CHAPTER 2
SOCIO-ECONOMIC
PLANNING

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2.1 Introduction

2.1.1 Overview

The Kazakhstan Government initiated the capital transfer in late 1997, which coincided with the economic difficulties following its Independence. They included a considerable GDP decrease, a rapid expansion of fiscal deficit and unemployment. The GDP before Independence, amounting to US$50 billion, dropped by half.

In line with the progress of capital development, the Government made intensive efforts to improve these economic conditions; stimulating production, reduction of fiscal deficit, privatization of utilities and other public companies and creation of employment. One of the important decisions made in this regard was the transfer of the capital.

The Capital of the Republic of Kazakhstan was Almaty (formerly know as Alma-Ata), when the independence of the nation was achieved in 1991. Almaty is located too far from the actual geographical center of the republic, and the city was already overbuilt with its population reaching 1,500,000 with no further prospect for expansion. Discussion of transferring the capital city to another location started as early as 1994 at a high level in the republican Government. As the result of a thorough comparative research upon the socio-economic, natural and infrastructural conditions, Astana (then called Akmola) was selected as the new capital.

In the course of the decision making for capital transfer, there were reportedly five important considerations.

(1) Geographical Location of the capital

The former capital, Almaty, is located too far from the geographic center of the Republic, which means that costs of transportation of goods and materials are expensive and energy consumption inefficient. Astana, on the other hand, is located close to the geographical center of the Republic, and is closer to major cities within the Republic.

(2) Transportation Network

Astana is conveniently located at the cross-road of railways and highways. Astana is on the northern route of the Siberian Rail connection. Astana is connected with the major cities, including Karaganda, Kostanai, Semey and

Almaty by railways and highways.

(3)   Strategic Aspect

Almaty is located close to international borders with neighboring nations. Although this may not create any immediate issues, location of the capital well apart from the international borders would be favorable from the strategic point of view.

(4)   Limitation to Development

Almaty is surrounded by steep hills around the existing city bounds, and does not provide much contingency for future development. The population of Almaty is approaching the 1.5 million mark, and the existing urban areas are already fairly built-up.   Astana on the other hand has almost unlimited open space around it, and is capable of accommodating the development needs in the future.

(5)   Ethnical Considerations

The ethnical composition of the republic is historically not uniform, with higher ratio of Russian population in the northern part.   The proposed transfer of the capital from Almaty to Astana was expected to accelerate mixing of ethnic groups and thereby realize better harmonization.

Since 1997, a substantial annual investment of nearly Tenge 40 billion has been provided for the construction of a new capital in Astana City, comprising mainly of large-scale infrastructure projects.   In 1999, public investments of the central and city governments combined accounted for 60% of this total investment. Astana is realizing a substantial and rapid growth of GRDP with this investment. The Kazakhstan Government estimated that a high level of investment exceeding the present level will continue during the five-year period from 2001 to 2005.

2.1.2   Present Condition of Socio-Economy in Kazakhstan

The Kazakhstan economy used to be a part of the total USSR economic system, but the disintegration of FSU placed Kazakhstan in a difficult circumstance where all the connections within the former USSR for procurement of input and sales of products evaporated. To adapt to the new circumstance, the Kazakhstan government started to carry out a number of economic reform programs aiming at transforming from a planned economy to a market-oriented economy, supported by various international cooperation programs. During 1992 – 1995, the

Kazakhstan economy shrank by 31% despite the initial efforts. In 1995, the Kazakhstan economy hit the bottom and economic growth rate turned positive in 1996 for the first time since independence in 1991. Macroeconomic stabilization had largely been achieved by 1997 as observed in the upturn of the economy in 1997 and decline in inflation rate. Progress was especially substantial in price and trade liberalization, privatization of enterprise and banking sector restructuring. Sector-wise, the resumption of economic growth in 1996 was led by the industry, trade and transport sectors. The agriculture sector is more volatile and influenced by weather condition, so negative growth persisted until 1998. In 1999, for the first time since 1991, the agriculture value added experienced a growth of 22% due to a jump in production, owing largely to favorable weather conditions. The construction sector, showing severe declines until 1996, expanded at a high rate of 8% in 1997 and again 11% in 1998. The start in 1997 of heavy investment in construction works in the new national capital, Astana, is said to have contributed to this.

In 1998, however, the economic growth rate turned to negative again: -2.5%. The government explained that the Asian financial and economic crisis in 1998 negatively affected the Kazakhstan economy. Actually the total export value dropped by 16% in 1998 after three consecutive years of increase. Since the import value did not decline proportionately, the trade deficit in 1998 expanded about 6-fold. The economy overcame this slump and started to grow again in 1999, sweeping away the adverse impact of the Asian economic crisis. The growth rates of the industry and agriculture sectors in 1999 were 2.2% and 22.0% respectively.

The income levels of the people seem to have been improving, but only gradually. The real average wage, precluding the influence of price level change, rose by 11.5% per annum from 1995 to 1998. The nominal wage in 1999 was Tenge 10,984 per person per month.

The population in Kazakhstan has been decreasing since her independence in 1991. The population kept falling by an average of -1.6% per annum between 1995 and 1998, reaching 14,958 thousand in 1998. During these 3 years, more than 700,000 citizens have left Kazakhstan. This phenomenon is still continuing due mainly to emigration of ethnic Russians.

The following table summarizes the recent socio-economic trends in Kazakhstan.

Major Socio-Economic Indicators in Kazakhstan

Item	Unit	1995	1996	1997	1998	1999
Population	Thousand	15,675.80	15,480.60	15,188.20	14,957.80	n.a
Employment	Thousand	6,551.50	6,518.90	6,472.30	6,127.60	6,109.00
GDP (Current price)	Billion Tenge	1,014.20	1,415.70	1,672.10	1,747.70	2,016.20
	Billion $	15.9	19.2	22.0	22.7	n.a
Real GDP growth	% to previous year	-8.2	0.5	1.7	-1.9	1.7a
Industry	-do-	-8.6	0.3	4.1	-2.1	2.2
Agriculture	-do-	-24.4	-5	-0.8	-18.9	22.0
Construction	-do-	-38	-21.8	8	11	n.a
Trade/repair of motor vehicles etc.	-do-	6.1	10.7	3	-2.6	n.a
						n.a
Transport	-do-	-13.2	1.8	4	-1.8	n.a
Communication	-do-	-4.8	-0.6	-1.1	5.8	n.a
Financial activities	-do-	-2.9	-9.6	-8.7	10	n.a
Real estate	-do-	n.a	n.a	n.a	0	n.a
State management	-do-	n.a	n.a	n.a	3.4	n.a
Education	-do-	-1.7	-3	-1.1	-3	n.a
Health care/social services	-do-	-2.9	-2.3	-9.4	-4	n.a
Other public services	-do-	n.a	n.a	n.a	-1.2	n.a
Other kinds of activities	-do-	n.a	n.a	n.a	-1	n.a
GDP per capita	10³Tenge/person	64.7	91.4	110.1	116.8	126.7
	$/person	1,011	1,239	1,450	1,519	n.a
Gross fixed capital formation	% to GDP	23	17.2	16.3	17.1	n.a
Nominal average monthly wage	Tenge	4,786.00	6,840.90	8,550.00	9,683.00	10,984.00
Real average monthly wage	Tenge, 1994 price	2,985.70	3,315.90	3,726.90	4,142.10	n.a
Exports (f.o.b, bop basis)	Million $	5,912.70	6,720.30	7,188.70	6,012.70	5,988.70
Imports (f.o.b, bop basis)	Million $	6,541.50	6,734.20	7,373.50	7,190.80	5,645.00
Trade balance	Million $	-628.8	-13.9	-184.8	-1,178.10	343.70
Exchange rate	Tg/$	63.97	73.8	75.9	76.9	138.2
CPI	1994=100	160.3	206.3	229.4	233.8	231.0
Rate of inflation	%/year	60.3	28.7	11.2	1.9	-1.2

Source : (1) Statistical Yearbook 99, Agency on Statistics of the Republic of Kazakhstan

(2) "Republic of Kazakhstan: Recent Economic Developments" August 1998 by International Monetary Fund.

(3) "Republic of Kazakhstan : Selected Issues and Statistical Appendix" March 2000 by International Monetary Fund

(4) International Financial Statistics December 2000, International Monetary Fund

Note: The exchange rates in 1995, 1996 and 1997 are those of the end of December. Those in 1998 and 1999 are those at the end
        of May 1998 and December 1999 respectively.

(5) "Brief Statistical Yearbook 1999" 2000 by Agency on Statistics of the Republic of Kazakhstan

2.1.3   Relevant Economic Planning

(1)   Blooming of Astana – Blooming of Kazakhstan (2000)

This planning document slightly differs in nature from the previously mentioned planning works. This plan was initiated by the Decree of

Government dated 24th December 2000 "About the creation of work team for development of the program 'Blooming of Astana – Blooming of Kazakhstan'", and stipulates the socio-economic development of Astana City for the period up to the year 2005.

On 17th July, 2000, the Concept part for the planning was approved by the Government. This document adopts the development of Astana city as the Government and Business City, in which the priority should be given to the service sector in combination with the transportation, communication, engineering services and construction. The document also notes that this direction of development does not preclude the significant development of industry, although the priority shall be placed on the modernization of existing and expansion of the small business enterprise network. It was mentioned that establishment of new large factories shall be prohibited entirely, while appropriate incentives should be provided for the entities catering to the maintaining of the city's activities, such as communication, transportation, construction, power and water supply and services of all types;.

Based on the approved concept, National Program up to 2005 has been prepared, and is awaiting approval now.

2.2   Population and Economic Planning Framework

2.2.1   Definition of City Development

Development of a city can be defined as the achieving of a well-managed population growth and an accompanying income increase concurrently.

The population growth and economic development are closely related with each other. Economic development would generate employment opportunities on one hand and the influx of workers would increase demand of new business on the other. Expansion of a city without substantial increase in the income would only cause confusion in livelihood, possibly increase crimes and create slums and shanties in a worst case scenario.

As will be mentioned later, in Japan or in a Southeast Asian nation such as Thailand, a work-related reason such as job seeking or work place transfer accounts for more than 60% of the inflow to large cities. It is imperative, therefore, to analyze and project the population growth and economic development at the same time.

This Chapter reveals the results of the projection of population and economic growth in an inter-related model.

2.2.2   Population Forecast of Astana City from the year 2000 to 2030

(1)   Actual Population Growth in Astana City

Population growth in a city consists of natural growth and social growth.

natural growth: number of birth minus death

social growth: number of inflow minus outflow

The indicators often used for the natural growth are birth rate and death rate per 1,000 people per annum.

The following table presents the actual population growth of Astana City in the last five years.

Actual population growth in recent five (5) years in Astana City (unit: person)

year	January annual 1 growth		birth per 1000	death per 1000	natural growth	natural increase	inflow	outflow	net inflow	adjust
1994	288,400		12.4	9.6	2.8	808	5,416	-11,124	-5,708	400
1995	283,900	-1.56%	11.5	11	0.5	142	4,857	-9,663	-4,806	-536
1996	278,700	-1.83%	11.2	11	0.2	56	2,822	-7,121	-4,299	643
1997	275,100	-1.29%	11.6	10.7	0.9	248	8,039	-7,890	149	-197
1998	275,300	0.07%	12.5	11.1	1.4	385	13,975	-9,159	4,816	37,699
1999	318,200	15.58%								
2000	321,600	1.07%								
Average, Astana 94-98			11.84	10.68	1.16					
Kazakhstan urban area 95-98			13.60	11.68	1.92					
Kazakhstan total 95-98			15.95	10.50	5.45					

Source: Social economic passport, Department of economy and small business development, January 2000, Social economic status of Astana city, Statistics department of Astana city, 2000, Statistical Yearbook of Kazakhstan 1999, Agency on Statistics
Note: "Adjust" is discrepancy of calculation.

