

# Waste Management Technologies in Regions, Georgia

## Municipal Waste Management Plan Development Guideline

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Prepared by:

International City/County Management Association

777 North Capitol Street NE, Suite 500

Washington, DC 20002-4201

Caucasus Environmental NGO Network (CENN)

27, Betlemi str., 0105, Tbilisi, Georgia

Together with the national expert Tamar Gugushvili

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# Municipal Waste Management Plan Development Guideline

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## **WASTE MANAGEMENT PLAN GUIDELINE FOR MUNICIPALITIES IN GEORGIA**

### **INTRODUCTION**

Municipal waste management has been a problem in Georgia for many years, both in terms of insufficient quality and coverage of waste related services, and in the consequential adverse impacts on human health and the environment. Municipalities with limited capacities and resources are struggling to provide effective waste services for their population. While waste services in city and municipality administrative centers need improvement, many smaller cities and villages still remain unserved by an effective municipal waste management system. Optimization and improvement of existing landfills has commenced at a national scale. However, significant investments are needed for the construction and maintenance of new regional sanitary landfills and transfer stations, as well as for the closure and aftercare of old disposal sites that are no longer required due to new regional landfills. In addition, random informal dumping sites (which have been common throughout Georgia) need to be closed and remediated. Also, the scale of waste recycling in Georgia is still insignificant, and mostly derived from the informal sector's<sup>1</sup> sale of material that they recover from collection system containers and disposal sites.

Presently, waste management (including municipal waste management in Georgia) is the responsibility of different government levels. The Ministry of Environment and Natural Resources Protection (Ministry) is responsible for the development and implementation of a unified national policy on waste management. To accomplish this, the Ministry is developing a national strategy and action plan on waste management, as well as a strategy on biodegradable municipal waste management. Currently, the Ministry issues environmental permits related to waste related activities and is responsible for state supervision of waste management. The Ministry also addresses issues related to the management of hazardous and other specific waste forms.

Local governments are responsible for municipal collection and transportation services as well as cleaning streets, parks and other public spaces within their local jurisdictions. Currently, future construction and operation of waste transfer stations, and landfill activities, including the construction, operation and closure of municipal waste landfills is the responsibility of the Ministry of Regional Development and Infrastructure. The exception to this national responsibility is the Adjara Autonomous Republic and the city of Tbilisi, where local governments are responsible for both the waste collection/transportation and landfill functions.

In addition to the above, The Ministry of Labour, Health and Social Affairs of Georgia, in cooperation with the Ministry of Environment and Natural Resources Protection, regulates and controls healthcare waste management. The Ministry of Agriculture of Georgia, also in

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<sup>1</sup>Subjects extracting municipal waste from containers and recycling it informally.

cooperation with the Ministry of Environment Protection and Natural Resources, regulates and controls the management of animal waste.

Those activities and industrial facilities that have the potential for significant adverse impacts on the environment are subject to an environmental permitting and mandatory Environmental Impact Assessment (EIA) process for their activities. The EIA process, among other aspects, must include waste management issues, this leads to the requirement for effective waste management as a component of the industry's permit conditions. All industrial activities, related to waste disposal or treatment, are subject to environmental permitting through the existing legal framework.

To enhance the manner by which all types of waste are managed throughout Georgia, a new Law – “Waste Management Code” was enacted on January 15, 2015. The new Law seeks to create a legal and regulatory framework that supports waste prevention and reuse, as well as environmentally sound waste management processes including collection, transport, recovery (recycling, composting, etc.) and disposal. The objective of the Law is to: 1) protect human health and the environment by preventing or reducing waste generation and its adverse impacts; 2) introduce effective mechanisms for managing waste; and 3) encourage a more effective use of resources that could be derived through better management of the municipal waste stream.

Through the “Waste Management Code”, the Government of Georgia seeks to improve waste management practices throughout the country by mandating higher design and operational standards that are consistent with those that exist in the European Union. This objective is supported by the fact that Georgia has obligations under the European Union-Georgia Association Agreement (signed in June 2014) to harmonize its waste management practices with those of the European Union.

