Social Development Study Division, Social Development Study Department
Mr. Kasai Takahiro	Staff, 1st Social Development Study Division, Social Development Study Department

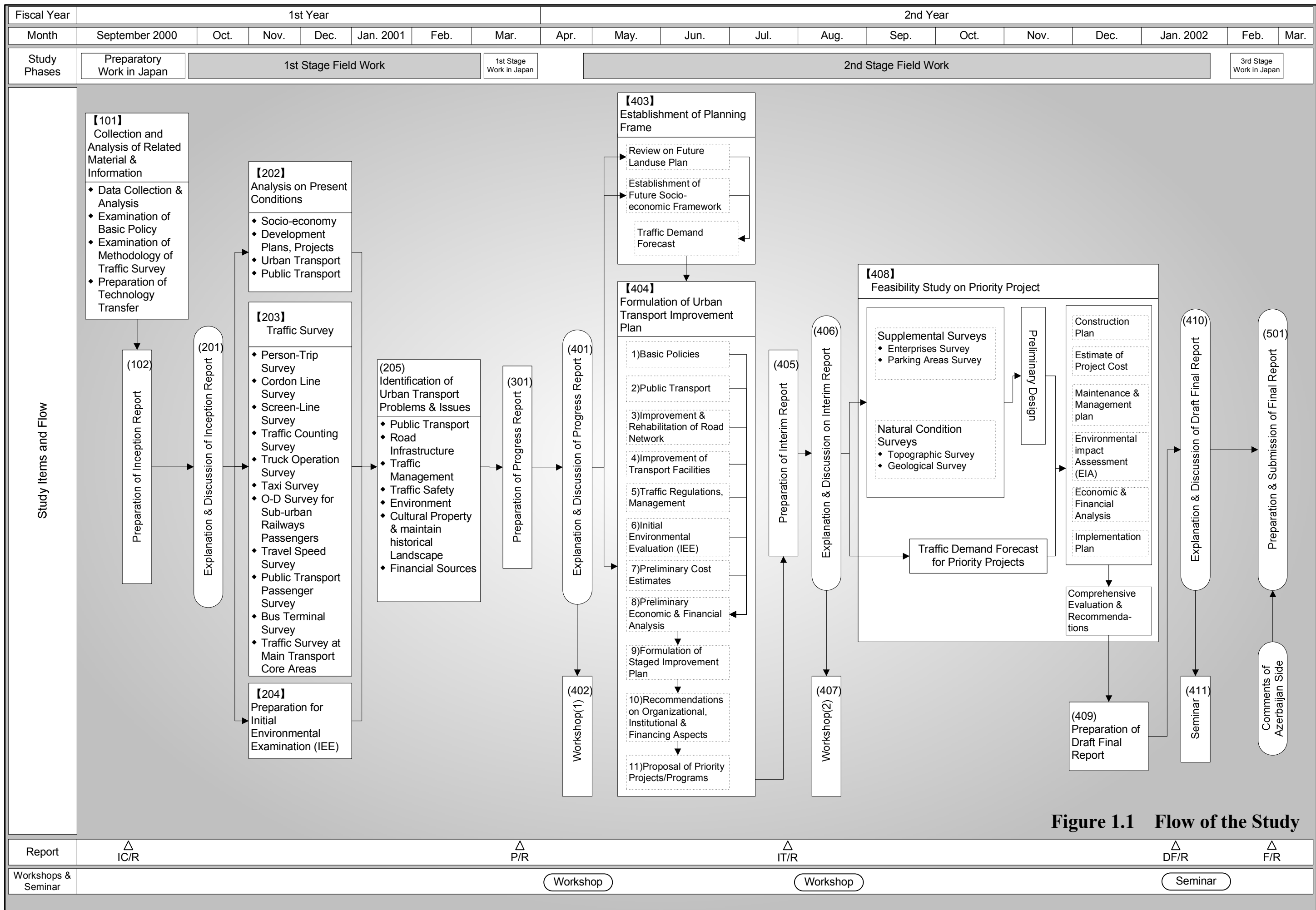


Figure 1.1 Flow of the Study

Report	△ IC/R	△ P/R	△ IT/R	△ DF/R	△ F/R
Workshops & Seminar		Workshop	Workshop	Seminar	



II. Existing Conditions

2. Socio-economic Conditions

(1) Changes in GDP

After the disintegration of the former Soviet Union, the decline in GDP continued from 1991 to 1996 but it is now undergoing a slow recovery. The decline especially in industry was significant. In 2000 the level of physical output was 60% of that of 1990.

