

Chapter 11

RECOMMENDATIONS
OF THE
MASTER PLAN

CHAPTER 11 RECOMMENDATIONS OF THE MASTER PLAN

The M/P recommends to the City that it adopt a new basic standard for SWM. This basic standard requires an upgrade of the disposal system to incorporate sanitary land-fill principles, and provide universal collection service coverage through rationalization of collection frequency and discharge practice to improve the utilization of collection equipment which represent the largest investments in overall SWM systems. This new standard is recommended as the least cost solution to the SWM problems of Almaty. If properly implemented it will create a better service than the current service, at a lower long term cost.

The plan recommends that separate collection services should only be introduced slowly as market demand for recyclable materials develops. The city must avoid any public or publicly guaranteed investment in large recycling schemes for which there is no proven demand.

The city must accept that while delivery of the service can be provided largely by the private sector, there is an overall public responsibility to maintain public health and environmental standards. To discharge these public responsibilities, the M/P recommends that:

- The City establish a public body the "Waste Authority" to assume overall responsibility for Waste Services in the city. This Authority will be responsible for identifying, in detail, the services that are necessary and arranging for these to be provided by contractors.
- The city must ensure that the Waste Authority has appropriate powers to collect user charges from the residents for these services, and has the freedom to set tariffs at a level which will make the service financially sustainable. This means that the Authority must be free to set tariffs based on estimated future costs, not historic costs as at present.
- The city must assist the Authority in raising loans to finance the new investments that are required including persuading the Government to issue a sovereign guarantee.

Clearly the current problems cannot be solved over-night. The most urgent problem is preventing further illegal dumping of wastes, to stop further environmental degradation. Once this is stopped, restoration of the currently degraded sites can be undertaken and other aspects of the current service improved.

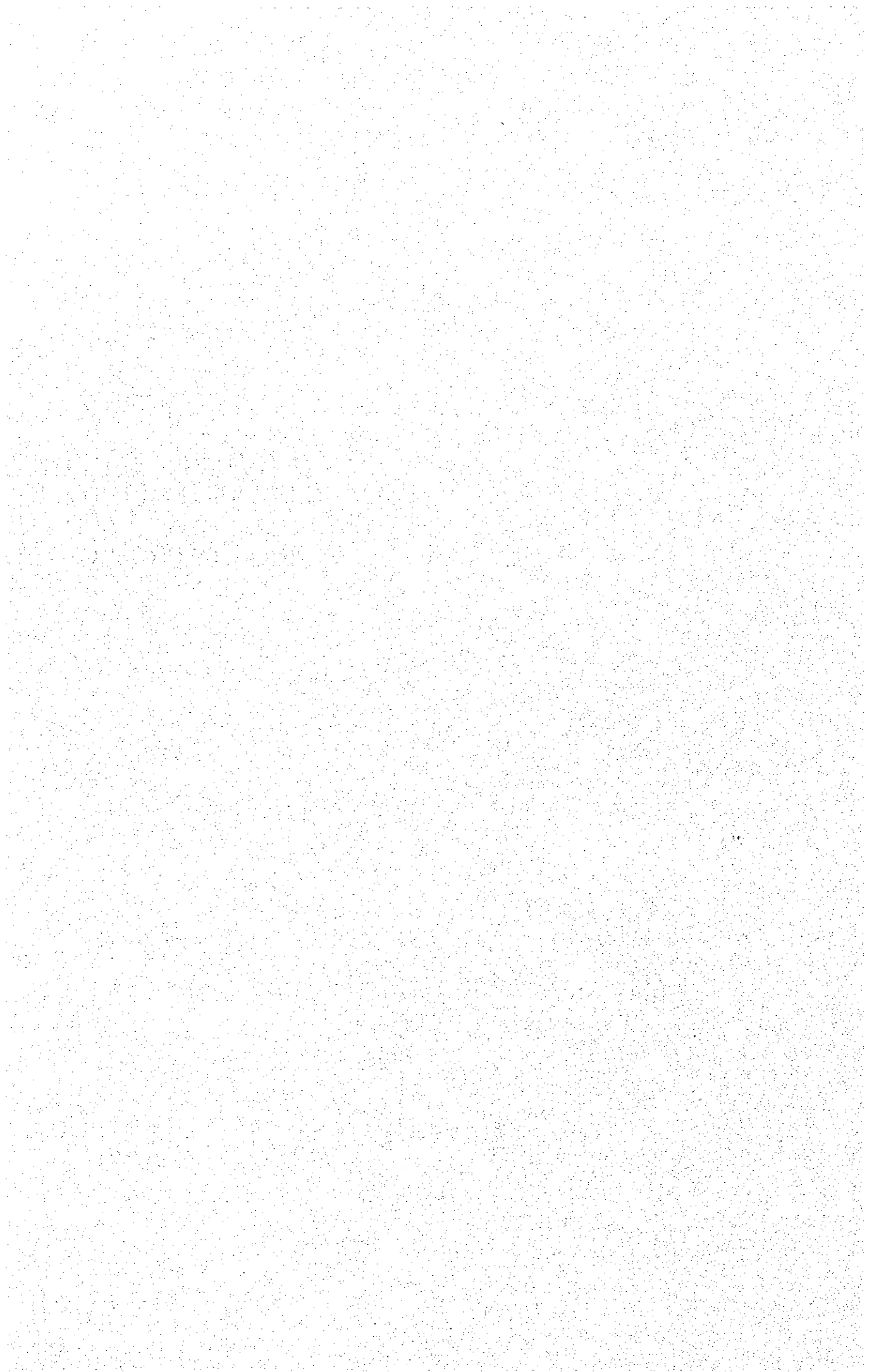
To stop further illegal dumping, development of new transfer station capacity is the top priority. Until this is done, contractors are literally forced to dump much of the collected waste illegally. Restoration of regular collection services in the individual housing areas is also a top priority to prevent the proliferation of small scale dumps in these areas.

PART III

FEASIBILITY STUDY ON
THE PRIORITY PROJECT

Chapter 12

OUTLINE OF THE
FEASIBILITY STUDY
AND
PRIORITY PROJECT



PART III FEASIBILITY STUDY OF THE PRIORITY PROJECT

CHAPTER 12 OUTLINE OF THE FEASIBILITY STUDY AND PRIORITY PROJECT

12.1 BACKGROUND OF THE FEASIBILITY STUDY

Almaty city is the largest city in the Republic of Kazakhstan with a population of 1.1 million and is the economic center of the country. Solid waste generated in the city is estimated to be 350,000 ton/year (960 ton/day) including industrial waste. Solid waste collection, management of transfer station and disposal site have been privatized since 1996. The collection companies conclude contracts with waste generators such as KSK (Resident Cooperatives) under which they collect solid waste and service charge. However, tariff of the service is set at low levels by the AMC. All the collection companies have no capability to renew equipment and facilities.

A compost plant was constructed but is not operated at present because of lack of demand for compost. It is however operated as a transfer facility. Karasai disposal site is the only approved disposal site for solid waste generated in Almaty city and it is located about 34 km from the city center. To cope with the long transportation distance, a transfer station was constructed but is not operated continuously at present due to a shortage of transportation trucks and accumulation of solid waste inside the transfer station. As a result, half of the solid waste collected in Almaty city is disposed of at other disposal sites that are supposed to be servicing neighboring towns and villages and not Almaty city. Both Karasai disposal site and the other disposal sites are just open dumping because of lack of equipment and facilities.

As explained earlier, the SWM of Almaty city is on the verge of collapse. Since solid waste collection and proper disposal is indispensable to maintain public health and cleanliness of the living environment, a sustainable system must be established. To cope with this situation, the M/P has been prepared as described in Part I to formulate a sustainable system and to achieve several specific targets in 2010.

The M/P has proposed to implement its proposals in two phases considering priority of components. First phase shall be implemented by year 2005 and consists of the following Priority Project.

- 1) Establishment of Waste Authority
- 2) Introduction of new collection systems
- 3) Construction of transfer stations
- 4) Improvement of Karasai disposal site
- 5) Model rehabilitation of Spasskaya illegal disposal site

This feasibility study is conducted for the above Priority Project which shall be implemented by the year 2005.

12.2 OUTLINE OF THE PRIORITY PROJECT

The Priority Project consists of five (5) components. Outline of each component is as follows.

1) Establishment of the Waste Authority

After privatization of solid waste collection service, a responsible organization to guarantee universal service ceased to exist. Also, all the private collection companies have poor financial base and are unable to renew their equipment. To cope with this situation, it has been agreed to establish Waste Authority of Almaty City as a 100% state owned enterprise which will be responsible for SWM throughout Almaty City.

The Waste Authority will collect all the service charge for SWM from the beneficiaries of the service. The actual collection service and operation of transfer stations and disposal site will be contracted out to private companies. Also new tariff system will be introduced to facilitate the financial base of the Waste Authority considering cross subsidy to low income groups.

