3.9 Transportation Planning[14]

3.9.1 Present Conditions of Roads and Traffic

(1) Transport Condition in Astana

Roads

Roads in the central area of Astana form a grid pattern network. The railway and the Ishim River run in parallel from northwest to southeast, separating the city area and road network. Currently only a few bridges are provided, namely, two land bridges over the railway track and one river bridge over the Ishim River. The network thereby has the drawback of concentrating traffic on those bridges.

Grade separation at intersections has not been adopted due to the moderate road traffic at present and high construction cost. Roads are seldom provided with medians, and central lines and other marking fading in places.

The heaviest transport demand at present is found in Respublika Avenue and Pushkin Street, which is one of the major north-south axis of the city, and in Abylai-khan Street which services the eastern part of the city. Traffic congestion seldom takes place, and the traffic flow is normally fluent and smooth in most of the roads.

Parking bay for vehicles are arranged in some places on arterial roads in the central area. Free parking spaces outside the road are also provided at the sites of large buildings and facilities such as government offices and markets. Shortage of parking space is not generally observed except in the Old Market area.

Intersections with traffic signals are common and few roundabouts are currently in use. All signals are of fixed time control, although 32 traffic signals are linked to the Automatic Traffic Control System (ATCS) located at the Department of Roads Inspectorate. A number of signal sets are not operating due to inappropriate maintenance.

The registered vehicles in 1999 were composed of 71.5% of cars, 19.7% of trucks, and 4.0% of trolley buses and buses respectively, according to the statistical data.

[14] Full text of Transportation Planning appears in Appendix B of Volume III; Supporting Report.

Number of Registered Vehicles in Astana, 1999

(unit:veh.)

Car	Truck	Bus	Trolley Bus	Special Car	Total
22,097	6,087	1,173	59	1,538	30,954

Source: Astana Socio-Economic Passport, Jan.2000, Astana Municipality

As the registered number of cars including trucks and buses in 1999 was 29,357 veh. in Astana City, the dissemination rate of vehicle was 92 veh. per thousand persons. This figure is considerably low, compared with those in Central and Eastern European countries. Therefore expansion of private vehicle trips is well presumable in future so that the transportation planning should include efficient measures in this regard.

Comparison of Vehicle Ownership

	Year	Population (1,000pers.)	No. of vehicle (1,000veh.)	Veh. Ownership (veh./1,000pers.)
Astana	1999	320	29	92
Moscow	1996	8,670	1,729	199
Bucharest	1995	2,340	320	137
Munich	1998	1,320	740	561
Stockholm	1994	710	221	311

Source: Major City of the World

Note: Number of vehicle includes trucks and buses and excludes special cars.

In 2030, the vehicle ownership is projected to reach 350 vehicles/1000 persons, in consideration of the growth rate of GRDP/capita, as discussed in Section 2.2. If the average vehicle trips/veh. from the traffic survey was applied to the forecast number of vehicles in future, the modal share of the vehicles would rise unreasonably high (68%), which would result in congestion. In this study, therefore, the planning methodology with an enhanced role of public transport was adopted.

Public Transport

Urban public transport in the city is served by buses, minibuses, trolley buses and taxis. Service routes are mainly set in the area between the railway station and the central district in the south. Only limited bus routes go beyond the railway track to the north. Catchment areas for the public transport routes are not well arranged to serve the whole city rationally. Taxis are operated by private firms, individual car owners and non-registered

companies.

Bus operation in Astana City suffers from an insufficiency of stopping and turnaround facilities. The issue is not so much the numbers of facilities, but rather the design and layout of facilities. Bus bays, tapers and pedestrian shelters are not commonly provided. Bus stops are apparently established on an ad hoc basis.

Transportation between the airport and the city depends solely on buses and taxis. There is only one road connecting the city to the airport, which is presently adequate for the passenger and freight transport demands.

Only one inter-modal terminal for urban public transport exists in Astana City, which is the bus terminal at the Astana railway station. The terminal not only provides routes within the city, but also regional routes covering the hinterland areas. Some of the international bus routes are also available at the terminal, although the passenger facility is in a poor condition, without any shelters and platforms.

The freight terminal facility for railway is established with a yard in the same area of Astana station. Freight terminals for trucks have not yet been provided.

(2) Regional Transport Conditions

Roads

The inter-city road network is composed of the national roads and regional roads. Five national roads radiate from or pass through Astana City. Out of those, road to the south is short, serving mostly the Astana airport. In the northern part of Astana, a national road constitutes a part of the outer ring road connects a few of the radiating national roads. This partial ring road functioning as a bypass way was only partly constructed. The section between Astrakhanskoye Highway and Shortandinskaya Highway in the northwest was already completed and the section between Vishnevskoye Highway and Sofievskoye Highway in the northeast is underway. Some regional roads in radial direction supplement the national roads. The roads are generally of higher geometric standards than those in western countries, due to the generous former Soviet Union (FSU) standards. Due to lack of sufficient maintenance work, however, the road condition is under aggravation, which hinders the road transport.

Railway

The railway tracks are located north of Astana, separating the city's territory into the northern industrial area and southern mixed use area with business, administrative and residential functions. Maintenance work has not been satisfactory in recent years due to the shortage of funds to purchase spare parts and materials in required qualities.

Reportedly, there has been discussion on the construction of a bypass rail line that would run parallel to the northern section of Astana ring road, although approval has not been granted yet. The section of line pertains to the Trans-Siberian (transcontinental) line connecting Northern Europe with China and other Far East areas. The proposed bypass would facilitate the removal of freight traffic from the lines to the main station, releasing the entire capacity for passenger trains.

Regional trains services connecting Astana with Kokshetau and Karaganda needs to be enhanced, with improvement of facilities and introducing express train services. This will be beneficial not only for commuters but also for tourist visiting Baraboe natural resort area.

Airport

The International Airport of Astana is located 18 km south of the city. Currently the airport is predominantly used for domestic flights with only a few regular international routes to and from Hanover, Frankfurt, Istanbul, and Moscow.

A number of improvements have been carried out to the airport, one of which is the extension of the former 1,000m runway in 04 direction to provide the overall runway length of 3,500m that can handle the Boeing 747 class aircraft. Renovation of the international airport is underway, financed by the Yen Loan, which include the construction of the new terminal building. This is an important step in strengthening the international transport capacity of Astana.

With the improvement of the facilities, the airport is expected to have stronger function as a center of regional air freight movement. The logistic services of an air cargo center will be strengthened at the airport in future.

(3) Problems

The general problems to be solved in the Master Plan with regard to the transportation planning are the following:

- With the future increase of private vehicles, traffic and shortage of parking facilities in the central area will likely be problematic.
- Regional traffic into the urban area is projected to expand rapidly.
- Poor transport infrastructure due to the insufficient maintenance work is commonly observed both in road and public transport, which makes the service level to aggravate.

The peculiar issues related to the indigenous conditions of Astana City are the following:

- Incorporation of planned ring road into the future urban structure
- Establishment of close connection between the existing old urban area and the proposed new urban area beyond the Ishim River
- Support to the urban development axis proposed in the Master Plan
- Provision of public transport service to the Astana airport being renovated as an international airport
- Establishment of coordinated transport system in line with the staged development of the city

3.9.2 Basic Concept for Transportation Planning

Issues on the transport planning in Astana and countermeasures by transport network formation are summarized below.

Issues and countermeasures for transportation planning

Issues	Countermeasures by transport network formation
General issues to be solved for designing the transport system	
• to establish the public transport system without large dependency on the private vehicles	- Formation of road network with sufficient cross section for the introduction of rail transit system
• to establish the parking policy and provide adequate parking facilities in the central area	- Road network pattern corresponding to the axial urban development and for the avoidance of traffic concentration (articulated urban corridor rather than multi-cores)
• to establish the urban freight transport system	- Utilization of ring roads
• to establish regional passenger and freight traffic system	- Utilization of ring roads
• to establish traffic control system and intersection improvement for the fluent traffic flow	- Establishment of road hierarchy comprising major arterial road, arterial road, supplementary road, etc. - Introduction of grade separation at intersections - Utilization of systematic traffic signal system - Establishment of traffic monitoring system and center
• to establish the ecological transport system with excellent landscape including neighboring environment	- Road construction with wide breadth for greenery - Introduction of green road and park road - Avoidance of surface structure of transport facilities
Particular issue accruing to the indigenous condition of Astana	
• to find the way to support the urban development axis	- Introduction of ladder (grid) pattern road network
• to find the way to incorporate the planned ring road into the future urban structure	- Specialization of functional role of ring roads by introducing the new ring roads for the fluent traffic movement in the urban area
• to find the way to the access to the Astana airport as a international airport	- Introduction of new public transport system
• to find the way to connect the old urban area and new urban area	- Utilization of ring road within the urban area - Bridge construction - Arrangement of roads to connect areas on the both sides of railway
• to find the way to meet the stepwise development of the city	- Formation of structural road network for the stepwise development frame of urban area

The essences of the concept are as follows. (Refer to Figure 3.9.3).

- Avoidance of traffic concentration and reinforcement of connection between existing urban area and new development area by utilization of ring roads
- Introduction of grid road network for supporting the new urban area development
- Formation of arterial road network with sufficient width for future rail transit network formation and favorable environmental condition

3.9.3 Transport Network Plan

(1) Future Transport Demand

Reinforcement of public transport and restriction of vehicle traffic in order to alleviate the traffic congestion and to realize of better urban environment is a

major worldwide trend in urban transport planning. In Astana, an emphasis will be placed on reducing the dependency on the vehicle in accordance with the major trend in the world.

Several forecast cases varying the modal shares of private vehicles and public transport were thus carried out in this Study. Finally the case with a modal split of person trips composed of passenger car (35%) and public transport (37.5%) was adopted as appropriate. This projection indicates that while the population in Astana will become 2.4 times larger from 2000 to 2030, the number of vehicle trips will become 4.5 times larger in the same period.

Amongst those trips, 350 thousand trips/day will be made by passenger cars registered in Astana, and 34 thousand trips/day will be made by trucks registered in Astana. The numbers of trips by passenger cars and trucks registered outside Astana will be 41 thousand trips/day and 5 thousand trips/day, respectively in 2030.

It is recognized that the desired lines of passenger car with large traffic volume would expand in 2030, corresponding to the expansion of urban area. The desired line showed large transport demand of passenger vehicle between new development residential area with high density and existing central urbanized area (Figure 3.9.4).

(2) Road Plan

1) Road hierarchy

Road standards in RK basically depend on SNIP 2.07.01-89. Road network density shall be over 4km/ km^2 on the average of the whole city including the main streets and streets and roads of local importance.

A 10m width of strip shall be secured for the future rail transit system on the public transport corridor based on SNIP 2.05.09-90.

Traffic assignment results showed favorable volume-capacity balance at each section in 2030.

Design Standard of Roads and Streets

Category of roads and streets	Calculated speed of traffic km/hour	Width of traffic lane, m	No. of traffic lanes	Minimum radius of curves in plan, m	Maximum longitudinal slope, (0/00)	Width of pedestrian part of side walk, m
Main roads:						
-highways	120	3.75	4-8	600	30	-
-of regulated traffic	80	3.50	2-6	400	50	-
Main streets:						
Of city importance:						
-of continuous traffic	100	3.75	4-8	500	40	4.5
-of regulated traffic	80	3.50	4-8	400	50	3.0
Of regional importance:						
-transport-pedestrian	70	3.50	2-4	250	60	2.25
-pedestrian-transport	50	4.00	2	125	40	3.0
Streets and roads of local importance:						
-streets in residential	40	3.00	2-3*	90	70	1.5
construction	30	3.00	2	50	80	1.5
-streets and roads of	50	3.50	2-4	90	60	1.5
scientific, industrial	40	3.50	2	50	70	1.5
and communal-storage zones						
-park roads	40	3.00	2	75	80	-
Throughfares:						
-main	40	2.75	2	50	70	1.0
-secondary	30	3.50	1	25	80	0.75
Pedestrian streets:						
-main	-	1.00	X	-	40	x
-secondary	-	0.75	X	-	60	x
Cycle tracks:						
-separate	20	1.50	1-2	30	40	-
-isolated	30	1.50	2-4	50	30	-

* Taking into account use of one lane for parking of passenger cars.

X: According to the calculation x; According to the design

Source: SNiP 2.07.01-89

For the establishment of future road network, present road width (no. of lanes) and existing road construction plan were taken into consideration. Road network plan in 2030 was proposed after examining the capacity requirement of the forecast traffic. The roads system comprises 22 main streets of city importance, and 46 main streets of regional importance (Figure 3.9.5).

The number of bridges to be constructed amounts to 21 and one bridge is now under construction and 10 bridges over the railway. Out of those bridges 18 will be constructed over the Ishim River and others over small rivers converging to the Ishim River. After the Ishim River improvement the average width of the river gives an average bridge length of 200 m.

Major Road Projects

No.	Termini	Length (planned)	Lanes (planned)	Lanes (existing)			Length (construction)	Length (Widening)	Remarks
				6	4	2			
		(km)		(km)	(km)	(km)	(km)	(km)	
sp-1	R1 ring road	83.90	4		8.00		75.90		
a-1	sp-1 - sp-1	28.55	6(4)		14.29		14.26	14.29	Sevornoye Highway, Potanin St., Sary ArkaSt.
a-2	R2 ring road	57.75	4			1.27	56.48	1.27	
a-3	R3 ring road	21.87	6	6.08	4.08		11.71	4.08	Abylaikhan St., Kenesary St.
a-4	a-1 - a-5	13.72	6(4)	1.96	9.72	2.04	0	11.56	Pushkin St., Respublica Ave.
a-5	a-1 - a-1	16.78	6		2.01	1.62	13.15	3.63	Gyote St., Valikhanov St.
a-6	sp-1 - sp-1	19.99	6	9.79	10.20		0	10.00	Astrakhanskoe St., Batyr Bogembai Ave., Panfilov St., Sofievskoye Highway
a-7	a-3 - sp-1	7.04	6	1.70	5.34		0	5.34	Vishnevskoye Highway
a-8	a-1 - a-10	7.61	6				7.61	0	
a-9	a-2 - a-3	6.16	6				6.16	0	
a-10	a-2 - a-3	5.68	6				5.68	0	
p-1	a-4 - a-2	15.28	4		1.10	2.51	11.67	2.51	Imanov St., Mirzoyan St.
p-2	a-5 - p-7	5.84	4		3.90	1.94	0	1.94	Gumilev St.
p-3	a-4 - sp-1	14.60	4		14.60		0	0	Kurgaldzhinskoye Highway
p-4	a-1 - a-5	3.87	4				3.87	0	
p-5	a-5 - a-10	8.30	4			0.49	7.81	0.49	
p-6	a-1 - a-2	13.79	4		6.47		7.32	0	Ugolnaya St., Vishnevskaya St.
p-7	a-2 - p-6	13.55	4			3.84	9.71	3.84	
p-8	a-2 - a-3	4.79	4				4.79	0	
p-9	a-2 - a-3	6.27	4		1.05	3.39	1.83	3.39	Stanislavsky St., Novaya St., Katchenko St., Kumisbekov St.
p-10	a-3 - a-5	3.34	4		3.10	0.24	0	0.24	Pobeda Ave.
p-11	a-4 - p-1	8.11	4	2.41	2.38		3.32	0	Kravtsov St., Manas St.
p-12	a-1 - sp-1	5.41	4		5.41		0	0	

2) Road and intersection improvement

Road improvement

- Rehabilitation of road surface: Rehabilitation work will be promoted with emphasis on the main streets.
- Marking and setting zebra crossings for pedestrian

Intersection improvement

Intersection improvement will be carried out at congested intersections identified in the present condition analysis. At the major intersections between ring roads (R1, R2, R3) and other main streets, grade separation shall be provided as much as possible.

Improvement of traffic signal

i) Installment of new traffic signals

- New traffic signal intersection: some 430 sites
- Installment of vehicle reactors
- Installment of pedestrian signals

ii) Systemization of intersection signals

- Installment of controllers
- Promotion of direction control and channelization at intersections
- Systemization of sequential intersections on the trunk routes

3) Parking

Temporary parking space demand

Temporary parking spaces for business, shopping and private affairs shall also be provided according to the purpose of the facility at the time of construction. In the case of small shops and companies, however, enough temporary parking spaces usually cannot be secured by themselves. In the central urban area where the land is intensively utilized, temporary parking spaces both on and off the road shall be provided not only by private sector but also by the public sector.

Necessary temporary parking spaces in District 3, 4, 5, 6, 12, 13, and 14 are estimated at in all 3,600 vehicles (pcu.) in 2030. Parking space standard basically depends on SNIP 2.07.01-89.

Parking facilities

Following types of temporary parking spaces for general use are proposed.

- On road parking space (public sector initiative, including those for loading and unloading purpose)
- Off road parking space (public sector initiative)
- Off road parking space (private sector initiative)

Temporary parking spaces are necessary for loading and unloading trucks in the areas where retailers and wholesalers aggregate. Multi-story parking space shall be developed in the central urban area. A "parking development area" shall be strategically designated for off road parking spaces to reduce on road parking in the central urban area and parking demand itself in the whole city (e.g. LRT terminal).

Parking restriction

As parking on the road is predicted to be problematic in future, following parking restriction shall be enforced.

- Each section of the roads in the central urban area shall be designated either as a permitted or prohibited section for parking. The permitted section for parking shall be provided with on road parking spaces.
- In the prohibited sections parking will be restricted, presumably depending on vehicle type or/and by the time zone.
- All parking at on road parking space shall be charged duly and the revenues shall be pooled to cater for the provision of parking and other transport facilities.
- Control of illegal parking shall be strictly enforced and sizable amount of fine for illegal parking shall be imposed. To this end, zoning of model area for parking restriction shall be considered.

(3) Public Transport Plan

The roles of public transport shall be hierarchically defined, typically ranging from a high speed mass transit, main feeder transport, circular transport, etc. and the major public transport corridors will also be identified. Structure of roads for public transport corridor shall be provided at a high grade standard. The performance level of each public transport mode shall be defined in consideration of recent technological development.

Inter-modal traffic connection between public transport and vehicles or bicycles shall be enhanced in the form of seamless services among different service suppliers, such as common in the park and ride facilities, etc. Kiss and ride system, and park and ride system will be considered only in the peripheral areas because of the limited spatial scale of the city (8-9km radius).

The following table summarizes the average design parameters of different public transport means.

Characteristics of Public Transport Means

Item	Unit	Metro	LRT	Tram	(Trolley) Bus
transport capacity	(pax./h/direction)	2500-40000	1500-18000	1000-6000	700-1800
trip length	(km)	5-15	3-10	1-5	1-5
minimum interval	(min.)	1-2	2-4	4-6	4-6
vehicle length	(m)	50-150	30-90	15-60	8-18
guideway		segregated tunnel	free lane-segregated	road-free lane	road free lane
stations		station	platform station	platform	bus stop platform
floor height	(cm)	80-120	50-90	30-80	30-70
station distance	(m)	800-1500	500-1500	300-700	300-700
operating speed	(km/h)	30-50	25-30	15-20	15-20
investment cost	(mil.USD/km)	15-50	7-15	5-10	1-3

Source: JICA Study Team

1) Rail Transit System

Type of rail transit system

In Astana, considering the scale of the city and the density of transport demand, middle capacity rail transit system is preferable. From the past experiences metro is not managerially profitable unless the city population exceeds one million.

In European countries, light railway transit (LRT) system as a middle capacity public transport system between mass transit and bus is broadly utilized. Much improvement has been achieved in this LRT system in terms of capacity, running speed, punctuality, and comfort by the introduction of segregated track and high performance trains based on the improvement in technology of the tram system. Construction of LRT system is presumed in the areas without large population and high passenger transport demand.

In this Study, construction of LRT lines is recommended for the sections where sizable public transport demand is expected.

Basic route pattern

According to the traffic demand forecast results, large transport demand will be expected in the following sections:

i) Abylai-khan Street - existing central urban area in east-west direction

ii) New housing development area - existing urban area in southeast-northwest direction

iii) Existing central urban area and Astana International Airport through new business district in north-south direction

iv) New housing area - new business district

The sections ii), iii), and iv) have strategically important implications for the new urban area development. A basic route pattern was devised to accommodate the above transport demands with effective expansion of coverage area of transport service. Also structural problems with respect to the space for the rail transit system, especially in case of route convergence, and influence on the general traffic were taken into account in this process. The three routes shown in the below table and in Figure 3.9.6 are proposed.