The deficit in national current account in 1999 was 10% of GDP. The current account deficit is largely financed by oil related investment.

In 2000 the GDP per capita at current prices was 619USD.

In spite of the shrinking economy, the number of employees has remained at the same level. However the shift of labor force from industry, construction, and transport to small trading activities, governmental health and education services and administration has occurred.

(2) Socio-economic Situation in the Study Area

1) Population

The total population in the Study Area is 2,025 thousand pers. including 91 thousand pers. of refugees and 145 thousand pers. of IDP. The population excluding refugees and IDP decreased by 0.3% from 1989. The population densities in the districts located in the central areas are some 220 pers./ha, however those of the district including industrial areas are low between 75 and 90 pers./ha.

Table 2.1 Populations in the Study Area (2000)

	District	Area(km ²)	Resident	Refugees	IDP	Total	Pop. in 1989	Pop. Density
1	Nasimi	9.8	195,928	14,500	11,300	221,728	216,800	22,625
2	Sabail	28.1	74,276	4,600	6,900	85,776	90,500	3,052
3	Yasamal	16.4	221,494	1,200	14,800	237,494	218,700	14,481
4	Narimanov	24.4	147,944	17,200	11,900	177,044	171,700	7,255
5	Nizami	19.6	159,125	7,400	12,900	179,425	170,200	9,154
6	Khatai	31.6	215,570	10,200	15,100	240,870	231,400	7,622
7	Binagadi	161.5	209,336	15,600	22,200	247,136	179,800	1,530
8	Sabunchi	244.3	188,619	8,300	16,200	213,119	191,900	872
9	Surakhani	122.0	165,795	8,100	12,900	186,795	127,200	1,531
10	Karadagh	1,083.7	94,286	2,400	8,900	105,586	84,700	97
11	Azizbekov	395.7	116,481	1,700	12,100	130,281	112,000	329
	Total	2,137.1	1,788,854	91,200	145,200	2,025,254	1,794,900	1,008

* IDP: Internally Displaced People

** Pop. in 1989 does not include refugees and IDP

2) Industrial Activities

In recent years, production output decreased in Nizami and Khatai districts; however, it increased in Sabail district. In each district in Baku, the number of factories remained at the same level, but the operation level of factories in Baku was lowered. Also, industry in Sumgayt, located 35km in the north, remains low and the tendency of workers' inflow to Baku is gradually intensified.

3) Motorization Rate

Motorization rate of Baku is at 75 vehicles/thousand pers., relatively low.

Table 2.2 Comparison of Motorization Rates

City	Year	Population (1,000 persons)	No. of Vehicles (1,000 vehicles)	Motorization rate (vehicles/1,000 persons)
Baku	2000	2,025	171	75
Astana	1999	320	29	91
Moscow	1996	8,670	1,729	199
Bucharest	1995	2,340	320	137
Munich	1998	1,320	740	561
Stockholm	1994	719	221	311

4) International Cooperation to Baku City

International organizations such as EBRD and World Bank are providing various types of cooperation to Azerbaijan. EBRD is focusing on the development of private sector investment and critical infrastructure investments.

Projects related to Baku, namely “Reorganization of the Transport Sector in Azerbaijan” (TACIS), “Development of the Port of Baku, Port Master Plan” (TACIS) “The Master Plan Study on Integrated International Management in Baku City in Azerbaijan Republic” (JICA) and “Baku Bypass Highway project”, are listed.

(3) Existing Institutional Condition

A drastic change in governmental structure and organizations has been made after independence. The Baku Municipality is also required to be a self-sustainable organization.

State concerns on transport actually provide transport services. Azeravtoyol and Azeravtonaglyat are such organizations.

Baku Subway is a State Concern controlled by the Cabinet of Ministers. It is expected to operate as a self-sustaining system by law, but the revenue from operations is only half of required total expense even with free utility supply.

The Department of Transport of Baku Municipality is in charge of operating surface public transport including tram, bus and trolley bus. It also issues licenses for the operation of taxis and minibuses.

The State Traffic Police Inspectorate under the Ministry of Internal Affairs is in charge of road safety.