2) Introduction of New Collection Systems

Although the standard of solid waste collection has been established, it is not implemented in the field because of lack of equipment. It is noted that there are many registered collection trucks but most of them are old and therefore two-thirds of the collection trucks shall be replaced within the next five years. In individual housing areas, collection service is provided mostly only once a week using dump trucks because of shortage of equipment. To improve the above situation, the new collection system shall be introduced

Table 12.2.1 Outline of New Collection System

Area	Existing system	New collection system
Block housing area (1) Frequency (2) Collection method (3) Equipment	Daily collection Container and side loader Side loader (Russian made)	3 times a week Small container & compactor 12 m ³ compactor 8 m ³ compactor
Individual housing area (1) Frequency (2) Collection method (3) Equipment	Once a week Small bin and/or bag Dump truck	2 times a week Bin and/or bag 8 m ³ compactor
Commercial area (1) Frequency (2) Collection method (3) Equipment	Daily collection Container and side loader Side loader	Daily or 3 times a week Large and small container 12 m ³ compactor and arm-roll truck

Note : Small container 1.1 m³ Large container 6 m³

3) Construction of Transfer Stations

Existing transfer station is not operated continuously because solid waste is accumulated inside the transfer station. The existing compost plant is operated as a transfer facility but has a small transfer capacity and is located within a rapidly developing residential area. Instead of this existing transfer station, new transfer stations at West and North will be constructed to transport solid waste to Karasai disposal site efficiently.

West transfer station is located beside the HES#2 power generation station in Auezovskii District and is planned to cover most of the city area except for the northern part and to transport 800 ton/day of waste.

North transfer station is located along Spasskaya road in Turksibskii District and is planned to cover Turksibskii District and the northern part of Medeuski district and to transport 300 ton/day of waste.

4) Improvement of Karasai Disposal Site

Karasai disposal site is located at a distance of 34 km west from the city center and is the only disposal site for the waste from Almaty city. However solid waste is simply open dumped there because of lack of facilities and equipment. Therefore, necessary facilities and equipment shall be prepared to conduct sanitary landfill and proper operation.

5) Model Rehabilitation of Spasskaya Illegal Disposal Site

As the result of old collection equipment and no operation of existing transfer station, there are many illegal disposal sites in and around Almaty city. These disposal sites shall be closed and rehabilitated to reduce environmental pollution. Spasskaya illegal disposal site is selected as a model for rehabilitation because it is located along a small river in the city's northern area.

Chapter 13

STEP-WISE
IMPLEMENTATION
OF THE
PRIORITY PROJECT

CHAPTER 13 STEP-WISE IMPLEMENTATION OF THE PRIORITY PROJECT

13.1 NECESSITY OF STEP-WISE IMPLEMENTATION

Although it is desirable to implement all of the components of the Priority Project as soon as possible, it is necessary to implement the Priority Project step by step considering financial constraints. It is very important that actual improvement, despite of partial implementation, shall be realized as soon as possible not only to achieve the M/P target but also to stop further deterioration of the existing system.

Considering the above, it is proposed that the Priority Project shall be divided into two stages consisting of the First Priority Project (Urgent Improvement Project) and the Second Priority Project.

13.2 ALTERNATIVES OF URGENT IMPROVEMENT PROJECT

Considering priority of each component of the priority project, there are two alternatives as shown in Table 13.2.1.

Table 13.2.1 Alternatives of the Urgent Improvement Project

	Alternative A Sector-wise Approach	Alternative B Area-wise Approach
Project components	West transfer station Karasai disposal site (equipment) Waste Authority	Collection (Individual houses and others) West transfer station Karasai disposal site (equipment) Waste Authority
Project scale	Suitable	Slightly large
Advantage	Proper project cost	Actual improvement in collection at individual houses
Disadvantage	Indirect improvement of collection service	More project cost

Although project cost of alternative B will be larger than alternative A, alternative B shall be selected because actual improvement in some areas is indispensable to receive residents acceptance to introduce new tariff system.

13.3 IMPLEMENTATION SCHEDULE OF THE PRIORITY PROJECT.

Implementation schedule of the Priority Project is set as shown in Figure 13.3.1.

Because related organizations in this sector have poor financial base and there are no appropriate organizations to implement the priority project at present, the Waste Authority shall first be established in January, 2000.

The financial source of the Waste Authority is only the service charge of SWM. Therefore, new tariff system shall be introduced immediately. It is recommended that:

- a. Intermediate tariff shall be introduced in July, 2000 including cross subsidy and unified tariff when the responsibility for providing the service is transferred to the Waste Authority instead of the collection companies (the collection companies will continue to operate the SWM services under contracts with the Waste Authority).
- b. New tariff shall be introduced in April, 2002 when universal service can be provided. The tariff shall be set to cover all of the cost.

Urgent Improvement Project shall be started from January, 2001 and will be completed in March, 2002. Also, Second Priority Project shall be started in the year 2002. According to this schedule, universal service will be provided in April, 2002 using the new equipment procured through the Urgent Improvement Project.

13.4 NECESSARY MEASURES FOR IMPLEMENTATION OF THE PRIORITY PROJECT

It is very important to understand that there is no responsible organization to provide universal service of SWM in Almaty City at present. In general, collection companies are responsible to provide the solid waste collection services at present based on contracts with waste generators such as KSK, although this situation does not guarantee universal service. The responsibility of these companies includes updating of their equipment in principal. However, they fail to follow the standards of the services required by the laws and regulations and also to renew their equipment. It is clear that they also fail to create sound financial base. Under these circumstances, it is very difficult to get financial support from others.

It is a pre-requisite for the Priority Project that the Waste Authority is established to provide universal service throughout Almaty City and to be responsible for SWM throughout the city to maintain public health and sanitary living environment in the city. Therefore, Almaty City Government must establish the Waste Authority as soon as possible.

The Waste Authority shall then make all possible efforts, within the current financial constraints in Kazakhstan, to increase its revenues and to raise finances to develop the SWM according to present norms and regulations and to ensure that the service provides universal coverage of Almaty City.

Chapter 14

FORMATION OF
WASTE AUTHORITY

CHAPTER 14 FORMATION OF WASTE AUTHORITY

14.1 WASTE AUTHORITY

14.1.1 Outline of the Waste Authority

Name	Waste Authority of Almaty City
Address	Room No. (to be found), Republic square, Almaty
Tel. & Fax	No telephone, No facsimile (to be secured)
Charter Fund	Existing state assets in the sector to be transferred from Department of Communal Services
Working capital (Circulating Fund)	140 million KZT (to be appropriated in the city budget for the year 2000)
Staff	25 persons including the Director
Date of formation	January 1 st , 2000
Registered No.	to be registered
Tax No.	to be registered

The City Akimate is currently drawing up all the necessary legal documents for the creation of the Waste Authority in accordance with Kazakh law. The following outline of the Charter lists the functional issues that need to be addressed in that document, but does not purport to cover all legal requirements for the formation of this body under the Kazakh legislation.

Table 14.1.1 Outline of Charter

<p>Objectives</p> <ul style="list-style-type: none"> • To ensure that a waste collection service for domestic and commercial wastes (excluding construction wastes) is provided in all residential and commercial areas of the city either using its own resources or by contracting out service provision • To ensure that key facilities i.e. transfer stations and disposal site(s) are provided in the city or surrounding area, to guarantee access to these facilities for all users wishing to discharge non-toxic wastes and to provide overall management of these facilities • To organize waste collection services for non-hazardous industrial wastes from small scale industry if they desire to opt-in to such a system • To collect waste management charges from all property owners or lessees of state land in residential and commercial areas of the city • To operate in such a way to ensure the long term financial stability of the sector • To provide services to the citizens of the city at the lowest possible price – i.e. it should operate as a non-profit organization <p>Funding</p> <ul style="list-style-type: none"> • All existing state owned assets used in the SWM sector shall be transferred to the Waste Authority and will form the Charter Fund of the Authority • The City Akimate will provide the working capital (recirculating funds) needed by

the Authority from the City Budget. Funding provided should be at least equal to the projected monthly turnover of the Authority

- The City Government will either borrow loan funds on behalf of the Authority or guarantee loans made to the Waste Authority

Ownership

The Authority shall be an 100% state owned enterprise of local significance – i.e. the responsible body will be the city akimate.

Governance

The board of directors shall comprise

- City Akim or his nominee
- Nominee of the Akim of Almaty Oblast
- Nominee of the National Environmental Committee
- Nominee of the Committee on Health Education &
- Nominee of GKI

Special Conditions

- It will obey all environmental regulations of the relevant state Authorities, and require its contractors to obey these regulations
- It will not invest in, lend to, lease to or guarantee loans to any entity for operations outside of the provision of basic Waste Management Services
- It will not invest in, lend to, lease to or guarantee loans to any entity for recycling operations
- It will encourage organize or manage separate collection of wastes where appropriate. It may sell non-separated or separated wastes to any commercial entity at a price below the cost of collection as long as the overall effect is to lower total charges that have to be levied on citizens

Special Powers and Responsibilities

- The Authority may require the Akim to provide a list of persons whom are exempt from the payment of the Waste Management Charge.
- The Authority may require the Akim to grant it special powers to seize property under land tax regulations where a property owner who is not exempt from payment of the Charge neglects to pay the charge.
- Power to refuse to accept toxic wastes at the transfer or disposal sites.
- Power to inspect waste loads being transported to the transfer or disposal sites
- Power to inspect any contract for the transfer or disposal of waste, on condition that commercial details will not be disclosed to third parties
- Responsibility to inform ACDEP or other responsible Government agency of the nature and quantities of wastes being transported to various sites.