The following could be deduced from the table:

1) Average of the birth rates, death rates and natural growth in the period from 1994 to 1998 are 11.84, 10.68 and 1.16 per 1,000, respectively. The natural growth rate is much lower than the national average of all Kazakhstan urban area, 1.92 per 1,000.

2) The social increase is more than ten (10) times of the natural increase. Population increase in Astana City comes chiefly from this social growth.

3) From 1994 to 1996, the city population decreased due to the fact that the outflow (average 9,300 people per year) exceeded the inflow of 4,400 plus natural growth of 340.

4) After the capital transfer in December 1997, the city population is showing a rapid growth, as the 15.58% increase in 1999, due mainly to a quite large influx of population.

Accordingly, the population forecast of Astana city would require careful estimation of social growth, namely the inflow and outflow of the population in the future.

(2)   Social Growth Elements

Social growth of population comes chiefly from work assignment or job hunting, marriage and schooling.[1] Astana City might have sizable inflow from neighboring towns or villages seeking job opportunities. In addition, there is a possibility that many families of government officials would move into this city. Furthermore, some of private companies, such as construction companies or banks, would choose to relocate their business to Astana.

On the other hand, nearly ten (10) thousand habitants have recently emigrated from Astana every year. This emigration is said to be prominent among the Russian inhabitants.

(3)   Large Social Growth in a Capital City

The Capital city tends to show a larger social growth than natural growth. Almaty City, for example, experienced a 3.5% annual growth during the twenty (20) years from 1939 to 1959.

> In 1926: 44,000 inhabitants (in 1929, Almaty became the capital)
> In 1939: 230,000
> In 1959: 458,000: 3.5% annual growth from 1939 to 1959[2]

In this period, the natural growth rate in the nation was 2%, while in urban areas the rate was presumably 1% or less, as the natural growth rates in urban districts are usually lower than the national average. Therefore, it is deduced that staple of the Almaty's high annual population growth rate of 3.5%, came mainly form the social growth of about 2.5% per year.

Actual experiences in foreign countries support the fact of substantial social growth in the capital cites. Turkey moved its capital from Istanbul to Ankara seventy years ago. Since then, the population has increased from 60,000 to 3,000,000. Canberra, the capital of Australia, achieved 3.3% annual increase from 1972 to 1992, while half of this boost is attributed to the social growth.

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[1] In Japan, job seeking or work place transfer accounts for 62% of reasons of inflow to big cities. Thailand, which has a high employment ratio in agricultural sector as Kazakhstan used to have, shows that work-related reasons reached to 60% among those of inflow from agricultural villages to big cities (Atsushi Otomo, Domestic movement of the people in the world, No5)
2 Hidesuke Kimura, Russians in central Asia: Past and Present, May 1998, page 203

(4)   Population Forecast of Astana City

Astana city has 322 thousand population as of January 1, 2000. For future population growth, two forecasts are prepared: 650 and 800 thousand in the year 2030[3]. Annual growth rates in the period of 30 years are 2.4% and 3.1%, respectively. The two forecasts have the same projection up to the year 2010. Table 2.2.2 shows the population forecast for Case 1, and Table 2.2.3 summarizes Case 2.

Population Forecasts of Astana City

Year	2000	2005	2010	2020	2030	Annual growth rate (2000-30)
Case 1	321,600	400,000	490,000	620,000	650,000	2.4%
Case 2	321,600	400,000	490,000	690,000	800,000	3.1%

Projected Population Growth of Astana up to 2030
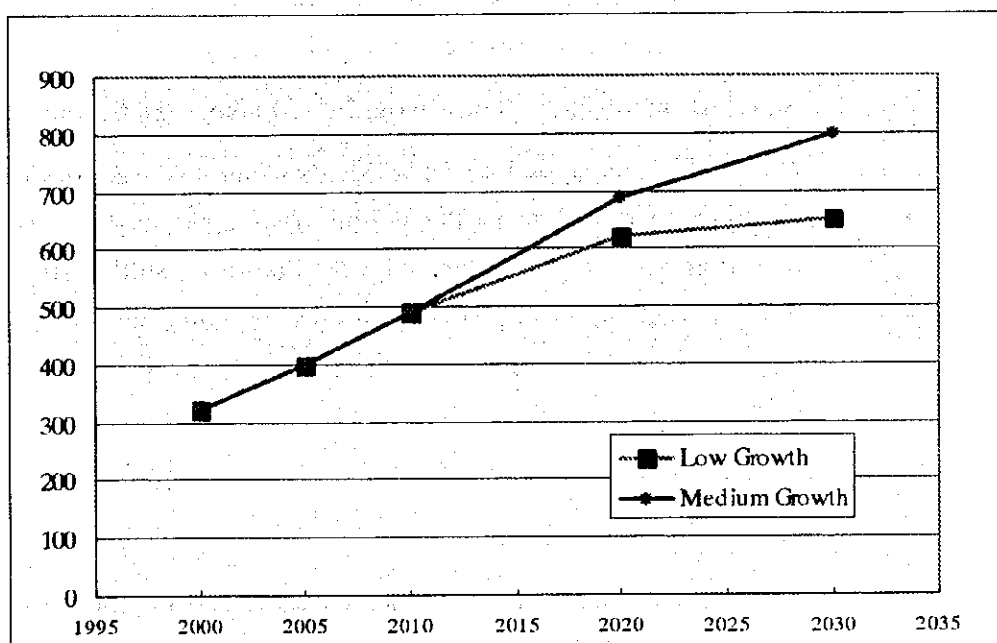
Considering experiences of 3.5% annual growth in Almaty or 3.3% in Canberra, Case 2 seems to be more realistic. These two long-term forecasts will be studied later in relation to the corresponding economic development projection in this report for verification of robustness.

Medium Term forecast of 490 thousand in the year 2010 is as follows.

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3 There is yet another population framework explained to the Preparatory Mission of this Master Plan in October 1999, which stipulated 650,000 in 2005 and 1,000,000 in 2030. This population growth scenario is considered to be too high, all things considered, and therefore is not adopted in this Master Plan

1) Natural growth

   It is assumed that the average natural growth rate from 1994 to 1999, 1.16 per 1,000 people, would be applied every year up to 2030.

2) Social Growth

   Expected inflows to Astana in the first five (5) years are:

   i) Families of the central government officials would move to Astana: 20,000 (estimation based on a hearing from Japanese Embassy)

   ii) Accompanying population growth would be twice of the above increase, judging from an experience of actual move of the capital transfer to Berlin: 40,000

   iii) With economic development in Astana, private companies, such as construction contractors, banks and super markets, would locate to Astana from other areas of Kazakhstan: 40,000 in reference to the information from companies in Almay

   Summing up, the total inflow would be 100 thousand people.

   On the other hand, outflow of residents would decrease from the present 10 to 4 thousand a year in the period from 2000 to 2004 as better career development or higher salary job opportunities resulting from the economic development in Astana would decrease the emigration of population. This emigration would further be reduced to 2 thousand from 2005 to 2009 as more job opportunities would be generated in Astana.

2.2.3   Economic Development of Astana City

   (1)   Existing Economic Situation

   The following table shows the added value and number of employment of each sector in 1999.

Estimation of output, added value, employment and added value per worker in each sector in 1999

	Output		Added value (AV)		Employment		AV/worker, year
	bil. ten	percent	bil. ten	percent	thousand	percent	US$,140te/$
Industry	16	15%	6	14%	16	11%	$2,895
Construction	36	35%	18	37%	14	9%	$9,278
Trading & Repair	17	16%	7	15%	9	6%	$5,846
Sub total	68	67%	31	66%	38	26%	$5,839
Transport	1	1%	0	1%	14	10%	$160
Other services	33	32%	16	34%	95	65%	$1,205
Includ. Public services	1.053	1%	0.5098	1%	31.8	22%	114.514351
Self-employed	27.188	27%	13.163	28%	26.3	18%	3575.034
Total	102	100%	48	100%	147	100%	$2,304

Source: Statistics department of Astana City

Industry includes mining, manufacturing and electricity, gas, water production and distribution. Most of the 110 companies operating in Astana Technopark are involved in various kinds of manufacturing, such as cast iron, metal work, wood work and welding. *Construction* covers both public works and private investment factories. Astana municipality defines that construction output is equal to the total of public and private investment. *Other services* involve hotels and restaurants, financial activities, real estate, state management, education, health care & social services, other public and private services and small business. *Self-employed* people largely engage in small business.

The three sectors, *Industry*, *Construction* and *Trading and Repair*, account for 67% of the total added value, with only 26% of the total employment. By contrast, *Transport* sector makes up only 1% of the total added value, with 10% of the total workforce. At the same time 22% of the total workforce work in *Public services* sector including state management, education, health care and social services, although it generate only 1% of GRDP. *Self-employed* accounts for 28% of GRDP and 18% of the employment.

As a result, the sum of *Industry, Construction, Trading and Repair* and *Self-employed* (small business) account for 95% of GRDP and 44% of the total employment. Added value per capita of these four sectors is significantly more than the all sector average. The development of these four sectors is deemed essential in increasing the income of Astana citizens.

(2)   Future Image of Economic Development

Potential: Astana is

- the capital and center of politics
- transshipment and fabrication place of grain business
- center of agriculture business (so called "agro-business")
- domestic and international transportation hub
- future logistic center on the Eurasian land bridge
- industrial city, as depicted in Astana Technoparks

Constraints: Astana has issues such as

- severe natural conditions
- high transportation cost to export products to Europe or China

At present, there are two directions for the future image of Astana, as discussed in the Astana Indicative Plan: a government and business city, or a government, business and industrial city.   The former is basically adopted as the concept of Astana, following the decision in RK, although industries appropriate to the new capital shall also be an indispensable part of this city's structure.

Judging from the above potential and constraints, it is recommended that

- Astana will become the capital not only providing such facilities as cultural, medical and educational services on the republic level, but also becoming the scientific and tourist center of the republic. Workforce involved in such public services will continue to account for a large portion of the total employment in this city. At the same time, Astana will be the biggest business center in this region.

- In *Medium Term* up to the year 2010, Astana will develop, capitalizing on substantial investment in fixed assets for the construction of this capital.   The share of *Construction* sector, however, will gradually decrease afterwards as other sectors develop.

- In *Long and Ultimate Terms*, Astana will expand light industry including food processing, agricultural machine fabrication as well as agricultural product transportation business and commercial activities. The strategy to develop industries is that in the meantime the growing demand for consumer goods and construction materials should be catered by enhancing import substitution. This will be followed by harnessing of research and development (R&D) and information technology (IT) types of new industries, capitalizing on well-educated youngsters chiefly graduated from universities and colleges located in Astana. *Industry, Trade and repair, Transportation,* and *Small business,*

therefore, will be the engine of economic development in Astana. Especially, the agro-business would be essential in stimulating the economic activities of Astana to grow, because its surrounding areas have ample potential to make a major agricultural production area in RK. From the viewpoint of the developing import-substitution industry, growth of food processing business would be important, as Kazakhstan imports food processing products, and progress in food processing business would save foreign currency.

To summarize, it is recommended that Astana will endeavor to become a government and business city with growing industries appropriate to the Capital. To realize this objective, the future economic structure will be as shown in the following table.