LRT Routes

No.	Project	Total Length (km)	No. of staions
L-1	Astana Int. A.P. - Akmola St. route	21.7	16.0
L-2	new housing area route	7.9 (18.90)	8 (21)
L-3	R3 loop route	21.9	23.0

Note: ( ) whole route

The issue of lowering the road traffic capacity of R3 ring road shall be avoided by the adoption of grade separation between LRT route and road traffic in some section.

2) Bus and Trolley buses

Trolley bus

Trolley bus has the disadvantage of relatively large amount of energy consumption per transport capacity compared with tram. The disadvantage is that larger investment cost is necessary for infrastructure development than buses, while no discernable difference exists in the transport capacity. As trolley bus is environmentally favorable with low noise and no air pollution, the existing trolley bus routes shall be maintained for access to the business area and transportation within the business area.

There is a possibility that buses and trolley buses will be replaced by electricity driven buses in future. Installing new trolley routes should therefore be suspended under the uncertain circumstances.

Bus

Out of area-wide public transport demand *from many to many* in the city, buses are expected to take care of;

i) Public transport demand which can not be satisfied by the individual transport mode (taxis) in terms of capacity as an area servicing public transport mode;

ii) Feeder public transport demand which cannot adequately be satisfied by rail transit system;

As a linear public transport service, bus is expected to take care of:

iii) Public transport demand in the peripheral area which is not satisfied by individual transport mode due to the capacity, but is not enough for rail transit;

iv) Transport demand between major transferring points.

- improvement of accessibility to the LRT stations as feeder transport
- service supply to the area where no mass transit service is provided
- service supply as regional transport mean
- service supply between major inter-modal facilities

3) Inter-modal Facilities

The following two types of multi-modal facilities are considered:

Multi-modal facility

Multi-modal facility is assumed to serve the transferring among bus, long distance bus, taxi, and LRT or railway. The multi-modal facility with customs function for Astana International Airport (city air terminal) was also proposed in the New City Center.

Feeder servicing inter-modal facility

Feeder servicing inter-modal facility is assumed to serve the transferring between LRT between residential area and business/commercial area and feeder service public transport.

Feeder servicing inter-modal facilities are proposed at stations near LRT terminus. Those will be minor facilities as the assumed transferring is between feeder bus and LRT.

3.9.4 Staging and Consideration of Network

Transportation network improvements are proposed projects here in accordance with the staged development of urban areas as summarized in Figure 3.9.6.

(1) Up to 2010

At this stage fundamental transport infrastructure for the new city development will be provided together with that for the redevelopment of existing central area. Major projects are following.

- Construction of north-south transport axis for the new urban axis development
- Construction of inner ring road (R3) to improve the fluidity of the traffic movement in the new and existing central areas and the connection between both banks of the Ishim River
- Completion of the outer ring road (R1) currently underway
- Construction of roads servicing to the New City Center, a new housing area in the southeast, and the industrial development area in the north
- Improvement of roads to cope with traffic condition in the existing central area and to rearrange existing urban area
- Construction of LRT (Astana International Airport - Akmola Station)
- Construction of multi-modal terminal at Akmola Station plaza and City Park of Culture and Recreation and construction of a city air terminal
- Completion of reconstruction and extension of the International Airport of Astana

(2) Up to 2020

At this stage the fundamental road network improvements for the whole city will be implemented.

- Construction of middle ring road (R2) to improve the fluidity of the traffic movement in the whole city area
- Completion of the northern half of outer ring road (R1)
- Construction of roads servicing the new housing area on the left bank of the Ishim River, and the industrial development area in the north
- Construction of roads to form new business and commercial district

- Improvement of roads in the existing lowly developed area for rearrangement of land use
- Construction of LRT (new housing area)
- Construction of multi-modal terminal at International Exhibition area

(3) Up to 2030

At this stage total transport network for the whole city will be formed.

- Completion of the southern half of outer ring road (R1)
- Construction of connection road between R1 and R2
- Construction of roads servicing the new housing area on the left bank of Ishim River
- Construction of roads to form new business and commercial district
- Improvement of roads in the existing lowly developed area for rearrangement of land use
- Construction of LRT (R3 loop route) including elevated track
- Construction of multi-modal terminal at Abylai-khan Street

With respect to the road capacity and traffic volume balance in 2030, traffic assignment by a transportation simulation computer software named JICA STRADA[15] was carried out. The major findings are the following (Figure 3.9.7).

- At each section of the radial direction just outside of inner ring road (R3) was within the affordable volume capacity ratio. The capacity of north-south transport corridor was well provided in 2030.
- The section in the east of the inner ring road comprising Abylai-khan Street will be rather tight for the future traffic demand because due to the road network road traffic will concentrate on the Abylai-khan Street.
- The road capacity across the railway was sufficient enough for the traffic demand in 2030.

Based on these findings, the following shall be taken account of for implementation.

[15] JICA STRADA is computer software developed for the traffic assignment by JICA.

- For the southeast-northwest movement along the Abylai-khan Street, construction of inner ring road (R3) and p-2 road shall be surely realized at early stage to alleviate the traffic load on the Abylai-khan Street. Also possibility of the additional road construction parallel to the Abylai-khan Street shall be pursued.

- Some of the proposed roads are rather above required level of the traffic volume. The proposed main streets of city importance to form north-south axis in the southward of the new development area up to 2030 are such roads. With the budgetary constraint, the number of lanes may be reduced, however right of way shall be reserved for the future widening for the traffic demand generated by development after 2030.

3.10 City Greenery Planning[16]

3.10.1 General

(1) Formation of Eco Corridor

The basic policy of the Master Plan is the formation of "Eco-City" which aims at the reduction of environmental negative impacts, *symbiosis* with nature and creation of urban amenity.

To realize the objective, the creation of greenery space such as *"Biotope"* (diverse habitat for wildlife) and environmental protection forest (called *"Eco-Forest"* in this Master Plan) is indispensable. These spaces should be formed based on a greenery master plan focusing on environmental protection function.

Various elements of greenery should be arranged systematically, not independently, in order to form an *"Eco Corridor"* that will function to ensure bio-diversity in the city. *Eco Corridor* consists of parks, river, cultivated land, natural grass land, Eco Forest, lakes and ponds including even artificial one and so on. *Eco Corridor* provides habitat to small animals including birds and insects, and functions as a path of fresh air and alleviates the effects of human activities on environment.

(2) Effects of Greenery

Building up of greenery is one of the main factors in creation of an pleasant and comfortable city endowed with recreation facilities available for the population. In terms of improving the sanitary conditions of the city, greenery has a favorable influence on microclimate, such as creating a source of ozone, oxygen and phytoncides serving as an environmental filter for air and increasing humidity of the air. Greenery also protects against intrusion of wind, dust and snow. Trees and bushes generally reduce the level of noise in the city.

[16] Full text of City Greenery Planning appears in Appendix C of Volume III; Supporting Report.

3.10.2 Current Status of the Greenery in Astana City

(1) Current status of the forestation in Astana City

Urban Greenery

The green areas for public use in Astana City at present are summarized in Table 3.10.1.

Table 3.10.1 Existing Green areas for public areas

	Name of Green Entity	Area (ha)	Notes
1.	Central City park	104.0	
2.	Park of "150 years of City"	12.0	Under construction
3.	Square of engineering workers	1.0	
4.	Square near to Republic Palace	2.2	
5.	Square close to Ministry of Finance RK	2.0	
	Total	121.2	

Source: Information of "*Zerenstroi*

The area of green planting of common use per person is approximately 3.8 m^2/person. (121.2ha/322,000persons) SNiP 2.07.01.89 stipulates the necessary area of greenery formation in large city (population of 500,000 - 100,000 persons) must be 12m^2/person (normally 10 m^2/person, however, in case of the steppe areas like Astana the quota should be increased by 20%.) Therefore, even greater efforts for increasing the volume of city greenery in Astana city should be made to meet the requirement of SNiP. The location of the city parks mentioned above is shown in Figure 3.10.1.

Environmental protection forest

Based on the land suitability assessment shown in Figure 3.10.2, formation of environmental forest is conducted as shown in Figure 3.10.3.

The first artificial forest plantations in the rim of the City were created by A.L.Adamovich in forest dacha "Krasny Yar" in 1904. This plantation became an example of forestation in dry steppe conditions in the vicinity of Astana. The work on establishment of environmental protection forest started in 1997. In 1998 and in 1999 an area of 2,500 ha of forest planting was conducted annually with tree and shrub of seedlings. In 2000, the forest-plantation zone was established over an area of 2,500 ha and the total area of the forest-plantation for the period of 3 years has become 7,500 ha.

(2) Administrative Organization of Greenery in Astana City

Urban Greenery

Section of Greenery Planting (*Zelen Stroi*) is in charge of urban greenery planting under the control of State Enterprise of the City Communal Service (*Gorcommunkhoz*). *Zelen Stroi* maintains Chubary nursery and dendrological garden.

Forestation

"*Kazgiproleshoz*" is in charge of design work for the public forestation program. Public works to create buffer green zone is conducted by Republican State enterprise "*Zhasyl Aym*ak", directly under the control of the Committee of Forestry, Fishery, and Hunting of the Ministry of Natural Resources and Environmental Protection of RK.

Forests after their inauguration are controlled, registered and accepted by Akmola Enterprise of Forest and Fauna Protection.

(3) Constraints and Potential For Greenery Plantation

There are several constraints on the establishment of the greenery plan of the Astana City. The city area is located on the flat, poorly drained, clay-loamy plains with relatively high level of heavily mineralized ground water table. In addition, strong winds blow throughout the year in the City. In order to establish a greenery plan, it is essential to take into consideration the land suitability for tree plantation properly.

Regarding the land suitability in the city area, there are results of a study carried out by V. P. Bobrinik. He classified the city area by the level of difficulty of plantation, based on the ground water table and content of salt in the groundwater. The "*Kazgiproleskhoz*" institute has also studied the land suitability of the area outside of the city in a Feasibility Study for the green zone formation. The results of these studies were used in the preparation of the greenery guideline for reference.

3.10.3 Planning Framework

(1) Target year

The year is set at 2030, the same as the target year of this Master Plan. This target year denotes the ultimate image of Astana.

(2) Perspective population and urban area

The projected population and the estimated area of urban area is summarized below.

Population growth and urban areas

Year	2000	2010	2020	2030
Population	322,000	490,000	690,000	800,000
Urban Area*	4,052 ha	6,476 ha	8,690 ha	10,025 ha

*; Gross residential are + government/business city part (escl. industrial area)

(3) Target of Greenery area

There are two targets for city greenery in this Project; one is for urban greenery and the other is for buffer belts. As for the city greenery, the standard is 12 m²/person, or 960ha for 800,000 persons in the year 2030, stipulated in the SNiP 2.07.01.89 as necessary areas of greenery formation in large city. Meantime, the norms of GOST 17.53.01-78 stipulate the necessary area of buffer belt as 250m²/person, which corresponds to an area of 20,000ha for the projected population of 800,000 in 2030.

Target greenery areas in each greenery category and in each target year are summarized as below.

Urban Greenery

Items	1999	2010	2020	2030
Urban Greenery Area (ha)	121.1	401	681	960
Projected Population	322,000	490,000	690,000	800000
Urban Greenery Area per person (m2/person)	3.8	8.2	9.9	12

Buffer Belts

Items	1999	2010	2020	2030
Forestation Area (ha)	10,180	13,453	16,726	20,000
Projected Population	322,000	490,000	690,000	800,000
Forestation Area per person (m2/person)	316	275	242	250

3.10.4 Planning of Greenery Arrangement

(1) General

The basic policy in the planning of greenery is to arrange greenery network so that the network maintains close relationship between each greenery unit component. From the point of view of mitigating the harsh urban climate, the greenery network generally provides moisture. Also it functions as an

ecological corridor, which provides the path for ecological system with diverse functions such as.

- To form a habitat for wildlife such as birds and insects
- To contribute to the improvement of landscape of urban areas
- To be used for recreation activities
- To be used as evacuation route or shelter in case of natural disaster

(2) Greenery network

The greenery network should be planned so as to prevent disorderly expansion of urban areas and to clearly delineate the shape of the city.

The water bodies of Astana (the Ishim River, Solyonaya Balka, Saryblak, Taldy Kol Lake and Maibalyk Lake) should be considered in conjunction with the greenery network, as they contribute to the control of temperature, moisture and ventilation in combination with the greenery.

The plan of greenery arrangement is as shown in Figure 3.10.4. The major elements of the planned greenery axes are as follows.

1) Green belt along the outer ring road

The greenery corridor along the outer ring road consists of tree plantation along the road and constitutes part of "Eco-Forest" around the city. This greenery belt constitutes the greenery frame of the city and thereby delineates the shape of the city. This greenery belt protects the city from unfavorable climate factors. "Eco-Forest" is an environmental protection forest, which could be used fro recreation as well. It is located on the area between the outer ring road and the City.

2) Main greenery axis in the city area

Greenery axis to be formed along the Ishim River will be the main greenery axis in the city. In addition, the greenery axis proposed along the railroad track will provide buffer between the industrial and residential areas and provides for an ecological corridor.

3) Minor greenery axes

The wedge-shaped minor greenery axes entering from the outer green belt to the main greenery axis function to alleviate the increasing temperature in the new urban areas. The minor greenery axes are planned as follows.

- Greenery Axis along the Akbulak and Sarybulak
- Greenery Axis from the Maibalyk Lake towards the village of Telman on the left bank of the Ishim.

4) Formation of greenery cores

Construction of urban parks within the urban areas of Astana could enhance the core of greenery in the city. New parks will be provided in a systematic manner, taking into consideration of the population and importance of each area..

5) Environmental protection area

The area extending southwest of the city maintains a vernacular landscape. It consists of steppe, swamps, lake, grazing of livestock, habitats of wild life such as waterfowls etc. This area, therefore, should be preserved as an environmental protection area with minimum allowable development. An advantage of Astana is that environmental protection area could be maintained in the close proximity of the City Center. To preserve this vernacular landscape is essential to achieve the ultimate goal of establishing an "Eco-City".

Part of this area could be planned as nature-oriented recreational area, as the area has easy access for the city residents. The city dwellers could paddle boats on the canals connecting the small-scale swamp, enjoy bird watching on the lakeside, do fishing and horse riding and even camping.

(3) Policies for Realization of the City Greenery

1) Development of Urban Parks

Urban parks could be core of the city greenery and they are basic elements of the greenery network. The scheme of urban park system in Kazakhstan is summarized in the table below.

Scheme of Urban Parks in Kazakhstan

Category	Size (ha)	Radius of served area, km	Remarks
City Park	15ha and more	Up to 5(20minutes)	In residential area
District Park	10ha and more	Up to 2(15minutes)	In the city district
Residential Area Garden	3ha and more	Up 1	In residential area closed to the center
Neighborhood Park	1ha and more	Up to 0.5	In micro district
Square	0.5ha and more	Up to 0.3	In plaza or the area in the set back of buildings along streets
Boulevards	-	-	-

Source: "SniP2.07.01-89"

The Square, neighborhood park, residential area garden and district park are planned mainly for the space for recreational activities in the daily life of local residents. The city park has a wider range of objectives and is planned basically for all the citizens living in the city.

In addition, special parks should be planned based on the characteristic of each area and for specific objectives.

Biotope such as birdbath and sanctuary should be introduced to these urban parks. People, particularly the young pupils and students, could experience and nurture the natural environment in these spaces and realize the charm of wild life.

2) Boulevards

As mentioned above, urban greenery should be formulated in a structure of network in relation to each other. In order to establish a robust network, introduction of boulevards is considered highly effective. Boulevards are open space consisting of full of greenery pedestrian paths and roads, which is virtually no existent at present in Astana. Boulevards will connect the greenery components such as neighborhood parks utilized in daily life to the greenery cores such as the city park. Boulevards will also enhance the local wind protection effects of environmental protection area mentioned above.

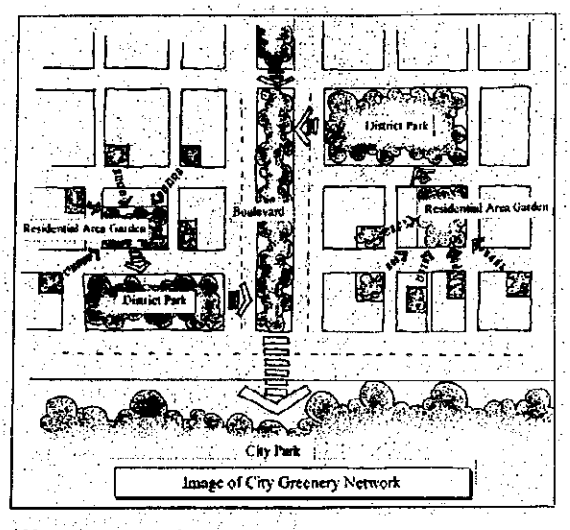
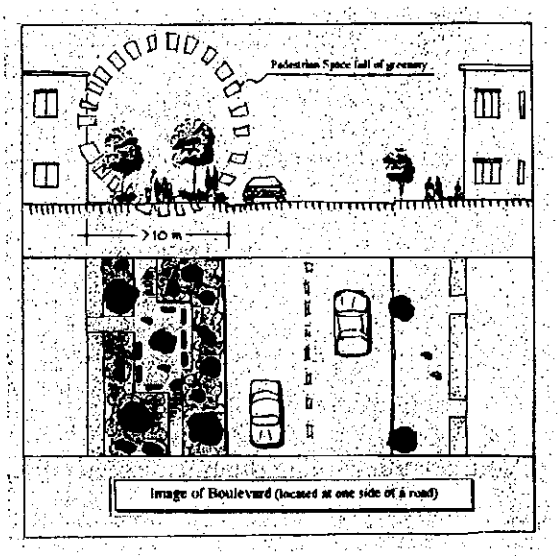


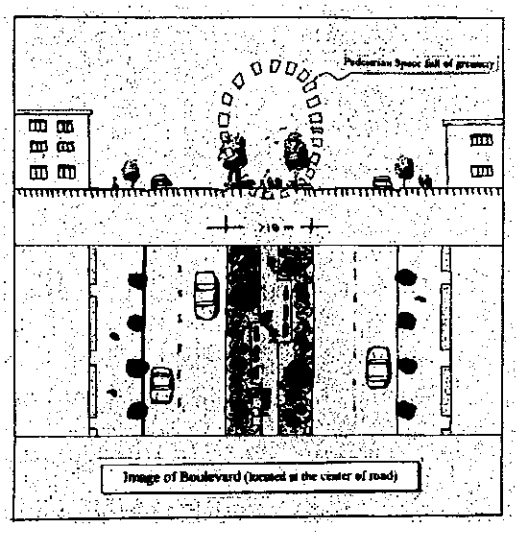
Image of City Greenery Network

Necessary conditions for the pedestrian space in boulevards stipulated in the SNiP are mentioned below.

- If located at the center of road, the required width is more than 18m.
- If it is located on the one side of the road, it should be more than 10m.

The general image of boulevards are shown below,





3) Greenery Enhancement Area

Greenery Enhancement Area is proposed for designation in specific areas in the existing city. The area should have a pleasant atmosphere fully lined with greenery. The following three areas are proposed as Greenery Enhancement Area.

- Beibitshilik Street (greenery corridor of south-north axis)
- Abai Avenue (greenery corridor of east-west axis)
- Batyr Bogembai Avenue (greenery corridor of east west axis)

In these areas, greenery should be enhanced by additional planting of trees and shrubs, as well as the existing greenery preserved. This area will be an ideal model for city greenery enhancement in the future.

4) Greenery in the atrium space of buildings

In view of enhancing urban greenery, new buildings will be encouraged to have an atrium space, where small-scale urban greenery could be provided. As the people living in Astana have rather a generally short period of enjoying greenery due to the climatic condition, an atrium

space could provide greenery for the enjoyment of citizens throughout the year.

(4) Arrangement Pattern of Urban Parks

1) Target greenery area

As mentioned in 3.10.3 (3), the target greenery area for urban parks is at least $12m^2$/person, or 960 ha in 2030. At present the greenery area of the city parks is 121ha. (city park:104ha, public open space relating to the residential system:17ha)

2) Necessary greenery area for the urban parks

In order to establish a well-balanced arrangement of urban parks, the greenery area should first be separated into two park categories, i.e. city parks and public open, and planned accordingly. The former fulfills the demand of wide range of recreational activities for all the citizens of the city, whereas the latter is a network of small scale parks for the use in the daily life of local residents.

In the park system of Kazakhstan, squares, neighborhood parks, residential area gardens and district parks could be categorized under public open space relating to the residential system.