14.1.2 Relationship to Other Bodies

Table 14.1.2 Relationship to Other Bodies

<p>Relationship to ACDEP</p> <ul style="list-style-type: none"> • The Waste Authority is responsible for providing services to meet the standards set by law • ACDEP and its mother body the Ministry of Environmental Protection is responsible for setting environmental standards, and enforcing them. If necessary it could prosecute the waste Authority either for faulty collection systems or failure to organize a universal service <p>Relationship to Anti-Monopoly Committee (AMC)</p> <ul style="list-style-type: none"> • The Waste Authority will be solely responsible for setting tariffs charged to householders and commercial premises, according to the principles laid down in its Charter. The AMC will relinquish control over these tariffs. The Waste Authority will however be subject to the normal audit checks imposed on all Government agencies to ensure that it is operating in accordance with its Charter. • If the Waste Authority encounters or suspects collusive practices by collection contractors, or a contractor succeeds in establishing a monopoly over collection companies so that the tendering process ceases to be an effective way to set contract prices, it may refer these matters to the AMC and ask it to set contract prices in accordance with existing Anti-monopoly legislation.
--

14.1.3 Organization Chart

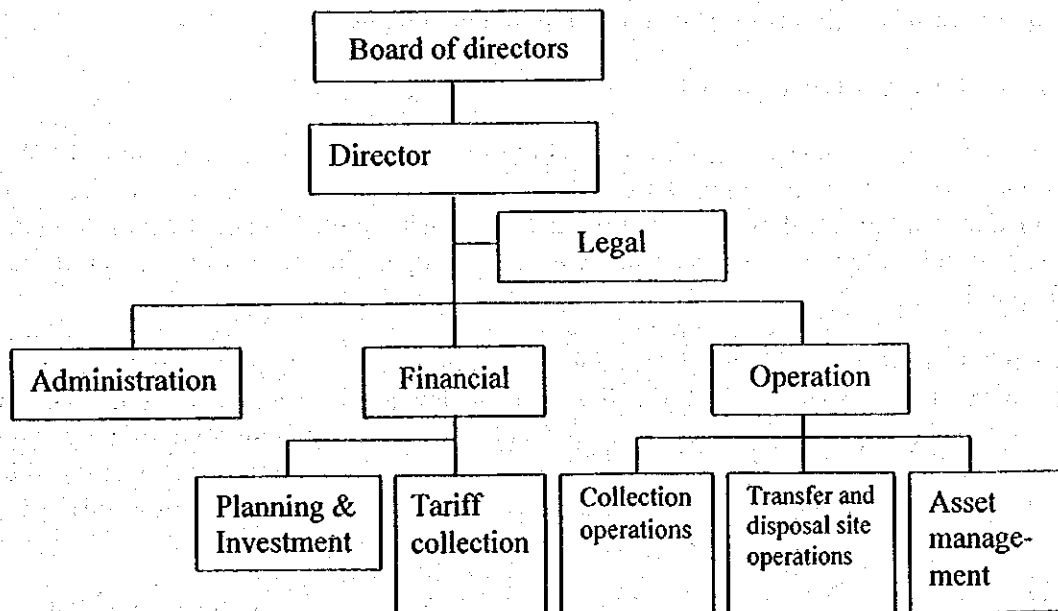


Figure 14.1.1 Organization of Waste Authority

14.1.4 Functions of Departments and Key Personnel of the Waste Authority

1) Director

The role of the director will be similar to that in most government agencies. It should be noted however that the key measure of economic performance for this entity will be minimizing total expenditures, rather than maximizing profits. This organization is designed to control total expenditures, all of which have to be recovered from the city's residents.

There are two main keys to minimizing costs, and the performance of the Director will be judged largely on his success in managing these two issues. The first is the operation of an effective tender system for collection and site management contracts which develops competition and promotes efficiency amongst the contractors. The second will be effective co-operation with various branches of the city Government to use their records of residency, land use, etc. to maximize the collection rate and to minimize the costs of collection of tariffs from households and commercial organizations

2) Lawyer

The lawyer will be responsible for all legal affairs of the Authority, but principally for the proper drafting and management of contracts between the Authority and its collection and site management contractors.

He will provide all possible assistance to ACDEP or other Environmental or Public Health Protection agencies in the prosecution of cases involving the mishandling of solid waste under environmental laws or Public Health Laws. Many cases of waste mishandling will probably be handled under the civil code where these involve breach of contracts between the Authority and its contractors. However the Chief lawyer will inform the ACDEP or other appropriate bodies of such actions and seek their opinion whether further action is justified under environmental laws.

3) Director - Operations

The operations manager will be responsible to the Director for the provision of SWM services throughout the city. This will involve responsibility for overall design of collection and disposal systems, letting and supervising collection contracts throughout the city and for letting and supervising contracts for operation of the transfer stations and disposal site.

He will be primarily responsible for management of the tendering process with assistance from the legal department who will advise on the legal structure of contracts. The operations manager however will be responsible for ensuring that the tendering process is managed in a commercially realistic manner to ensure that competition is encouraged for collection and site management contracts. He will also be responsible for ensuring that the Waste Authority provides a service in all areas of the city.

He will also be ultimately responsible for maintaining a register of all contracts between industrial enterprises and collection companies for the delivery of wastes to the transfer station(s) or directly to the disposal site. (Under the special powers listed above the Waste Authority will have the power to inspect all contracts for the transport of waste to its sites. - see "Special Powers and Responsibilities" section in Box 14.1.1)

The Operations Department will be broken into three sections as follows:

(1) Collection Operations

The city will be divided into ten zones, the six districts with the two largest districts divided into two parts. A zone supervisor will be appointed for each zone. Each supervisor will oversee one or two zones only.

The supervisor will be responsible for identifying collection routes in the zone to ensure complete coverage and to allow efficient operation of trucks. He will also ensure that the location of container platforms is appropriate, and that an adequate number of containers is supplied to each platform. Where the numbers are changed he will inform the Tariff collection department to ensure that tariffs in this region are adjusted.

Under the supervision of the Operations Manager he will manage the tendering process for collection runs in his zone. This process needs to have some flexibility in specification of routes particularly if the tenderers have different capacity trucks. (Tenderers should be given the opportunity to combine several runs and to redivide them to suit their particular equipment. However in such a circumstance they would have to show that they still achieve total coverage of the area.)

He will be responsible for the initial investigation of all complaints from residents in his area about the performance of the service. He will be responsible for advising the operations manager and the legal department if appropriate, on the need for action against the contractor, KSK or resident for breach of civil contract or the need to refer the matter to ACDEP for breach of environmental laws.

(2) Transfer and Disposal Site Operations

This section will supervise operations and access to the transfer station site(s) and disposal site. Staff to operate weighbridge(s) and control entry and exit to the site will be provided by the operator under the management contract. However the Waste Authority staff will approve access arrangements.

Collection contractors working under contracts let by the Waste Authority will be supplied by the Authority with coupons covering the contracted tonnage. Other collection contractors or entities using these facilities will pre-purchase coupons from the Waste Authority. These will be collected at the site by the contractor operating the site on behalf of the Authority.

This section may as appropriate delegate its powers to inspect loads to verify that no toxic wastes or other unacceptable wastes are accepted at these sites to the contractors operating the sites on behalf of the Authority, but will oversee inspection arrangements.

(3) Asset Management Section

The authority will own the transfer stations and disposal sites. In addition at least during the first five to ten years of operations it will own the equipment used at these sites (transfer trucks, earthmoving equipment at the disposal site etc). It will

also own most of the collection fleet in the early years. This equipment will be leased to the collection contractors.

This section will monitor the adequacy of maintenance and operating procedures adopted by the management contractors and lessees of the equipment. If differences with the contractor cannot be resolved through discussions he will advise the legal department of the possible need to launch actions for breach of the management contract.

This section will also advise the Planning and Investment Department of projected replacement needs for equipment.

4) Director - Finance

The Director - Finance will be responsible for overall financial management. He will supervise payments to contractors, and collection of all charges, both for the provision of collection services and for access to the transfer stations and disposal site by third parties. He will supervise the preparation of the Authority's budget and be responsible to the Director for meeting this budget. He will be responsible for ensuring that total revenues collected cover all expenses of the Authority. He will also be responsible for managing any reserves that are accumulated by the Authority (The maximum size of these reserves should be specified in the legislation establishing the Authority).

5) Planning and Investment

This section will be responsible for preparing the budget of the Authority and estimating the tariffs that should be charged for all the different services provided by the Authority. The tariffs charged to households and commercial organizations should reflect the collection and disposal costs actually incurred (as indicated by contract prices) and the rate of waste generated as indicated by the number of containers provided in an area. Tariffs charged for third party access to the transfer stations and disposal site shall reflect a fair allocation of expenses between the services provided to the third party and the Authority's own contractors.

This section will also be responsible for planning transition arrangements, the introduction of new collection timetables and planning for the introduction of new style containers.

It will also manage the public awareness campaign that will precede the introduction of new schedules and collection arrangements, co-ordinating with collection operations staff in individual areas.

6) Tariff Collection and Payments

This section will be responsible for calculation of fees to be collected from all households and commercial entities for provision of solid waste collection services, and for sale of coupons to third parties for access to the transfer and disposal facilities. In most cases the physical collection of moneys will be handled by the Bank(s) and/or KSK's. The preparation of schedules of payments may also be contracted out to the existing "Computation Centers" that are currently preparing these notices for many of the KSK's in the city.

This section will also be responsible for preparing lists of fees receivable from recipients of the service. These will be calculated from records provided by various departments of the Akimate on land and building ownership (or residency – depending on the final basis selected for liability for payment of waste fees) and on eligibility for social security concessions. These lists will be supplied to the physical collection agents. The staffing requirement for this task might have to be adjusted once access arrangements to social security data or its equivalent are finalized.

This section will also be responsible for reconciling the payments received from the collection agents (banks and KSK's) against the fees payable and in initiating recovery actions against non-payers. They will also handle requests from residents for changes to their status and liability to pay the waste collection charge.

In addition the section will process payments due to contractors and other creditors of the Authority.