Target of Future Economic Structure in Astana up to the year 2030

		Actual	Estim.	Plan				
		1998	1999	2000	2005	2010	2020	2030
Industry	output	17%	15%	16%	14%	15%	15%	15%
	add.va	15%	14%	15%	12%	13%	13%	13%
	employ		11%	11%	11%	11%	10%	10%
Construction	output	38%	35%	35%	19%	22%	15%	10%
(invest)	add.va	40%	37%	38%	20%	23%	16%	11%
	employ		9%	9%	9%	8%	7%	5%
Trading&	output	13%	16%	20%	24%	30%	30%	30%
Repair	add.va	12%	15%	18%	22%	27%	27%	27%
	employ		6%	6%	6%	7%	8%	10%
Transport	output	1%	1%	1%	1%	2%	4%	5%
	add.va	1%	1%	1%	0%	1%	2%	3%
	employ		10%	10%	10%	10%	10%	10%
Other	output	30%	32%	27%	43%	31%	36%	40%
services	add.va	31%	34%	29%	46%	35%	41%	46%
	employ		65%	64%	64%	64%	65%	65%

- *Trading and repair* would account for 30% of the total output, 10% of the total employment in 2030, increasing from 16% and 6%, respectively in 1999.

- *Transportation* would make up 5% of the total output in 2030, expanded from 1% in 1999. The ratio of 10% in total employment would continue to 2030.

- *Other services* would account for 40% of the total output in 2030, rising from 32% in 1999 due to small business development. The ratio of 64 or 65% in total employment would be maintained.

- *Industry* would keep approximately 15% of the total output and 10% of the total employment up to 2030.

- The portion of *Construction* would gradually decrease to 10% of the total output and 5% of the total employment in 2030.

The above ratios of added value and employment in each sector will be later used in the simulation.

(3)   Economic Development Elements: Importance of Total Factors of Productivity (TFP)

Important factors of economic development are workforce increase, investment and total factors of productivity (TFP). TFP is considered as productivity increase, not attributable to the workforce expansion or investment. The next table shows that half of the actual GDP growth from 1966 to 90 in Japan accrued from the growth in TFP.

Analysis of Economic Growth in Japan

	1966-73	1973-79	1979-85	1985-90	1966-90
Actual GDP growth	9.34%	3.57%	3.72%	4.49%	5.45%
Growth by investment	4.63%	2.11%	1.58%	1.64%	2.30%
Growth by workforce increase	0.44%	-0.09%	0.49%	0.82%	0.41%
Growth by TFP	4.27%	1.55%	1.64%	2.03%	2.74%

Source: Ministry of Economy and Planning in Japan, 1994

It is also reported that enhancement of school education by increasing hours of education substantially accounted for 25% of the growth of GDP per capita in the United States from 1929 to 1982.

TFP is said to have five component items:

- new market
- new commodity or products
- new technology
- new materials
- management or organization improvement

In this report, these five items are called direct elements of TFP, whereas indirect elements are hard infrastructure such as roads, water supply, power supply and soft infrastructure such as finance, investment policy and education. TFP will increase with an investment in research and development (R&D) of the market, products, technology, materials and in hard infrastructure.

There might still be ample room in increasing productivity as only ten years have passed since the transition to market-economy. One of the more important factors to develop the economy of Astana would be to increase productivity, supported by private enterprise activities and public investment.

2.2.4 Simulation of Population Increase and Economic Development in Astana

The purposes of the simulation in this section are:

1) to verify actual annual growth of GDP in Kazakhstan, GRDP in Astana in the period of 1995-2000.

2) to verify actual multiplier of investment in Kazakhstan as well as that in Astana in the above same period. The multiplier indicates the incremental GDP accruing from a unit increase of public or private investment. In other words, the multiplier explains that an additional investment not only increases the total output by the same amount, but also causes a further increase by its multiplier effect through the generation of effective demand. The multiplier would increase with accumulation of investment.

3) to estimate annual growth of GDP in Kazakhstan, GRDP in Astana in the period of 2001-2005, based on the Indicative Plans

4) to estimate the long-term population and economic growth in Astana to the year 2030 simulating population, investment, multiplier, annual growth of GRDP, GRDP per capita and added value per worker in each sector including *Industry, Trading and repair*.

This simulation is based on the following conditions:

1) In GDP and GRDP calculation, investment value is converted to present value (PV) at the year 2000 by applying a discount factor.

2) It is assumed that demand is always larger than supply, therefore, production increase would be used or sold.

3) The cost consists of direct construction cost and engineering services, excluding VAT, land acquisition and compensation cost, administration expenses and contingency. The cost was estimated based on the Master Plan in the following three categories: *Urban development and architecture, Infrastructures* and *Engineering protection*. (Refer to Chapter 7)

4) Productivity increase by TFP is not considered to make a conservative but

realistic forecast, as that productivity increase by TFP would decrease investment expenditures.

5) The conversion factor between total output and GRDP in the year 1998 is used for each year because they are the latest available data. The total output and GRDP in 1998 were Tenge 94,268 and 43,769 million respectively, according to the statistics, Gross Value Added at Regional Level in the Republic of Kazakhstan, 1998.

6) The conversion factors in 1998 between output and added value in each sector including industry, construction and trading are also applied for each year. These units in 1998 are also measured by the above-mentioned statistics.

(1) Recent five-year economic growth from 1995 to 2000

　　　1) GRDP growth from 1995 to 2000

Astana has achieved annual economic growth of 16.7% in the real term in the last five years from 1995 to 2000, while the real national average has been only 0.6% in the same period. This rapid expansion in Astana has been attributed to enormous increase of investments. Those investment expenditures have accounted for 80% of GRDP since 1997 every year, while on the national average the ratio was 8%-15% of GDP. Please refer to Table 2.2.4 "Economic Development Forecast for Kazakhstan" and Table 2.2.5 (1/3) "Economic Development Forecast, Case 1".

　　　2) GRDP per capita growth

In 1995, GRDP per capita of Astana was estimated to be 84 thousand tenge, equivalent to only 63% of the national average, 134 thousand tenge. The Astana GRDP per capita, however, exceeded the national average in 1998, due to the above-mentioned rapid economic growth. GRDP per capita in the year 2000 would reach 160 thousand tenge. Refer to Table 2.2.5 (1/3) "Economic Development Forecast, Case 1".

　　　3) Investment effect

Investments in infrastructure formation tend to affect the added value in an area due to a multiplier effect. This multiplier effect is analyzed based on the comparison of investments and added value resulting from the investment. The multiplier indicates a corresponding net increase of added value resulting from a unit incremental investment. During

the five-year-period from 1995 to 2000, investment multiplier of Astana is estimated to be 1.04, higher than the national average, 0.65. This means that 100-tenge investment would generate 104-tenge added value in Astana, while it would increase only 65-tenge added value in other areas in Kazakhstan[4].

The calculation of this investment effect is:

<u>Assumption</u>

- an investment would increase added value over the period of five years.
- in other words, a 1/5 of the investment would accrue on added value a year.
- Total Factors of Productivity (TFP) is not considered.

<u>Manner of calculation</u>

The next figure shows a calculation example of Astana economic growth.

Increase of Added Value by Investment in Astana in the Period from 1995 to 2000.

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[4] This multiplier shows investment effect in national or regional economy, therefore, does not present a rate of return on the project invested.

```
                                        increase of      / 3 billion due to
                                        Added value     /  population
                                        Tenge 28 billion   increase

                                                          \ 25 billion due to
              Added Value                                   investment
              Tenge 24 billion


   Year        95    96    97    98   99   2000   01   02   03   04   05

   Investment  7  ─────────────────── 1
                     5  ───────────────── 1
                          25  ────────────── 5
                                43  ──────── 8
                                     40   9────────────
```

                              Total: Tenge 24 billion
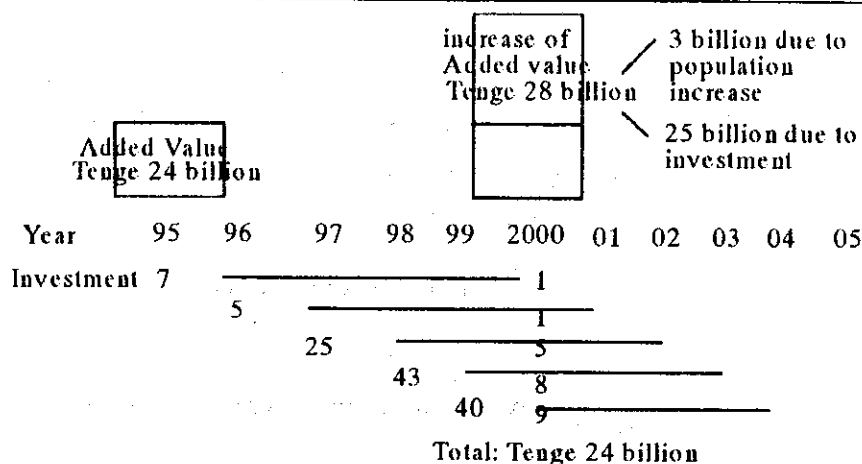
```
year    160,00/
2000    capita      ┌──────────────────┬─────────────────────────────────┐
                    │ added value       │ (160,000-84,000)x 322,000 people│
                    │ increase          │ =25 billion tenge               │
                    │ by investment     │                                 │
                    │                   │ investment =24 billion tenge    │
year    84,000/     │                   │ investment effect=25/24=1.04    │
1995    capita      ├──────────────────┼──────────────┬──────────────────┤
                    │ GRDP in 1995      │ added value  │ 84,000x(322,000-284,000) │
                    │ 24 billion tenge  │ increase by  │ =3 billion tenge │
                    │                   │ workforce    │                  │
                    └──────────────────┴──────────────┴──────────────────┘
                                284 thousand        322 thousand
                                people              people
                                year 1995           year 2000
```

Astana would realize GRDP of Tenge 52 billion in 2000, with an increase of Tenge 28 billion from 1995. In this five-year period, the population would increase from 284 to 322 thousand. This GRDP increase of Tenge 28 billion would consists of:

Tenge 3 billion attributed to population increase:

  Tenge 84,000 / capita x (322,000- 284,000) = Tenge 3 billion

Tenge 25 billion due to investment:

  Tenge (160,000-84,000) / capita x 322,000 people = Tenge 25 billion

The investment effect (hereinafter called multiplier) is:

GRDP increase due to the invest

  = Tenge 25 billion / Tenge 24 billion

  = 1.04

The multiplier of Kazakhstan as a whole of 0.65 in the same period was estimated in the same manner. This national multiplier is assumed to increase to 1.06 in the five years from 2001 to 2005, following an

estimate based on the National Indicative Plan[5].

According to this plan, annual GDP growth in Kazakhstan would be 4.4% in the same period. The Kazakhstan government assumes that existing population, approximately 15 million, shall continue for next five years. Annual growth of GDP per capita, therefore, would be the same as GDP growth rate, 4.4%. Investment would account for 17% of GDP in this period, much less than that in Astana.

Refer to Table 2.2.4 "Economic Development Forecast for Kazakhstan" and Table 2.2.5 (1/3) "Economic Development Forecast, Case 1".

(2)   Long term population and economic growth up to 2030

Two cases of simulation will be prepared for long-term population and economic growth up to the year 2030. The most realistic, worthwhile and accountable one will be selected.

1) Case 1

Assumptions

- The population in Astana would be 650 thousand in 2030, on the basis of the low growth population forecast.

- The multiplier of 1.06 is applied to the period of the year 2001 to 2005. Then, the multiplier is assumed to increase, gradually up to 1.5 in the year 2030.

- The total investment would be Tenge 1,051 billion from the year 2001 to 2030, equivalent to US$ 7,299 million at Tenge 144 / US$, on the pro-rata basis of the Master Plan, as shown in the Chapter 7 "Integrated Implementation Plan and Investment Cost".