The transport policies in Azerbaijan are the following:

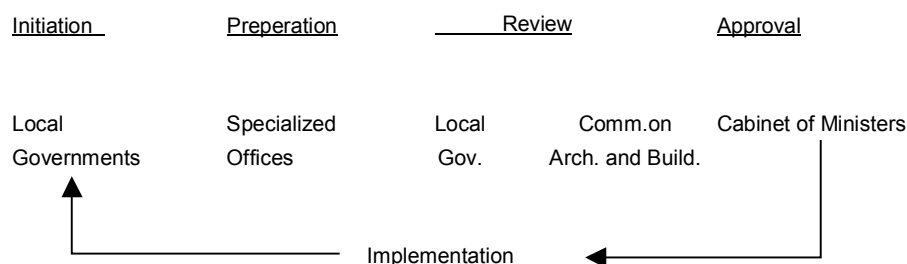
- Implementation of economic, investment, tariff and scientific-technical policy in the field of transport
- Forecast of state needs, including cargo transportation and other transportation services
- Provision of equal terms for restriction and development in transport sector
- Carrying out of state regulations to ensure safe, efficient and regular work of transport sector
- Protection of state interests, legal interests and rights of transport enterprises and transport users
- Increase of efficiency and competitiveness at world market of transport services
- Strengthening and development of mutual cooperation in the field of transport

3. Land Use and Environmental Condition

(1) Present Institutional System for Physical Planning

Present institutional system for physical planning is illustrated below.

The Office of the Mayor issues the permits on compliance of individual construction activities with the land.



(2) Land Use Patterns

There is practically no sub-urbanization. Nearly all residences are within the Baku amphitheatre. Another feature of the present structure is the large undeveloped area in the center of the city.

There is considerable potential for the construction of high-rise buildings in the center of the city, because 40% of the residential land in Baku is still occupied by one-storey buildings.

Three principals of Soviet era planning seem to have had a major impact on the present urban form and land use: first priority to industry in land allocation; agricultural production encouraged within the city; and restriction of redevelopment of old areas of the town and old buildings.

There seems to be some consensus that industry should be moved from the city center. The primacy of industry shaped the transport network, especially subway network.

There are two major changes that require revisions in the General Plan. First, there is no land allocation for the low-density residential units being built by the emerging middle class. Secondly, the need for commercial space is growing.