There is no standard for the balance between the city parks and the public open spaces based on the residential system. Therefore, the proportion of areas of the city parks and the public open space relating to the residential system will be determined at 40:60.[17]

By the use of this standard, the additional areas that need to be developed as city parks is 280 ha, and that for the open space based on the residential system is 559 ha as shown in the calculation below.

Park category	Target area	Existing area	Additionally necessary area
City park	960ha*0.4=384ha	104ha	384ha-104ha=280ha. (approximately 1.7km*1.7km)
Parks based on the residential system	960ha*0.6=576ha	17ha	576ha-17ha=559ha . (approximately 2.4km*2.4km)

Target greenery areas in each city park and in each target year are summarized as below.

[17] This division is in compliance with the Japanese standard of urban park development.

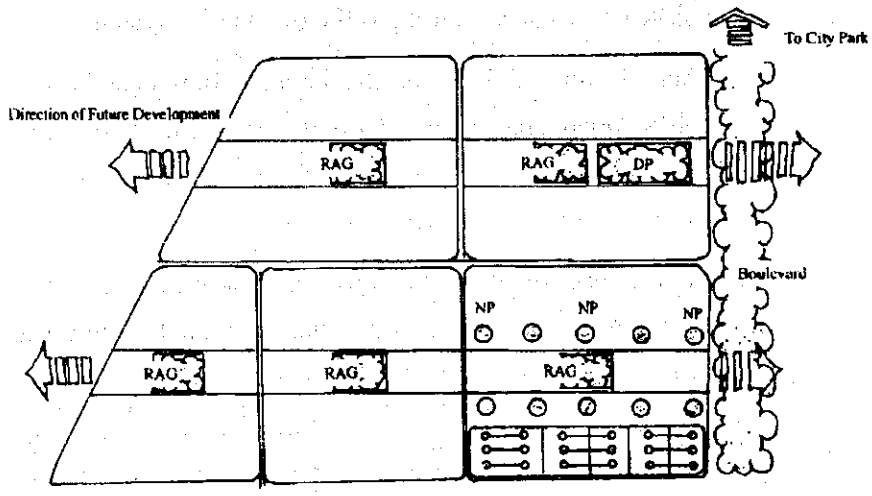
Target greenery areas

(unit: ha)

Items	Preferred Characteristics	2010	2020	2030	Total
Nature Park	Suitability for walking		20	20	40
Riverside Park	Landscaping at waterfront	26	4		30
Presidential Park	Ceremony and commemoration	30			30
Island Park	Natural conservation		30	10	40
Hillside Park	Perspective view		30		30
Sport Park	Various sports		28	22	50
Botanical garden	Display and consultation on greenery			30	30
Zoo	Wildlife education			30	30
Total		56	112	112	280

3) Arrangement Pattern of public open space relating to the residential system

The figure below shows the result of the case study in the district located southeast of the city on the arrangement pattern of public open space relating to the residential system. The case study is carried out on the premise that the planned population of the district is 20,000 persons and the necessary area of the public open space relating to the residential system is approximately 15ha.



(5) Planting methodology

1) Required greenery characteristics

In order to create and conserve a high quality urban landscape, the greenery to be introduced in the city should have the following characteristics.

- Potential to be core greenery or constituting greenery axis

- Adding accents to, and reinforcing urban landscape
- Harmonized with water body environment
- Harmonized with artificial structure such as buildings and houses

2) Quality of greenery

In the standpoint of improving urban landscape, greenery itself should have the following qualities.

- Creating unified and integral image
- Having reasonable variety in tree species and planting pattern
- Well maintained

3) Plant species

Plant species used in the greenery should be of the following nature.

- To be adaptable to the soil and climate condition of Astana region
- To have characteristic that suits the planting purposes (symbolization, landscaping, resistance to dryness, salt and low temperature)
- To have availability of seedlings and trees
- To be easy for maintenance

Recommended planting species are shown in the Supporting Report. The selection was made based on the recommendation of "*Kazniilha*", the Kazakh Scientific Research Institute of Forestry and Agricultural Forest Improvement.

4) Standard planting patterns

Densities of planting in each greenery categories are shown in the table below.

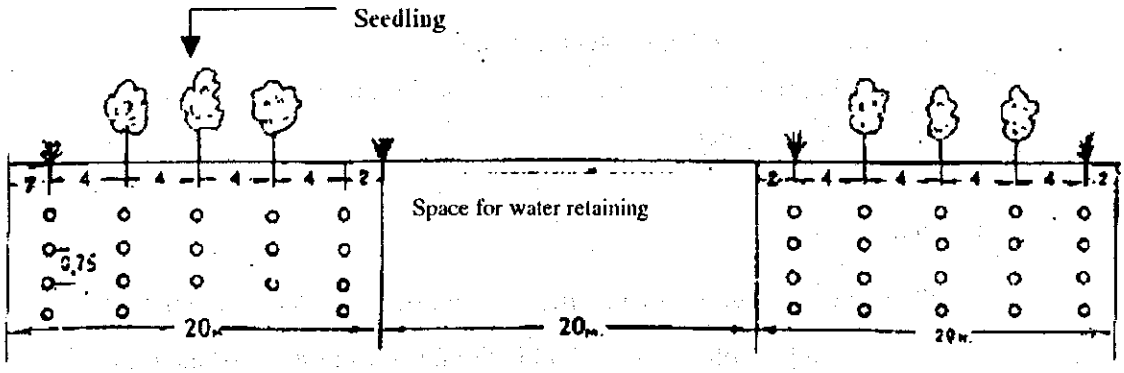
Unit: number of trees /hectare

Category	Trees	Shrubs
Parks	200-250	1500-2000
Squares	150	1500
Boulevards	250	2500-4500
Residential area	150-200	2500-1500
Territories of public institutions and sport facilities	150	2000-2500
Buffer zones	400-1000	1000-3000

(Source: "Regulations on establishment, maintenance and protection of green" V.P.Bobronik)

As the Eco-Forest will be exposed to the harsh environment such as strong winds in its location at the periphery of the city, the planting is to

be carried out at high density. The seedlings grow steadily while adapting to the climate year by year. Eco-Forest consists of plantations of several rows. This type of plantation is considered to have the advantageous characteristics in terms of resistance to strong wind, air filtration and noise suppression. The general planting pattern of Eco-Forest is as shown below.



3.10.5 Recommendations

(1) Make good use of sludge generated from sewerage plant for tree planting

From the viewpoint of alleviation of negative environmental impacts and *symbiosis* with nature, it is desirable to make good use of sludge generated from sewage treatment plant as an organic fertilizer for the soil improvement.

(2) Greenery of closed landfill site

The landfill site located north of the city is scheduled for closure within two years due to the landfill capacity. Planting of trees and shrubs should be contemplated on the landfill site to improve the environment in the long run. Greenery provision of the landfill site should be conducted after reclamation according to the SNiP.

(3) Roof garden

Considering the scenery from high-rise buildings, providing greenery on top of buildings will be an effective measure for townscape improvement. Thus roof gardens of medium and low-rise buildings are proposed for implementation. The plan of roof garden should take into consideration the

structural issues of the architecture, such as the strength of the roof. Therefore, research and development in this field should be conducted properly.

(4) Field survey on groundwater table and water quality

The high level of saline groundwater and reportedly saline soil are he main constraints facing the provision of greenery in Astana. In the detail design phase, a comprehensive field survey and analysis of groundwater and soil should be conducted in order to fully describe the actual conditions for formulating effective measures for enhancing greenery.

TABLE

Table 3.1.1 Historical Events and Growth of Population

Year	Population	Related Incident
1897	9,700	Recognition as township (1824), given a status of a district town (July 1863)
1926	12,800	Russian Revolution (1917)
1939	32,100	Commencement of railroad operation (1931)
1949	76,000	End of World War II (1945)
1959	102,300	Announcement as center of Virgin Lands Scheme, renamed to Tselinograd (1960)
1970	181,300	Denouncement from center of Virgin Lands Scheme (1971)
1979	233,600	
1989	282,500	
1992	293,500	Independence of RK and rename to Akmola (1991)
1993	292,000	
1994	289,800	
1995	285,500	
1996	280,300	
1997	271,000	Officially announced the capital of RK (December 1997)
1998	277,100	International celebration as new capital of RK (June 1998)
1999	322,400	

Table 3.1.2 List of Monuments of Historical/Cultural Heritage under State Protection

#	Name of The Memorial	Dated	Location	Category of Protection, Document	Balance owning
1	2	3	4	5	6
Historical and Cultural Republican Importance Memorials of Astana City under Protection					
A-1	Congress Hall (Tseiinik's Palace)	1963	Beibitshilik str., 1	Provision of the Council of Ministers of Kaz. SSR # 38 dated 26.01.1982	Akimat of Astana City
A-2	Building of staging department of Kazakh Music-drama theatre named after K. Kuanyshbayev (kindergarten # 20 "Belochka"	End of XIX cent.	Otyrar str., 31	Provision of the Council of Ministers of Kaz. SSR # 38 dated 26.01.1982	Kazakh Music-drama theatre
Historical and Cultural Local Importance Monuments of Astana city under Protection					
B-1	"Zhastar" palace	1974	Republic ave. , 17	Decision of region executive committee # 6/194 dated 26.03.1981	"Zhastar" palace
B-2	Ukrainian Embassy building (house of merchant Kubrin, executive committee and headquarters of rev. Three, reg. Historical-area studying Museum)	1909	Auesov str., 57	Decision of region executive committee # 7/208 dated 17.04.1978	Communal Property Control
B-3	Building of medical centre of Presidential Affairs (house of merchant Silin, placement of 2-nd squadron of Red Guard, region Philharmonic, regional Culture Control)	End of XIX, Beg. of XX cent. 1918	Kenesary str., 103	Decision of region executive committee # 13 dated 5.10.1976	Centre Of Medical Technologies Implementa-tion
B-4	Building of 3-rd city hospital (house of merchant Moiseev, gymnasium. Sheading Council, sheading Committee of RKPb)	1914 1918	Bukeikhan str., 40	Decision of region executive committee # 7/208 dated 17.04.1978	Repub. Clinic Hospital for invalids of Patriotic War
B-5	Building of the Supreme Court of RK (Special Forces were formed)	Beg. of XX cent. 1921	Omarov str., 57	Decision of region executive committee # 7/208 dated 17.04.01978	Republican Supreme Court
B-6	Building of Linear Communication Service (headquarter of 310-th and 387-th Fire Divisions)	1930-th 1941	Abai str., 55	Decision of region executive committee # 20 dated 25.10.1976	City Telephone Station
B-7	"Astana" shop building (trade house of Kubrin, "Raduga" shop)	1905-1907	Kenesary str., 105	Decision of region executive committee # 2/28 dated 30.01.1984	CJSC "Sharyk" rented by CJSC "Tatti"
B-8	"Ishim" hotel building	1960-1965	Beibitshilik str., 8	Decision of region executive committee # 2/28 dated 30.01.1984	Presidential Affairs Control
B-9	Building of Museum named after S. Sefullin (house of merchant Kazantsev, "Zorka" kindergarten)	1846	Auesov str., 78	Decision of region executive committee # 2/28 dated 30.01.1984	Museum named after S. Sefullin
B-10	Administrative building of the Museum named after S. Sefullin.(house of doctor Blagoveshenskiy F. I.)	Beg. of XX cent.	Auesov str., 78	Decision of region executive committee # 2/28 dated 30.01.1984	Museum named after S. Sefullin
B-11	Building of Medical Supply Department of the Defence Ministry of RK	1880	Jangildina str., 40	Decision of region executive committee # 2/28 dated 30.01.1984	Property of the Republic
B-12	Railway Station and neighbouring square	1954	Railway Square	Decision of region executive committee # 6/194 dated 26.03.1981	Akmola regional DGP Branch of passenger transportation
B-13	Konstantino-Eleninskaya Church	1854-1900	Korkyt str., 12	Decision of region executive committee # 2/28 dated 30.01.1984	Konstantino-Eleninskaya Church
B-14	Memorial to S. Sefullin	1972	Pobeda ave., 116	Decision of region executive committee # 6/194 dated 26.03.1981	City Municipal Economy
B-15	Obelisk on the place of decimation of 38 partisans – participants of Mariin rebellion	1919	Area of Gas Equipment Plant	Decision of region executive committee # 7-208 dated 17.04.1978	City Municipal Economy

Table 3.1.3 Historical And Cultural Monuments Proposed for Protection(1/2)					
#	Name of The Memorial	Dated	Location	Typology	Balance owning
1	2	3	4	5	6
C-1	Memorial to S. Seifullin	1994	Seifullin str., 67	Monumental sculpture	City Municipal Economy
C-2	Memorial to Tole-bi, Azybek-bi, Aiteke-bi.	1998	Zh. Omarov str., 57	Monumental sculpture	City Municipal Economy
C-3	Memorial to A. S. Pushkin	1999	Pushkina str., corner of Moskovskaya str.	Monumental sculpture	City Municipal Economy
C-4	Memorial to Abai	2000	Abai str., corner of Republic ave.	Monumental sculpture	City Municipal Economy
C-5	Memorial to The Protectors of Fatherland	1995	Depot of City Municipal Economy	Monumental sculpture	City Municipal Economy
C-6	Stele "Of the Victory"	1975	Depot of City Municipal Economy	Monumental sculpture	City Municipal Economy
C-7	Memorial to the memory of victims of political repression	1997	Airport road	Monumental sculpture	City Municipal Economy
C-8	New square with fountain "Tree of Life"	6.07. 2000	New Square	Sculpture composition	City Municipal Economy
C-9	Central square with fountain and sculpture composition	1999	Front of the Presidential Palace	Sculpture composition	City Municipal Economy
C-10	Memorial to Kazakhstan citizens, fallen in Afghanistan war	7.05. 2000	Munaitpasova str., corner of Abylai Khana str.	Monumental construction	Unit of Afghanistan veterans
C-11	Memorial to V. I. Lenin	1975	Area of former cinema "Tselinniy"	Monumental construction	City Municipal Economy
C-12	Memorial to the fighters for Soviet Governance	1917-1921 1972	Cemetery area	Monumental construction	City Municipal Economy
C-13	Muslim mosque	1996	Koshkarbayev str., 95	Memorial of cult architecture	
C-14	Rome-Catolic Church	27.06.99li ghtning	Tashenova str.,3	Memorial of cult architecture	Rome-Catolic Church
C-15	New-Apostol Church			Memorial of cult Architecture	New-Apostol
C-16	Opera & Ballet Theatre named after K. Baiseitova	1954	Akjayk str., 10	Memorial of civil &public architecture	City Municipal Economy
C-17	Russian-Drama Theatre named after M. Gorkiy	1914	Bigeldinova str., 72	Memorial of civil &public architecture	Russian Drama Theatre
C-18	Administrative building of Russian Drama Theatre named after M. Gorkiy	End of XIX cent.	Zheltoksan str., 17	Memorial of Architecture	Russian Drama Theatre
C-19	Shop "Pucha"	1950	Beibitshilik str., 75	Memorial of civil &public architecture	"Pucha" Ltd.
C-20	Building of Kazakh Musical Drama theatre department named after K. Kuanyshbayeva	End of XIX cent.	Otyrar str., 29	Memorial of Architecture	Kazakh Musical Drama theatre
C-21	Department of internal affairs of Astana city	Beg. of XX cent.	Beibitshilik str., 17	Memorial of Civil Architecture	Department of internal affairs café "Tselina"
C-22	Building of national press-club	End of XIX cent.	Beibitshilik str., 2	Memorial of civil &public architecture	"Eksim Bank" rents RK
C-23	The building of state residence of Presidential Affairs of RK	Beg. of XX cent.	Beibitshilik str., 6	Memorial of civil &public architecture	Management of Presidential Affairs
C-24	Committee of National Security	End of XIX, beg. of XX cent.	Begildinova str., 76	Memorial of architecture	Committee of National Security

Table 3.1.3 Historical And Cultural Monuments Proposed for Protection(2/2)					
#	Name of The Memorial	Dated	Location	Typology	Balance owning
1	2	3	4	5	6
C-26	"Europe-Palace"	Beg. of XX cent	Abai ave., 53	Memorial of architecture	Europe-Palace
C-27	Astanaenergoservice	End of XIX, beg. of XX cent.	Otyrar str., 41	Memorial of architecture	OJSC "Astanaenergos ervice"
C-28	Inter-Continental Hotel	1998	Abay ave., 114	Memorial and public architecture	OJSC Hotel "Astana"
C-29	Ministry of Defence	End of XIX, beg. of XX cent.	Auesov str., 49	Memorial of architecture	Ministry of Defence
C-30	Administration of President	1968	Beibitshilik str., 11	Memorial of civil architecture	House Hold Department (temporarily)
C-31	Parliament	1998	Abay ave., 57	Memorial of civil architecture	Parliament
C-32	Government	1982	Omarov str., 60	Memorial of civil architecture	House Hold Department of Government
C-33	Palace of Ceremonies	1982	Republic ave., 40	Memorial of civil architecture	Culture Management
C-34	Palace of Youth	1985	Bukeykhan str., 40	Memorial of civil architecture	City management of Education
C-35	House of Ministries	1999	Pobeda ave., 33	Memorial of civil architecture	Ministry of Finance
C-36	"Kazkommerzbank" building	End of XIX, beg. of XX cent.	Abai ave., 66	Memorial of architecture	Kazkommerzba nk
C-37	Building of Representative Relations	50-60 years	Bukeikhan str., 38	Memorial of civil architecture	Ministry of Foreign Affairs
C-38	Building, Trade, Industrial palate	Beg. of XX cent.	Auesova str., 66	Memorial of civil architecture	Kazakh Oil
C-39	Building of Cinema City	2000	Imanova str., 10	Memorial of civil architecture	Cinema City
C-40	Eurasian University	2000	Munaitpasovstr., 5	Memorial of civil architecture	Eurasian University
C-41	Ethnopark	1997	Airport road	Memorial of history and culture	Ethnopark
C-42	House, where the greatest Kazakh scientist, famous public figure Mr. Zholdasbekov lived	1931-1999	Abai ave., 1-1	Memorial of history	

Table 3.1.4 Created monuments, sculptusres and small architectural forms					
#	Name of The Memorial	Dated	Location	Typology	Balance owning
1	2	3	4	5	6
D-1	"Naiza" stele	1998	Bridge across Ishim river	Monumental creation	City municipal economy
D-2	"Snow Leopards" before the automobile bridge	1998	Bridge across Ishim river	Sculptural composition	City municipal economy
D-3	"Archer" sculpture	1998	Abai av. 73/Business Centre	Small architectural from	City municipal economy
D-4	"Berkutchi" sculpture	1998	Abai av./corner of Republic av.	Small architectural from	City municipal economy
D-5	"Steppe Madonna" sculpture	1998	Republic av. 3 Museum of modern arts	Small architectural from	City municipal economy
D-6	"Playing Children" sculpture	1998	Republic av./corner of Kenesary str.	Small architectural from	City municipal economy
D-7	"Cattle Run" sculpture	1998	Beibitshilik Str. 10	Small architectural from	City municipal economy
D-8	"Caravan" sculpture	1998	Kenesary str. 107	Small architectural from	City municipal economy
D-9	"Cosmos" sculptural composition – 6 pieces	1999	Kenesary str. In front of "KazakOil" building	Small architectural from	City municipal economy
D-10	"Muse" sculpture	1999	Beside the "Elite" fashion house	Small architectural from	City municipal economy
D-11	The Park of Stone sculptures – 23 pieces	1999	Beside Congress Hall	Small architectural from	City municipal economy
D-12	"Bata" monument	2000	Railway station square	Monumental creation	Akmola regional branch passenger's transportation
D-13	"Harmony"		Besides the Ceremonial Palace	Sculptural composition	

Table 3.2.1 Major Streets in Astana (Width more than 10 m)