- The workforce ratio would gradually increase up to 55% (workforce ratio= total employment/ population).

Results of simulation

- GRDP per capita of Astana would rise to Tenge 275 thousand in the year 2005 while GDP per capita in Kazakhstan would become

---

[5] In Japan, the multiplier in the public works was estimated to be 1.91 in 1990, according to an expert in Agency of Economic and Planning in Japan.

Tenge 180 thousand. In the year 2005, Astana would realize 150% of the present GDP per capita.

- GRDP annual growth up to 2030 would be 7.2%, consisting of 2.4% population growth plus GRDP per capita growth of 4.7%.

- GRDP per capita in 2030 would be Tenge 640 thousand, equivalent to US$4,444.

Table 2.2.5 shows growth of added value, workforce and added value per worker in industry, construction, trading & repair, transportation sectors, calculating with the Target of Future Economic Structure in Astana.

- Annual growth of added value, added value per worker in industry sector would be 6.9% and 4.2% respectively.

- Those in trading & repair sector would be 8.7% and 4.0%.

Annual growth averages of added value in industry and service sector in upper middle-income countries[6] from 1990 to 97 were 3.0% and 3.5%, respectively.

On the other hand, some middle income countries, such as Thailand, Malaysia and Indonesia, had an annual growth of more than 10% in industry and service sectors in late 1980' or 1990'. It was attributed to substantial domestic and foreign investment, 30-40% of GDP.

Thus, with the substantial increase of investment, Astana would realize higher growth than 6.9% in industry and 8.7% in trading & repair. In addition, annual growth rates of added value per worker would be higher than 4.2% in industry and 4.0% in trading & repair, respectively. Case 2, therefore, will be prepared to seek more possible plan.

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[6] The upper middle income countries come from definition in 1997 of the World Bank, such as:
   Lower income countries: GDP per capita below $785
   Lower middle income countries: GDP per capita $786- 3,125
   Upper middle income countries: GDP per capita $3,126- 9,955
   Higher income countries: GDP per capita more than US$9,956

Comparison of Annual Growth in Industry and Trading & Repair

	Forecast of annual growth		Actual annual growth		
	Case 1	Case 2	Thailand	Malaysia	Indonesia
Period	year 2001-2030		year 91-95	90-97	85-93
Industry annual growth of added value	6.9%	8.0%	10.7%	13.0%	14.4%
annual growth of added value/worker	4.2%	4.6%	6.2%	4.0%	8.6%
Trading & repair annual growth of added value	8.7%	9.9%	10.3%	9.1%	4.4%
annual growth of added value/worker	4.0%	4.3%	6.9%	5.0%	0.6%

Please refer to Table 2.2.5 (1/3, 2/3, 3/3) "Economic Development Forecast, Case 1" and Table 2.2.1 "Comparison of economic growth in Case 1, 2 and other Asian countries".

2) Case 2

   Assumptions

   - The population in Astana would be 800 thousand in 2030, on the basis of the medium growth population forecast.

   - The multiplier of 1.06 would gradually increase, up to 1.5 in the year 2030.

   - The total investment would be Tenge 1,293 billion from the year 2001 to 2030, equivalent to US$ 8,981 million at Tenge 144 / US$.[7]

   - The workforce ratio would gradually increase up to 55% (workforce ratio= total employment/ population).

   Results of simulation

   - GRDP per capita of Astana would rise to Tenge 301 thousand in the year 2005 while GDP per capita in Kazakhstan would become Tenge 180 thousand. In the year 2005, Astana would realize 170% of GDP per capita.

   - GRDP annual growth up to 2030 would be 8.3%, consisting of 3.1% population growth plus GRDP per capita growth of 5.1%.[8]

---

[7] This total investment is larger than those assumed in the Progress Report (2), which used the annual investment of Tenge 41 billion, shown in the Astana Indicative Plan continuing up to the year 2030.

- GRDP per capita in 2030 would be Tenge 713 thousand, equivalent to US$4,951.

- Annual growth of added value, added value per worker in industry sector would be 8.0% and 4.6% respectively.

- Those in trading & repair sector would be 9.9% and 4.3%.

2.2.5   Adopted Scenario of Economic Development in Astana

This Case 2 seems to be more realistic and robust than Case 1 because:

- A 5.1% annual growth of GRDP per capita could be achieved as the national target of 4.4% is established in the National Indicative Plan for the period of 2001-2005.

- Annual growth of added value would increase to 8.0% in *Industry* and 9.9% in *Trading & repair* sectors. These growth rates, higher than in Case 1, would be achievable judging from those in Thailand or Malaysia.

- Annual growth of added value per worker would be to 4.6% in *Industry* and 4.3% in *Trading & repair* sectors. These higher growth rates would be more realistic, in comparison with those in the mentioned Asian countries.

- Astana would be able to become an upper middle-income city because of the expected GRDP per capita, US$4,951 in the year 2030.

- The total investment in the period of 2001-2030, excluding VAT and land acquisition and compensation cost, administration expenses, contingency and replacement cost, would amount to Tenge 1,293 billion. This expenditure level, annual investment of Tenge 43 billion, would be possible, judging from the actual annual investment of nearly Tenge 40 billion in 1998 and 1999.

To summarize, Case 2 is considered to be both practical and achievable. This Master Plan thus adopts Case 2 as the development scenario of Asatana.

- Expected population in the year 2030: 800,000 people (annual growth of 3.1%)

- Expected annual average growth of GRDP per capita from 2001 to 2030: 5.1%

- Expected GRDP per capita in 2030: Tenge 713 thousand (US$4,951 at Tenge 144 / US$)

---

[8] This growth of 8.3% is larger than that in Progress Report (2), 7.2%, due to the increase of investment assumed.

- Expected GRDP annual growth from 2001 to 2030: 8.3%

- Expected annual growth of added value per worker in industry and trading & repair sector: 4.6% and 4.3%, respectively

Refer to Table 2.2.6 (1/3, 2/3, 3/3) "Economic Development Forecast, Case 2" and Table 2.2.1 "Comparison of economic growth in Case 1, 2 and other Asian countries".

2.3   Financial Framework

2.3.1   Investment and its finance in the new capital construction

Construction of a capital city requires a substantial sum of investment. Since the capital transfer in 1997, an annual investment of nearly Tenge 40 billion has been provided for the construction of Astana. In general, the cost of the development of the capital will include components such as urban development and architecture, infrastructures, and engineering protection. From the nature of projects, these components could be divided into the following three categories; *profit-seeking, less profit seeking* and *non-profit seeking* works.

The *profit seeking* works would include commercial building, offices and residential complexes. These *profit seeking* projects could in general be financed by foreign or domestic investments or commercial banks if the investors could ascertain that an adequate level of robust profit would be generated.

The *less profit seeking* works include infrastructures such as water supply, sewerage, power/ heat supply, gas supply, telecommunication, public transport such as bus and railway. These *less profit seeking* projects would mainly be financed by government budgets. Nonetheless, private investors can also be involved in these finances, and in such cases the public expenditure could be reduced.

Non-profit seeking works consist mainly of public works such as government offices, roads, bridges, parks, greenery, land preparation, water resources and flood mitigation. These projects will ordinarily be financed by the government budgets, since they do not by definition generate any immediate profits.

Private investments for production, such as industries or trades, would bring about more added value and income accrual to the people. Moreover, these production facilities will contribute to the economic development in Astana. In this regard, small industries or business[9] shall play an important role in sustaining economic activities in Astana, as rapidly growing city such as Astana will require various urban and commercial services.

Issues related to the financial aspects of construction of the new capital can therefore be lumped into the following three categories;

---

[9] Small business is defined by a Kazakhstan law, meeting both of the following two criteria:
1. employees not more than 50
2. annual sales of less than 60,000 times of the numerals (at present, annual sales of less than Tenge 38 million, according to Astana Municipality)

1) Robustness of finance for the necessary investments; how to maintain uninterrupted finance to the new capital construction in due consideration of government budget limitation.

2) Promotion of investments to infrastructures; how to proceed with deregulation and improve the management of infrastructure.

3) Financial support to small business: how to expand and enhance the presently limited finance for small business.

Thus, these three issues will be discussed in turn in the following sections.

2.3.2 Robustness of Finance for Necessary Investments

(1) Actual Local Finance of Astana Municipality from 1995 to 2000

Government budgets have been the largest source of funding for the new capital construction. In 1999, public investments of the republican (central) and city governments combined accounted for 60% of the total investment in Astana. In recent years Astana Municipality has had a quick and substantial increase of its budget. In 2000, the expenditure budget of the municipality was Tenge 19,680 million, which is equivalent to nearly five (5) percent of the state budget. This city budget seems to be quite large compared to the 2% share of Astana population in the national total. At present, this budget allocation might be a heavy burden to the state.

The expenditure budget consists of the current and investment expenses. The details of invest expenditures which amount to Tenge 11,304 million is shown in the following table. According to the municipality, feasibility studies (F/S) are conducted for every public investment project by local design or construction companies. The implementation organizations of these investments, however, do not seem to have sufficient expertise in financial control, as will be explained later in the sphere of water tariff.

The Usage of Investment Expenditures (unit: Tenge million)

Total	11,304	100%
Building facilities	3,941	35%
Engineering network	2,950	26%
Housing	2,242	20%
Bridge and Road	1,452	13%
Water supply	294	3%
Sewerage	256	2%
Power supply	123	1%
Heating network	46	0%

Source: Economic Department, Astana Municipality, April 2000

(2) Finance Plan by the Astana Indicative Plan, from the year 2001 to 2005

According to Astana Indicative Plan, annual investments, ranging from Tenge 40,100 to 42,770 million, are planned to continue for the Astana capital construction from 2001 to 2005, as shown in the next table.

The followings could be observed from the table:

• The Kazakhstan Government estimates that a high level of investment, exceeding Tenge 40,000 million, would continue during the five-year-period from 2001.

• The public investments, approximately Tenge 11,000 million each by the republican (central) and local government budgets, would account for 55% of the total investment during the above five years.

• Foreign direct investment (FDI) would make up 16% of the total finance. The remaining 29% comes from private companies or funds of organizations.

External government loans are not included in the total investment of Tenge 40,000 million in the above period. If inclusive, Tenge 7,000 to 10,000 million would be added to this sum.

Actual and Forecast of Investment in Astana (unit: Tenge million)

Financial source	Actual	Estimat.	Forecast					Total
	1999	2000	2001	2002	2003	2004	2005	2000-2005
Total	35,759.8	39,420.9	40,550.0	40,750.0	41,510.0	42,480.0	42,770.0	283,240.7
Republican govt. budget	14,242.0	12,000.0	11,400.0	10,900.0	10,400.0	10,100.0	9,600.0	78,642.0
Astana municipality budget	7,152.0	11,304.0	li1,400.0	11,500.0	11,600.0	11,700.0	11,800.0	76,456.0
Fund of state-owned organization & enterprise	463.4	463.4	450.0	430.0	430.0	420.0	420.0	3,076.8
Fund of organization & enterprise	6,694.0	7,250.0	10,140.0	10,090.0	11,161.0	12,300.0	12,868.0	70,503.0
Foreign investment total	6,380.3	7,573.5	6,320.0	6,990.0	7,069.0	7,110.0	7,212.0	48,654.8
Credit/loan not guaranteed by government	5,421.1			6,990.0	7,069.0	7,110.0	7,212.0	33,802.1
Loan under government guarantee	959.2	5,940.0	6,320.0					13,219.2
Grants		1,633.5						1,633.5
Bank loan								0.0
Loan from other organizations								0.0
Money of population (private companies)	828.1	830.0	840.0	840.0	850.0	850.0	870.0	5,908.1
External government loan	2,580.2	6,799.8	9,638.0	8,167.0	6,993.0	7,215.0	6,998.0	48,391.0

Source: Projects of indicative plan, social economic development of Republic Kazakhstan, investment activities, city of Astana

Note: This indicative plan excludes fund of state-owned organization & enterprises in 2001 and 2004.