The new Law “Waste Management Code” will lead to new waste management initiatives intended to: 1) optimize and expand the coverage of formal municipal collection services; 2) implement new landfills designed and constructed to sound international standards; and 3) significantly increase the rate of recovery through formal municipal recycling and composting programs. To support this target improvement process, the Georgian Law “Waste Management Code” stipulates that local governments (that are now, and will continue to be, responsible for municipal waste collection and transport) must develop comprehensive *Municipal Waste Management* plans that aim to improve their waste related functions. The waste management plan must be based on waste management hierarchy and the principles stipulated by Article 5 of Waste Management Code. The Law “Waste Management Code” stipulates that these plans are to cover a 5 year planning timeframe and that they should correspond to the national waste management strategy and action plan currently under development. The municipal plans must also correlate to other national waste management initiatives for specific waste streams including, at a minimum, persistent organic pollutants, mercury, healthcare waste, animal waste, and asbestos.

According to the Law of Georgia’s “Waste Management Code”, local governments are responsible for providing an effective municipal waste collection systems within their administrative borders, as well as the gradual introduction of source separated material

collection systems, to enhance the effectiveness of recovery processes. The Law defines the general principles for collection processes in which waste shall be collected, transported and treated in a manner that does not impede its further recovery. Also, the Law requires that municipal waste shall be collected, transported and treated in a manner that excludes, to the maximum extent possible, pollution of the environment and risks to human health. More specific requirements related to waste collection and treatment will be defined by a Government resolution on “Municipal Waste Collection and Treatment Rules”, which, according to the Law “Waste Management Code”, shall be developed before 1 February 2016.

The Law “Waste Management Code” prohibits any illegal disposal of waste outside of waste collection containers and collection facilities. To accomplish this, municipalities are authorized to enforce the cleaning of littered areas, where a litterer cannot be identified the owner of the littered land becomes responsible for cleanup. In cases of a littered area being owned by the municipality, the municipality shall take care of the cleanup of the area.

The Law “Waste Management Code” also stipulates that the MWM plans must define the means by which the level of recycling and recovery will be significantly increased through formal programs developed by the municipalities. This may include regional initiatives aimed at achieving a more effective economy of scale for the recovery process. (The Law stipulates that adjacent municipalities can develop common MWM systems and also can collectively develop a common MWM plan, if warranted).

Specifically, Article 13 of the Law “Waste Management Code” defines both the intent and minimum content of the mandated municipal waste management plans (see the text box below for the specific requirements stipulated in the Law). The National Waste Management Strategy and the National Waste Management Action Plan (to be developed before 31 December, 2015) will prioritize the objectives of the Law and define the measures to be implemented in the short, medium and long term. The most urgent measures are expected to be focused on improving waste collection and disposal processes, while longer term measures will, most likely, address waste minimization, reduction, and recovery processes.

**Article 13 – Municipal waste management plan**

- (1) Each municipality shall adopt a plan for the management of the municipal waste produced within its territory for a period of five years. A Municipal Waste Management Plan may be prepared jointly by neighbouring municipalities.
- (2) The Municipal Waste Management Plan shall be compliant with the National Waste Management Plan and other plans under Article 12 paragraph 7 of this Law.
- (3) The adoption of the Municipal Waste Management Plan shall be preceded by public consultations, involving the relevant stakeholders and the neighbouring municipalities. These public consultations shall be carried out by the respective municipality(ies).
- (4) The Municipal Waste Management Plan shall contain the following:
  - a) information on the existing system for collection of waste from population;
  - b) data on the types and the amounts of non-hazardous waste collected, recovered and disposed of;
  - c) data on the types and the amounts of hazardous waste from population collected, recovered and disposed of;
  - d) location of the waste treatment facilities;
  - e) planned measures to be taken for the establishment of separate collection and recovery of municipal waste, including of biodegradable waste and packaging waste;
  - f) planned construction of new waste treatment facilities;
  - g) programmes to raise awareness of the public on waste management issues;
  - h) implemented and planned measures for co-operation with other municipalities in the field of waste management;
  - i) the way and timeframe in which the proposed measures shall be implemented, responsible persons, estimated costs and sources of financing for their implementation.