14.2 PREPARATION FOR ESTABLISHING THE WASTE AUTHORITY

14.2.1 Initial Steps

1) Preparation of Initial Capital

(1) Charter fund

All existing state owned assets used in the SWM sector shall be transferred to the Waste Authority

(2) Initial working capital

The initial working capital shall be secured from the city budget in 2000. As annual revenue and expenses will be 1.4 billion KZT in 2005, it is desired to secure 140 million KZT (10 % of annual expenses).

The contribution of sufficient working capital for the Waste Authority is essential to its success. It must establish proper commercial relationships with its sub-contractors, including paying them on time in accordance with their contract terms. This will be a major step towards developing competition and encouraging new entrants to the sector.

2) Preparation of Akim's decree to establish the Waste Authority

This should specify the powers and responsibilities of the Waste Authority, taking into account the items already included in Box 14.1.1. The study team understands that the staff of the akimate are already preparing this decree.

3) Preparation of duty statements for Waste Authority personnel.

These need to be prepared by akimate staff taking into account all requirements of relevant Kazakh legislation to cover the duties outlined in Section 14.1.4.

4) Selection of Key Staff of the Authority

A suitable General Director, Operations Director and Finance Director need to be selected and appointed as quickly as possible to take over the day to day steps necessary to start operations of the Authority on 1 January, 2000.

5) Preparation of draft Agreement for transfer of collection contracts from KSK's to the Waste Authority

Immediately after the inception on the Waste Authority, and the commencement of tariff collection by the Waste Authority rather than the collection companies, it will be necessary to negotiate the transfer of existing agreements between the collection companies and the KSK's etc over to the Waste Authority, so that the collection companies can be paid by the Waste Authority.

A draft agreement for this transfer should be prepared and discussed with the companies before the Waste Authority is formally created so that this transfer is as rapid as possible.

6) Preparation of draft of public awareness program to ensure citizen's acceptance of new tariff system

The formation of the Waste Authority should be accompanied by a public relations campaign to explain the objectives of the Authority and the medium term benefits for the residents of Almaty. This campaign will also have to justify the initial rise in tariffs, in part to cover the costs of the cross-subsidy scheme (see section 14.3.4)

7) Preparation of an office suitable for the Waste Authority and necessary furniture and equipment

Suitable office space in Akim's office shall be secured because it will be free of charge. Also it is expected that all of electricity and telephone charge including solid waste collection charge will be paid by Akimate budget.

14.2.2 Schedule for Establishing the Waste Authority

The Waste Authority shall be established in January, 2000. The Waste Authority will be the implementing body for the Urgent Improvement Project. (It will assume the role of a PIU – Project Implementation Unit often established to co-ordinate foreign aid projects.)

A draft timetable for the transfer of functions to the Waste Authority is shown in Figure 14.2. The key dates are:

- | | | |
|----|---|----------------|
| a. | Akim's order on establishment of Waste Authority | |
| | Establishment of Waste Authority | January, 2000 |
| b. | Completion of the Agreement with collection companies | July, 2000 |
| c. | Akim's order on relationship between resident and Waste Authority | |
| | Introduction of Intermediate tariff | July, 2000 |
| d. | Start of the tender for contract out | October, 2000 |
| e. | Completion of preparation for Urgent Improvement Project | |
| | Preparation of Second priority Project | December, 2000 |
| f. | Completion of contract out | July, 2001 |
| g. | Completion of Urgent Improvement Project | April, 2002 |
| h. | Provide universal service and introduction of New tariff | April, 2002 |

Figure 14.2.1 Establishment of Waste Authority - Transfer of Responsibilities

Responsible body	Transformation Period											
	1	2	3	4	5	6	7	8	9	10	11	12
1 Responsible body	Present situation											
2 Main Event	Collection company						Waste Authority					
	Establishment of Waste Authority						Contract Contract Contract Group A Group B Group C					
	Akims order to establish Authority						Tender Group A Tender Group B Tender Group C					
	Negotiation of Agreement with 34 coll. companies and with Parasat						Akims Order (responsibilities of residents and Waste Authority)					
3 Money Flow	Resident KSK						Resident (KSK)					
	Bank						Bank					
	Coll. Company						Waste Authority					
	Mix of existing and new arrangements						Agreement Coll. Company					
4 Contract	Resident (KSK)						Relations between residents and Waste Authority based on Akims Order					
	Payment Service Coll. Com.						Waste Auth. Coll. Com.					
5 Service	By existing coll. comp. based on existing contract						By qualified company based on contracts					
6 Tariff	Present Tariff						New tariff (Full cost recovery and univ. service)					
7 Leasing Equipment T/S and D/S	As existing						Leasing to qualified company					
8 Project Urgent project Second project	JICA Study						Procurement and construction Tender					

14.3 CROSS SUBSIDY AND NEW TARIFF SYSTEM

14.3.1 Principles of New Tariff

On the one hand to keep the burden on the service users as low as possible, on the other hand to keep the business operation of the Waste Authority sound and stable, principles for tariff setting should be established. Following are such principles for the tariff of the new SWM system:

1) Tariff be set to cover all the production cost of the service

Costs to be covered by the charges include capital investment costs as well as O&M costs for SWM services. The following points should be taken into consideration.

Firstly, in many countries capital investments for social services are financed by general taxation. However due to the financial difficulties of the City and the central government, they must be financed from user charges. If the ability of the residents to pay is limited, then there may be justification for foreign aid.

Secondly, that the need to recover costs through user charges should encourage financial discipline and cost efficiencies in the Waste Authority. This requires a separate budget for the Authority, and clarification of management responsibility.

Thirdly, cost recovery should be improved by reforming the budget system and improving efficiency of SWM operation on a step-by-step basis.

Fourthly, where operating costs cannot be fully recovered through a waste charge after improving cost efficiencies, tariff should be increased sufficiently to erase the deficits.

2) Charges to be collected by the Waste Authority

Charges should not be collected by the contractors of waste collection in order to simplify the money flow from the users. Charges should be collected by the Waste Authority which will have more appropriate powers to enforce collection of the charges. Charges for collective (block) houses, however, should be collected through KSK's since this system is presently established.

3) Tariff to be based on the waste amount collected from each category of user

Estimated costs are allocated among service users in accordance with their waste generation or disposal. Based on these allocated costs, charges are to be set to cover fully the costs for each category of users.

4) For low income households, charges to be exempted (Cross Subsidy)

Low income households should be exempted from the charge in order to lighten the burden on them. Details are discussed in the following section.

14.3.2 Cross Subsidy

It is inevitable that tariff rates will have to increase to fund the improvement of SWM services. Thus, rates should be differentiated among income groups of households in order to lighten the burden on low income households. Firstly, average cost is calculated for each category of user before cross subsidy. Then, the rates are differentiated among income classes of households according to the following simple principle:

- Households with incomes in the lowest quartile should be exempted from SWM fees. The tariffs for the remaining 75% of households should be increased to fund this exemption.

The First quartile for household income is KZT 3,569 (see Section 6.3 Financial Limitation), which is almost the same as the average pension of KZT 3,561.3¹. Thus, for example, if a pensioner receives only pension and its amount is average or less, he/she does not have to pay the SWM fees.

Note, a cross subsidy between households and commercial/industrial entities is not recommended. Such a cross subsidy would not work effectively for the following reason. If commercial/industrial entities can mark up the prices of products to keep up the business profit, high as well as low income households have to buy the products at higher prices, partially negating the effect of the exemption for low income households. Worse, this price increase affects households regardless of their waste discharge. If commercial /industrial entities can not mark up prices, their business profit will decrease and salaries of workers (or households) will decrease in turn, reducing the income especially of low income households.

14.3.3 Required Charges

The present collection rate of charges is approximately 70% (see 2.8.2 Present Conditions of Almaty City). It is expected that the rate would be increased since the quality of service would be increased and the Waste Authority has more effective powers to collect charges. Hence, it is assumed that the collection rate will increase to 90% after the establishment of the Waste Authority.

It is necessary to collect KZT 1.2 billion of total charges in 2005 and KZT 1.4 billion in 2010 assuming that the long-term loan will be prepared with annual interest rate of 8%. Required charges are as follows.

Table 14.3.1 Required Tariff Rates of Users

	2005	2010
	Rate (KZT)	Rate (KZT)
Domestic	77.1 /person/month	82.0 /person/month
Commercial	4,150.8 /ton	4,024.9 /ton
Medical	4,150.8 /ton	4,024.9 /ton
Transfer Station	2,075.4 /ton	2,012.5 /ton
Disposal Site	1,037.7 /ton	1,006.2 /ton

Note 1) VAT is not included in costs.

2) Tipping fees at transfer stations and the disposal site are set at 50% and 25% of the collection charge respectively.

¹ Figure supplied by the Statistical Department of the City.

14.3.4 Implementation Schedule

1) Step by Step Approach

Implementation of the new SWM system will inevitably increase tariff rates partly because the existing rates have been based on incorrect assumptions on collection rates and on abnormally low depreciation charges based on historic costs rather than replacement costs, and partly because the quality of SWM will be improved.

Since it would be difficult to introduce the new tariff in one step, it should be introduced in several steps. The new tariff should be introduced in accordance with the progress of the Procurement Plan, which will improve the quality of SWM services. Provisionally the timetable should be:

- July 2000: Start of Waste Authority's service
- April 2002: Start of Universal Service

2) Results of the Financial Projection

The results of the financial projection (Section 9.8 Financial Plan) suggest the following rates should be applied for domestic waste. This assumes that the Authority will be charged 8% interest on long-term loan US dollar loans, and that the cross subsidy system will be introduced.