(3)   Finance framework

Considering the previous discussion, finance to the 30-year- investment would be:

1) the *non-profit seeking* works or some of *less-profit seeking* projects will have to be financed mainly by government budgets. Active roles of international soft loans are expected in early years to enhance and supplement the necessary investment.

2) the *profit-seeking* works could be financed by private investments or foreign direct investments. Deregulation and improvement of investment framework is essential

3) With an increase in the state budget in the future, the burden of budget allocation to Astana will be reduced. If private investors will be involved in public works, government expenditure could further be reduced.

The following table shows an image of finance to the three categorized works. It is important to reduce the burden of government budgets with the introduction of private investments to infrastructures. Deregulation in public service tariffs or improvement of management public sectors would promote the private investments.

Finance framework to the thirty (30)-year investment to the new capital construction

Use of fund	Source of fund
Non-profit seeking works	Government budget
(infrastructure)	↑ promotion of private investments
Less-profit seeking works	Private investment
Profit-seeking works	Foreign investment

2.3.3   Promotion of Investments to Infrastructures

As mentioned earlier, Astana city advocates many large-scale infrastructure projects with a substantial amount of investment. Unfortunately, the implementation organizations do not seem to have enough financial profitability to attract international soft loans and private investment.

For example, the existing water supply tariffs are apparently not high enough to cover the foregone investment. The current tariff is Tenge 14.53 per m3 for drinking water. Assuming that a new facility is planned to supply 135,000 m^3 per day, the revenue accruing from these supply facilities would be:

Tenge 14.53 /m³ x 135,000 m³ x 365 days = Tenge 716 million a year

On the other hand, the operation cost for the production of drinking water in the new facility would be Tenge 9.66 per m^3.

Tenge 9.66 /m³ x 135,000 m³ x 365 days = Tenge 476 million a year

Thus, the surplus of revenue minus operation cost is Tenge 240 million (716- 476 = 240).

In other words, the marginal profit per m^3 would be:

Tenge 14.53/m3 – Tenge 9.66/m³ = Tenge 4.87/ m³

Thus, the marginal profit at 135,000 m^3 per day would be:

Tenge 4.87/ m³ x 135,000 m³ /day x 365 day/year = Tenge 240 million a year

Thus, the sum of annual depreciation and interest cost must be lower than Tenge 240 million to obtain a profit, after covering all investment and operation costs.

Assuming that the life of the new facility is 30 years and interest cost is 13%, the investment for the new facility shall be within:

$X /30 years + X/2 x 13\% = Tenge\ 240\ million$

$X = Tenge\ 2,440\ million$

The investment in the new facility would far exceed Tenge 2,440 million, therefore, a large loss would be expected with the new facility. The solution would be operation cost reduction or tariff increase.
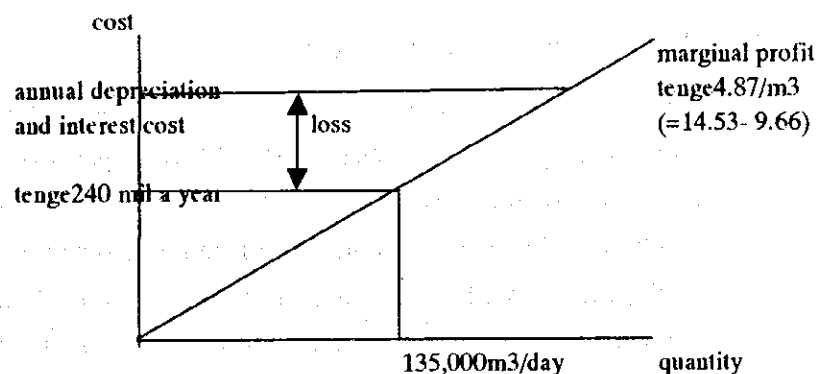
This calculation is simplified, and more in-depth analysis will be needed in a feasibility study. This simple calculation, however, clearly shows that it will be difficult to recover a new investment with the existing operation cost and tariff.

Though implementation organizations of large-scale infrastructure projects have already started to introduce an independent accounting system, including preparation of balance sheets and income statements, their quality of financial control and management skills do not seem to meet the requirement of international financial institutions. It is recommended that financial control and management skills in large public infrastructures be improved in such area as reduction of operation cost, reduction of wastage and improved tariff collection, as will be later discussed. Along with such improvement, deregulation of public service tariffs would enhance opportunities for private investments in infrastructure.

2.3.4   Financial Support to Small Business in Astana

(1)   Rapid Development of Small Business in Astana

In Astana, development and expansion of small business has also been rapid. In 1999, small business generated 20% of the total output in Astana according to the municipality. Small business covers a wide range of activities such as industry, construction, transportation, trade & repair, hotel & restaurants and other various kinds of urban services. People involved in such business numbered 30 thousand with an increase of 25% from 1998. Small business units counted 10,670 including individual entrepreneurs and legal entities as of April 2000, which had increased nearly 40% from 1998.

(2)   Actual Finance to Small Business

The Department of Economy and Developing Small Business at the Municipality said that banks should increase loans to small business, according to an indication of the President and recommendation by National Bank. In 1999, the actual volume of financing to small business totaled Tenge 2,332 million, with an increase of 15% from 1998. Nearly 500 projects were funded, which produced 71 new goods/ services and created 1,190 new jobs.[10]

The funding of Tenge 2,332 million consisted of Tenge 2,282 million from commercial banks and Tenge 50 million from the municipality. In other words, the portion of the municipality fund in the total finance to small business was merely 2%.

In 1999, the commercial banks provided funds to 496 small business units, with the annual interest rate of 20- 30% and the loan period from 1 to 3 years. The municipality offered funds through Astana Finance to seven small business units, with the annual interest rate of 15% and loan period of 3 years. As a result, only 4.6% of the small business units were able to receive loans from banks or the municipality.

(496 + 7 units) / total 10,670 units = 4.6%

Many small businesses would prefer loans from municipality to commercial banks because of generally lower interest rates. The municipality in response increased the budget of the fund to Tenge 100 million in 2000.

The municipality places priority of funding to import-substitution industry such as fabrication of food-processing products, disposal plastic dishes,

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[10] A quote from a brochure of Astana Finance "ASTANA is a city of investment potentialities", published in 2000

injection equipment, ball-point pens or calculators in pursuit of national or city economic growth. The commercial banks, however, make their own selection of borrowers, irrespective of such priority policy.

(3)   Process of Evaluation

Astana Finance was a successful bidder in the competition among banks to become an agent of funding by the municipality. They proceed with evaluation of loan application from small business as in the following:

- interviewing of the small business entities
- collecting financial reports, business plans and other documents
- appraising expertise of the entity: juridical expertise, economic expertise and collateral
- decision making by its credit committee
- getting an approval from the municipality

Evaluation of the business plan and collateral appraisal are the two (2) critical elements. Many small businesses do not have enough management skills to provide adequate business plans. Moreover, they do not have enough collateral, such as buildings, machinery and stocks.

(4)   Issues in Financing to Small Business in Astana

In summary, the issues of financing to small business in Astana boil down to:

a) The annual interest rates of 20- 30% from commercial banks are too high for many small businesses. The loan period of 1 to 3 years is too short, especially to companies in the industrial sector.

b) It sometimes takes a long time to come to a decision to lend money after receipt of an application, because of time consuming evaluation of collateral or business plans.

c) Not more than 5% of the small business units were able to receive loans from banks or the municipality: According to the municipality, reasons for such a low portion of funding for small business entities are that the financers generally lack enough funds or that only a few applications are worthwhile for providing loans with good business plans or new ideas.

d) The priority policy of the municipality is not reflected in funding by commercial banks. Loans under such a policy initiative accounted for only 2% of the total fund to small business.

(5)　Proposals

Summarizing the foregoing discussion, the following proposals are made.

1)　Reinforcement of Finance by Municipality to Small Business

As mentioned before, the portion of the municipality fund in total finance to small business was a mere 2% in 1999. This is apparently too small to materialize the municipality's policy of developing import-substitution industry.

In Japan, for comparison's sake, three government banks provide loans to small and medium sized enterprises (SME). The share of the three banks' fund to SME was 30-35% of the total finance in 1960's and 12% in 1970's.

The municipality was only able to increase the fund from Tenge 50 million in 1999 to Tenge 100 million in 2000, due to limitation of budget. Even the increased amount is by far insufficient to meet the need. Accordingly, it is recommended that the municipality seek yet another source of funds, for instance, international financial institutions. An example of the financial scheme would be as illustrated below:

Example of Financial Scheme from International Financial Institutions to Small Business
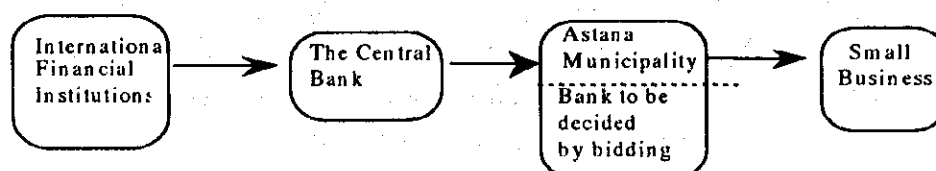
It is imperative that a bank, as an agent of the municipality, not only provides finance to small business but also assists them to provide a better business plan and develop management skills.

2)　Co-Funding Between the Municipality and Commercial Banks

Commercial banks sometimes offered co-funding to small business, together with the municipality. The city government could process such co-finance with the above-mentioned fund from international finance institutions. The total volume of funding with lower interest rates would increase owing to the co-funding, as schematically described in the next example.

Co-Funding Between the Municipality and Commercial Banks

```
┌──────────────┐   US$1million  with        US$2million with      ┌──────────┐
│ Astana       │   annual interest rate ─┐  ─annual interest rate ─→│ Small    │
│ Municipality │   of 10%                │  of 15%                  │ Business │
│ Bank decided │                         │                         └──────────┘
│ by bid       │                         │
│ Co-Funding   │                         │
│ ┌──────────┐ │   US$2million with      │  US$1million with──────→┌──────────┐
│ │Commercial│ │   annual interest rate ─┘  annual interest rate    │ Other    │
│ │Banks     │ │   of 20%                   of 20%                   │ Business │
│ └──────────┘ │                                                    │ Entities │
└──────────────┘                                                    └──────────┘
```
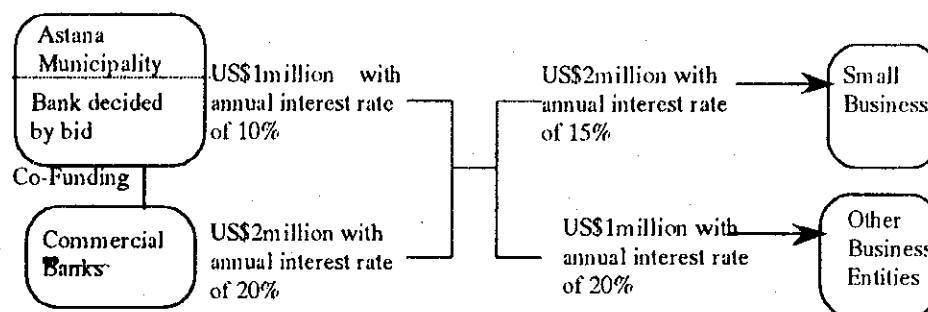
3) Lease Finance Scheme

As mentioned earlier, collateral is one of the two critical issues in banks' evaluation of potential borrowers. A lease scheme could solve this problem as the banks would be able to own the facilities financed until the final repayment by the borrowers is made, as described in the next chart.