No	Street Name	Length (m)	Width (m)	Pavement (m2)	Other area (m2)	Total Area (m2)	Average width (m)
1	Sary-Arka	2,500	26	6,080	19,160	90,240	36.1
2	Astrakhanskaya Highway	2,100	25	1,560	804	54,864	26.1
3	Bogenbai	2,400	25	7,200	200,000	267,200	111.3
4	Manasa	1,942	25	7,686	63,000	119,236	61.4
5	Respublika	2,330	24	11,374	54,490	121,784	52.3
6	Vavilova	682	24	475	6,698	23,541	34.5
7	Beibetshilik	3,400	23	47,400	81,000	206,600	60.8
8	Birzhan Sal	400	23	3,500	2,335	15,035	37.6
9	Auezova	3,600	22	56,000	20,000	155,200	43.1
10	Kravtsova	1,000	22	6,000	61,100	89,100	89.1
11	Mirzoiana	700	20	2,400	74,850	91,250	130.4
12	Panfilova	870	19		7,420	23,950	27.5
13	Abylai-khana	2,000	18	12,000	28,000	76,000	38.0
14	Pobeda	3,320	18	19,932	12,943	92,635	27.9
15	Pushkina	2,200	17	10,200	34,750	82,350	37.4
16	Akzhaiyk	1,400	16	10,900	962	34,262	24.5
17	Baraeva	1,203	16	5,272	10,780	35,300	29.3
18	Valikhanova	2,100	16	12,800	25,600	72,000	34.3
19	Abai	5,500	15	27,841	39,594	149,935	27.3
20	Omarova	3,400	15	17,276	21,377	89,653	26.4
21	Begeldinov	320	14	1,848	1,452	7,780	24.3
22	Dzhangildina	3,800	12	21,950	23,725	91,275	24.0
23	Gumilyova	3,000	12	3,704	24,000	63,704	21.2
24	Moskovskaya	2,400	12	8,904	23,000	60,704	25.3
25	Mukana	1,800	12	8,725	95,975	126,300	70.2
26	Petrova	934	12	5,484	7,790	24,482	26.2
27	Road between microdistricts #4 and #5	700	12		34,010	42,410	60.6
28	Seifullina	3,700	12	22,200	37,000	103,600	28.0
29	Tsiolkovskii	3,996	12	10,500	16,800	75,252	18.8
30	Imanova	1,300	11	4,400	11,000	29,700	22.8
31	Kenesary	5,200	11	32,161	32,547	121,908	23.4
32	Baitursynova	2,000	10	8,000	12,000	40,000	20.0
33	Bukeikhana	1,060	10	7,185	2,520	20,305	19.2
34	Bypass road	1,584	10	2,184	76,547	94,571	59.7
35	Lesozavodskaya	2,500	10	5,000	15,000	45,000	18.0
36	Likhachyova	2,100	10	4,400	46,000	71,400	34.0
37	9th of May	1,900	10	9,742	6,600	35,342	18.6
38	Mozhaiskii	1,070	10		10,800	21,500	20.1
39	Potanina	950	10	2,590	21,875	33,965	35.8
40	Road between microdistrict #9 and Alpharabi	3,000	10		0	30,000	10.0
41	Sembinova	1,670	10	3,328	29,968	49,996	29.9
42	Zatayevicha	1,500	10	6,000	15,000	36,000	24.0
43	Zhumabayeva	910	10		53,690	62,790	69.0

Table 3.2.2 General Range of Prices of Housing Units by Categories

Category	Typical age	Typical type	Material/infrastructures	Average price /m^2 of total area
Low-rise houses in old residential areas	Mostly more than 30 years old	1 story; the total area is 50-250 m^2	Ephemeral (not durable) materials	US$ 50 to 100/m^2
Low-rise housing buildings in old residential areas	10 to 20 years ago	1-2 stories; The total area is 50-250 m^2	Permanent materials, with or without access to water, power and telephone	US$ 80 to 150/m^2
Low-rise housing buildings in old and new residential areas	2 to 10 years ago	1-2 stories. Total area between 150 to 300 m^2. Total land are between 600 to 1,500 m^2.	Permanent materials with concrete foundations. Access to water, power and telephone.	US$ 150 to 550/m^2
Apartments in the olf residential development	10 to 20 years ago	5-9 stories. Standard types are 30 to 90 m^2.	Varies. Usually an elevator for floors above 5 stories.	US$ 120 to 400/m^2
Apartments in the new residential development	Within the recent 4 years.	5-25. The total area is 50-250 m^2.	Good environment, availability of infrastructures.	US$ 400 to 500/m^2 for 3 to 4 year old apartments; US$ 500 to 550/m^2 for new ones.

Table 3.2.3 Townscape Characteristics of Major Streets (More than Width 10 m)

No	Street Name	Total Length (m)	Lane Width (m)	Per 1 m of Length			No. Trees (Nos.)
				Pave-ment (m2)	Tree Area (m2)	Lawn /flower area (m2)	
1	Sary-Arka	2,500	26	2.4	7.7	3.1	369
2	Astrakhanskaya Highway	2,100	25	0.7	0.4	0.0	2,890
3	Bogenbai	2,400	25	3.0	0.0	0.0	623
4	Manasa	1,942	25	4.0	32.4	37.1	1,316
5	Respublika	2,330	24	4.9	0.0	0.0	1,947
6	Vavilova	682	24	0.7	9.8	0.0	
7	Beibetshilik	3,400	23	13.9	23.8	8.8	1,403
8	Birzhan Sal	400	23	8.8	5.8	13.0	244
9	Auezova	3,600	22	15.6	5.6	7.7	2,183
10	Kravtsova	1,000	22	6.0	61.1	26.7	1,625
11	Mirzoiana	700	20	3.4	106.9	14.0	343
12	Panfilova	870	19	0.0	7.3	4.7	94
13	Abylai-khana	2,000	18	6.0	14.0	40.8	2,431
14	Pobeda	3,320	18	6.0	3.9	12.7	2,076
15	Pushkina	2,200	17	4.6	15.8	5.1	800
16	Akzhaiyk	1,400	16	7.8	0.7	8.9	451
17	Baraeva	1,203	16	4.4	9.0	11.3	554
18	Valikhanova	2,100	16	6.1	12.2	6.0	842
19	Abai	5,500	15	5.1	7.2	2.4	1,862
20	Omarova	3,400	15	5.1	6.3	4.0	324
21	Begeldinov	320	14	5.8	4.5	9.1	81
22	Dzhangildina	3,800	12	5.8	6.2	1.9	267
23	Gumilyova	3,000	12	1.2	8.0	28.3	2,209
24	Moskovskaya	2,400	12	3.7	9.6	5.0	489
25	Mukana	1,800	12	4.8	53.3	30.0	2,571
26	Petrova	934	12	5.9	8.3	0.0	
27	Road between microdistricts #4 and #5	700	12	0.0	48.6	0.0	
28	Seifullina	3,700	12	6.0	10.0	23.3	1,434
29	Tsiolkovskii	3,996	12	2.6	4.2	1.6	572
30	Imanova	1,300	11	3.4	8.5	13.3	267
31	Kenesary	5,200	11	6.2	6.3	6.6	1,524
32	Baitursynova	2,000	10	4.0	6.0	0.0	
33	Bukeikhana	1,060	10	6.8	2.4	34.6	451
34	Bypass road	1,584	10	1.4	48.3	0.0	
35	Lesozavodskaya	2,500	10	2.0	6.0	0.0	315
36	Likhachyova	2,100	10	2.1	21.9	0.0	
37	9th of May	1,900	10	5.1	3.5	6.3	450
38	Mozhaiskii	1,070	10	0.0	10.1	0.0	3,391
39	Potanina	950	10	2.7	22.5	7.3	307
40	Road between microdistrict #9 and Alpharabi	3,000	10	0.0	0.0	0.0	
41	Sembinova	1,670	10	2.0	17.9	3.8	869
42	Zatayevicha	1,500	10	4.0	10.0	0.0	
43	Zhumabayeva	910	10	0.0	59.0	18.5	362

Table 3.4.1 Estimated District-wise Area--Residential Area--Population--Density in 2000

Planning Region	Sub-Zoning	Low Density			Medium Density			High Density			Total						
		Net Residential Area (ha)	Population	Gross Housing Stock (m2)	Net Residential Area (ha)	Population	Gross Housing Stock (m2)	Net Residential Area (ha)	Population	Gross Housing Stock (m2)	Total Area(ha)	Total Net Residential Area(ha)	Subtotal Population Existing (and development of existing urban fabric)	Subtotal Population New Developed Areas	Total Population	Gross Housing Stock (m2)	Avarage Net Population Density (p/ha)
1. Central Planning Region	Residential District 3	95	4,317	65,618	204	41,983	638,142	0	0	0	385	300	46,300	0	46,300	703,760	154
	Residential District 4	97	6,133	93,222	202	42,891	651,943	26	7,776	118,195	563	325	56,800	0	56,800	863,360	175
	Residential District 5	142	9,008	136,922	126	25,292	384,438	0	0	0	357	268	34,300	0	34,300	521,360	128
	Residential District 6	94	5,272	80,134	175	32,828	498,986	0	0	0	384	269	38,100	0	38,100	579,120	142
	Sub-total	*429*	*24,730*	*375,896*	*707*	*142,994*	*2,173,509*	*26*	*7,776*	*118,195*	*1,689*	*1,162*	*175,500*	*0*	*175,500*	*2,667,600*	151
2. Northern Planning Region	Northern Industrial District	285	11,558	175,682	0	0	0	0	0	0	2,146	285	11,558	0	11,558	175,682	41
	Central Industrial District	30	1,342	20,398	0	0	0	0	0	0	2,313	30	1,342	0	1,342	20,398	44
	Settlement Zheleznodoezhny	118	3,410	51,832	0	0	0	0	0	0	176	118	3,410	0	3,410	51,832	29
	Sub-total	*434*	*16,310*	*247,912*	*0*	*0*	*0*	*0*	*0*	*0*	*4,635*	*434*	*16,310*	*0*	*16,310*	*247,912*	38
3. Southeastern Planning Region	Residential District 7	106	4,431	67,351	212	47,169	716,969	0	0	0	594	318	51,600	0	51,600	784,320	162
	Residential District 8	0	0	0	149	30,200	459,040	0	0	0	395	149	30,200	0	30,200	459,040	202
	Residential District 9	46	2,700	41,040	0	0	0	0	0	0	676	46	2,700	0	2,700	41,040	59
	Residential District 10	133	1,329	20,201	0	0	0	0	0	0	213	133	1,329	0	1,329	20,201	10
	Industrial District - Station 40	0	0	0	0	0	0	0	0	0	616	0	0	0	0	0	0
	Settlement Promyshlenny	60	2,512	38,182	0	0	0	0	0	0	114	60	2,512	0	2,512	38,182	42
	Settlement Internatsionalnoye	130	2,470	37,544	0	0	0	0	0	0	130	130	2,470	0	2,470	37,544	19
	Settlement Michurino	56	1,107	16,826	0	0	0	0	0	0	56	56	1,107	0	1,107	16,826	20
	Settlement Kuygenzhar	54	318	4,834	0	0	0	0	0	0	54	54	318	0	318	4,834	6
	Sub-total	*585*	*14,867*	*225,978*	*362*	*77,369*	*1,176,009*	*0*	*0*	*0*	*2,848*	*946*	*92,236*	*0*	*92,236*	*1,401,987*	97
4. Southern Planning Region	Residential District 11	28	1,600	24,320	0	0	0	0	0	0	1,100	28	1,600	0	1,600	24,320	57
	Residential District 12 (incl. Airport zone)	147	12,700	193,040	0	0	0	0	0	0	5,237	147	12,700	0	12,700	193,040	86
	Settlement Prigorodnoye	97	1,286	19,547	0	0	0	0	0	0	118	97	1,286	0	1,286	19,547	13
	Settlement Telman	49	426	6,475	0	0	0	0	0	0	49	49	426	0	426	6,475	9
	Sub-total	*321*	*16,012*	*243,382*	*0*	*0*	*0*	*0*	*0*	*0*	*6,504*	*321*	*16,012*	*0*	*16,012*	*243,382*	50
5. Northwestern Planning Region	Residential District 1	98	3,960	60,192	3	540	8,208	0	0	0	332	100	4,500	0	4,500	68,400	45
	Residential District 2	239	13,529	205,641	42	8,971	136,359	0	0	0	441	281	22,500	0	22,500	342,000	80
	Settlement Kirovo	105	3,620	55,024	0	0	0	0	0	0	231	105	3,620	0	3,620	55,024	34
	West Industrial District	6	70	1,064	0	0	0	0	0	0	561	6	70	0	70	1,064	12
	Sub-total	*448*	*21,179*	*321,921*	*45*	*9,511*	*144,567*	*0*	*0*	*0*	*1,565*	*493*	*30,690*	*0*	*30,690*	*466,488*	62
Grand Total		**2,216**	**93,098**	**1,415,090**	**1,114**	**229,874**	**3,494,085**	**26**	**7,776**	**118,195**	**17,241**	**3,355**	**330,748**	**0**	**330,748**	**5,027,370**	99

Note the planning regions follow Ak Orda original boundaries - but are expanded to extend to new city boundaries, as well as the sub-zoning divisions are a continuation of the original Ak Orda sub-divisions - but are amended to

Table 3.4.2 Projected District-wise Area--Residential Area--Population--Density in 2010

Planning Region	Sub-Zoning	Low Density		Medium Density		High Density		Total					
		Net Residential Area (ha)	Population	Net Residential Area (ha)	Population	Net Residential Area (ha)	Population	Total Area(ha)	Total Net Residential Area(ha)	Subtotal Population Existing (and development of existing urban fabric)	Subtotal Population New Developed Areas	Total Population	Avarage Net Population Density (p/ha)
1. Central Planning Region	Residential District 3	95	4,317	204	41,983	0	0	385	300	46,300	0	46,300	154
	Residential District 4A	49	2,339	250	53,085	26	7,776	563	325	63,200	0	63,200	194
	Residential District 5	107	6,808	161	32,191	0	0	357	268	39,000	0	39,000	146
	Residential District 6	71	3,959	198	38,340	0	0	384	269	42,300	0	42,300	157
	Sub-Total	323	17,423	813	165,599	26	7,776	1,689	1,162	190,800	0	190,800	164
2. Northern Planning Region	Northern Industrial District	184	5,624	0	0	0	0	2,146	184	5,624	0	5,624	31
	Central Industrial District	118	3,410	0	0	0	0	3,353	118	3,410	0	3,410	29
	Planning District I	0	0	0	0	0	0	6,302	0	0	0	0	0
	Planning District II	0	0	0	0	0	0	3,710	0	0	0	0	0
	Planning District III	0	0	0	0	0	0	2,927	0	0	0	0	0
	Planning District IV	0	0	0	0	0	0	4,176	0	0	0	0	0
	Sub-Total	302	9,034	0	0	0	0	22,614	302	9,034	0	9,034	30
3. Southeastern Planning Region	Residential District 7	8	79	212	44,526	98	34,286	562	318	55,600	23,291	78,891	248
	Residential District 8	0	0	149	30,800	0	0	395	149	30,800	0	30,800	207
	Residential District 9	215	12,887	118	16,287	0	0	552	333	2,700	26,474	29,174	88
	Residential District 10	133	5,800	0	0	0	0	213	133	5,800	0	5,800	44
	Industrial District - Station 40	60	2,512	76	7,550	0	0	752	136	2,512	7,550	10,062	74
	Residential District 17	44	2,620	199	24,669	106	31,842	715	349	0	59,131	59,131	169
	Residential District 18	0	0	0	0	0	0	902	0	0	0	0	0
	Residential District 19	0	0	0	0	0	0	783	0	0	0	0	0
	Planning District V	240	3,895	0	0	0	0	6,396	240	3,895	0	3,895	16
	Sub-Total	700	27,793	755	123,832	204	66,128	11,270	1,658	101,307	116,446	217,753	131
4. Southern Planning Region	Residential District 11	120	3,940	0	0	0	0	1,251	120	1,600	2,340	3,940	33
	Residential District 12	342	16,315	0	0	0	0	668	342	10,200	6,115	16,315	48
	Residential District 13	199	8,825	0	0	0	0	942	199	0	8,825	8,825	44
	Residential District 14	70	3,121	3	365	23	6,267	1,425	96	270	9,483	9,753	101
	Residential District 15	0	0	0	0	0	0	820	0	0	0	0	0
	Residential District 16	49	426	0	0	0	0	933	49	426	0	426	9
	Planning District VI (New Airport Planning Unit)	0	0	0	0	0	0	1,885	0	0	0	0	0
	Planning District VII	85	2,500	0	0	0	0	3,789	85	2,500	0	2,500	29
	Planning District VIII	0	0	0	0	0	0	12,686	0	0	0	0	0
	Sub-Total	865	35,127	3	365	23	6,267	24,399	891	14,996	26,763	41,759	47
5. Northwest Planning Region	Residential District 1	97	3,960	3	540	0	0	332	100	4,500	0	4,500	45
	Residential District 2	239	13,529	42	8,971	0	0	441	281	22,500	0	22,500	80
	West Industrial District	12	70	0	0	0	0	575	12	70	0	70	6
	Residential District 4B	105	3,620	0	0	0	0	685	105	3,620	0	3,620	34
	Planning District IX	0	0	0	0	0	0	7,876	0	0	0	0	0
	Sub-Total	454	21,179	45	9,511	0	0	9,909	498	30,690	0	30,690	62
Grand Total		2,643	110,556	1,616	299,307	253	80,171	69,881	4,511	346,827	143,209	490,036	109

Table 3.4.3 Projected District-wise Area--Residential Area--Population--Density in 2020

Planning Region	Sub-Zoning	Low Density		Medium Density		High Density		Total					
		Net Residential Area (ha)	Population	Net Residential Area (ha)	Population	Net Residential Area (ha)	Population	Total Area(ha)	Total Net Residential Area(ha)	Subtotal Population Existing (and development of existing urban fabric)	Subtotal Population New Developed Areas	Total Population	Avarage Net Population Density (p/ha)
1. Central Planning Region	Residential District 3	63	3,673	237	48,627	0	0	385	300	52,300	0	52,300	174
	Residential District 4A	28	1,798	283	60,026	26	7,776	563	336	67,225	2,375	69,600	207
	Residential District 5	73	4,719	196	39,181	0	0	357	268	43,900	0	43,900	164
	Residential District 6	42	2,741	227	43,859	0	0	384	269	46,600	0	46,600	173
	Sub-Total	205	12,931	942	191,693	26	7,776	1,689	1,173	210,025	2,375	212,400	181
2. Northern Planning Region	Northern Industrial District	184	5,624	0	0	0	0	2,146	184	5,624	0	5,624	31
	Central Industrial District	118	3,410	0	0	0	0	3,353	118	3,410	0	3,410	29
	Planning District I	0	0	0	0	0	0	6,302	0	0	0	0	0
	Planning District II	0	0	0	0	0	0	3,710	0	0	0	0	0
	Planning District III	0	0	0	0	0	0	2,927	0	0	0	0	0
	Planning District IV	0	0	0	0	0	0	4,176	0	0	0	0	0
	Sub-Total	302	9,034	0	0	0	0	22,614	302	9,034	0	9,034	30
3. Southeastern Planning Region	Residential District 7	8	79	212	47,526	98	34,286	562	318	58,600	24,210	81,891	257
	Residential District 8	0	0	149	30,800	0	0	395	149	30,800	0	30,800	206
	Residential District 9	215	12,887	118	16,287	0	0	552	333	2,700	22,434	29,174	88
	Residential District 10	148	11,000	0	0	0	0	213	148	11,000	0	11,000	74
	Industrial District - Station 40	136	10,062	0	0	0	0	752	136	2,512	7,550	10,062	74
	Residential District 17	44	2,620	239	29,647	123	37,005	715	406	0	69,272	69,272	171
	Residential District 18	305	18,294	75	10,097	0	0	902	380	0	28,391	28,391	0
	Residential District 19	121	6,037	99	11,881	0	0	783	220	0	0	17,918	0
	Planning District V	240	3,895	0	0	0	0	6,396	240	3,895	0	3,895	16
	Sub-Total	1,216	64,874	893	146,238	221	71,291	11,270	2,331	109,507	151,857	282,403	121
4. Southern Planning Region	Residential District 11	120	7,080	0	0	0	0	1,251	120	1,600	5,480	7,080	59
	Residential District 12	342	16,315	0	0	0	0	668	342	10,200	6,115	16,315	48
	Residential District 13	199	8,825	0	0	0	0	942	199	0	8,825	8,825	44
	Residential District 14	113	5,257	11	1,476	73	20,025	1,425	197	270	26,488	26,758	136
	Residential District 15	250	15,470	0	0	0	0	820	250	0	15,470	15,470	0
	Residential District 16	78	4,681	117	15,767	0	0	933	195	0	20,448	20,448	105
	Planning District VI (New Airport Planning Unit)	0	0	0	0	0	0	1,885	0	0	0	0	0
	Planning District VII	85	2,500	0	0	0	0	3,789	85	2,500	0	2,500	29
	Planning District VIII	0	0	0	0	0	0	12,686	0	0	0	0	0
	Sub-Total	1,187	60,128	128	17,243	73	20,025	24,399	1,388	14,570	82,826	97,396	70
5. Northwest Planning Region	Residential District 1	86	4,632	22	4,368	0	0	332	108	9,000	0	9,000	84
	Residential District 2	183	10,137	99	21,063	0	0	441	281	31,200	0	31,200	111
	West Industrial District	12	70	0	0	0	0	575	12	70	0	70	6
	Residential District 4B	214	12,817	156	19,800	52	13,312	685	422	3,620	42,309	45,929	109
	Planning District IX	0	0	0	0	0	0	7,876	0	0	0	0	0
	Sub-Total	494	27,656	276	45,231	52	13,312	9,909	822	43,890	42,309	86,199	105
Grand Total		3,405	174,623	2,238	400,405	372	112,404	69,881	6,015	387,026	279,367	687,432	114