Date	Household tariff
July, 2000	55 KZT/person/month
April, 2002	75 KZT/person/month

According to the forecast of the household income, the average disposal income of households in the top 75% income group is as follows:

Table 14.3.2 Estimated Disposable Income of Higher 75% Households

(per person, monthly; KZT)

1999	2000	2001	2002	2003	2004	2005
6,495.7	6,625.6	6,758.1	6,893.3	7,031.1	7,171.8	7,315.2

Source: JICA Study Team

Note) Since the aggregated income of higher 75% households is estimated at 87.8% of that of the whole households, the former is 1.17 (= 0.88/0.75) times larger than the latter.

The proposed tariff of 75 KZT/person/month is approximately 1.0% of the estimated average disposal income of higher 75% in 2005.

14.3.5 Feasibility of Introducing New Tariff

Introduction of the new tariff may be seen as difficult. On the one hand the City Government may be reluctant to force an unpopular increase charge in the current environment of economic hardships, particularly when there will be no obvious immediate improvement in service. On the other hand the City Government will be aware that no potential donor or lender will provide finance until it has shown that it is prepared to adjust the tariff system to ensure that the service will be sustainable in the medium and long term.

The study team notes that the introduction of the cross subsidy is unlikely to have little actual effect on the amount of cash collected. In practice the cross subsidy will largely

regularize the existing situation where of the order of 30% of the residents are not paying the existing tariff, in many cases due to poverty.

The rise in tariff can be partly justified by the introduction of the cross subsidy scheme, which the City Government is introducing to help the poorest residents of the City. The existing tariff was calculated on the assumption that all residents would pay the tariff. The cross subsidy scheme recognizes that collection of fees from the poorest households is not realistic. The higher tariff is partly the result of recognizing the actual rate of collection.

14.4 CONTRACT OUT

14.4.1 Effective Privatization

The effective implementation of contracting out arrangements is central to Institutional reform and real privatization of the sector. Contracting out is intended to harness the skills of the private sector to improve the efficiency of service delivery, while retaining public control over identification of the services that should be provided. The privatization that has taken place in the sector to date is largely illusory. It has simply allowed the management of the old state enterprises to gain more direct control over the cash flows.

The structure that is desirable in the longer term is easy to identify. Hopefully a few large companies as well as smaller companies will emerge and compete for all major contracts in the sector, both for the operation of collection services and the operation of transfer and disposal services.

Eventually these companies will either own or lease from private financial institutions all the equipment required (collection trucks, transfer trucks and mobile equipment needed at the disposal site). The only major assets that will remain state owned are the actual transfer and disposal sites and the major fixed facilities on those sites.

Over half the costs of operation of Waste Management services are capital related costs (depreciation and financing costs – interest on debt or dividends on equity – for the equipment). Until the private sector is directly responsible for these costs so that it is financially rewarded/penalized if it utilizes this equipment efficiently/inefficiently privatization of the sector will not be effective.

This is a long term objective. Given the current weakness of the private sector, it will be at least ten years before such a scenario will be realistic. Initially much of the equipment will have to be purchased and owned by the Waste Authority. Management of the contract out system must take account of the transitional problems and take care to encourage the development of private sector capabilities to acquire and operate the equipment that is needed.

In the short term it is especially important to encourage efficient use of capital equipment. There will remain a shortage of equipment for some time, making it practically impossible to provide universal coverage. Increasing the degree of coverage of services

will in the short term depend on increasing the productivity of existing equipment whether by better manning arrangements, maintenance procedures or whatever.

14.4.2 Ownership Arrangements

1) Containers

All containers should be owned by the Waste Authority. Ownership of existing containers should be transferred from the KSK's and KSD's to the Authority on its formation. The condition of almost all containers is very poor, so no cash payments for these containers appear to be justified.

Even in the long term the Waste Authority should retain ownership of containers. This will facilitate the change in container design when new collection procedures are introduced. Particularly during the transition phase when old style containers are used in some areas, and new style containers are used in other areas, it will make the relocation of containers easier and prevent conflicts arising between the Authority and KSK's. If the KSK's retain ownership, conflicts will inevitably arise when KSK's try to avoid expenditures on new containers to meet Waste Authority requirements to change containers to match new collection equipment.

In the longer term ownership of the containers by the Authority will facilitate its role in ensuring universal coverage. It will be far easier for it to adjust the number of containers at existing locations, and introduce new containers if it retains ownership of these.

2) Collection Trucks

On the formation of the Waste Authority, all state assets used in SWM are to be transferred to the Authority. This includes most of the existing collection trucks except for a few that have been purchased by some of the small private companies.

Most of the fleet currently operated by Parasat are actually state assets that should be transferred to the Authority. The study team has been refused any information on the purchase arrangements for the new trucks that Parasat has promised to acquire. The team is therefore not in a position to judge whether de jure these will be state or private assets.

The project as a matter of urgency will quickly replace a significant proportion of the existing fleet. These will be state assets controlled by the Waste Authority. They will be either a grant, in kind, made to the city of Almaty or purchased under a loan made either to the city or directly to the Waste authority and guaranteed by the Republican or City Government. The arrangements for the use of this equipment by private collection companies is discussed below.

The procedures to evaluate bids for collection contracts are detailed later and are designed to encourage the collection companies to acquire their own equipment. It would be desirable for the companies to become totally self sufficient for equipment quickly. However, for financial planning purposes, the team has assumed that by the start of the first replacement cycle in 2006, the private sector will be acquiring only half of the total number of new vehicles required as replacements. The balance are assumed to be acquired by the Waste Authority.

Never the less this will represent a significant input by the companies into the decision process on the actual life cycle² that is appropriate in Kazakhstan, and on the particular equipment that is most suitable for local conditions.

The Waste Authority will not choose the trucks acquired privately by these companies. The collection contracts will include specifications of containers to be handled, and also include other performance requirements (such as limits on allowable spillage), but it will be the responsibility of the companies buying trucks to determine whether their projected purchases can meet these specifications.

Of course the Authority will be required to announce well in advance any planned changes to the technical specifications of containers or other performance requirements.

3) Transfer Trucks

The existing trucks used for this purpose are state property which will be transferred to the Waste Authority on its formation. Replacements required before 2006 are assumed to be financed by the Waste Authority; replacements after that date by the private sector.

4) Earthmoving Equipment (Disposal site)

Current equipment (which is in extremely poor condition) is state owned, but will be replaced as quickly as possible under the M/P. Initial acquisitions will be financed by the Waste Authority, but replacements after 2006 should be financed by the private sector.

14.4.3 Leasing by the Waste Authority

Much of the equipment that will be used by the contractors will actually be owned by the Waste Authority, but "leased" to the contractors. In an ideal situation, the contractors would lease this equipment from a financial sector entity which would be independent of the Waste Authority. This would provide a separate check on the financial viability of the arrangements. This separate financial organization would itself be exposed to financial risks if over-investment occurred, and so in its own interests would vet all new investment proposals. (For example if too many specialized collection trucks were bought it would end up repossessing trucks from lessees who could not pay the leases due to lack of contracts; the finance company would then find that there was no secondary market for these repossessed vehicles).

Such a separation of functions (leasing of equipment and management of contracts) is not feasible in current conditions Kazakhstan. There is little practical option except for the Waste Authority to lease the equipment to the contractors. Given that the contractors would have to pay the lease fees out of money paid to them by the Authority under the collection contracts, the team recommends that there is no actual monetary payment from the contractors to the Waste Authority for the use of equipment. This reduces the

² The life cycle of equipment is a function not only of technical but also economic factors, and we expect that the optimal life cycle for this equipment will be longer in Kazakhstan than in Japan where factor costs are dramatically different. Life expectancies have been assumed for the purposes of financial planning for the Authority, but of course one of the objectives of privatization is to provide incentives for optimizing the actual life of this equipment, and so actual life cycles may change once effective privatization takes place.

financial risks to the Authority from bankruptcy of collection companies, and also avoids possible confusion on the liability of these payments to VAT.

However for the purpose of comparing bids for the selection of the winner of tenders, a deemed lease payment for the use of the equipment is to be added to the contract bid price, where Waste Authority equipment is to be used by the contractor.

This deemed lease payment should be based on:

- Depreciation charge for the equipment based on purchase price for new equipment or the current market value for existing equipment, using the life expectancies laid down in the financial plan for the Authority;
- A deemed interest charge calculated on the full depreciated value (book value) of the equipment at a rate of 15% if the lease is deemed to be written in US dollars or 25% if the lease is deemed to be written in Kazakh tenge.

These interest rates should be used to calculate the deemed lease charge even if the Waste Authority is given the equipment under a grant program, or is able to purchase the equipment using a loan with a concessional interest rate.

These deemed lease payments reflect the real opportunity cost of capital in Kazakhstan, and underline the need for prudent use of capital. The size of this deemed lease payment both reflects the underlying economic conditions in Kazakhstan, but also provides a very substantial incentive for contractors to acquire their own equipment so that they can quote a lower overall price (after adjustment by this deemed lease payment).

14.4.4 Contracts to be let

The following major contracts will be let by the Waste Authority for the operation of Waste Services.

- a. Collection contracts for the ten collection zones supervised by the Authority
- b. Management of West transfer station
- c. Management of Spasskaya transfer station
- d. Management of Karasai disposal site

For monitoring of collection, the Authority will divide the city into ten zones, with a supervisor responsible for each zone. When letting collection contracts, these zones may be sub-divided into several sub-zones, and separate tenders called for each sub-zone. The decision to subdivide these zones will be a commercial decision of the Authority that will depend on the perceived capabilities of the tenderers. The size of a sub-zone should be chosen to maximize competition, and to provide the newer smaller companies a realistic chance of winning some tenders. A final decision on the sub-zones may be delayed until the completion of the pre-qualification process for tenderers.