Lease Finance Scheme

```
                         ┌──────────┐
                         │ Small    │
                         │ Business │
  Repayment of           └──────────┘
  principal and              ↑  ↘ Order of machines
  interest                   │   ↘
                        Delivery   ↘
┌──────────────┐                    ┌──────────────┐
│ Astana       │                    │ Machine      │
│ Municipality │ ──────────────────→│ manufacturer │
│ Bank to be   │ Payment for the machines └──────────┘
│ decided      │ Owning of the machines until
│ by bidding   │ the final repayment from the
└──────────────┘ small business is made
```
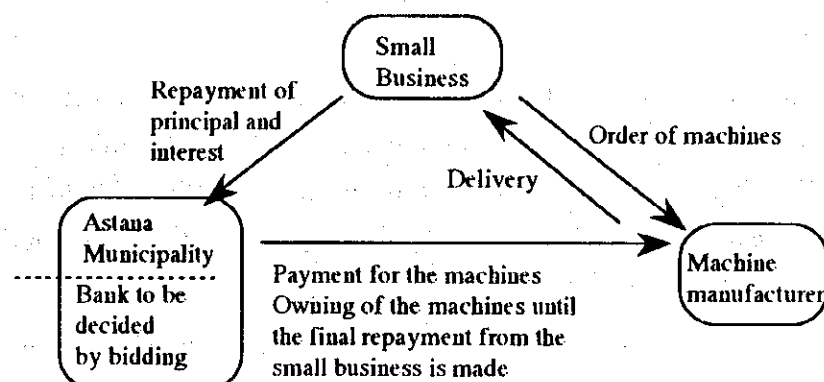
It is important that the small business entity directly places an order to makers, not through intermediate companies, as these intermediate companies might ask for a very high margin to the small business. A consulting company could assist the small business entities with market research information.

2.4   Social Framework

2.4.1   Astana as a "Model City of Social Welfare".

Kazakhstan was virtually the least poor of the central Asian countries in Soviet era, according to the World Bank.[11] This report pointed out that estimates from the 1989 Family Budget Survey (FBS) suggested that around 15 percent of the population had incomes below the "socially acceptable minimum" compared to 33-52 percent in other central Asian countries. Furthermore, it stated that upon the independence, most human development indicators were higher in Kazakhstan than in countries with comparable levels of income.

Since independence, Kazakhstan has experienced difficulties in transition to a market economy, including a substantial GDP decrease, fiscal deficit expansion, and an external debt increase. With the state fiscal deficit, governments curtailed their budget in social welfare areas, including education, health care and cultural activities. For example, the education budget decreased from 5.7% of the GDP in 1990 to 4.0% in 1998, while OECD countries allocate 7% of GDP to the education area.[12]

This reduction in education expenditure in Kazakhstan has caused shortage of schools/ textbooks, lack of maintenance and deferred salary payment to teachers. Health care budget was reduced from 3% of GDP in 1995 to 1.5% in 1998. This cutback has left obsolete medical equipment and caused shortage of medicine/ training of personnel.

In this connection, Astana should pursue a role model for building a welfare city. At present, Astana municipality has substantially more budget per capita in education, health care and culture activities than the national averages. Especially the municipal government provides nearly 4 times more budgets to the healthcare activities than national average. It is essential that Astana improves its social welfare level by effectively using this budget and present the outcome to other citizens of Kazakhstan.

One basic condition of the above is to ascertain the affordability of various essential urban services that are provided not only to the average citizen, but also to citizens with limited means of living.

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[11] The World Bank "Kazakhstan Living Standards during the Transition", March 1998

[12] Cf. International Development Center of Japan, Kazakhstan/ Uzbekistan, Kyrghyzstan 2000, page 92

Comparison of annual budget per capita, Astana and State, 1999 base (unit: Tenge)

	Astana budget per capita (a)	State budget per capita (b)	(a)/(b)
Education	10,037	5,269	190%
Recreational & cultural activities	8,593	3,009	286%
Health care	3,042	821	370%

Source: Social economic passport, Statistical yearbook of Kazakhstan 2000

2.4.2 Existing Situation of Social Welfare in Astana

(1) Wage

In general, wages in Astana are higher than the national average in terms of nominal monthly wages as depicted in the following table. Wages in agriculture, hotel & restaurants and public administration sectors in particular are more than twice as much as the national averages of the same categories. In Astana City, wages of those involved with education, health and social work by contrast are less than those in the other sectors. The lower earnings may be accelerating transfer of qualified teachers, nurses or other social workers away from these occupations.

Comparison of nominal monthly wages, Astana and Kazakhstan in 1998 (unit: Tenge)

	Astana, 1998 base (a)	Kazakhstan, 1998 (b)	(a)/(b)
Industry	15,349	13,465	114%
Agriculture	9,299	3,896	239%
Construction	13,710	12,375	111%
Trade, repair	11,789	8,249	143%
Transport, Communication	17,204	11,929	144%
Hotel, restaurants	25,925	8,660	299%
Financial activities	33,063	19,324	171%
Real estate activities	13,206	10,334	128%
Public administration	25,263	10,310	245%
Education	9,689	7,247	134%
Heath social work	7,170	6,454	111%

Source: Social economic passport, Statistical yearbook 1999 of Kazakhstan

It should be noted that these nominal wages do not always represent the actual payment from employers, as some companies with financial problems may not be paying salaries as reported. Thus, actual earnings might be less than these nominal wages.

Maintaining the presently high level of wages in the future will depend on the economic development of Astana, as discussed in Section 2.2 above.

(2)   Education

In Astana[13], there are 59 comprehensive schools, 35 preschool entities, 5 professional schools, and 14 colleges including 8 private ones. Eleven (11) non-state schools have been opened. Astana City has the following centers for further training of highly-qualified teachers: the Eurasian University named after L.Gumilyov, Agrarian Academy named after S. Seyfullin, Medical Academy and Kazakh National Music Academy. In Astana, there are 13 non-public high schools.

With these facilities, Astana has a much higher ratio of residents with higher education per 1,000 people than the republican average, as described in the following table. Despite this, since the capital transfer in 1997, Astana City has faced a shortage of primary and secondary schools due to the large population inflow. In 1998, there was an increase of five thousand (5,000) students in these schools. A critical issue now is how to finance school construction, and the municipal government is in need of foreign grants. Shortage of textbooks or deferred salary payment is not as serious issues in Astana as in any other area.

Allocation of lands and investment funds partly to the construction of new schools will have to be considered seriously.

Education Level (above 15-year-old) of Astana and Kazakhstan per 1000 Residents in 1999

	Astana	Kazakhstan
Higher education	209	124
Unfinished higher education	45	17
Specialized colleges	294	223

Source: Data from City Department for Statistics & Analysis, March 2000

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[13] A quote from a brochure "ASTANA is a city of investment potentialities" published in 2000.

(3)   Health Care

In Astana, 44 private medical facilities in addition to 37 public ones are in operation. Medical academies, one public and two private medical colleges, ensure training and teaching of specialists in the healthcare field. The implementation of the municipality program "Health of the People" is given a high priority. This program adopts approaches of improving healthcare system in providing high quality medical services as well as in reforming medical facilities management. The most important issues in the healthcare field are provision of anti-tuberculosis service, immune prophylaxis of the population, maternity and childhood care, primary medical help for disease-prevention, preservation of healthy population and forming of a healthy way of living.[14]

Comparison of Medical Facilities in Astana and Kazakhstan

	Astana	Kazakhstan
Residents in 1999, thousand	318	14,896
Number of doctors in 1999	2,046	50,600
per 10,000	64	34
Number of paramedical personnel in 1999	3,092	110,400
per 10,000	97	74
Hospital beds per 10,000 in 1998	97	80

Source: Social economic passport, Statistical yearbook 2000 of Kazakhstan

Due to the program and other efforts, Astana city has a higher level of health care facility including number of doctors, paramedical personnel and hospital beds per 10,000 residents, as shown in the following table.

(4)   Culture

[15]In Astana, there is a wide range of cultural establishments such as cinemas, museums, theaters including the Kazakh Music and Drama Theater, Russian Drama Theater and Kazakh Ballet and Opera Theater, cultural facilities including Youth Palace and Culture Palace for Railway Employees. The most popular and important culture centers in Astana is the Congress Hall with 1,600 seats and the recently commissioned modern Cinema City theater

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[14] A quote from a brochure "ASTANA is a city of investment potentialities" published in 2000.

[15] A quote from a brochure "ASTANA is a city of investment potentialities" published in 2000.

equipped with sophisticated film projection technology. Astana has 18 libraries with branches. The largest library in the city is the Central Library.

2.4.3　Policy and Proposal to Increase Level of Social Welfare

[16] In the strategy revealed in "Kazakhstan-2030", the health, education and well-being of the citizens of the Republic of Kazakhstan are referred to as the long-term priorities. Although Astana seems to have higher level of income, education, health care and cultural activities than the national average even today, some social issues, such as poverty and shortage of schools, still persist in Astana. The following would be the key to improve the existing situation of the social problems.

a) An effective practice of understanding and catering for residents needs would rely on information sharing and public discussion between the local executive bodies and inhabitants. Development and improvement needs on the part of the citizens thus gathered should be the basis of setting the goals in social welfare areas

b) One of the important targets for social condition in Astana would be the number of residents below the poverty line.

To cope with and solve the above items a) and b), introduction of a local administration appraisal system would be effective.

[17] A local administration appraisal system is to introduce a goal realization approach to Astana municipality. In this system, the municipality would:

a) Establish numerical goals expected by residents

b) Assess performance every year of the relevant government divisions in charge.

c) Disclose to the resident the extent of realization of the goals in numerical terms.

Expected effects would be:

- This system motivates the municipality officials to increase their work efficiency and enhance transparency

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[16] UNDP, National Human development Report, Kazakhstan 1998, page 66

[17] cf. JICA "Master Plan of Eastern Black Seaboard in Turkey" in 2000

- Policies and programs without good performance would be critically reviewed. It becomes difficult to intervene in policies or projects with mere political consideration

In conjunction to this, while the Astana Indicative Plan established a number of goals and targets, the important issue is to disclose, share and observe the extent of realization of these targets with the citizens. The local administration appraisal system such as proposed above would be an effective tool to supervise the municipality administration in realizing real needs of the people.

2.4.4   Increase of Incomes in Lower Income Group.

Differentiation of income in different segments of population group may pause a basic issue of affordability. The following table demonstrates income distribution of 210 sample households in Astana.

Distribution of average monthly income examined at 210 households in Astana, Dec.99

Tenge	below 4,000	4,001 -8,000	8,001 -12,000	12,001 -16,000	over 16,001	total
People	153	296	106	52	37	644
Ratio	24%	46%	16%	8%	6%	100%
Accumulated		70%	86%	94%	100%	

Source: Data from City Department for Statistics & Analysis, March 2000

According to "Social Economic Status of Astana City, Statistics Department of Astana city, 2000", monthly minimum living cost is Tenge 4,103. A quarter of the residents examined in the above survey are below this level. Economic Research Institute reported in July, 1997 that monthly expenses to keep a living standard of middle class is more than Tenge 13,270 /person.[18] According to this definition, 86% of the inhabitants examined cannot afford these middle class living expenses. It is important, therefore, to increase the level of income of those with limited means of living.