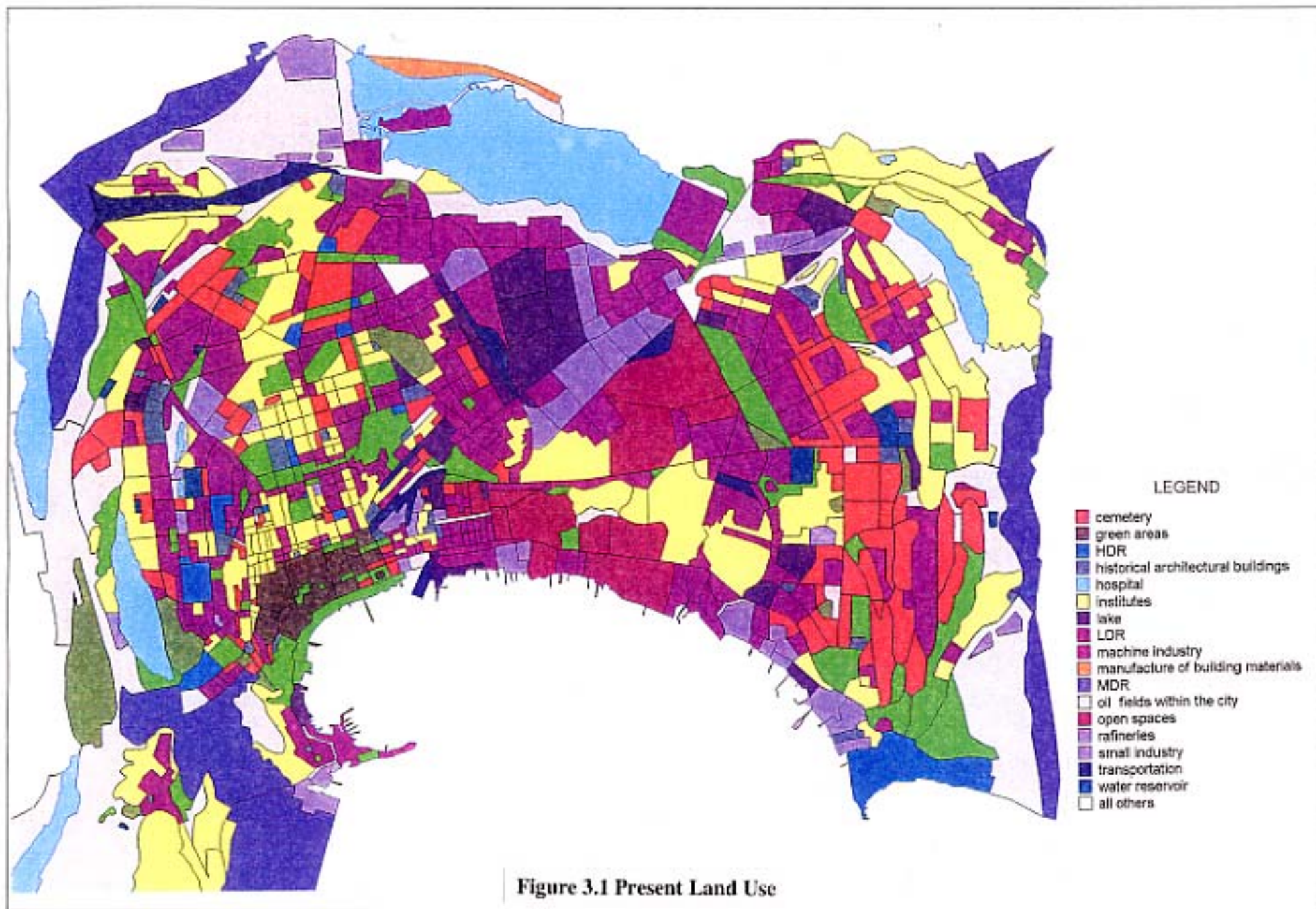
(3) Environmental Condition

In Azerbaijan, the EIA procedure is applicable to all economic activities.

The principles for the EIA implementation are defined in “Law of the Republic of Azerbaijan on Environmental Protection (1999)”.

The particular EIA procedure is defined in “Handbook for the Environmental Impact Assessment Process in Azerbaijan (1996)”. This Handbook stipulates the preliminary consideration whether the full EIA implementation is needed or not for a proposed economic activity. However, the concrete procedure of the environmental examination is not defined in the guideline. In February 2001, the air pollution standard was revised.

Built-up area in surrounding “Old City” and dense residential areas are found in the east of the urbanized area. In between both areas, a large tract of industrial area including idle land is located.



4. Person Trip Characteristics

(1) Outline of Traffic Surveys Conducted

In this study, various traffic surveys shown below were carried out to identify traffic characteristics in the planning area especially focusing on the person trips.

No.	Name of Survey	Scope	Date Conducted
1.	Person trip survey	20,000 hh within the study area (about 5%). Additional 500 samples in Sumgayt	Nov. 2000 to Jan. 2001
2.	Cordon Line roadside OD survey	10 locations (24hrs at 7 locations and 14 hrs at rest)	7 th -22 nd Feb. 2001
3.	Screen Line traffic counting survey	7 locations (24 hours at all locations)	19 th -22 nd Dec. 2000
4.	Traffic volume counting at major roads	16 locations (24 hours at 13 locations and 14 hrs at rest)	13 th -21 st Dec. 2000
5.	Truck movement survey	20 companies.	5 th -19 th Feb. 2001
6.	Taxi movement survey	100 samples from taxi companies.	25 th Jan-2 nd Feb. 2001
7.	Public vehicle occupancy survey	7 locations (6 screen line points and 1 subway)	11 th -22 nd Dec.2000
8.	Suburban railway OD survey	1 location at Baku railway station	4 th Dec.2000
9.	Bus terminal survey	10 locations (16 hrs)	15 th -19 th Jan. 2001
10.	Intersection traffic movement survey	5 locations (peaks hours 7-10am, 12-2 pm, 5-8 pm)	4 th Jan. 2001
11.	Traffic behavior survey at 20 Jan. and 28 May Squares	2 locations (16 hours)	14 th -19 th Feb. 2001
12.	Travel speed survey	4 routes (by car and bus)	4 th -20 th Dec. 2000
13.	Parking survey	Selected CBD area.	24 th Jan. 2001

(2) Person Trip Characteristics

The original person trip data obtained by the person trip survey were expanded to show all the trips made by inhabitants of Baku. The results are summarized below.

The average trip rate is 2.04 trips/person a day. The average trip rate of male is greater than that of female. Trip rate of person belonging to a household with car ownership is greater than that without car ownership.

Of the modal split, walking only comprised 49%, buses including minibuses 24%, private car 15% and subway 9% respectively. Public transport thus plays the most important role in the urban transportation of Baku. To-work trips constituted about 15%, to-school trips 12%, to-home 48% and other private trips 25%.