14.4.5 Tendering Process

There is still little experience in the tendering and contracting process in Kazakhstan. Often it is seen as a new legal form to replace the old work orders that were issued by higher administrative levels to the operational sections of their organizations. While there are many similarities, there are also important differences that must be understood before the tendering process can make a real contribution to efficiency improvement and cost reduction.

The old system tried to control all the inputs and steps to be undertaken by the work-team, and was based on an extensive system of norms. Payment was also based on these systems of norms. Quality control was also based almost exclusively on extensive monitoring of the inputs.

A tendering and contracting system however should be based wherever possible on specifying and monitoring outputs, not inputs.³ Obviously this is not always possible and in practice a contract will in some instances have to specify inputs to be supplied based on standards similar to the Soviet system of norms. A detailed understanding of the differences requires a lot of practical experience, and cannot be fully specified here. Indeed potential donors may well consider providing some practical technical assistance to the Waste Authority after its formation to help it develop its contracting procedures.

The economic rationale for changing from an administrative work-order system to a contractual system is to provide flexibility and scope for innovation and improvement in how inputs are used to produce the required output. Thus for example a collection contract would not specify the truck crew to be used by the contractor. That is for the contractor to determine to minimize his overall costs. However improvement of economic efficiency may require other policy reforms as well as the introduction of proper contracting procedures.

For example for several years the shortage of collection vehicles will persist. Increasing the coverage of the collection system will depend on increasing the productivity of the existing fleet (of Russian manufactured trucks). These trucks were designed for one-man operation, but require time consuming moves by the driver from the driving controls to the hydraulic loading controls. Productivity might be improved by having additional crew ride at the rear of the truck to speed up loading operations. Thus it would be wrong for the contract to specify the crew arrangements in accordance with the current norms. But simply leaving the contractor the option of using different crewing arrangements will not necessarily result in better crewing arrangements. If the current leasing charges paid by the collection contractors (in some cases as low as KZT 700 for three months) are retained, the contractors will not change existing crewing arrangements. Given the low lease costs, the contractor has no incentive to improve the productivity of the truck. His only concern is productivity of labour.

If however the deemed leasing charge based on opportunity cost proposed in 14.4.3 is introduced then the contractor will attempt to optimize crewing arrangements to balance productivity of the truck with productivity of labour. The deemed leasing charge for say a KO 413 collection truck will of course depend on its age and condition, but could exceed 20,000 KZT per month. Employing additional crew to raise truck productivity will then be an option that the contractors may wish to consider.

³ For example a contract for the construction of a concrete slab on compacted land-fill might specify objective tests (to be carried out by an independent laboratory) that must be passed to show that the level of compaction was achieved, and the sampling and testing process for concrete cores to be taken from the cement during the pour (again to be carried out by an independent laboratory). In contrast, the work order from earlier times specified the compaction procedure to be used and only required verification that the compaction rollers had passed over the fill the number of times required by the norm. Similarly it concentrated on verifying that the norms specified for mixing the concrete had been followed rather than verifying that the concrete placed actually had the strength required and predicted by the norm.

1) Steps in the Tendering Process

(1) Pre-qualification of tenderers

The Waste Authority should invite through public notices all potential bidders for contracts to register with the Authority. The Authority will then determine those companies that are qualified to perform various waste management services. Requests to tender will only be forwarded to these pre-qualified tenderers.

The information to be supplied in this qualification process should include:

- Evidence that the company holds any licences required by ACDEP or other Government agencies to perform Waste Management Services
- Copies of audited accounts of the company (so that the Waste Authority can assess the financial capability of the company to carry out contracts)
- Brief description of technical capability of the company

Based on its assessment of the capabilities of the registered companies, the Authority will finalize its selection of sub-zones for collection contracts.

(2) Request for Tender

The Authority will issue requests for tenders to all pre-qualified contractors. These requests will specify the tasks to be performed, closing date for tenders and the process that will be followed in evaluating the bids. These bids will be solicited on the express undertaking of the Waste Authority that all responses will be treated as "Commercial-in-Confidence"; That is details of the bids will not be disclosed by the Authority. Further details are included in 14.4.6.

(3) Submission of bids

Companies wishing to compete for the contracts will submit bids in accordance with the request for tender by the specified date. The Authority will have the right to reject bids that do not conform to the terms of the request.

(4) Evaluation of bids

The Waste Authority will evaluate the bids in accordance with the procedures outlined in the request for proposals and select the winner within the timeframe specified in the request for proposals. The evaluation process may include an evaluation of the technical proposal, experience of the enterprise and of the staff as well as an evaluation of prices.

(5) Contract

The winning bidder will be invited to enter into a contract based on the terms specified in the request for tender and the bid submitted by him.

14.4.6 Contents of Requests for Bids

The requests for bids will at a minimum include the following details:

1) For Collection Contracts

(1) General description

- Period of contract
- Area to be covered
- Allowable times for service (Hours within which collection must be completed)
- Frequency of service (days of operation)
- Location and number of containers (or location of pick up points for open systems)
- Maximum change that must be allowed to number of pick up points and number of containers (if applicable)
- Validity period required for bid
- Closing date for submissions

(2) Technical/Performance

- Specifications of containers to be handled (or loose bags to be collected)
- Minimum space available at collection points (and limited releases of responsibilities of the contractor if Waste Authority fails to meet these specifications)
- Limits on allowable spillage etc
- Any other special conditions – noise limitations etc.

(3) Penalties for non-performance

- Penalties in the event of spillages etc
- Penalties for non-collection
- Penalties for collection outside specified hours (critical to prevent contractors proposing unrealistic schedules to win tenders)
- Breaches rendering contract liable to cancellation

(4) Financial

- Payment terms – frequency of payments etc.
- Insurance required to cover third party risk

(5) Equipment lease

- Equipment available for hire
- Deemed lease charge for this equipment
- Maintenance requirements for this equipment
- Procedures for monitoring of equipment condition by Waste Authority
- Insurance requirements for equipment
- Approved organizations for carrying out maintenance on this equipment
- Options for purchase of equipment

(6) Evaluation procedures

- Specific tests to be applied to judge technical capability to carry out services as proposed

- Price comparison procedures, especially highlighting how the deemed lease charge will be used to adjust bid prices and compare bids from companies using Authority equipment with companies using their own equipment
- Procedures for treating non-conforming bids

2) For site (transfer or disposal) management contracts

(1) General description

- Period of contract
- Times of operation
- Access controls to be applied (including collection of coupons for Authority etc)
- Frequency of service (days of operation)
- Tonnages to be handled)
- Maximum change to tonnages that may be imposed by Authority
- Validity period required for bid
- Closing date for submissions

(2) Technical/Performance

- Specifications of facilities provided on site
- Specifications of vehicles to be accepted
- Operating rates to be achieved
- Limits on allowable spillage, etc.
- Procedures that must be adopted (such as covering waste daily at disposal site)
- Any other special conditions – noise limitations etc.

(3) Penalties for non-performance

- Penalties in the event of spillages, failure to follow designated procedures (such as failure to cover landfill at the disposal site) etc
- Penalties for failure to maintain operating rates
- Penalties for closure during specified operating hours
- Breaches rendering contract liable to cancellation

(4) Financial

As for collection contracts

(5) Equipment lease

As for collection contracts

(6) Evaluation procedures

As for collection contracts

14.4.7 Contents of Bids

Bids submitted by potential contractors should include

- A technical proposal describing how the service will be performed to meet the requirements of the Authority
- A legal section addressing all specific requirements of the Authority either explicitly accepting or rejecting these conditions. (The bidder should understand that if he rejects any condition the Authority may reject the bid.)
- A financial section where prices and price variations are specified. Price variations should cover
 - ⇒ Price variations due to inflation, currency fluctuation etc
 - ⇒ Price variations due to change of scope of work – number of containers to be emptied, tonnage to be accepted at disposal site etc.

This section should also specify the period for which the price remains valid and optionally variations that may be applicable if the Authority asks to accept the bid after this period has expired.

14.4.8 Contract Period

The study team recommends that initially contracts would be signed for only one year. Once some contractors acquire some of their own equipment, then contract periods should be extended to say three to five years. This may be necessary to provide contractors reasonable security for their planned capital investments. This will almost certainly be necessary for collection contracts, as most of the equipment cannot be used for other purposes. Much of the equipment required for the site management contracts, especially management of the disposal site, has alternative uses. Long term contracts will not be as important in these circumstances.

Chapter 15

**INTRODUCTION OF
NEW COLLECTION SYSTEM**

CHAPTER 15 INTRODUCTION OF NEW COLLECTION SYSTEM

15.1 PLANNING CONDITIONS

15.1.1 Targets of the Priority Project

1) Urgent Issues

The problems of the waste collection in Almaty city have been discussed in Chapter 2 and can be briefly described as follows:

- Poor conditions of the equipment in operation
- Discrepancy in collection service levels between areas of the city
- Long distances to the disposal site and lack of transfer capability

In order to resolve these issues the M/P has introduced a new collection system based on operation of more efficient compactor trucks coupled with a more rational discharge system and construction of transfer facilities.

2) Established Targets

Although presently about 75% of the generated domestic, commercial and medical waste is collected only 55% reaches the Karasai disposal site, the only sanctioned disposal site for the Almaty city waste. Of the remaining 20%, half of the amount is taken to the Spasskaya disposal site and the remainder to dump sites surrounding the city and originally constructed to serve areas outside it. However these sites are closer than Karasai disposal site.