2.4.5   Household Affordability of Housing and Utilities

The effects of the investments to the new capital construction will accrue on household economy. One possible effect may take the form of increased burden of

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[18] Cf. International Development Center of Japan, Kazakhstan/ Uzbekistan, Kyrgyzstan 2000, page 118

housing or utility payments. Since the public works conducted under government funding shall be financed basically by taxes, the effects of housing and utility payments shall have to be checked in the composition of disposable income. With a generally large difference in people's incomes, the affordability for citizens shall be examined in relation to households with average incomes and those with lower incomes.

It is difficult to estimate the exact portion of housing rent expense out of household income, as the statistics usually do not specify such expenditure and the house rent is usually paid together with utility expenses, such as water, power and heat supply. The maximum housing rent portion is roughly estimated to be 38%, following an example shown by the Department of Labor, Employment and Social Security of Population, Astana City *Akimat*.

On the other hand, according to the "Social-economic status of Astana City", the average expenditure for the utility payment was 9.5% of household income in November, 1999. Utility payments in this section refers to the expenses for the bills of utilities related to the basic human needs such as water, sewerage, power and heat, plus somewhat dispensable but clearly important services such as gas, telecommunication and solid waste.

In Japan, the maximum burden of housing cost is said to be around 25% of household income and payment to utilities would be less than 10%. Considering the present situation in Astana, the burden of housing and utility payments for investments in this JICA Master Plan shall be less than 40%, preferably less than 30%.

This criterion on the affordability of housing and utility payment will be verified later.

TABLE

Table 2.2.1 Comparison of economic growth in Case 1, 2, and other Asian countries

	unit	Case 1	Case 2	Kazakhstan	Thailand	Malaysia	Indonesia
Population at 2030	thou.	650	800				
annual growth %		2,4%	3,1%				
30 year investment excluding VAT, land acquisition, administration, contingency and replacement cost	bil.ten	1 051	1 293				
Multiplier		1.06-1.5	1.06-1.5		annual growth, year 90-97		
GRDP annual increase	%	7,2%	8,3%	4,4%	7,5%	8,70%	7,50%
GRDP/capita growth	%	4,7%	5,1%	4,4%	6,3%	6,40%	5,80%
GRDP/capita in 2030	tho.ten	640	713				
144tenge/$	US$	$4 444	$4 951				
					annual growth		
					year 91-95	90-97	85-93
Industry annual growth of added value	%	6,9%	8,0%		10,7%	13,0%	14,4%
annual growth of added value/worker	%	4,2%	4,6%		6,2%	4,0%	8,6%
Trading & repair annual growth of added value	%	8,7%	9,9%		10,3%	9,1%	4,4%
annual growth of added value/worker	%	4,0%	4,3%		6,9%	5,0%	0,6%

Table 2.2.2 Population Forecast (Low Growth)

year	January 1	annual growth	birth per 1000	death per 1000	natural growth	natural increase	inflow	outflow	net inflow	adjust
1994	288,400		12.4	9.6	2.8	808	5,416	11,124	-5,708	400
1995	283,900	-1.56%	11.5	11	0.5	142	4,857	9,633	-4,776	-566
1996	278,700	-1.83%	11.2	11	0.2	56	2,822	7,121	-4,299	643
1997	275,100	-1.29%	11.6	10.7	0.9	248	8,039	7,890	149	-197
1998	275,300	0.07%	12.5	11.1	1.4	385	13,975	9,159	4,816	37,599
1999	318,100	15.55%	11.84	10.68	1.16	369	14,000	10,869	3,131	0
2000	321,600	1.10%	11.84	10.68	1.16	373	20,000	4,000	16,000	0
2001	337,973	5.09%	11.84	10.68	1.16	392	20,000	4,000	16,000	0
2002	354,365	4.85%	11.84	10.68	1.16	411	20,000	4,000	16,000	0
2003	370,776	4.63%	11.84	10.68	1.16	430	20,000	4,000	16,000	0
2004	387,206	4.43%	11.84	10.68	1.16	449	20,000	4,000	16,000	0
2005	403,655	4.25%	11.84	10.68	1.16	468	20,000	4,000	16,000	0
2006	420,124	4.08%	11.84	10.68	1.16	487	20,000	2,000	18,000	0
2007	438,611	4.40%	11.84	10.68	1.16	509	20,000	2,000	18,000	0
2008	457,120	4.22%	11.84	10.68	1.16	530	20,000	2,000	18,000	0
2009	475,650	4.05%	11.84	10.68	1.16	552	20,000	2,000	18,000	0
2010	494,202	3.90%	11.84	10.68	1.16	573	20,000	2,000	18,000	0
2011	512,775	3.76%	11.84	10.68	1.16	595	15,000	1,500	13,500	0
2012	526,870	2.75%	11.84	10.68	1.16	611	15,000	1,500	13,500	0
2013	540,981	2.68%	11.84	10.68	1.16	628	15,000	1,500	13,500	0
2014	555,109	2.61%	11.84	10.68	1.16	644	15,000	1,500	13,500	0
2015	569,253	2.55%	11.84	10.68	1.16	660	15,000	1,500	13,500	0
2016	583,413	2.49%	11.84	10.68	1.16	677	10,000	1,300	8,700	0
2017	592,790	1.61%	11.84	10.68	1.16	688	10,000	1,300	8,700	0
2018	602,177	1.58%	11.84	10.68	1.16	699	10,000	1,300	8,700	0
2019	611,576	1.56%	11.84	10.68	1.16	709	10,000	1,300	8,700	0
2020	620,985	1.54%	11.84	10.68	1.16	720	10,000	1,300	8,700	0
2021	630,406	1.52%	11.84	10.68	1.16	731	3,000	1,300	1,700	0
2022	632,837	0.39%	11.84	10.68	1.16	734	3,000	1,300	1,700	0
2023	635,271	0.38%	11.84	10.68	1.16	737	3,000	1,300	1,700	0
2024	637,708	0.38%	11.84	10.68	1.16	740	3,000	1,300	1,700	0
2025	640,148	0.38%	11.84	10.68	1.16	743	3,000	1,300	1,700	0
2026	642,590	0.38%	11.84	10.68	1.16	745	2,000	1,300	700	0
2027	644,036	0.22%	11.84	10.68	1.16	747	2,000	1,300	700	0
2028	645,483	0.22%	11.84	10.68	1.16	749	2,000	1,300	700	0
2029	646,931	0.22%	11.84	10.68	1.16	750	2,000	1,300	700	0
2030	648,382	0.22%	11.84	10.68	1.16	752	2,000	1,300	700	0

Table 2.2.3 Population Forecast (Medium Growth)

year	January 1	annual growth	birth per 1000	death per 1000	natural growth	natural increase	inflow	outflow	net inflow	adjust
1994	288,400		12.4	9.6	2.8	808	5,416	11,124	-5,708	400
1995	283,900	-1.56%	11.5	11	0.5	142	4,857	9,633	-4,776	-566
1996	278,700	-1.83%	11.2	11	0.2	56	2,822	7,121	-4,299	643
1997	275,100	-1.29%	11.6	10.7	0.9	248	8,039	7,890	149	-197
1998	275,300	0.07%	12.5	11.1	1.4	385	13,975	9,159	4,816	37,599
1999	318,100	15.55%	11.84	10.68	1.16	369	14,000	10,869	3,131	0
2000	321,600	1.10%	11.84	10.68	1.16	373	20,000	4,000	16,000	0
2001	337,973	5.09%	11.84	10.68	1.16	392	20,000	4,000	16,000	0
2002	354,365	4.85%	11.84	10.68	1.16	411	20,000	4,000	16,000	0
2003	370,776	4.63%	11.84	10.68	1.16	430	20,000	4,000	16,000	0
2004	387,206	4.43%	11.84	10.68	1.16	449	20,000	4,000	16,000	0
2005	403,655	4.25%	11.84	10.68	1.16	468	20,000	4,000	16,000	0
2006	420,124	4.08%	11.84	10.68	1.16	487	20,000	2,000	18,000	0
2007	438,611	4.40%	11.84	10.68	1.16	509	20,000	2,000	18,000	0
2008	457,120	4.22%	11.84	10.68	1.16	530	20,000	2,000	18,000	0
2009	475,650	4.05%	11.84	10.68	1.16	552	20,000	2,000	18,000	0
2010	494,202	3.90%	11.84	10.68	1.16	573	20,000	2,000	18,000	0
2011	512,775	3.76%	11.84	10.68	1.16	595	20,000	1,500	18,500	0
2012	531,870	3.72%	11.84	10.68	1.16	617	20,000	1,500	18,500	0
2013	550,987	3.59%	11.84	10.68	1.16	639	20,000	1,500	18,500	0
2014	570,126	3.47%	11.84	10.68	1.16	661	20,000	1,500	18,500	0
2015	589,287	3.36%	11.84	10.68	1.16	684	20,000	1,500	18,500	0
2016	608,471	3.26%	11.84	10.68	1.16	706	20,000	1,000	19,000	0
2017	628,177	3.24%	11.84	10.68	1.16	729	20,000	1,000	19,000	0
2018	647,905	3.14%	11.84	10.68	1.16	752	20,000	1,000	19,000	0
2019	667,657	3.05%	11.84	10.68	1.16	774	20,000	1,000	19,000	0
2020	687,432	2.96%	11.84	10.68	1.16	797	20,000	1,000	19,000	0
2021	707,229	2.88%	11.84	10.68	1.16	820	10,000	1,000	9,000	0
2022	717,049	1.39%	11.84	10.68	1.16	832	10,000	1,000	9,000	0
2023	726,881	1.37%	11.84	10.68	1.16	843	10,000	1,000	9,000	0
2024	736,724	1.35%	11.84	10.68	1.16	855	10,000	1,000	9,000	0
2025	746,579	1.34%	11.84	10.68	1.16	866	10,000	1,000	9,000	0
2026	756,445	1.32%	11.84	10.68	1.16	877	10,000	1,000	9,000	0
2027	766,322	1.31%	11.84	10.68	1.16	889	10,000	1,000	9,000	0
2028	776,211	1.29%	11.84	10.68	1.16	900	10,000	1,000	9,000	0
2029	786,112	1.28%	11.84	10.68	1.16	912	10,000	1,000	9,000	0
2030	796,024	1.26%	11.84	10.68	1.16	923	10,000	1,000	9,000	0

Table 2.2.4 Economic Development Forecast for Kazakhstan

Kazakhstan	unit	Actual				Esti.		Plan					Remark
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
Population	million	15.68	15.48	15.188	14.96	14.958	14.958	14.9578	14.958	14.96	14.958	14.958	
Deflator	%		139%	116%	108%	107%	111%	108%	105%	105%	105%	106%	
	Discount rate	208%	149%	129%	119%	111%	100%	93%	89%	84%	80%	76%	
GDP	bil. ten	1,014	1,416	1,672	1,748	1,892	2,167	2,407	2,626	2,870	3,167	3,525	
FV (PV) at 2000	bil. ten	2,107	2,116	2,151	2,083	2,104	2,167	2,237	2,326	2,422	2,545	2,685	
Actual annual growth rate	%					95-2000	0.6%				00-05	4.4%	
GDP/capita	th. ten	65	91	110	117	127	145	161	176	192	212	236	
FV at 2000	th. ten	134	137	142	139	141	145	150	156	162	170	180	
GDP increase by invest	bil. tenge						157					518	
Invest	bil. ten	149	119	140	214	258	329	432	544	674	814	945	Average
ratio in GDP	%	15%	8%	8%	12%	14%	15%	22%	20%	18%	15%	10%	17%
FV at 2000	bil. ten	309	178	180	256	286	329	402	482	569	654	720	
5 year invest	bil. ten						1,208					2,436	
Effective	bil. ten						242					487	
Efficiency (AD/invest)							0.65					1.06	