Source: Law of Georgia “Waste Management Code”



## THE BASIS FOR DEVELOPING MUNICIPAL WASTE MANAGEMENT PLANS

By definition, a municipal waste management plan is a document or development framework established by a municipality to define the manner by which they will fulfill their waste management responsibilities. The process of developing an effective WM plan (at the national or local level) must include all aspects of WM functions ranging from policy-making and institutional development to the technical design and implementation of new or upgraded processes and facilities. Effective, detailed strategies and action plans must be developed for national and local governments that have a responsibility for specific WM functions under the Law of Georgia “Waste Management Code”. As a result, the symbiosis of the national and local WM plans and the strategies that will evolve over the next few years will be critical in assuring the overall success of the “Waste Management Code” in establishing an environmentally sound and cost effective waste management system throughout Georgia.

To achieve this, local level planning and development activities must be in line with the requirements of the waste management strategy, action plan and specific sub-laws that are to be developed in accordance with the “Waste Management Code”. The sub-laws will define municipal waste landfill design, operation, closure and aftercare requirements; municipal waste collection and treatment rules; special requirements for the collection and treatment of hazardous wastes; waste classification processes; waste activity monitoring and reporting as well as other relevant activities aimed at assuring the intent of the “Waste Management Code”.

The results of a successful MWM Plan and its improvement strategy and action elements will optimize the municipality’s role in the overall national integrated WM system. To eventually meet E.U. standards, this national system will likely include conventional functional processes and infrastructure such as:

- Collection systems (for mixed waste and eventually for source separated materials);
- Transport systems (from collection points to transfer stations, processing facilities, or landfills);
- Transfer stations (to optimize collection system efficiency and reduce the overall cost of collection and transport);
- Mechanical processing facilities (for recycling and composting purposes);
- Treatment facilities (thermal, physical, or biological processes for volume reduction or resource recovery); and
- Landfills (for final disposal of non-recoverable waste stream elements).

The MWM Plans that are the subject of this guidance document will help provide information that will assist in determining the best options to accomplish the above target results. These are the responsibility of municipalities as defined by the Law “Waste Management Code”.

Current waste management situations in Georgia will require significant and, likely, costly improvements to meet the requirements of the Georgian Law “Waste Management Code” which seeks to emulate the WM standards currently in place in the E.U. Specific conditions in

Georgia will, likely, determine the initial technical and economic viability of some of options available to achieve the above elements particularly those that are intended for processing and treatment. In Georgia, municipalities are initially faced with the need to initially address the effectiveness of their core collection and disposal services. The development of advanced processing and treatment technologies, such as those which have been developed in the E.U., may eventually be established in Georgia. However, only after core collection, transport and disposal services have been optimized, because of limited economic resources. (The current Landfill Directive in the E.U prohibits the landfill disposal of a significant proportion (recyclables, organics, etc.) of the municipal waste stream. This is an important driver for developing many of the advanced treatment systems that exist in E.U. countries.)

Successful WM improvements in Georgia must be affordable for the country's population, businesses and government, if the WM planning outcomes are to be effective and sustainable. As previously presented, not all of the envisioned national waste management system functions are the responsibility of Georgian municipalities. Waste disposal throughout Georgia (except for the Adjara Autonomous Republic and Tbilisi) is managed by a state owned Solid Waste Management Company under the Ministry of Regional Development and Infrastructure through the eventual development of regional landfills. (While not a direct responsibility of the municipalities, these regional landfills will likely impact the development of MWM plans since the physical location of the new landfills within each region may affect the function of a municipality's collection and transport systems. Also, the regional landfills may have economic implications if disposal fees must be paid by municipalities based on the measured amount of municipal waste delivered to the disposal sites.) Through the Law "Waste Management Code", municipalities retain their responsibility for collection and transport services as well as for implementation of formal recovery programs. Because of this, the MWM plans that are the subject of this guidance document are intended to help define how the municipalities should fulfill their responsibilities.