The M/P has set the target for collection of 100% of the generated waste (excluding 10% for recycling) by the year 2010. The target for both the collection service and transport to Karasai disposal site in the year 2005 has been set at 95% for the following reasons:

- Construction of two transfer stations will cover the required waste transfer amount demand
- New collection system will be introduced in individual housing areas, urgent areas of block housing and commercial areas involving new compactor trucks which will enhance the truck fleet capability

15.1.2 Waste Amounts to be collected in 2005

Taking into consideration the target set for the year 2005, and the waste types to be collected through contract-out by the Waste Authority, the waste amounts are shown in Table 15.1.1. The average daily waste amount in the year 2005 is 829 t/d and considering 6 days/week collection the amount shall be 967 ton/d.

Table 15.1.1 Waste Amount in 2005

Waste type	1999		2005	
	Ton/day	Share of domestic (%)	Ton/day	Share of domestic (%)
1. Domestic Waste				
(1) Full conveniences (BH)	284	60%	297	61%
(2) Partial conveniences (BH)	43	9%	55	11%
(3) No conveniences (IH)	147	31%	131	27%
Sub total Domestic Waste	474	100%	483	100%
2. Commercial Waste	316		322	
3. Medical Waste	21		24	
Total Waste	811		829	

15.2 INTRODUCTION OF NEW COLLECTION SYSTEM

15.2.1 Necessity of New Collection System

The truck fleet presently used is aging and renewal is necessary to secure the required service. Therefore there is an opportunity to introduce a new collection system when selecting the new trucks to be procured. A new collection system is necessary for the city, taking into consideration the need for the following items.

- (1) Provision of universal collection service at an affordable cost
- (2) Renewal of existing truck fleet and increasing of haul capacity
- (3) Improvement of truck capacity and haul efficiencies through selection of suitable truck types
- (4) Improvement of truck operating conditions through rationalization of discharge system

15.2.2 New Collection System to be Applied

1) Components of the New Collection System

The New Collection System shall be applied to collect the waste generated from Individual Housing Areas, Block Housing Areas and Commercial Areas. Table 15.2.1 shows the three components of the New Collection System and the corresponding waste types.

Table 15.2.1 Description of New Collection System Components in 2005

Component	Equipment	Service Waste	Waste amount (ave. t/d)
(1)	Compactor 8m ³ with both manual loading and mechanical loading from containers 1.1m ³	Individual Housing, block housing with partial conveniences and some parts of block housing with full conveniences	243
(2)	Compactor 12m ³ with mechanical loading from containers 1.1m ³	Majority of block housing with full conveniences and commercial waste from small shops	145
(3)	Arm roll truck with containers 6m ³	Commercial waste from large generators and markets	193

For each type of waste served the new collection system proposed is compared with the existing systems in the following sections.

2) Individual Housing Area (IH)

In IH areas the present system of collection using dump trucks from in front of each house will be replaced by compactor truck and waste station collection. Table 15.2.2 shows the changes proposed from the existing system in the new collection system.

Table 15.2.2 New Collection System in Individual Housing Areas

No.	Item	New Collection System	Existing Collection System
1	Collection truck	<ul style="list-style-type: none"> • Compactor truck 8m³ 	<ul style="list-style-type: none"> • Flat bed and dump truck (Ave. 2 ton capacity)
2	Discharge system	<ul style="list-style-type: none"> • At designated collection stations in plastic bags • Discharge schedule will be fixed by day and time set within a few hours before truck comes 	<ul style="list-style-type: none"> • In front of the house, in pails, tin cans or plastic bags • Early in the morning on the usual collection day or when the truck passes (if the truck does not come the waste is usually kept on the street)
3	Collection frequency	<ul style="list-style-type: none"> • Twice a week according to a fixed schedule 	<ul style="list-style-type: none"> • Once a week or irregular
4	Issues	<ul style="list-style-type: none"> • Collection frequency will be increased to 2 days/week • Collection frequency will become regular • Operating costs will decrease and service will become regular and more efficient • Better working condition for workers • Residents cooperation in bringing their wastes to the collection station needs to be promoted 	<ul style="list-style-type: none"> • Dump trucks can perform on average only 1.3 trips/day and the present dump truck number can not provide complete and regular coverage. To provide improved service 110 dump trucks will be required, compared to 32 compactors. • Tedious work for the collection workers who must lift the waste onto the trucks and arrange it on the truck. • Residents comfort with not having to walk to the stations is offset by their discomfort with the irregular service

3) Block Housing Areas (BH)

In BH areas three significant changes are proposed. Side loader trucks (different types of KO, Russian manufactured) will be replaced with compactor trucks (12m³ capacity for medium and high rise blocks and 8m³ for low rise blocks). Secondly existing containers of 0.65 to 0.75m³ will be replaced by standard 1.1m³ containers with lids. And thirdly the discharge frequency will be fixed by the day and time instead of at any time as at present. Table 15.2.3 shows the changes proposed from the existing system in the new collection system.

Table 15.2.3 New Collection System in Block Housing Areas

No.	Item	New Collection System	Existing Collection System
1	Collection truck	<ul style="list-style-type: none"> • Compactor trucks of 12 m³ and 8m³. The smaller compactor will be applied in the block housing areas with partial conveniences and other block housing areas with difficult access because of narrow roads. 	<ul style="list-style-type: none"> • Side loaders of different capacities, mostly 2.0 t/trip with only 8 units of capacity 8.0 ton
2	Discharge system	<ul style="list-style-type: none"> • At designated collection stations in containers of 1.1m³ • Discharge schedule will be fixed by day and time set within a few hours before truck comes 	<ul style="list-style-type: none"> • At designated collection stations in containers of 0.65 to 0.75m³ • At any time and day
3	Collection frequency	<ul style="list-style-type: none"> • Three days a week according to a fixed schedule 	<ul style="list-style-type: none"> • Mostly once a day but time not fixed (mainly depending on truck condition)
4	Issues	<ul style="list-style-type: none"> • Collection service level will be decreased from almost daily to 3 day/week but service coverage will be widened • Operating costs will decrease and service will become more efficient as trucks haul more waste per trip and make more trips per day • Suitable container size and sufficient number will be placed at container station in order to eradicate the image of overflowing containers at the stations • Much effort will be required to convince the citizens of the need to reduce collection frequency in order to provide universal service 	<ul style="list-style-type: none"> • Present trucks have low haul capacities and cannot therefore provide universal service while maintaining daily collection in certain areas • Container number and size are insufficient and as a result waste is always overflowing at the stations • Because of unfixed discharge hours waste is always found at the collection station as early as one hour after the collection truck has passed creating an unhealthy situation in the middle of the residential area. • While residents enjoy the possibility to discharge waste at any time there are complaints regarding waste scattering at the container stations

4) Commercial Waste

Instead of the present system of using side loaders and dump trucks, compactor 12m³ capacity and arm roll trucks will be used. Compactors will serve small generators of commercial waste, while the larger generators such as hotels, markets, department stores will be served by the arm roll trucks.

Daily collection will be provided at such places as markets, city commercial centers and hospitals. Arm roll trucks will mainly serve large generators of waste. Comparison with the existing system is similar to those explained above.

15.2.3 Priority of Implementation

It is desirable to introduce the new collection system as soon as possible to provide universal service coverage in the city. However this will require large investment costs in order to buy all the required new equipment. The approach taken in this priority project is to decrease the amount of trucks to be purchased by utilizing the trucks purchased during the last three years up to the year 2006, i.e. to the end of the priority project period. Therefore it is proposed that the priority project for the period up to 2005 be implemented in two steps, as explained hereafter.

First Step: New Collection System Component 1 (Urgent Priority Project: Introduce Regular Frequency Collection Service to Individual Housing Areas, Block Housing with partial conveniences, and Other Urgent Areas)

Priority in scheduling for introduction of new collection system shall be given to the individual housing areas and block housing with partial conveniences (low-rise block housing) and some problem block housing areas. The problem of lack of regular waste collection, open dumping and unsuitable equipment in these areas is severe. These are considered urgent priority areas where universal and stable collection service needs to be introduced.

The effects implementation of the First Step will have are as follows:

- Population served by this first step is 454,500 (41% of the population)
- Upgrade collection service coverage rate to 85%

Second Step: New Collection System Components 2 and 3 (Second Priority Project: Replacement of Aged Equipment in Block Housing and serving commercial waste)

As a second step in the schedule, new collection system components 2 and 3 should be introduced in block housing areas and commercial areas respectively to replace aging equipment. But as explained earlier the new system in block housing areas will be gradually introduced to make use of existing equipment. Up to the end of the priority project period the new collection system and existing one will co-exist in these areas.

The effects implementation of the Second Step will have are as follows:

- Population served by this second step is 123,600 (11% of the population)
- All commercial waste collection shall be served by the new collection system
- Upgrade collection service coverage rate to 95%

Figure 15.2.1 shows these areas of the city where the First Step shall be implemented and the characteristics of each area are described in the Supporting Report. The Second Step shall be estimated at the block housing areas located in Auezovski and Zhetysuski districts because of the ease of introducing the new collection system in these newly developed areas. Table 15.2.4 shows the population that will be served by each step of the new collection system implementation.