Table3.4.4 Projected District-wise Area--Residential Area--Population--Density in 2030

Planning Region	Sub-Zoning	Low Density		Medium Density		High Density		Total					
		Net Residential Area (ha)	Population	Net Residential Area (ha)	Population	Net Residential Area (ha)	Population	Total Area(ha)	Total Net Residential Area(ha)	Subtotal Population Existing (and development of existing urban fabric)	Subtotal Population New Developed Areas	Total Population	Avarage Net Population Density (p/ha)
1. Central Planning Region	Residential District 3	23	1,514	277	56,786	0	0	385	300	58,300	0	58,300	194
	Residential District 4A	28	1,798	283	60,026	26	7,776	563	336	67,225	2,375	69,600	207
	Residential District 5	73	4,718	196	39	0	0	357	268	43,900	0	43,900	164
	Residential District 6	42	2,741	227	43,859	0	0	384	269	46,600	0	46,600	173
	Sub-Total	166	10,771	981	160,710	26	7,776	1,689	1,173	216,025	2,375	218,400	186
2. Northern Planning Region	Northern Industrial District	184	5,624	0	0	0	0	2,146	184	5,624	0	5,624	31
	Central Industrial District	118	3,410	0	0	0	0	3,353	118	3,410	0	3,410	29
	Planning District I	0	0	0	0	0	0	6,302	0	0	0	0	0
	Planning District II	0	0	0	0	0	0	3,710	0	0	0	0	0
	Planning District III	0	0	0	0	0	0	2,927	0	0	0	0	0
	Planning District IV	0	0	0	0	0	0	4,176	0	0	0	0	0
	Sub-Total	302	9,034	0	0	0	0	22,614	302	9,034	0	9,034	30
3. Southeastern Planning Region	Residential District 7	8	79	212	47,526	98	34,286	562	318	58,600	23,291	81,891	258
	Residential District 8	0	0	149	30,800	0	0	395	149	30,800	0	30,800	207
	Residential District 9	215	12,887	118	16,287	0	0	552	333	2,700	26,474	29,174	88
	Residential District 10	148	11,000	0	0	0	0	213	148	11,000	0	11,000	74
	Industrial District - Station 40	136	10,062	0	0	0	0	752	136	2,512	7,550	10,062	74
	Residential District 17	44	2,620	239	29,647	123	37,005	715	406	0	69,272	69,272	171
	Residential District 18	305	18,294	75	10,097	0	0	902	380	0	23,286	28,391	0
	Residential District 19	121	6,037	99	11,881	0	0	783	220	0	17,918	17,918	0
	Planning District V	240	3,895	0	0	0	0	6,396	240	3,895	0	3,895	16
	Sub-Total	1,216	64,874	893	146,238	221	71,291	11,270	2,329	109,507	167,791	282,403	121
4. Southern Planning Region	Residential District 11	309	18,422	106	13,747	76	21,987	1,251	490	1,600	52,556	54,156	111
	Residential District 12	342	16,315	0	0	0	0	668	342	10,200	6,115	16,315	48
	Residential District 13	199	8,825	0	0	0	0	942	199	0	8,825	8,825	44
	Residential District 14	155	7,381	27	3,618	127	34,822	1,425	309	270	45,551	45,821	148
	Residential District 15	291	18,006	0	0	0	0	820	291	0	18,006	18,006	0
	Residential District 16	185	11,083	219	30,082	0	0	933	404	0	41,165	41,165	102
	Planning District VI (New Airport Planning Unit)	0	0	0	0	0	0	1,885	0	0	0	0	0
	Planning District VII	85	2,500	0	0	0	0	3,789	85	2,500	0	2,500	29
	Planning District VIII	0	0	0	0	0	0	12,686	0	0	0	0	0
	Sub-Total	1,566	82,532	351	47,447	203	56,809	24,399	2,120	14,570	172,218	186,788	88
5. Northwest Planning Region	Residential District 1	96	6,211	32	7,289	0	0	332	128	13,500	0	13,500	105
	Residential District 2	125	6,379	157	33,521	0	0	441	281	39,900	0	39,900	142
	West Industrial District	12	70	0	0	0		575	12	70	0	70	6
	Residential District 4B	214	12,817	156	19,800	52	13,312	685	422	3,620	42,309	45,929	109
	Planning District IX	0	0	0	0	0	0	7,876	0	0	0	0	0
	Sub-Total	445	25,477	345	60,610	52	13,312	9,909	843	57,090	42,309	99,399	118
Grand Total		3,695	192,688	2,571	415,005	502	149,188	69,881	6,767	406,226	384,693	796,024	118

Table 3.4.5 (1/3) Projected District-wise Housing Floor Areas in 2010

Planning Region	Sub-Zoning		Population			Housing Stock (m2)				
			Beginning of Jan/2000	Total by the end of 2010	Population under redevelopment	Beginning of Jan/2000	2000 - 2010 Retirement	2000 - 2010 Residual	2000 - 2010 New Construction	Total by the end of 2010
1. Central Planning Region	Residential District 3									
		1-2Storeys	4,317	4,317	0	65,618	0	65,618	0	65,618
		Between 3 and 9 storeys	41,983	41,983	0	638,142	0	638,142	0	638,142
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 4									
		1-2Storeys	6,133	2,339	3,794	93,222	57,669	35,553	0	35,553
		Between 3 and 9 storeys	42,891	53,085	0	651,943	0	651,943	183,492	835,435
		More than 9 Storeys	7,776	7,776	0	118,195	0	118,195	0	118,195
	Residential District 5									
		1-2Storeys	9,008	6,808	2,200	136,922	33,440	103,482	0	103,482
		Between 3 and 9 storeys	25,292	32,191	0	384,438	0	384,438	124,182	508,620
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 6									
		1-2Storeys	5,272	3,959	1,313	80,134	19,958	60,177	0	60,177
		Between 3 and 9 storeys	32,828	38,340	0	498,986	0	498,986	99,216	598,202
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*24,730*	*17,423*	*7,307*	*375,896*	*111,066*	*264,830*	*0*	*264,830*
		Between 3 and 9 storeys	*142,994*	*165,599*	*0*	*2,173,509*	*0*	*2,173,509*	*406,890*	*2,580,399*
		More than 9 Storeys	*7,776*	*7,776*	*0*	*118,195*	*0*	*118,195*	*0*	*118,195*
		Total - all types	*175,500*	*190,798*	*7,307*	*2,667,600*	*111,066*	*2,556,534*	*406,890*	*2,963,424*
2. Northern Planning Region	Northern Industrial District									
		1-2Storeys	11,558	5,624	5,934	175,682	90,197	85,485	0	85,485
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Central Industrial District (inc.Settlement Zheleznodorzhny)									
		1-2Storeys	4,752	3,410	1,342	72,230	20,398	51,832	0	51,832
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District I									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District II									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District III									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District IV									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*16,310*	*9,034*	*7,276*	*247,912*	*110,595*	*137,317*	*0*	*137,317*
		Between 3 and 9 storeys	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		More than 9 Storeys	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Total - all types	*16,310*	*9,034*	*7,276*	*247,912*	*110,595*	*137,317*	*0*	*137,317*

Table 3.4.5 (2/3) Projected District-wise Housing Floor Areas 2010

	Sub-Zoning		Population			Housing Stock (m2)				
			Beginning of Jan/2000	Total by the end of 2010	Population under redevelopment	Beginning of Jan/2000	2000 - 2010 Retirement	2000 - 2010 Residual	2000 - 2010 New Construction	Total by the end of 2010
3. Southeastern Planning Region	Residential District 7	1-2Storeys	4,431	79	4,352	67,351	66,150	1,201	0	1,201
		Between 3 and 9 storeys	47,169	44,526	2,643	716,959	40,164	676,795	0	676,795
		More than 9 Storeys	0	34,286	0	0	0	0	617,148	617,148
	Residential District 8	1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	30,200	30,800	0	459,040	0	459,040	10,800	469,840
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 9	1-2Storeys	2,700	12,887	0	41,040	0	41,040	183,366	224,406
		Between 3 and 9 storeys	0	16,287	0	0	0	0	293,166	293,166
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 10	1-2Storeys	1,329	5,800	0	20,201	0	20,201	80,478	100,679
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Industrial District - Station 40 (inc. Settlement Promyshlenny)	1-2Storeys	2,512	2,512	0	38,182	0	38,182	0	38,182
		Between 3 and 9 storeys	0	7,550	0	0	0	0	135,900	135,900
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 17	1-2Storeys	0	2,620	0	0	0	0	47,160	47,160
		Between 3 and 9 storeys	0	24,669	0	0	0	0	444,042	444,042
		More than 9 Storeys	0	31,842	0	0	0	0	573,156	573,156
	Residential District 18	1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 19	1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District V (inc. Settlement Internasionalnye & Michurino & Kuvegzhar)	1-2Storeys	3,895	3,895	0	59,204	0	59,204	0	59,204
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total	*1-2Storeys*	*14,867*	*27,793*	*4,352*	*225,978*	*66,150*	*159,828*	*311,004*	*470,832*
		Between 3 and 9 storeys	*77,369*	*123,832*	*2,643*	*1,176,009*	*40,174*	*1,135,835*	*883,908*	*2,019,743*
		More than 9 Storeys	*0*	*66,128*	*0*	*0*	*0*	*0*	*1,190,304*	*1,190,304*
		Total - all types	*92,236*	*217,753*	*6,995*	*1,401,987*	*106,324*	*1,295,663*	*2,385,216*	*3,680,879*
4. Southern Planning Region	Residential District 11	1-2Storeys	1,600	3,940	0	24,320	0	24,320	42,120	66,440
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 12 (incl. Airport zone)	1-2Storeys	12,700	16,315	0	193,040	0	193,040	65,070	258,110
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 13	1-2Storeys	0	8,825	0	0	0	0	158,850	158,850
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 14 (inc. Settlement Priengordonye)	1-2Storeys	1,286	3,121	0	19,547	0	19,547	33,030	52,577
		Between 3 and 9 storeys	0	365	0	0	0	0	6,570	6,570
		More than 9 Storeys	0	6,267	0	0	0	0	112,806	112,806
	Residential District 15 (inc. Settlement Telman)	1-2Storeys	426	0	426	6,475	6,475	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 16	1-2Storeys	0	426	0	0	0	0	7,668	7,668
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VI	1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VII	1-2Storeys	0	2,500	0	0	0	0	45,000	45,000
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VIII	1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total	*1-2Storeys*	*16,012*	*35,127*	*426*	*243,382*	*6,475*	*236,907*	*331,738*	*588,645*
		Between 3 and 9 storeys	*0*	*365*	*0*	*0*	*0*	*0*	*6,570*	*6,570*
		More than 9 Storeys	*0*	*6,267*	*0*	*0*	*0*	*0*	*112,806*	*112,806*
		Total - all types	*16,012*	*41,759*	*426*	*243,382*	*6,475*	*236,907*	*471,114*	*708,021*

Table 3.4.5 (3/3) Projected District-wise Housing Floor Areas 2010

Planning Region	Sub-Zoning		Population			Housing Stock (m2)				
			Beginning of Jan/2000	Total by the end of 2010	Population under redevelopment	Beginning of Jan/2000	2000 - 2010 Retirement	2000 - 2010 Residual	2000 - 2010 New Construction	Total by the end of 2010
5. Northwestern Planning Region	Residential District 1									
		1-2Storeys	3,960	3,960	0	60,192	0	60,192	0	60,192
		Between 3 and 9 storeys	540	540	0	8,208	0	8,208	0	8,208
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 2									
		1-2Storeys	13,529	13,529	0	205,641	0	205,641	0	205,641
		Between 3 and 9 storeys	8,970	8,971	0	136,344	0	136,344	18	136,362
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 4B (Jar. Settlement Kiraya)									
		1-2Storeys	3,620	70	3,550	55,024	53,960	1,064	0	1,064
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	West Industrial District									
		1-2Storeys	70	3,620	0	1,064	0	1,064	63,900	64,964
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VI									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*21,179*	*21,179*	*3,550*	*321,921*	*53,960*	*267,961*	*63,900*	*331,861*
		Between 3 and 9 storeys	*9,510*	*9,511*	*0*	*144,552*	*0*	*144,552*	*18*	*144,570*
		More than 9 Storeys	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Total - all types	*30,689*	*30,690*	*3,550*	*466,473*	*53,960*	*412,513*	*63,918*	*476,431*
Grand Total										
		1-2Storeys	*93,098*	*110,556*	*22,911*	*1,415,090*	*348,247*	*1,066,842*	*726,642*	*1,793,484*
		Between 3 and 9 storeys	*229,873*	*299,307*	*2,643*	*3,494,070*	*40,174*	*3,453,896*	*1,297,386*	*4,751,282*
		More than 9 Storeys	*7,776*	*80,171*	*0*	*118,195*	*0*	*118,195*	*1,303,110*	*1,421,305*
		Total - all types	*330,747*	*490,034*	*25,554*	*5,027,354*	*388,421*	*4,638,934*	*3,327,138*	*7,966,072*

Table 3.4.6 (1/3) Projected District-wise Housing Floor Areas in 2020

Planning Region	Sub-Zoning		Population			Housing Stock (m2)				
			Beginning of Jan/2010	Total by the end of 2020	Population under redevelopment	Beginning of Jan/2010	2010 - 2020 Retirement	2010 - 2020 Residual	2010 - 2020 New Construction	Total by the end of 2020
1. Central Planning Region	Residential District 3									
		1-2Storeys	4,317	3,673	644	65,618	11,592	54,026	0	54,026
		Between 3 and 9 storeys	41,983	48,627	0	638,142	0	638,142	146,168	784,310
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 4A									
		1-2Storeys	2,339	1,798	541	35,553	9,738	25,815	0	25,815
		Between 3 and 9 storeys	53,085	60,026	0	835,435	0	835,435	152,702	988,137
		More than 9 Storeys	7,776	7,776	0	118,195	0	118,195	0	118,195
	Residential District 5									
		1-2Storeys	6,808	4,719	2,089	103,482	37,602	65,880	0	65,880
		Between 3 and 9 storeys	32,191	39,181	0	508,620	0	508,620	153,780	662,400
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 6									
		1-2Storeys	3,959	2,741	1,218	60,177	21,924	38,253	0	38,253
		Between 3 and 9 storeys	38,340	43,859	0	598,202	0	598,202	121,418	719,620
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*17,423*	*12,931*	*4,492*	*264,830*	*80,856*	*183,974*	*0*	*183,974*
		Between 3 and 9 storeys	*165,599*	*191,693*	*0*	*2,580,399*	*0*	*2,580,399*	*574,068*	*3,154,467*
		More than 9 Storeys	*7,776*	*7,776*	*0*	*118,195*	*0*	*118,195*	*0*	*118,195*
		Total - all types	*190,798*	*212,400*	*4,492*	*2,963,424*	*80,856*	*2,882,568*	*574,068*	*3,456,636*
2. Northern Planning Region	Northern Industrial District									
		1-2Storeys	5,624	5,624	0	85,485	0	85,485	0	85,485
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Central Industrial District (inc.Settlement Zheleznodnezhny)									
		1-2Storeys	3,410	3,410	0	51,832	0	51,832	0	51,832
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District I									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District II									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District III									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District IV									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*9,034*	*9,034*	*0*	*137,317*	*0*	*137,317*	*0*	*137,317*
		Between 3 and 9 storeys	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		More than 9 Storeys	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Total - all types	*9,034*	*9,034*	*0*	*137,317*	*0*	*137,317*	*0*	*137,317*

Table 3.4.6 (2/3) Projected District-wise Housing Floor Areas in 2020

Planning Region	Sub-Zoning		Population			Housing Stock (m2)				
			Beginning of Jan/2010	Total by the end of 2020	Population under redevelopment	Beginning of Jan/2010	2010 - 2020 Retirement	2010 - 2020 Residual	2010 - 2020 New Construction	Total by the end of 2020
3. Southeastern Planning Region	Residential District 7									
		1-2Storeys	79	79	0	1,201	0	1,201	0	1,201
		Between 3 and 9 storeys	44,526	47,526	0	676,795	0	676,795	66,000	742,795
		More than 9 Storeys	34,286	34,286	0	617,148	0	617,148	0	617,148
	Residential District 8									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	30,800	30,800	0	469,840	0	469,840	0	469,840
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 9									
		1-2Storeys	12,887	12,887	0	224,406	0	224,406	0	224,406
		Between 3 and 9 storeys	16,287	16,287	0	293,166	0	293,166	0	293,166
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 10									
		1-2Storeys	5,800	11,000	0	100,679	0	100,679	114,400	215,079
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Industrial District - Station 40 (inc. Settlement Promyshlenny)									
		1-2Storeys	2,512	10,062	0	38,182	0	38,182	166,100	204,282
		Between 3 and 9 storeys	7,550	0	7,550	135,900	135,900	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 17									
		1-2Storeys	2,620	2,620	0	47,160	0	47,160	0	47,160
		Between 3 and 9 storeys	24,669	29,647	0	444,042	0	444,042	109,516	553,558
		More than 9 Storeys	31,842	37,005	0	573,156	0	573,156	113,586	686,742
	Residential District 18									
		1-2Storeys	0	18,294	0	0	0	0	402,468	402,468
		Between 3 and 9 storeys	0	10,097	0	0	0	0	222,134	222,134
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 19									
		1-2Storeys	0	6,037	0	0	0	0	132,814	132,814
		Between 3 and 9 storeys	0	11,881	0	0	0	0	261,382	261,382
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District V (inc.Settlement Internasionalnoye & Michurino & Kuyeenhar)									
		1-2Storeys	3,895	3,895	0	59,204	0	59,204	0	59,204
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*27,793*	*64,874*	*0*	*470,832*	*0*	*470,832*	*815,782*	*1,286,614*
		Between 3 and 9 storeys	*123,832*	*146,238*	*7,550*	*2,019,743*	*135,900*	*1,883,843*	*659,032*	*2,542,875*
		More than 9 Storeys	*66,128*	*71,291*	*0*	*1,190,304*	*0*	*1,190,304*	*113,586*	*1,303,890*
		Total - all types	*217,753*	*282,403*	*7,550*	*3,680,879*	*135,900*	*3,544,979*	*1,588,400*	*5,133,379*
4. Southern Planning Region	Residential District 11									
		1-2Storeys	3,940	7,080	0	66,440	0	66,440	69,080	135,520
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 12 (incl. Airport zone)									
		1-2Storeys	16,315	16,315	0	258,110	0	258,110	0	258,110
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 13									
		1-2Storeys	8,825	8,825	0	158,850	0	158,850	0	158,850
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 14 (inc. Settlement Prignoginoye)									
		1-2Storeys	3,121	5,257	0	52,577	0	52,577	46,992	99,569
		Between 3 and 9 storeys	365	1,476	0	6,570	0	6,570	24,442	31,012
		More than 9 Storeys	6,267	20,025	0	112,806	0	112,806	302,676	415,482
	Residential District 15 (inc. Settlement Telman)									
		1-2Storeys	0	15,470	0	0	0	0	340,340	340,340
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 16									
		1-2Storeys	426	4,681	0	7,668	0	7,668	93,610	101,278
		Between 3 and 9 storeys	0	15,767	0	0	0	0	346,874	346,874
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VI									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VII									
		1-2Storeys	2,500	2,500	0	45,000	0	45,000	0	45,000
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VIII									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*35,727*	*60,128*	*0*	*588,645*	*0*	*588,645*	*550,022*	*1,138,667*
		Between 3 and 9 storeys	*365*	*17,243*	*0*	*6,570*	*0*	*6,570*	*371,316*	*377,886*
		More than 9 Storeys	*6,267*	*20,025*	*0*	*112,806*	*0*	*112,806*	*302,676*	*415,482*
		Total - all types	*41,759*	*97,396*	*0*	*708,021*	*0*	*708,021*	*1,224,014*	*1,932,035*