Significant desire lines are in east-west corridor for Nasimi, center of city with suburb residential areas, such as Sabail, Yasamal, Narimanov, Kahatai and Binagadi. Strong desire lines by car are found in the radiation corridor to city center. Large bus desire lines are indicated in the radiation corridor to city center and Nizami area.

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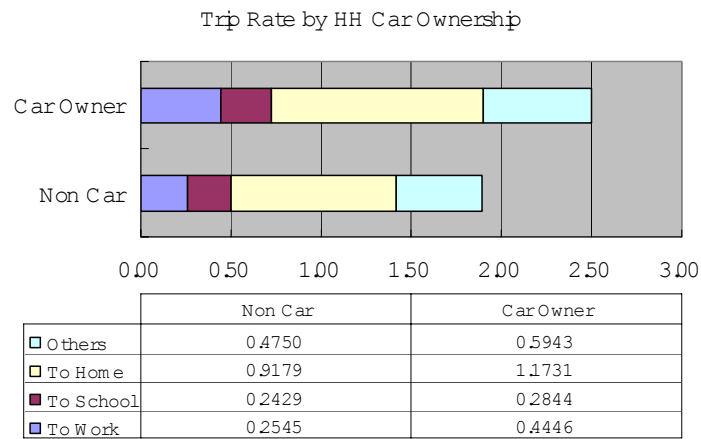


Figure 4.1 Person Trip Rates by Car Ownership in Baku (trips/pers.day)

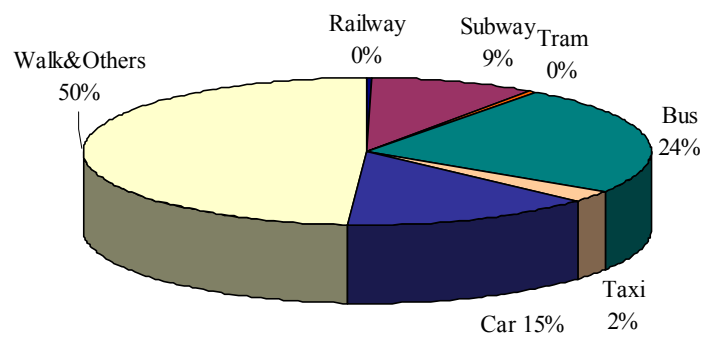


Figure 4.2 Estimated Modal Share in Baku

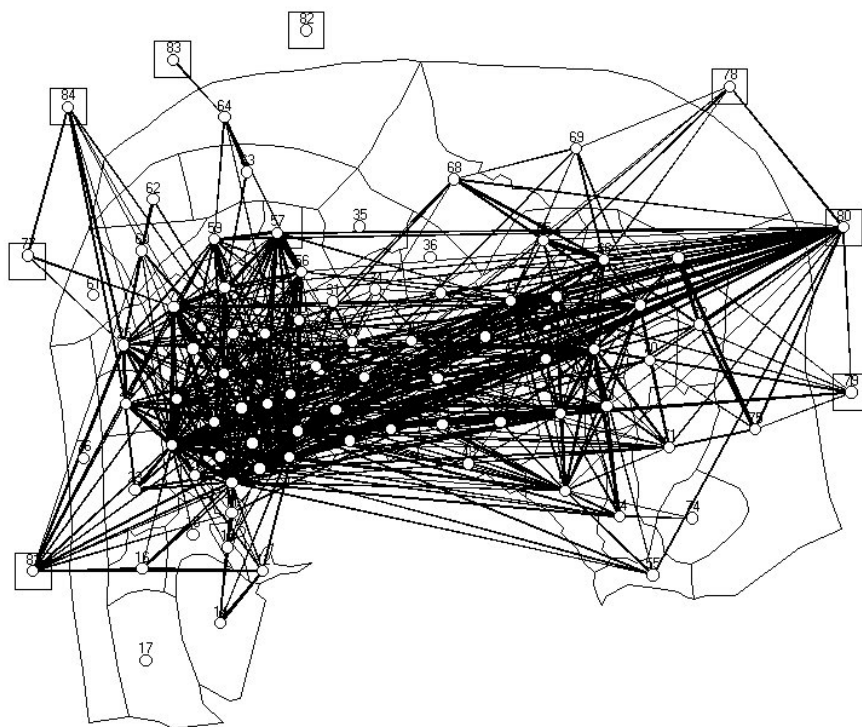


Figure 4.3 Desired Line by All Modes in Baku