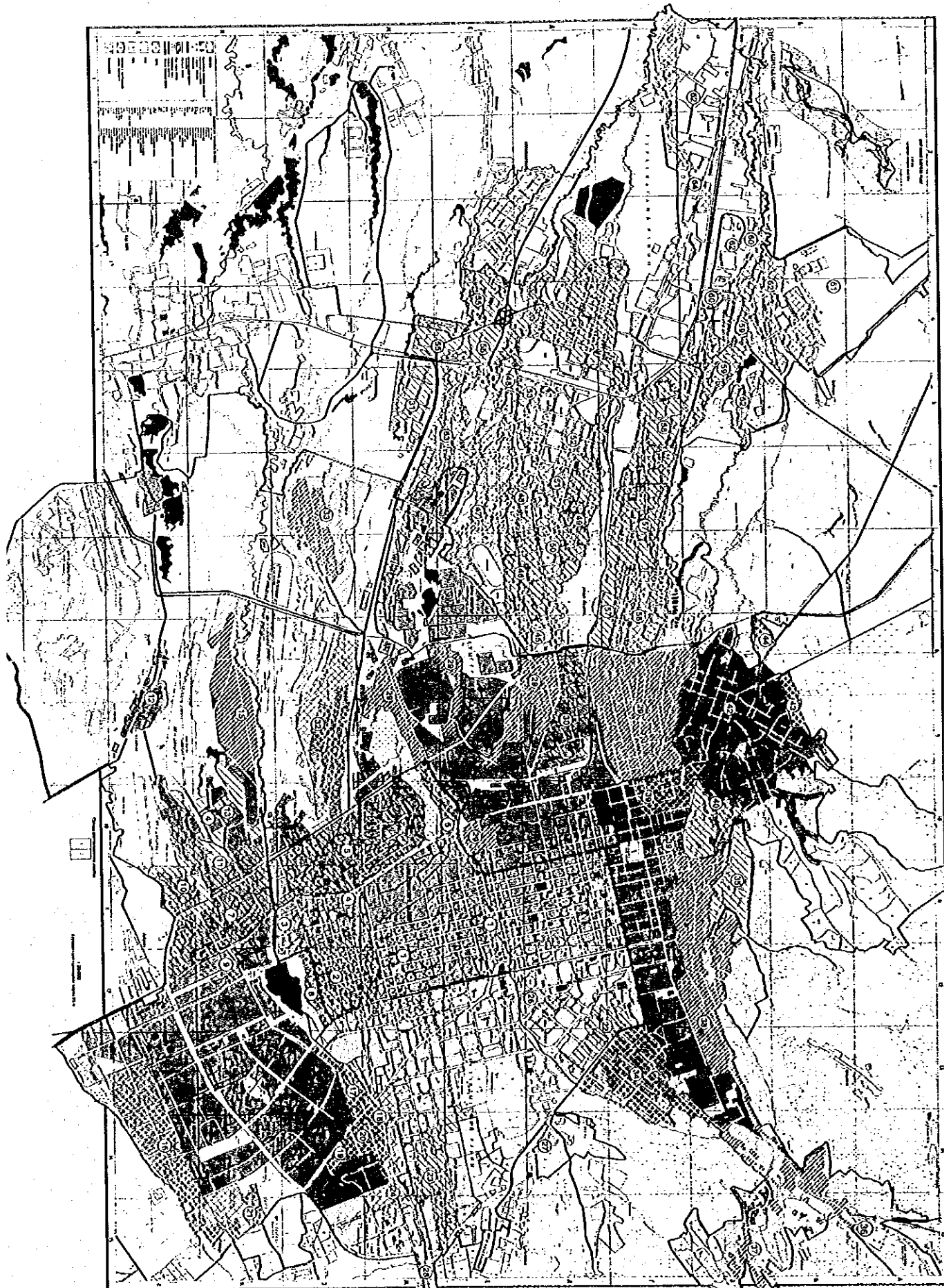


Figure 15.2.1 Urgent Project Implementation Areas

Table 15.2.4 Beneficiaries of the New Collection Service

Collection Zone	Step One		Step Two
	IH	BH	BH
1. Almalinski	23,700	45,100	----
2. Auezovski North	13,400	28,500	----
3. Auezovski South	20,100	42,700	99,600
4. Bostandykski	13,800	55,700	----
5. Zhetysuski West	15,600	10,300	24,000
6. Zhetysuski East	23,500	15,400	----
7. Medeuski North	24,000	15,200	----
8. Medeuski South	16,000	10,100	----
9. Turksibski North	27,800	12,900	----
10. Turksibski South	27,800	12,900	----
TOTAL	205,700	248,800	123,600

15.3 SOLID WASTE COLLECTION PLAN IN YEAR 2005

15.3.1 Contract-out Zones

The city has been divided into ten (10) contract-out zones as explained in Chapter 9. Based on the waste amounts to be collected from each zone the required equipment and manpower have been calculated. The zones are shown in Figure 15.3.1.

15.3.2 Distribution of Equipment in Year 2005

Table 15.3.1 shows the distribution of required equipment and manpower by collection zone in the year 2005. The calculations to determine the truck numbers are explained in the Supporting Report.

Table 15.3.1 Equipment Requirements in 2005

Collection zone	New Collection System					Existing System		
	Comp 8 m ³	Comp 12 m ³	Arm roll 6 m ³	Cont. 1.1m ³	Cont. 6m ³	KO Small	KO 415	Cont. 0.7m ³
1. Almalinski	6	--	4	192	27	14	--	1,014
2. Auezovski North	2	--	4	96	27	12	--	869
3. Auezovski South	4	5	2	889	13	--	--	--
4. Bostandykski	4	--	1	192	7	6	2	724
5. Zhetysuski West	2	3	3	418	19	--	--	--
6. Zhetysuski East	3	--	4	96	27	8	--	579
7. Medeuski North	3	--	2	97	13	--	1	145
8. Medeuski South	3	--	1	96	7	--	1	145
9. Turksibski North	4	--	2	96	13	8	--	579
10. Turksibski South	3	--	4	--	27	3	1	362
TOTAL	32	8	27	2,172	180	51	5	4,416

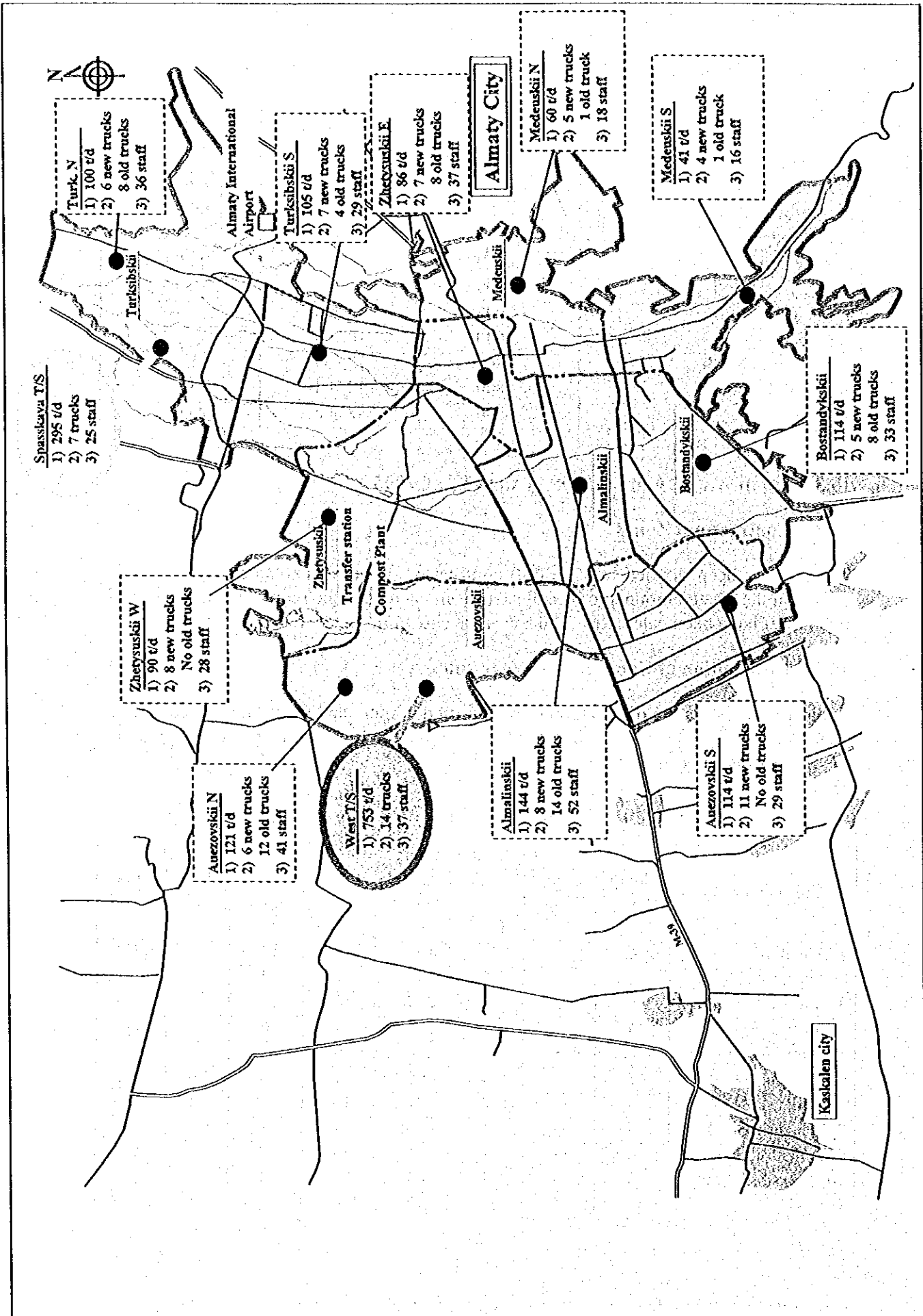


Figure 15.3.1 Equipment and Manpower Requirements by Collection Zone in 2005