Table 3.4.6 (3/3) Projected District-wise Housing Floor Areas 2020

Planning Region	Sub-Zoning		Population			Housing Stock (m2)				
			Beginning of Jan/2010	Total by the end of 2020	Population under redevelopment	Beginning of Jan/2010	2010 - 2020			Total by the end of 220
							Retirement	Residual	New Construction	
5. Northwestern Planning Region	Residential District 1									
		1-2Storeys	3,960	4,632	0	60,192	0	60,192	14,784	74,976
		Between 3 and 9 storeys	540	4,368	0	8,208	0	8,208	84,216	92,424
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 2									
		1-2Storeys	13,529	10,137	3,392	205,641	61,056	144,585	0	144,585
		Between 3 and 9 storeys	8,971	21,063	0	136,362	0	136,362	266,024	402,386
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 4B (inc. Settlement Kiroyo)									
		1-2Storeys	70	70	0	1,064	0	1,064	0	1,064
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	West Industrial District									
		1-2Storeys	3,620	12,817	0	64,964	0	64,964	202,334	267,298
		Between 3 and 9 storeys	0	19,800	0	0	0	0	435,600	435,600
		More than 9 Storeys	0	13,312	0	0	0	0	292,864	292,864
	Planning District IX									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*21,179*	*27,656*	*3,392*	*331,861*	*61,056*	*270,805*	*217,118*	*487,923*
		Between 3 and 9 storeys	*9,511*	*45,231*	*0*	*144,570*	*0*	*144,570*	*785,840*	*930,410*
		More than 9 Storeys	*0*	*13,312*	*0*	*0*	*0*	*0*	*292,864*	*292,864*
		Total - all types	*30,690*	*86,199*	*3,392*	*476,431*	*61,056*	*415,375*	*1,295,822*	*1,711,197*
Grand Total	*Sub Total*									
		1-2Storeys	*110,556*	*173,623*	*7,884*	*1,793,484*	*141,912*	*1,651,572*	*1,582,922*	*3,234,494*
		Between 3 and 9 storeys	*289,796*	*355,174*	*7,550*	*4,606,772*	*135,900*	*4,470,872*	*1,604,356*	*6,075,228*
		More than 9 Storeys	*80,171*	*112,404*	*0*	*1,421,305*	*0*	*1,421,305*	*709,126*	*2,130,431*
		Total - all types	***490,034***	***687,432***	***15,434***	***7,966,072***	***277,812***	***7,688,260***	***4,682,304***	***12,370,564***

Table 3.4.7 (1/3) Projected District-wise Housing Floor Areas in 2030

Planning Region	Sub-Zoning		Population			Housing Stock (m2)				
			Beginning of Jan/2020	Total by the end of 2030	Population under redevelopment	Beginning of Jan/2030	2020 - 2030 Retirement	2020 - 2030 Residual	2020 - 2030 New Construction	Total by the end of 2030
1. Central Planning Region	Residential District 3									
		1-2Storeys	3,673	1,514	2,159	54,026	47,498	6,528	0	6,528
		Between 3 and 9 storeys	48,627	56,786	0	784,310	0	784,310	203,975	988,285
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 4A+B143									
		1-2Storeys	1,798	1,798	0	25,815	0	25,815	0	25,815
		Between 3 and 9 storeys	60,026	60,026	0	988,137	0	988,137	0	988,137
		More than 9 Storeys	7,776	7,776	0	118,195	0	118,195	0	118,195
	Residential District 5									
		1-2Storeys	4,719	4,718	1	65,880	22	65,858	0	65,858
		Between 3 and 9 storeys	39,181	39,181	0	662,400	0	662,400	0	662,400
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 6									
		1-2Storeys	2,741	2,741	0	38,253	0	38,253	0	38,253
		Between 3 and 9 storeys	43,859	43,859	0	719,620	0	719,620	0	719,620
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*12,931*	*10,771*	*2,160*	*183,974*	*47,520*	*136,454*	*0*	*136,454*
		Between 3 and 9 storeys	*191,693*	*199,852*	*0*	*3,154,467*	*0*	*3,154,467*	*203,975*	*3,358,442*
		More than 9 Storeys	*7,776*	*7,776*	*0*	*118,195*	*0*	*118,195*	*0*	*118,195*
		Total - all types	*212,400*	*218,399*	*2,160*	*3,456,636*	*47,520*	*3,409,116*	*203,975*	*3,613,091*
2. Northern Planning Region	Northern Industrial District									
		1-2Storeys	5,624	5,624	0	85,485	0	85,485	0	85,485
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Central Industrial District (inc.Settlement Zheleznodorzhny)									
		1-2Storeys	3,410	3,410	0	51,832	0	51,832	0	51,832
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District I									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District II									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District III									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District IV									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*9,034*	*9,034*	*0*	*137,317*	*0*	*137,317*	*0*	*137,317*
		Between 3 and 9 storeys	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		More than 9 Storeys	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Total - all types	*9,034*	*9,034*	*0*	*137,317*	*0*	*137,317*	*0*	*137,317*

Table 3.4.7 (2/3) Projected District-wise Housing Floor Areas in 2030

Planning Region	Sub-Zoning	Population			Housing Stock (m2)				
		Beginning of Jan/2020	Total by the end of 2030	Population under redevelopment	Beginning of Jan/2030	2020 - 2030 Retirement	2020 - 2030 Residual	2020 - 2030 New Construction	Total by the end of 2030
3. Southeastern Planning Region	Residential District 7								
	1-2Storeys	79	79	0	1,201	0	1,201	0	1,201
	Between 3 and 9 storeys	47,526	47,526	0	742,795	0	742,795	0	742,795
	More than 9 Storeys	34,286	34,286	0	617,148	0	617,148	0	617,148
	Residential District 8								
	1-2Storeys	0	0	0	0	0	0	0	0
	Between 3 and 9 storeys	30,800	30,800	0	469,840	0	469,840	0	469,840
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 9								
	1-2Storeys	12,887	12,887	0	224,406	0	224,406	0	224,406
	Between 3 and 9 storeys	16,287	16,287	0	293,166	0	293,166	0	293,166
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 10								
	1-2Storeys	11,000	11,000	0	215,079	0	215,079	0	215,079
	Between 3 and 9 storeys	0	0	0	0	0	0	0	0
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Industrial District - Station 40 (inc. Settlement Promyshlenny)								
	1-2Storeys	10,062	10,062	0	204,282	0	204,282	0	204,282
	Between 3 and 9 storeys	0	0	0	0	0	0	0	0
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 17								
	1-2Storeys	2,620	2,620	0	47,160	0	47,160	0	47,160
	Between 3 and 9 storeys	29,647	29,647	0	553,558	0	553,558	0	553,558
	More than 9 Storeys	37,005	37,005	0	686,742	0	686,742	0	686,742
	Residential District 18								
	1-2Storeys	18,294	18,294	0	402,468	0	402,468	0	402,468
	Between 3 and 9 storeys	10,097	10,097	0	222,134	0	222,134	0	222,134
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 19								
	1-2Storeys	6,037	6,037	0	132,814	0	132,814	0	132,814
	Between 3 and 9 storeys	11,881	11,881	0	261,382	0	261,382	0	261,382
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District V (inc Settlement Internasionalnoye & Michurino & Kuyseenzhar)								
	1-2Storeys	3,895	3,895	0	59,204	0	59,204	0	59,204
	Between 3 and 9 storeys	0	0	0	0	0	0	0	0
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total								
	1-2Storeys	*64,874*	*64,874*	*0*	*1,286,614*	*0*	*1,286,614*	*0*	*1,286,614*
	Between 3 and 9 storeys	*146,238*	*146,238*	*0*	*2,542,875*	*0*	*2,542,875*	*0*	*2,542,875*
	More than 9 Storeys	*71,291*	*71,291*	*0*	*1,303,890*	*0*	*1,303,890*	*0*	*1,303,890*
	Total - all types	*282,403*	*282,403*	*0*	*5,133,379*	*0*	*5,133,379*	*0*	*5,133,379*
4. Southern Planning Region	Residential District 11								
	1-2Storeys	7,080	18,422	0	135,520	0	135,520	283,550	419,070
	Between 3 and 9 storeys	0	13,747	0	0	0	0	343,675	343,675
	More than 9 Storeys	0	21,987	0	0	0	0	549,675	549,675
	Residential District 12 (incl. Airport zone)								
	1-2Storeys	16,315	16,315	0	258,110	0	258,110	0	258,110
	Between 3 and 9 storeys	0	0	0	0	0	0	0	0
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 13								
	1-2Storeys	8,825	8,825	0	158,850	0	158,850	0	158,850
	Between 3 and 9 storeys	0	0	0	0	0	0	0	0
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 14 (inc. Settlement Prigorodnoye)								
	1-2Storeys	5,257	7,381	0	99,569	0	99,569	53,100	152,669
	Between 3 and 9 storeys	1,476	3,618	0	31,012	0	31,012	53,550	84,562
	More than 9 Storeys	20,025	34,822	0	415,482	0	415,482	369,925	785,407
	Residential District 15 (inc. Settlement Telman)								
	1-2Storeys	15,470	18,006	0	340,340	0	340,340	63,400	403,740
	Between 3 and 9 storeys	0	0	0	0	0	0	0	0
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 16								
	1-2Storeys	4,681	11,083	0	101,278	0	101,278	160,050	261,328
	Between 3 and 9 storeys	15,767	30,082	0	346,874	0	346,874	357,875	704,749
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VI								
	1-2Storeys	0	0	0	0	0	0	0	0
	Between 3 and 9 storeys	0	0	0	0	0	0	0	0
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VII								
	1-2Storeys	2,500	2,500	0	45,000	0	45,000	0	45,000
	Between 3 and 9 storeys	0	0	0	0	0	0	0	0
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Planning District VIII								
	1-2Storeys	0	0	0	0	0	0	0	0
	Between 3 and 9 storeys	0	0	0	0	0	0	0	0
	More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total								
	1-2Storeys	*60,128*	*82,532*	*0*	*1,138,667*	*0*	*1,138,667*	*560,100*	*1,698,767*
	Between 3 and 9 storeys	*17,243*	*47,447*	*0*	*377,886*	*0*	*377,886*	*755,100*	*1,132,986*
	More than 9 Storeys	*20,025*	*56,809*	*0*	*415,482*	*0*	*415,482*	*919,600*	*1,335,082*
	Total - all types	*97,396*	*186,788*	*0*	*1,932,035*	*0*	*1,932,035*	*2,234,800*	*4,166,835*

Table 3.4.7 (3/3) Projected District-wise Housing Floor Areas 2030

Planning Region	Sub-Zoning		Population			Housing Stock (m2)				
			Beginning of Jan/2020	Total by the end of 2030	Population under redevelopment	Beginning of Jan/2020	2020 - 2030			Total by the end of 2030
							Retirement	Residual	New Construction	
5. Northwestern Planning Region	Residential District 1									
		1-2Storeys	4,632	6,211	0	74,976	0	74,976	39,475	114,451
		Between 3 and 9 storeys	4,632	7,289	0	92,424	0	92,424	66,425	158,849
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 2									
		1-2Storeys	10,137	6,379	3,758	144,585	82,676	61,909	0	61,909
		Between 3 and 9 storeys	21,063	33,521	0	402,386	0	402,386	311,450	713,836
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Residential District 4B (inc. Settlement Kiroyo)									
		1-2Storeys	70	70	0	1,064	0	1,064	0	1,064
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	West Industrial District									
		1-2Storeys	12,817	12,817	0	267,298	0	267,298	0	267,298
		Between 3 and 9 storeys	19,800	19,800	0	435,600	0	435,600	0	435,600
		More than 9 Storeys	13,312	13,312	0	292,864	0	292,864	0	292,864
	Planning District IX									
		1-2Storeys	0	0	0	0	0	0	0	0
		Between 3 and 9 storeys	0	0	0	0	0	0	0	0
		More than 9 Storeys	0	0	0	0	0	0	0	0
	Sub Total									
		1-2Storeys	*27,656*	*25,477*	*3,758*	*487,923*	*82,676*	*405,247*	*39,475*	*444,722*
		Between 3 and 9 storeys	*45,495*	*60,610*	*0*	*930,410*	*0*	*930,410*	*377,875*	*1,308,285*
		More than 9 Storeys	*13,312*	*13,312*	*0*	*292,864*	*0*	*292,864*	*0*	*292,864*
		Total - all types	*86,463*	*99,399*	*3,758*	*1,711,197*	*82,676*	*1,628,521*	*417,350*	*2,045,871*
Grand Total										
		1-2Storeys	*174,623*	*192,688*	*5,918*	*3,234,494*	*130,196*	*3,104,298*	*599,575*	*3,703,873*
		Between 3 and 9 storeys	*400,669*	*454,147*	*0*	*7,005,638*	*0*	*7,005,638*	*1,336,950*	*8,342,588*
		More than 9 Storeys	*104,628*	*141,412*	*0*	*2,012,236*	*0*	*2,012,236*	*919,600*	*2,931,836*
		Total - all types	*687,696*	*796,023*	*5,918*	*12,370,564*	*130,196*	*12,240,368*	*2,856,125*	*15,096,493*

Table 3.4.8 Estimated District-wise Area--Office Floor Area-Working Population in 2000

Planning District	Sub-Zoning	1	2	3	4	5	6	7	8	9	10	11	12	13	Working Population	Office (only) Gross Floor Area in m2
Central	Residential District 3	243	1,078	1,900	1,971	0	486	1,842	3,146	2,331	2,128	1,556	3,748	4,440	24,869	380,436
	Residential District 4	243	1,824	1,800	1,870	419	514	345	6,006	2,032	1,165	1,088	3,889	4,607	25,802	383,884
	Residential District 5	3,679	1,824	0	379	523	200	0	929	747	134	251	1,947	2,307	12,920	116,914
	Residential District 6	1,459	2,073	1,400	910	0	200	1,267	2,270	2,002	314	184	2,714	3,215	18,008	225,746
	Sub-Total	*5,624*	*6,799*	*5,100*	*5,130*	*942*	*1,400*	*3,454*	*12,351*	*7,112*	*3,741*	*3,079*	*12,298*	*14,569*	*81,599*	*1,106,980*
Northern Planning Region	Northern Industrial Zone	2,463	1,327	1,500	2,653	0	0	0	733	448	426	251	2,202	2,609	14,612	153,758
	Central Industrial Zone	4,013	2,902	2,000	1,390	105	0	2,303	331	359	179	678	3,204	3,793	21,257	223,832
	Settlement Zheleznodoezhny															
	Sub-Total	*6,476*	*4,229*	*3,500*	*4,043*	*105*	*0*	*2,303*	*1,064*	*807*	*605*	*929*	*5,406*	*6,402*	*35,869*	*377,590*
South- Eastern Planning Region	Residential District 7	486	249	0	758	105	0	806	268	418	739	100	883	1,046	5,859	82,942
	Residential District 8	0	0	0	0	174	0	0	143	986	1,210	0	565	669	3,747	59,057
	Residential District 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Residential District 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Industrial Zone Station 40								134	0	0	25	36	45	240	4,500
	Settlement Promysshlenny															
	Settlement Internatsionalnoye															
	Settlement Michurino															
	Settlement Kuygenzhar															
	Sub-Total	*486*	*249*	*0*	*758*	*279*	*0*	*806*	*545*	*1,404*	*1,949*	*125*	*1,484*	*1,760*	*9,846*	*146,500*
Southern Planning Region	Residential District 11	1,338	-	-	-	174	-	-	-	-	-	50	351	416	2,330	15,384
	Residential District 12	1,186	124	0	1,617	0	0	0	357	179	0	117	805	953	5,339	56,533
	Settlement Prigorodnoye															
	Settlement Telman															
	Sub-Total	*2,524*	*124*	*0*	*1,617*	*174*	*0*	*0*	*357*	*179*	*0*	*167*	*1,156*	*1,369*	*7,669*	*71,918*
North- Western Planning Region	Residential District 1	0	0	0	0	0	0	0	0	90	314	0	91	107	601	10,434
	Residential District 2	395	1,700	0	2,552	0	0	1,036	393	508	291	0	1,545	1,830	10,252	120,816
	Settlement Kirovo															
	Western Industrial Zone	243	290	0	0	0	0	0	0	0	0	0	120	142	795	4,310
Unknown		152	207	-	-	-	-	-	89	-	-	-	101	119	669	
	Sub-Total	790	2,198	-	2,552	-	-	1,036	483	598	605	-	1,856	2,199	12,317	135,560
Grand Total		15,901	13,599	8,600	14,100	1,500	1,400	7,599	14,800	10,100	6,900	4,301	22,200	26,300	147,300	1,838,548

(note this table lists office floor areas only -not industrial or other small business-, but gives total of working population-including industrial and other small business)

Legend : 1 = Industry, 2 = Construction, 3 = Trade & Repair, 4 = Transport & Communication, 5 = Hotel & Restaurant, 6 = Financial Activities, 7 = Real Estate, 8 = State Management, 9 = Education, 10 = Health Care & Social Services, 11 = Other Public & Communal Services, 12 = Self-Employed, 13 = Others

Table 3.4.9 Projected District-wise Area--Office Floor Area-Working Population in 2010

Planning District	Sub-Zoning	1	2	3	4	5	6	7	8	9	10	11	12	13	Working Population	Office (only) Gross Floor Area in m2
Central	Residential District 3			846	2,911	330	101	550	1,074	1,635	1,115	1,276	7,777	6,357	23,971	281,138
	Residential District 4			1,154	3,974	450	148	804	1,571	2,231	1,522	1,742	10,615	9,179	33,390	392,126
	Residential District 5			712						1,377	845	196	1,196	1,011	5,338	63,801
	Residential District 6			773						747	1,019	213	1,298	1,096	5,144	63,678
	Sub-Total	0	0	3,485	6,885	780	250	1,354	2,645	5,989	4,501	3,427	20,886	17,643	67,843	800,744
Northern Planning Region	Northern Industrial Zone	10,104	7,185	2,800	450					199	135	28	173	146	21,220	54,470
	Central Industrial Zone	15,728	10,352	5,000	430					120	82	17	105	88	31,923	79,876
	I (High Tech Industrial Park)	0								0	0	0	0	0	0	0
	II (High Tech Industrial Park)	0								0	0	0	0	0	0	0
	III (High Tech Industrial Park)	0								0	0	0	0	0	0	0
(note data not available at 240800)	IV (Military Academy)								0	0	0	0	0	0	0	0
	IV (Cargo Centre+Services)				600										600	6,048
	Sub-Total	25,832	17,537	7,800	1,480	0	0	0	0	319	218	45	277	234	53,742	140,394
South- Eastern Planning Region	Residential District 7			1,441						1,393	1,900	397	2,420	2,044	9,595	118,762
	Residential District 8			563						1,087	742	155	945	798	4,289	51,846
	Residential District 9			533						1,030	703	147	895	756	4,063	49,109
	Residential District 10			106						205	140	29	178	150	808	9,763
	Industrial Zone Station 40	700	1,145	561						355	242	51	309	261	3,624	22,157
	Residential District 17			1,080						2,088	1,424	298	1,814	1,532	8,235	99,536
	Residential District 18			0						0	0	0	0	0	0	0
	Residential District 19			0						0	0	0	0	0	0	0
	V									138	94	20	119	101	471	5,839
	Sub-Total	700	1,145	4,283	0	0	0	0	0	6,295	5,243	1,096	6,680	5,643	31,085	357,013
Southern Planning Region	Residential District 11			72						139	95	20	121	102	549	6,632
	Residential District 12			298						576	393	82	500	423	2,272	27,463
	Residential District 13			161	9,996	865	684	4,014	24,130	312	213	1,216	7,412	5,284	54,286	1,221,594
	Residential District 14			178	4,284	955	1,440	8,450		344	235	1,344	8,193	7,900	33,324	524,982
	Residential District 15			0						0	0	0	0	0	0	0
	Residential District 16			8						15	10	2	13	11	59	717
	VI (Airport - Airport City)				2,500					0	0	0	0	0	2,500	25,200
	VII (Sports City)									0	0	0	0	0	0	0
	VII (University)									0					0	0
	VII (International Exhibition)			180						88	60	13	77	65	483	5,562
	VIII									0	0	0	0	0	0	0
	Sub-Total	0	0	897	16,780	1,820	2,124	12,464	24,130	1,474	1,006	2,677	16,316	13,785	93,472	1,812,151
North- Western Planning Region	Residential District 1			82						159	108	23	138	117	627	7,575
	Residential District 2			411						794	542	113	690	583	3,134	37,875
	Western Industrial Zone	1,179	1,718	755	30	0	0	0	0	2	2	0	6	5	3,699	10,325
	Residential District 4B			66						128	87	18	111	94	504	6,094
	IX									0	0	0	0	0	0	0
	Sub-Total	1,179	1,718	1,314	30	0	0	0	0	1,083	739	154	946	799	7,964	61,868
Grand Total		*27,711*	*20,400*	*17,779*	*25,175*	*2,600*	*2,374*	*13,818*	*26,775*	*15,161*	*11,706*	*7,399*	*45,104*	*38,104*	*254,106*	*3,172,170*