FV=Future Value, PV=Present Value

Table 2.2.5 (1/3) Economic Development Forecast (Case 1)

Astana city	unit	Actual				Esti.		Plan						Annual growth 2000-30
		1995	1996	1997	1998	1999	2000	2005	2010	2015	2020	2025	2030	
Population	thou.	284	279	275	275	318	322	400	490	570	620	640	650	2.4%
Deflator	%		139%	116%	108%	107%	111%	100%	100%	100%	100%	100%	100%	
Discount rate	%	208%	149%	129%	119%	111%	100%	100%	100%	100%	100%	100%	100%	
Output	bil. ten	25	28	51	94	102	111	237	392	548	696	798	895	
GRDP	bil. ten	11	13	24	44	48	52	110	182	254	323	371	416	7.2%
FV at 2000	bil. ten	24	19	30	52	53	52	110	182	254	323	371	416	
Actual annual growth rate	%					95-2000	16.7%	16.3%	10.6%	6.9%	4.9%	2.8%	2.3%	
GRDP/capita	th. ten	40	47	86	159	149	160	275	371	446	521	579	640	
FV at 2000	th. ten	84	70	110	190	166	160	275	371	446	521	579	640	4.7%
Necessary GDP increase by invest	bil. ten		Actual GRDP increase by invest				25	46	47	43	46	37	39	
Invest	bil. ten	3	3	19	36	36	39							Average
ratio in GRDP	%	28%	25%	82%	82%	75%	76%	39%	24%	14%	11%	7%	6%	17%
Annual invest, FV at 2000	bil. ten	7	5	25	43	40	39	43	43	36	36	26	26	
												30 year investment, bil. Tenge		
5 year accumu.	bil. ten						119	215	215	179	179	132	132	1,051
Effective invest	bil. ten						24	43	43	36	36	26	26	Annual
Efficiency (AD/invest)							1.04	1.06	1.10	1.20	1.30	1.40	1.50	35
5 year AD increase	bil. ten							46	47	43	46	37	39	

Table 2.2.5 (2/3) Economic Development Forecast (Case 1)

	unit	Actual 1998	Estim. 1999	Plan 2000	Plan 2005	Plan 2010	Plan 2020	Plan 2030	2001-30 annual increase
Population	thou.	275	318	322	400	490	620	650	2.4%
Output	bil. ten.	94	102	111	237	392	696	895	7.2%
GRDP	bil. ten.	44	48	52	110	182	323	416	7.2%
GRDP/ capita	thousa. tenge	159	149	160	275	371	521	640	4.7%
Invest	bil ten.	36	36	39	43	43	36	26	
Invest/G DP	%	82%	75%	76%	39%	24%	11%	6%	
Employ	thou.		147	154	192	255	335	358	2.9%

	unit	Actual 1998	Estim. 1999	Plan 2000	Plan 2005	Plan 2010	Plan 2020	Plan 2030	2001-30 annual increase
Total Output	bil. ten.	94	102	111	237	392	696	895	
GRDP	bil. ten.	44	48	52	110	182	323	416	7.2%
Industry output	percent	17%	15%	16%	14%	15%	15%	15%	
	bil. ten.	16	16	18	32	59	104	134	
add.va	percent	15%	14%	15%	12%	13%	13%	13%	
	bil. ten.	7	6	8	13	24	43	55	6.9%
Construct output (invest)	percent	38%	35%	35%	18%	22%	15%	10%	
	bil. ten.	36	36	39	43	86	104	90	
add.va	percent	40%	37%	38%	19%	23%	16%	11%	
	bil. ten.	18	18	19	21	43	52	44	2.8%
Trading& output Repair	percent	13%	16%	20%	23%	30%	30%	30%	
	bil. ten.	13	17	22	55	118	209	269	
add.va	percent	12%	15%	18%	21%	27%	27%	27%	
	bil. ten.	5	7	9	23	50	89	114	8.7%
Transport output	percent	1%	1%	1%	1%	2%	4%	5%	
	bil. ten.	1	1	1	2	8	28	45	
add.va	percent	1%	1%	1%	0%	1%	2%	3%	
	bil. ten.	0	0	0	0	2	8	13	12.9%
The other output services	percent	30%	32%	27%	45%	31%	36%	40%	
	bil. ten.	28	33	30	105	121	251	358	
add.va	percent	31%	34%	29%	47%	35%	41%	46%	
	bil. ten.	14	16	15	52	63	132	190	8.8%

Table 2.2.5 (3/3) Economic Development Forecast (Case 1)

	unit	Actual 1999	Plan 2000	2005	2010	2020	2030	2001-30 annual increase
Total Employ	person	147	154	192	255	335	358	
Industry employ	percent	11%	11%	11%	11%	10%	10%	
	thou. workforce	16	17	21	28	33	36	
add.va/worker,year	thou. tenge	405	450	631	860	1,279	1,541	4.2%
Construct employ	percent	9%	9%	9%	8%	7%	5%	
	thou. workforce	14	15	18	20	23	18	
add.va/worker,year	thou. tenge	1,299	1,343	1,161	2,089	2,201	2,475	2.1%
Trade & employ	percent	6%	6%	6%	7%	8%	10%	
Repair	thou. workforce	9	9	12	18	27	36	
add.va/worker,year	thou. tenge	818	994	1,908	2,794	3,306	3,186	4.0%
Transport employ	percent	10%	10%	10%	10%	10%	10%	
	thou. workforce	14	16	19	25	33	36	
add.va/worker,year	thou. tenge	22	22	23	88	238	358	9.8%
The other employ	percent	65%	64%	64%	64%	65%	65%	
services	thou. workforce	95	98	122	163	218	232	
add.va/worker,year	thou. tenge	169	154	425	387	608	817	5.7%

Table 2.2.6 (1/3) Economic Development Forecast (Case 2)

Astana city	unit	Actual 1995	1996	1997	1998	Esti. 1999	2000	Plan 2005	2010	2015	2020	2025	2030	Annual growth 2000-30
Population	thou.	284	279	275	275	318	322	400	490	590	690	750	800	3.1%
Deflator	%		139%	116%	108%	107%	111%	100%	100%	100%	100%	100%	100%	
Discount rate	%	208%	149%	129%	119%	111%	100%	100%	100%	100%	100%	100%	100%	
Output	bil. / ten	25	28	51	94	102	111	259	443	647	880	1,054	1,229	
GRDP	ten / bil.	11	13	24	44	48	52	120	206	300	409	489	571	8.3%
FV at 2000	bil. / ten	24	19	30	52	53	52	120	206	300	409	489	571	
Actual annual growth rate	%					95-2000	16.7%	18.5%	11.3%	7.9%	6.3%	3.7%	3.1%	5.1%
GRDP/capita	th. / ten	40	47	86	159	149	160	301	420	509	592	653	713	
FV at 2000	th. / ten	84	70	110	190	166	160	301	420	509	592	653	713	
Necessary GDP increase by invest	bil. / ten	Actual GRDP increase by invest					25	56	58	53	57	45	49	
Invest	bil. / ten	3	3	19	36	36	39							
ratio in GRDP	%	28%	25%	82%	82%	75%	76%	44%	26%	15%	11%	7%	6%	Average 18%
Annual invest, FV at 2000	bil. / ten	7	5	25	43	40	39	53	53	44	44	32	32	

30 year investment, bil tenge

	unit	2000	2005	2010	2015	2020	2025	2030	Annual
5 year accumu.	bil. / ten / bil.	119	265	265	220	220	162	162	1,293
Effective invest	ten / bil.	24	53	53	44	44	32	32	43
Efficiency (AD/invest)	ten	1.04	1.06	1.10	1.20	1.30	1.40	1.50	
5 year AD increase	bil. / ten		56	58	53	57	45	49	

Table 2.2.6 (2/3) Economic Development Forecast (Case 2)

	unit	Actual 1998	Estim. 1999	Plan 2000	2005	2010	2020	2030	2001-30 annual increase
Population	thou.	275	318	322	400	490	690	800	3.1%
Output	bil. ten	94	102	111	259	443	880	1,229	8.3%
GRDP	bil. ten	44	48	52	120	206	409	571	8.3%
GRDP/capita	thousa. tenge	159	149	160	301	420	592	713	5.1%
Invest	bil ten.	36	36	39	53	53	44	32	
Invest/GDP	%	82%	75%	76%	44%	26%	11%	6%	
Employ	thou.		147	154	192	255	373	440	3.6%

		unit	Actual 1998	Estim. 1999	Plan 2000	2005	2010	2020	2030	2001-30 annual increase
Total Output		bil. ten	94	102	111	259	443	880	1,229	
GRDP		bil. ten	44	48	52	120	206	409	571	8.3%
Industry	output	percent	17%	15%	16%	12%	15%	15%	15%	
		bil. ten	16	16	18	32	66	132	184	
	add.va	percent	15%	14%	15%	11%	13%	13%	13%	
		bil. ten	7	6	8	13	27	54	76	8.0%
Construct	output	percent	38%	35%	35%	16%	22%	15%	10%	
(invest)		bil. ten	36	36	39	43	97	132	123	
	add.va	percent	40%	37%	38%	18%	23%	16%	11%	
		bil. ten	18	18	19	21	48	65	61	3.9%
Trading&	output	percent	13%	16%	20%	21%	30%	30%	30%	
Repair		bil. ten	13	17	22	55	133	264	369	
	add.va	percent	12%	15%	18%	19%	27%	27%	27%	
		bil. ten	5	7	9	23	56	112	156	9.9%
Transport	output	percent	1%	1%	1%	1%	2%	4%	5%	
		bil. ten	1	1	1	2	9	35	61	
	add.va	percent	1%	1%	1%	0%	1%	2%	3%	
		bil. ten	0	0	0	0	3	10	18	14.1%
The other	output	percent	30%	32%	27%	49%	31%	36%	40%	
services		bil. ten	28	33	30	128	137	317	492	
	add.va	percent	31%	34%	29%	52%	35%	41%	46%	
		bil. ten	14	16	15	62	71	167	260	10.0%

Table 2.2.6 (3/3) Economic Development Forecast (Case 2)

	unit	Actual 1999	Plan 2000	2005	2010	2020	2030	2001-30 annual increase
Total Employ	person	147	154	192	255	373	440	
Industry employ	percent	11%	11%	11%	11%	10%	10%	
	thou. workforce	16	17	21	28	37	44	
add.va/worker,year	thou. tenge	405	450	631	972	1,452	1,718	4.6%
Construct employ	percent	9%	9%	9%	8%	7%	5%	
	thou. workforce	14	15	18	20	26	22	
add.va/worker,year	thou. tenge	1,299	1,343	1,161	2,363	2,500	2,760	2.4%
Trade & employ	percent	6%	6%	6%	7%	8%	10%	
Repair	thou. workforce	9	9	12	18	30	44	
add.va/worker,year	thou. tenge	818	994	1,908	3,160	3,755	3,553	4.3%
Transport employ	percent	10%	10%	10%	10%	10%	10%	
	thou. workforce	14	16	19	25	37	44	
add.va/worker,year	thou. tenge	22	22	23	99	270	399	10.2%
The other employ	percent	65%	64%	64%	64%	65%	65%	
services	thou. workforce	95	98	122	163	242	286	
add.va/worker,year	thou. tenge	169	154	511	438	691	911	6.1%