(note this table list office floor areas only -not industrial or other small business, but gives total of working population-including industrial and other small business)

Legend : 1 = Industry, 2 = Construction, 3 = Trade & Repair, 4 = Transport & Communication, 5 = Hotel & Restaurant, 6 = Financial Activities, 7 = Real Estate, 8 = State Management, 9 = Education, 10 = Health Care & Social Services, 11 = Other Public & Communal Services, 12 = Self-Employed, 13 = Others

Table 3.4.10 Projected District-wise Area--Office Floor Area-Working Population in 2020

Planning District	Sub-Zoning	1	2	3	4	5	6	7	8	9	10	11	12	13	Working Population	Office (only) Gross Floor Area in m2
Central	Residential District 3			1,134	5,761	489	309	1,665	1,617	1,963	1,339	1,852	11,297	9,097	36,523	445,201
	Residential District 4			1,509	5,111	651	442	2,379	2,312	2,612	1,782	2,465	15,034	13,113	47,410	583,202
	Residential District 5			952						1,648	1,012	234	1,428	1,205	6,478	79,356
	Residential District 6			1,010						874	1,193	249	1,516	1,279	6,121	77,418
	Sub-Total	0	0	4,604	10,872	1,140	750	4,044	3,929	7,097	5,326	4,799	29,276	24,694	96,531	1,185,176
Northern Planning Region	Northern Industrial Zone	14,911	9,192	5,506	900					211	144	30	183	154	31,231	102,917
	Central Industrial Zone	22,898	13,244	7,693	860					128	87	18	111	94	45,133	135,095
	I (High Tech Industrial Park)									0	0	0	0	0	0	0
	II (High Tech Industrial Park)									0	0	0	0	0	0	0
	III (High Tech Industrial Park)									0	0	0	0	0	0	0
(note data not available at 240800)	IV (Military Academy)									0	0	0	0	0	0	0
	IV (Cargo Centre-Services)				1,200										1,200	12,579
	Sub-Total	37,809	22,436	13,199	2,960	0	0	0	0	339	231	48	294	248	77,564	250,591
South- Eastern Planning Region	Residential District 7			1,775						1,537	2,097	437	2,664	2,247	10,757	136,048
	Residential District 8			668						1,156	789	164	1,002	845	4,624	57,227
	Residential District 9			632						1,095	747	156	949	801	4,380	54,206
	Residential District 10			238						413	282	59	358	302	1,651	20,438
	Industrial Zone Station 40	1,004	1,465	641						378	258	54	327	276	4,402	25,853
	Residential District 17			1,501						2,600	1,774	369	2,254	1,901	10,399	128,710
	Residential District 18			615						1,066	727	151	924	779	4,262	52,751
	Residential District 19			388						672	459	96	583	492	2,690	33,292
	V									146	100	21	127	107	500	6,352
	Sub-Total	1,004	1,465	6,460	0	0	0	0	0	9,062	7,230	1,506	9,188	7,750	43,664	514,877
Southern Planning Region	Residential District 11			153						266	181	38	230	194	1,063	13,155
	Residential District 12			354						612	418	87	531	448	2,449	30,314
	Residential District 13			191	14,622	660	759	4,090	33,930	331	226	956	5,834	7,752	69,351	1,618,691
	Residential District 14			580	6,266	2,000	1,939	10,449		1,004	685	2,900	17,694	12,095	55,612	873,077
	Residential District 15			335						581	396	83	503	425	2,322	28,744
	Residential District 16			443						767	524	109	665	561	3,070	37,993
	VI (Airport - Airport City)				2,500					0	0	0	0	0	2,500	26,206
	VII (Sports City)									94	132	13	81	69	389	5,415
	VII (University)									1,650					1,650	17,296
	VII (International Exhibition)			180						0	0	0	0	0	180	1,887
	VIII									0	0	0	0	0	0	0
	Sub-Total	0	0	2,237	23,388	2,660	2,698	14,539	33,930	5,305	2,562	4,186	25,539	21,543	138,586	2,652,777
North- Western Planning Region	Residential District 1			195						338	230	48	293	247	1,351	16,722
	Residential District 2			676						1,171	799	166	1,015	856	4,684	57,971
	Western Industrial Zone	943	2,199	1,257	60	0	0	0	0	3	2	0	2	2	4,467	17,382
	Residential District 4B			996						1,724	1,176	245	1,494	1,260	6,895	85,338
	IX									0	0	0	0	0	0	0
	Sub-Total	943	2,199	3,123	60	0	0	0	0	3,235	2,207	460	2,804	2,366	17,396	177,412
Grand Total		*39,756*	*26,100*	*29,623*	*37,280*	*3,800*	*3,448*	*18,583*	*37,859*	*25,039*	*17,556*	*10,999*	*67,101*	*56,600*	*373,742*	*4,780,833*

(note this table list office floor areas only -not industrial or other small business, but gives total of working population-including industrial and other small business)

Legend : 1 = Industry, 2 = Construction, 3 = Trade & Repair, 4 = Transport & Communication, 5 = Hotel & Restaurant, 6 = Financial Activities, 7 = Real Estate, 8 = State Management, 9 = Education, 10 = Health Care & Social Services, 11 = Other Public & Communal Services, 12 = Self-Employed, 13 = Others

Table 3.4.11 Projected District-wise Area--Office Floor Area-Working Population in 2030

Planning District	Sub-Zoning	1	2	3	4	5	6	7	8	9	10	11	12	13	Working Population	Office (only) Gross Floor Area in m2
Central	Residential District 3			1,611	4,814	615	383	2,088	2,028	2,226	1,523	2,275	13,949	10,673	42,185	502,794
	Residential District 4A			1,924	5,746	735	515	2,809	2,729	2,658	1,819	2,716	16,652	15,169	53,471	637,924
	Residential District 5			1,213						1,677	1,032	237	1,454	1,228	6,841	80,866
	Residential District 6			1,288						890	1,218	252	1,543	1,303	6,494	79,096
	Sub-Total	0	0	6,036	10,560	1,350	898	4,896	4,757	7,451	5,592	5,479	33,599	28,373	108,991	1,300,680
Northern Planning Region	Northern Industrial Zone	15,741	7,751	8,128	1,350					215	147	30	186	157	33,706	132,946
	Central Industrial Zone	24,172	11,164	11,383	1,290					130	89	18	113	95	48,455	175,720
	I (High Tech Industrial Park)									0	0	0	0	0	0	0
	II (High Tech Industrial Park)									0	0	0	0	0	0	0
	III (High Tech Industrial Park)									0	0	0	0	0	0	0
(note data not available at 240800)	IV (Military Academy)									0	0	0	0	0	0	0
	IV (Cargo Centre-Services)				1,800										1,800	18,326
	Sub-Total	39,913	18,915	19,511	4,440	0	0	0	0	345	236	49	299	253	83,961	326,991
South- Eastern Planning Region	Residential District 7			2,263						1,564	2,140	442	2,712	2,290	11,412	138,996
	Residential District 8			851						1,176	805	166	1,020	861	4,880	58,266
	Residential District 9			806						1,114	762	158	966	816	4,623	55,190
	Residential District 10			304						420	287	59	364	308	1,743	20,809
	Industrial Zone Station 40	1,063	1,232	885						384	263	54	333	281	4,496	27,890
	Residential District 17			1,914						2,645	1,810	374	2,294	1,938	10,976	131,045
	Residential District 18			785						1,084	742	153	940	794	4,498	53,708
	Residential District 19			495						684	468	97	593	501	2,839	33,896
	V									149	102	21	129	109	510	6,272
	Sub-Total	1,063	1,232	8,304	0	0	0	0	0	9,221	7,379	1,525	9,353	7,899	45,977	526,072
Southern Planning Region	Residential District 11			1,497						2,068	1,415	293	1,794	1,515	8,581	102,449
	Residential District 12			451						623	426	88	540	456	2,585	30,864
	Residential District 13			244	17,248	509	577	3,143	40,050	337	231	742	4,551	9,110	76,741	1,744,593
	Residential District 14			1,266	7,392	2,641	2,563	13,974		1,750	1,197	3,853	23,631	14,689	72,957	1,144,757
	Residential District 15			498						688	470	97	596	504	2,853	34,063
	Residential District 16			1,138						1,572	1,076	222	1,363	1,151	6,522	77,873
	VI (Airport - Airport City)				2,500					0	0	0	0	0	2,500	25,452
	VII (Sports City)									0	224	0	0	0	224	4,260
	VII (University)									2,800					2,800	28,507
	VII (International Exhibition)			540						95	65	14	83	70	867	9,524
	VIII									0	0	0	0	0	0	0
	Sub-Total	0	0	5,633	27,140	3,150	3,139	17,117	40,050	9,933	5,105	5,308	32,558	27,495	176,630	3,202,341
North- Western Planning Region	Residential District 1			373						516	353	73	447	378	2,139	25,538
	Residential District 2			1,103						1,524	1,043	216	1,321	1,116	6,322	75,480
	Western Industrial Zone	1,112	1,853	1,855	90	0	0	0	0	3	2	0	2	2	4,919	23,374
	Residential District 4B			1,269						1,754	1,200	248	1,521	1,285	7,277	86,886
	IX									0	0	0	0	0	0	0
	Sub-Total	1,112	1,853	4,600	90	0	0	0	0	3,796	2,597	537	3,292	2,780	20,658	211,278
Grand Total		*42,088*	*22,000*	*44,085*	*42,230*	*4,500*	*4,037*	*22,013*	*44,807*	*30,746*	*20,909*	*12,899*	*79,101*	*66,800*	*436,216*	*5,567,362*

(note this table list office floor areas only -not industrial or other small business-, but gives total of working population-including idustrial and other small business)

Legend : 1 = Industry, 2 = Construction, 3 = Trade & Repair, 4 = Transport & Communication, 5 = Hotel & Restaurant, 6 = Financial Activities, 7 = Real Estate, 8 = State Management, 9 = Education, 10 = Health Care & Social Services, 11 = Other Public & Communal Services, 12 = Self-Employed, 13 = Others

Table 3.4.12 Estimated District-Commercial Area-in 2000

Planning Region	Sub-Zoning	Neighborhood Shopping Total Gross Floor Area in m2	District Shopping Gross Floor Areas in m2	City Centre Shopping Gross Floor Area in m2	Total Retail Floor Area in m2
1. Central Planning Region	Residential District 3	8,103	8,103	0	16,205
	Residential District 4A	9,940	9,940	51,266	71,146
	Residential District 5	6,003	6,003	0	12,005
	Residential District 6	6,668	6,668	0	13,335
	Sub-Total	30,713	30,713	51,266	112,691
2. Northern Planning Region	Northern Industrial District	4,045	0	0	4,045
	Central Industrial District	470	0	0	470
	Settlement Zheleznodoezhny	1,194	0	0	1,194
	Sub-Total	5,709	0	0	5,709
3. Southeastern Planning Region	Residential District 7	9,030	9,030	0	18,060
	Residential District 8	5,285	5,401	0	10,686
	Residential District 9	945	0	0	945
	Residential District 10	465	0	0	465
	Industrial District - Station 40	0	0	0	0
	Settlement Promyshlenny	879	0	0	879
	Settlement Internatsionalnoye	865	0	0	865
	Settlement Michurino	387	0	0	387
	Settlement Kuygenzhar	111	0	0	111
	Sub-Total	17,968	14,431	0	32,399
4. Southern Planning Region	Residential District 11	560	0	0	560
	Residential District 12	4,445	0	0	4,445
	Settlement Prigorodnoye	450	0	0	450
	Settlement Telman	149	0	0	149
	Sub-Total	5,604	0	0	5,604
5. Northwestern Planning Region	Residential District 1	1,575	0	0	1,575
	Residential District 2	3,938	3,938	0	7,875
	Settlement Kirovo	1,267	0	0	1,267
	West Industrial District	25	0	0	25
	Sub-Total	6,804	3,938	0	10,742
Grand Total		*66,797*	*49,081*	*51,266*	*167,144*

Note : the Number of Shop Staff is included in the Working Population Table

Table 3.4.13 Projected District-wise-Commercial Area-in 2010

Planning Region	Sub-Zoning	Neighborhood Shopping Total Gross Floor Area in m2	District Shopping Gross Floor Areas in m2	City Centre Shopping Gross Floor Area in m2	Total Retail Floor Area in m2
1. Central Planning Region	Residential District 3	8,797	8,797	0	17,594
	Residential District 4A	12,008	12,382	59,893	84,284
	Residential District 5	7,410	7,410	0	14,820
	Residential District 6	8,037	8,037	0	16,074
	Sub-Total	36,252	36,626	59,893	132,772
2. Northern Planning Region	Northern Industrial District	2,137	0	0	2,137
	Central Industrial District	1,296	0	0	1,296
	Planning District I	0	0	0	0
	Planning District II	0	0	0	0
	Planning District III	0	0	0	0
	Planning District IV	0	0	0	0
	Sub-Total	3,433	0	0	3,433
3. Southeastern Planning Region	Residential District 7	14,989	14,989	0	29,979
	Residential District 8	5,852	6,403	0	12,255
	Residential District 9	5,543	8,006	0	13,549
	Residential District 10	1,102	0	0	1,102
	Industrial District - Station 40	1,912	0	0	1,912
	Residential District 17	11,235	12,073	0	23,308
	Residential District 18	0	0	0	0
	Residential District 19	0	0	0	0
	Planning District V	1,480	0	0	1,480
	Sub-Total	42,113	41,471	0	83,585
4. Southern Planning Region	Residential District 11	749	0	0	749
	Residential District 12	3,100	4,313	0	7,412
	Residential District 13	1,677	0	43,123	44,800
	Residential District 14	1,853	0	13,832	15,685
	Residential District 15	0	0	0	0
	Residential District 16	162	0	0	162
	Planning District VI (New Airport Planning Unit)	0	0	0	0
	Planning District VII	950	0	0	950
	Planning District VIII	0	0	0	0
	Sub-Total	8,490	4,313	56,955	69,758
5. Northwestern Planning Region	Residential District 1	855	0	0	855
	Residential District 2	4,275	5,818	0	10,093
	West Industrial District	27	0	0	27
	Residential District 4B	688	0	0	688
	Planning District IX	0	0	0	0
	Sub-Total	5,844	5,818	0	11,662
Grand Total		*96,133*	*88,228*	*116,848*	*301,209*

Note : the Number of Shop Staff is included in the Working Population Table

Table 3.4.14 Projected District-wise -Commercial Area-in 2020

Planning Region	Sub-Zoning	Neighborhood Shopping Total Gross Floor Area in m2	District Shopping Gross Floor Areas in m2	City Centre Shopping Gross Floor Area in m2	Total Retail Floor Area in m2
1. Central Planning Region	Residential District 3	10,460	10,460	0	20,920
	Residential District 4A	13,920	14,628	58,432	86,980
	Residential District 5	8,780	8,780	0	17,560
	Residential District 6	9,320	9,320	0	18,640
	Sub-Total	42,480	43,188	58,432	144,100
2. Northern Planning Region	Northern Industrial District	2,250	0	0	2,250
	Central Industrial District	1,364	0	0	1,364
	Planning District I	0	0	0	0
	Planning District II	0	0	0	0
	Planning District III	0	0	0	0
	Planning District IV	0	0	0	0
	Sub-Total	3,614	0	0	3,614
3. Southeastern Planning Region	Residential District 7	16,378	16,378	0	32,756
	Residential District 8	6,160	7,260	0	13,420
	Residential District 9	5,835	7,941	0	13,776
	Residential District 10	2,200	0	0	2,200
	Industrial District - Station 40	2,012	0	0	2,012
	Residential District 17	13,854	15,743	0	29,598
	Residential District 18	5,678	5,678	0	11,356
	Residential District 19	3,584	3,584	0	7,167
	Planning District V	1,558	0	0	1,558
	Sub-Total	57,260	56,584	0	113,844
4. Southern Planning Region	Residential District 11	1,416	0	0	1,416
	Residential District 12	3,263	4,854	0	8,117
	Residential District 13	1,765	0	100,169	101,934
	Residential District 14	5,352	0	34,567	39,919
	Residential District 15	3,094	3,094	0	6,188
	Residential District 16	4,090	4,090	0	8,179
	Planning District VI (New Airport Planning Unit)	0	0	0	0
	Planning District VII	1,000	0	0	1,000
	Planning District VIII	0	0	0	0
	Sub-Total	19,979	12,037	134,736	166,752
5. Northwestern Planning Region	Residential District 1	1,800	0	0	1,800
	Residential District 2	6,240	8,040	0	14,280
	West Industrial District	28	0	0	28
	Residential District 4B	9,186	9,186	0	18,372
	Planning District IX	0	0	0	0
	Sub-Total	17,254	17,226	0	34,480
Grand Total		140,586	129,035	193,168	462,789

Note : the Number of Shop Staff is included in the Working Population Table

Table 3.4.15 Projected District-wise -Commercial Area-in 2030

Planning Region	Sub-Zoning	Neighborhood Shopping Total Gross Floor Area in m2	District Shopping Gross Floor Areas in m2	City Centre Shopping Gross Floor Area in m2	Total Retail Floor Area in m2
1. Central Planning Region	Residential District 3	17 490	17 490	0	34 980
	Residential District 4A	20 880	20 880	70 534	112 294
	Residential District 5	13 170	13 170	0	26 340
	Residential District 6	13 980	13 980	0	27 960
	Sub-Total	65 520	65 520	70 534	201 574
2. Northern Planning Region	Northern Industrial District	3 374	0	0	3 374
	Central Industrial District	2 046	0	0	2 046
	Planning District I	0	0	0	0
	Planning District II	0	0	0	0
	Planning District III	0	0	0	0
	Planning District IV	0	0	0	0
	Sub-Total	5 420	0	0	5 420
3. Southeastern Planning Region	Residential District 7	24 567	24 567	0	49 135
	Residential District 8	9 240	10 890	0	20 130
	Residential District 9	8 752	13 421	0	22 173
	Residential District 10	3 300	0	0	3 300
	Industrial District - Station 40	3 019	0	0	3 019
	Residential District 17	20 782	23 615	0	44 396
	Residential District 18	8 517	8 517	0	17 035
	Residential District 19	5 375	5 375	0	10 751
	Planning District V	2 337	0	0	2 337
	Sub-Total	85 889	86 385	0	172 275
4. Southern Planning Region	Residential District 11	16 247	16 247	0	32 494
	Residential District 12	4 895	6 218	0	11 113
	Residential District 13	2 648	0	163 887	166 535
	Residential District 14	13 746	0	60 181	73 927
	Residential District 15	5 402	5 402	0	10 804
	Residential District 16	12 350	12 350	0	24 699
	Planning District VI (New Airport Planning Unit)	0	0	0	0
	Planning District VII	1 500	0	0	1 500
	Planning District VIII	0	0	0	0
	Sub-Total	56 786	40 216	224 068	321 071
5. Northwestern Planning Region	Residential District 1	4 050	4 050	0	8 100
	Residential District 2	11 970	11 970	0	23 940
	West Industrial District	42	0	0	42
	Residential District 4B	13 779	13 779	0	27 557
	Planning District IX	0	0	0	0
	Sub-Total	29 841	29 799	0	59 639
Grand Total		*243 457*	*221 921*	*294 602*	*759 979*

Note : the Number of Shop Staff is included in the Working Population Table

Table 3.4.16 Necessary Land Area by Zone and Sector 2010

			proportion within industry	unit area (worker/ha)	number of workers	necessary land area (ha)	net inflow from transfer (ha)	total area necessary (ha)	area occupied in 1999 (ha)	additional area required (ha)
A. Northern Industrial Zone	1	**Industry**								
	1.1	Agro-processing	53%	71	5,355	75	5	80	155	*none*
	1.2	Textile/Clothing	5%	179	505	3	0	3	10	*none*
	1.3	Non-metal mineral products	16%	23	1,617	70	1	72	53	*19*
	1.4	Metallurgy/metal processing	8%	49	808	16	1	17	29	*none*
	1.5	Machinery/equipment	7%	53	707	13	1	14	21	*none*
	1.6	Other industries	11%	64	1,111	17	1	18	39	*none*
		Sub-total	*100%*		*10,104*	*196*	*9*	*204*	*306*	*none*
total area of zone (ha) 2,146	2	**Construction**		60	7,185	120	13	132	78	54
	3	**Trade & Repair**		60	2,800	47	8	55	75	*none*
	4	**Transport & Communication**		60	450	8	0	8	60	*none*
% of zone 25%	5	**Other Services**		300	681	2	0	2	25	*none*
		Total			21,220	372	30	401	544	54
B. Central Industrial Zone	1	**Industry**								
	1.1	Agro-processing	53%	71	8,336	117	18	135	103	*32*
	1.2	Textile/Clothing	5%	179	786	4	2	6	7	*none*
	1.3	Non-metal mineral products	16%	23	2,516	110	6	115	35	*80*
	1.4	Metallurgy/metal processing	8%	49	1,258	26	3	28	19	*9*
	1.5	Machinery/equipment	7%	53	1,101	21	2	23	14	*9*
	1.6	Other industries	11%	64	1,730	27	4	31	26	*5*
		Sub-total	*100%*		*15,728*	*304*	*35*	*339*	*204*	*135*
total area of zone (ha) 3,353	2	**Construction**		60	10,352	173	13	185	70	115
	3	**Trade & Repair**		60	5,000	83	8	91	106	*none*
	4	**Transport & Communication**		60	430	7	0	7	76	*none*
% of zone 19%	5	**Other Services**		300	412	1	0	1	50	*none*
		Total			31,922	569	56	623	506	250
C. Industrial Zone Station 40	1	**Industry**								
	1.1	Agro-processing	53%	71	371	5	0	5	26	*none*
	1.2	Textile/Clothing	5%	179	35	0	0	0	2	*none*
	1.3	Non-metal mineral products	16%	23	112	5	0	5	9	*none*
	1.4	Metallurgy/metal processing	8%	49	56	1	0	1	5	*none*
	1.5	Machinery/equipment	7%	53	49	1	0	1	3	*none*
	1.6	Other industries	11%	64	77	1	0	1	7	*none*
		Sub-total	*100%*		*700*	*14*	*0*	*14*	*52*	*none*
total area of zone (ha) 752	2	**Construction**		60	1,145	19	2	21	22	none
	3	**Trade & Repair**		60	561	9	-1	9	84	*none*
	4	**Transport & Communication**		60	0	0	0	0	62	*none*
% of zone 33%	5	**Other Services**		300	1,218	4	0	4	28	*none*
		Total			3,624	46	1	48	248	0
D. Western Industrial Zone	1	**Industry**								
	1.1	Agro-processing	53%	71	625	9	-2	7	24	*none*
	1.2	Textile/Clothing	5%	179	59	0	0	0	2	*none*
	1.3	Non-metal mineral products	16%	23	189	8	-1	8	8	*none*
	1.4	Metallurgy/metal processing	8%	49	94	2	0	2	5	*none*
	1.5	Machinery/equipment	7%	53	83	2	0	1	3	*none*
	1.6	Other industries	11%	64	130	2	0	2	6	*none*
		Sub-total	*100%*		*1,179*	*23*	*-4*	*19*	*48*	*none*
total area of zone (ha) 575	2	**Construction**		60	1,718	29	0	29	28	1
	3	**Trade & Repair**		60	755	13	0	13	22	*none*
	4	**Transport & Communication**		60	30	1	0	1	5	*none*
% of zone 21%	5	**Other Services**		300	15	0	0	0	18	*none*
		Total			3,697	65	-4	62	121	1
E. Cargo Center and Services	1	**Industry**								
	1.1	Agro-processing	53%	71						
	1.2	Textile/Clothing	5%	179						
	1.3	Non-metal mineral products	16%	23						
	1.4	Metallurgy/metal processing	8%	49						
	1.5	Machinery/equipment	7%	53						
	1.6	Other industries	11%	64						
		Sub-total	*100%*							
total area of zone (ha) 90	2	**Construction**		60						
	3	**Trade & Repair**		60						
	4	**Transport & Communication**		15	600	40		40	0	40
% of zone 44%	5	**Other Services**								
		Total			600	40	0	40	0	40
		Grand Total			61,063	1,091	83	1174	1419	345

Table 3.4.17 Necessary Land Area by Zone and Sector 2020

	2020		proportion within industry	unit area (worker/ha)	number of workers	necessary land area (ha)	net inflow from transfer (ha)	total area necessary (ha)	area occupied in 2010 (ha)	additional area required (ha)
A. Northern Industrial Zone	1	**Industry**								
	1.1	Agro-processing	56%	71	8,350	117	3	120	155	*none*
	1.2	Textile/Clothing	7%	179	1,044	6	0	6	10	*none*
	1.3	Non-metal mineral products	15%	23	2,237	97	1	98	72	*26*
	1.4	Metallurgy/metal processing	6%	49	895	18	0	18	29	*none*
	1.5	Machinery/equipment	8%	53	1,193	23	0	23	21	*2*
	1.6	Other industries	8%	64	1,193	19	0	19	39	*none*
		Sub-total	*100%*		*14,911*	*280*	*6*	*285*	*306*	*none*
total area of zone (ha) 2,146	2	**Construction**		60	9,192	153	4	157	*132*	*25*
	3	**Trade & Repair**		60	5,506	92	44	136	*75*	*61*
	4	**Transport & Communication**		60	900	15	1	16	*60*	*none*
% of zone 28%	5	**Other Services**		300	722	2	1	3	*25*	*none*
		Total			31,231	542	55	597	598	86
B. Central Industrial Zone	1	**Industry**								
	1.1	Agro-processing	56%	71	12,823	180	-5	174	135	*39*
	1.2	Textile/Clothing	7%	179	1,603	9	-1	8	7	*1*
	1.3	Non-metal mineral products	15%	23	3,435	150	-1	148	115	*33*
	1.4	Metallurgy/metal processing	6%	49	1,374	28	-1	27	28	*none*
	1.5	Machinery/equipment	8%	53	1,832	35	-1	34	23	*11*
	1.6	Other industries	8%	64	1,832	29	-1	28	31	*none*
		Sub-total	*100%*		*22,898*	*430*	*-10*	*420*	*339*	*81*
total area of zone (ha) 3,353	2	**Construction**		60	13,244	221	13	234	*185*	*49*
	3	**Trade & Repair**		60	7,693	128	-15	114	*106*	*8*
	4	**Transport & Communication**		60	860	14	6	21	*76*	*none*
% of zone 24%	5	**Other Services**		300	438	1	0	1	*50*	*none*
		Total			45,133	794	-5	790	756	138
C. Industrial Zone Station 40	1	**Industry**								
	1.1	Agro-processing	56%	71	562	8	-1	7	26	*none*
	1.2	Textile/Clothing	7%	179	70	0	0	0	2	*none*
	1.3	Non-metal mineral products	15%	23	151	7	0	6	9	*none*
	1.4	Metallurgy/metal processing	6%	49	60	1	0	1	5	*none*
	1.5	Machinery/equipment	8%	53	80	2	0	1	3	*none*
	1.6	Other industries	8%	64	80	1	0	1	7	*none*
		Sub-total	*100%*		*1,004*	*19*	*-2*	*17*	*52*	*none*
total area of zone (ha) 536	2	**Construction**		60	1,465	24	-17	7	*22*	*none*
	3	**Trade & Repair**		60	641	11	-3	8	*84*	*none*
	4	**Transport & Communication**		60	0	0	0	0	*62*	*none*
% of zone 46%	5	**Other Services**		300	1,293	4	0	4	*28*	*none*
		Total			4,403	58	-23	36	248	0
D. Western Industrial Zone	1	**Industry**								
	1.1	Agro-processing	56%	71	528	7	2	9	24	*none*
	1.2	Textile/Clothing	7%	179	66	0	0	1	2	*none*
	1.3	Non-metal mineral products	15%	23	141	6	1	7	8	*none*
	1.4	Metallurgy/metal processing	6%	49	57	1	0	1	5	*none*
	1.5	Machinery/equipment	8%	53	75	1	0	2	3	*none*
	1.6	Other industries	8%	64	75	1	0	1	6	*none*
		Sub-total	*100%*		*943*	*18*	*4*	*21*	*48*	*none*
total area of zone (ha) 575	2	**Construction**		60	2,199	37	0	37	*29*	*8*
	3	**Trade & Repair**		60	1,257	21	1	22	*22*	*0*
	4	**Transport & Communication**		60	60	1	0	1	*5*	*none*
% of zone 21%	5	**Other Services**		300	9	0	0	0	*18*	*none*
		Total			4,468	76	5	81	122	8
E. Cargo Center and Services	1	**Industry**								
	1.1	Agro-processing	56%	71						
	1.2	Textile/Clothing	7%	179						
	1.3	Non-metal mineral products	15%	23						
	1.4	Metallurgy/metal processing	6%	49						
	1.5	Machinery/equipment	8%	53						
	1.6	Other industries	8%	64						
		Sub-total	*100%*							
total area of zone (ha) 180	2	**Construction**		60						
	3	**Trade & Repair**		60						
	4	**Transport & Communication**		15	1,200	80		80	40	*40*
% of zone 44%	5	**Other Services**								
		Total			1,200	80	0	80	40	40
		Grand Total			86,435	1,551	32	1,584	1,764	272

Table 3.4.18 Necessary Land Area by Zone and Sector 2030

2030			proportion within industry	unit area (worker/ha)	number of workers	necessary land area (ha)	net inflow from transfer (ha)	total area necessary (ha)	area occupied in 2020 (ha)	additional area required (ha)
A. Northern Industrial Zone	1	**Industry**								
	1.1	Agro-processing	60%	71.4	9,445	132	6	138	155	none
	1.2	Textile/Clothing	10%	178.5	1,574	9	1	10	10	0
	1.3	Non-metal mineral products	10%	22.95	1,574	69	1	70	98	none
	1.4	Metallurgy/metal processing	5%	49.3	787	16	0	16	29	none
	1.5	Machinery/equipment	10%	52.7	1,574	30	1	31	23	8
	1.6	Other industries	5%	63.75	787	12	0	13	39	none
		Sub-total	*100%*		*15,741*	*268*	*10*	*278*	*306*	none
total area of zone (ha) 2,146	2	**Construction**		60	7,751	129	0	129	*157*	none
	3	**Trade & Repair**		60	8,128	135	4	139	*136*	3
	4	**Transport & Communication**		60	1,350	23	2	25	*60*	none
% of zone 32%	5	**Other Services**		300	735	2	0	2	*25*	none
		Total			33,705	557	16	573	684	3
B. Central Industrial Zone	1	**Industry**								
	1.1	Agro-processing	60%	84	14,503	173	0	173	174	none
	1.2	Textile/Clothing	10%	210	2,417	12	0	12	8	4
	1.3	Non-metal mineral products	10%	27	2,417	90	0	90	148	none
	1.4	Metallurgy/metal processing	5%	58	1,209	21	0	21	28	none
	1.5	Machinery/equipment	10%	62	2,417	39	0	39	34	5
	1.6	Other industries	5%	75	1,209	16	0	16	31	none
		Sub-total	*100%*		*24,172*	*350*	*0*	*350*	*420*	none
total area of zone (ha) 3,353	2	**Construction**		60	11,164	186	0	186	*234*	none
	3	**Trade & Repair**		60	11,383	190	0	190	*114*	76
	4	**Transport & Communication**		60	1,290	22	0	22	*76*	none
% of zone 27%	5	**Other Services**		300	445	1	0	1	*50*	none
		Total			48,454	748	0	749	894	76
C. Industrial Zone Station 40	1	**Industry**								
	1.1	Agro-processing	60%	84	638	8	0	8	26	none
	1.2	Textile/Clothing	10%	210	106	1	0	1	2	none
	1.3	Non-metal mineral products	10%	27	106	4	0	4	9	none
	1.4	Metallurgy/metal processing	5%	58	53	1	0	1	5	none
	1.5	Machinery/equipment	10%	62	106	2	0	2	3	none
	1.6	Other industries	5%	75	53	1	0	1	7	none
		Sub-total	*100%*		*1,063*	*15*	*0*	*15*	*52*	none
total area of zone (ha) 536	2	**Construction**		60	1,232	21	0	21	*22*	none
	3	**Trade & Repair**		60	885	15	0	15	*84*	none
	4	**Transport & Communication**		60	0	0	0	0	*62*	none
% of zone 46%	5	**Other Services**		300	1,315	4	0	4	*28*	none
		Total			4,495	55	0	55	248	0
D. Western Industrial Zone	1	**Industry**								
	1.1	Agro-processing	60%	84	667	8	-2	6	24	none
	1.2	Textile/Clothing	10%	210	111	1	0	0	2	none
	1.3	Non-metal mineral products	10%	27	111	4	0	4	8	none
	1.4	Metallurgy/metal processing	5%	58	56	1	0	1	5	none
	1.5	Machinery/equipment	10%	62	111	2	0	1	3	none
	1.6	Other industries	5%	75	56	1	0	1	6	none
		Sub-total	*100%*		*1,112*	*16*	*-4*	*12*	*48*	none
total area of zone (ha) 407	2	**Construction**		60	1,853	31	0	31	*37*	none
	3	**Trade & Repair**		60	1,855	31	-4	27	*22*	5
	4	**Transport & Communication**		60	90	2	-2	0	*5*	none
% of zone 32%	5	**Other Services**		300	9	0	0	0	*18*	none
		Total			4,919	79	-9	70	130	5
E. Cargo Center and Services	1	**Industry**								
	1.1	Agro-processing	60%	84						
	1.2	Textile/Clothing	10%	210						
	1.3	Non-metal mineral products	10%	27						
	1.4	Metallurgy/metal processing	5%	58						
	1.5	Machinery/equipment	10%	62						
	1.6	Other industries	5%	75						
		Sub-total	*100%*							
total area of zone (ha) 270	2	**Construction**		60						
	3	**Trade & Repair**		60						
	4	**Transport & Communication**		15	1,800	120		120	80	*40*
% of zone 44%	5	**Other Services**								
		Total			1,800	120	0	120	80	40
		Grand Total			93,373	1,560	6	1,567	2,036	124

Table 3.8.1(1) List of proposed cultural property for preservation

Station Precinct (S)

no.	location	name	stories	date	remarks
S-1	1, Akzaiyk st	housing	2	40-50	mass development of the street with similar facades
S-2	2, Akzaiyk st.	housing	2		
S-3	3, Akzaiyk st.	shop/housing	2		
S-4	4, Akzaiyk st.	office	2		
S-5	5, Akzaiyk st.	office/housing	3		
S-6	6, Akzaiyk st.	housing	3		
S-7	7, Akzaiyk st.	office	3		
S-8	8, Akzaiyk st.	shop/housing	3		
S-9	12, Akzaiyk st.	shop/housing	3	40-50	mass development of the street with similar facades
S-10	13, Akzaiyk st.	shop/housing			
S-11	14, Akzaiyk st.	housing			
S-12	15, Akzaiyk st.	housing			
S-13	16, Akzaiyk st.	housing			
S-14	17, Akzaiyk st.	shop/housing			
S-15	18, Akzaiyk st.	housing			
S-16	19, Akzaiyk st.	housing			
S-17	21, Akzaiyk st.	housing			
S-18	23, Akzaiyk st.	housing			
S-19	25, Akzaiyk st.	housing			
S-20	East-1	Libkneht st. housing	2	40-50	#228 Type, by Moscow arch. Mayrson for railway workers housings. In this period they are very rich and strong, as the railway was very important from the view point o the country's economic growth
S-21	East-2				
S-22	West-1				
S-23	West-2				
S-24	West-3				
S-25	West-4				
S-26	West-5				
S-27	South-1	Lineinaya st. housings	2	40-50	ditto
S-28	South-2				
S-29	South-3				
S-30	South-4				
S-31	South-5				
S-32	12, Gyote st.	Gyote st, housings	2	40-50	ditto
S-33	14, ditto				
S-34	16, ditto				
S-35	18, ditto				
S-36	20, ditto				
S-37	14, Timir. St.	Timiryazev st. housings	2	40-50	ditto
S-38	16, ditto				
S-39	station yard	Water tower	-	30s	supplied water to locomotives too
S-40	11,Pervomaiskaya st	No.37 Secondary school	2	50s	typical school style during the great time of railway workers
S-41	19,Pervomaiskaya st	Kindergarten	2	50s	

Table 3.8.1(2) List of proposed cultural property for preservation

Biebitshilik Street Precinct (B)

no.	location	name	stories	date	remarks
B-1	25, Beibitshilik St.	Printing Company	4	60s	Soviet Industrial-Functional Style, 70'add wall paintings
B-2	24, Beibitshilik st.	housing	5	62-64	Moscow PC panel, wall is thicker (35-40cm)
B-3	26, Beibitshilik st.	housing	5		
B-4	28, Beibitshilik st.	housing	5		
B-5	30, Beibitshilik st.	housing	5		
B-6	29, Beibitshilik st.	housing	5	62-64	Leningrad PC panel, wall is thinner with insulation. Steel joints are welded (rust problems)
B-7	31, Beibitshilik st.	housing	5		
B-8	33, Beibitshilik st.	housing	5		
B-9	35, Beibitshilik st.	housing	5		
B-10	37, Beibitshilik st.	Ministry of Energy	5	60s	Khrushchev Style
B-11	39, Beibitshilik st.	Polytech College	4	60-61	Stalin Style
B-12	40, Beibitshilik st.	housing	5	62-64	Lenongrad PC panel with ceramic tiled surface and insulation inside
B-13	42, Beibitshilik st.	housing	5		
B-14	44, Beibitshilik st.	housing	5		
B-15	49, Beibitshilik st.	Medical Academy	5	63-64	Typical school design from Moscow (there are many in USSR)
B-16	51, Beibitshilik st.	Medical Academy	5		
B-17	53, Beibitshilik st.	Medical Academy	5		
B-18	59, Beibitshilik st.	Automobile tech school	4	60-61	Capitol ornament by gypsum, which Khrushchev prohibited by decree
B-19	73, Beibitshilik st.	Arch Faculty Agricultural	3	50s	Stalin Façade has ornament
B-20	64, Beibitshilik st.	"MOSKVA" shop	2	1963	"Constructive Functional" style
B-21	114, Poveda	Hospital for railway worke	3	50s	Stalin Style
B-22	Agricultural Univ.	Student Club	2	1949	Façade ornament, w/pink wall

Kenesary Street Precinct (K)

no.	location	name	stories	date	remarks
K-1	1, Lane	housing/shop	4	50s	
K-2	5, Lane	housing/shop	3	50s	
K-3	151, Kenesary	Wooden house	1	19C	merchant house, logs came from Siberia
K-4	31, ditto	Wooden house	1	19C	
K-5	68, ditto	housing/shop	3	50s	
K-6	70, ditto	Water tower	(5+)	30s	supplied water for locomotives too
K-7	72, ditto	shop/house	3	50s	
K-8	74, ditto	shop/house	4	50s	
K-9	76, ditto	Gov. office	2	50s	
K-10	78, ditto	housing	3	50s	
K-11	80, ditto	housing	3	50s	
K-12	91, ditto	shop/house	2	50s	
K-13	93, ditto	Gov. office	3	50s	
K-14	95, ditto	housing	3	50s	
K-15	97, ditto	Gov. office	3	50s	
K-16	99, ditto	Gov. office	2	50s	
K-17	20, Poveda st.	Housing	2	50s	for railway high ranked workers housing, #230 type designed by Moscow arch.Mayrson
K-18	22, Poveda st.				
K-19	24, Poveda st.				
K-20	26, Poveda st.				
K-21	30, Poveda st.				
K-22	27, Poveda st.				

Table 3.8.1(3) List of proposed cultural property for preservation

OTHERS (O)

no.	location	name	stories	date	remarks
O-1	over ISHIM	Bridge to the Central Park	-	60s	Wooden bridge was collapsed due to heavy passenger traffic and was newly build by reinforced concrete
O-2	Central Park	Central Alley	-	late 19C	about 300m length 10m wide
O-3	Old Fortress area	Uzakaya street	-	1830s	about 150m length 7m wide
O-4	Central Park	Old Poplar Tree	-	early 20C	about 100 years old, near Boat house.
O-5	behind Telekom	Kirov's house	1	20s	Kirov, no.2 after Stalin stayed in 30s
O-6	49, Abai st.	Min. of Transport	3	30s	former Karaganda Railway Dep.
O-7	83, Abai st.	Wall Fence	-	20s	Tatar's "Green Mosk"'s Wall Fence. The mosk was burned down in20s
O-8	84, Abai st.	Housing	3	1954	Built by Japanese prosoners of the war. Works and details are valued as high-grade
O-9	86, Abai st.				
O-10	19, Pushkin st.	"Tselinselmash" Plant	2	50s	Stalin style