### **Setting Objectives and Performance Targets**

An effective WM Plan should define the goals and objectives of the parties responsible for various WM functions. This could include plans developed by the national and municipal governments as well as waste management plans developed by waste generators such as industrial facilities. The national integrated WM system envisioned for Georgia in adopting the Law "Waste Management Code" will require a supportive and cooperative relationship between the national government and its local authorities. At the local level of governance, MWM plans must seek to achieve a number of important objectives, including:

- Meeting regulatory requirements that mandate the development of effective local programs, processes and facilities that comply with the "Waste Management Code";
- Minimizing costs and risks associated with the local management of waste;
- Reducing the environmental consequences that may have resulted from historically ineffective collection systems and poorly sited and operated disposal facilities;
- Expanding collection service coverage to a municipality's entire population; and
- Gaining the economic benefits that may be associated with the recovery of waste components that have value through composting and recycling initiatives.

To meet these objectives, a municipality's MWM planning process must consider all relevant factors that influence how the current MWM system works and how an upgraded municipal

system can be developed and sustained. This should include all relevant institutional, social, financial, economic, technical, and environmental factors that define the manner by which the municipality must:

- Define and understand its current waste management system and all of its individual physical, operational and economic elements;
- Identify existing deficiencies within the current system that must be addressed to provide an effective level of service and meet the requirements of the “Waste Management Code”;
- Identify alternative approaches and options that can improve the current municipal system and eliminate identified deficiencies while also expanding collection service coverage and quality;
- Identify and evaluate the existing roles and responsibilities of key stakeholders and define how those roles can be utilized, modified or enhanced to implement an effective MWM system in the future;
- Set sound implementation priorities and performance targets for the necessary actions that a municipality must take to improve existing MWM situations including accommodating the emphasis of the Law “Waste Management Code” on the ultimate development of formal recovery programs;
- Identify and secure the economic and technical resources that are needed to achieve and sustain the desired results of the planning process;
- Develop implementation budgets and a realistic schedule for achieving the MWM plan’s desired outcomes and meet national regulatory requirements;
- Provide the means and criteria for defining how to commence and complete the implementation of the Plan results and measuring the progress made in accomplishing the Plan results;
- Define the means for monitoring the function of the municipality’s upgraded MWM system once the plan recommendations have been implemented to assure their continued effective level of performance;
- Develop a monitoring framework for periodically reviewing MWM system functions and updating the MWM Plan on a regular basis.

### **Phases of an Effective Municipal Planning Process**

The recommended process for planning and implementing an effective MWM system may be categorized into the six phases illustrated in Figure 1 which presents both the anticipated functions and activities that a municipality should undertake in developing its MWM plans.

- **The Planning Preparation Phase:** This is the initial planning function that should be that is aimed at defining and mobilizing the resources necessary for the municipality’s comprehensive planning effort;
- **The Existing Conditions Status Phase:** This is the planning function intended to define current baseline conditions by assessing a municipality’s existing MWM system and all of the factors that influence its function and deficiencies;

- **The Options Assessment Phase:** Once a municipality's existing MWM system has been accurately and thoroughly defined, viable alternatives (technical, institutional, financial, etc.) to overcoming existing system deficiencies and meeting requirements of the Law "Waste Management Code" must be evaluated to determine which of the options available for the various system elements are in the best interest of the municipality. This option's assessment phase provides the basis for establishing the WM action plan that will be the foundation of the municipality's implementation strategy for planned improvements;
- **The Plan Adoption Phase** - Once existing MWM conditions in the municipality have been defined and viable options to overcome existing deficiencies have been identified, assessed, and selected, the MWM Plan and its implementation strategy should be formally adopted by municipal elected officials and approved by national regulatory officials responsible for assuring that the MWM Plan and its recommendations comply with the requirements of the "Waste Management Code";
- **The Implementation Phase:** After the formal adoption of the municipality's MWM plan, the implementation of the plan's target outcomes can occur which may include the development of policy, financial/economic, institutional, and technical instruments that are to improve the MWM system as well as implementing the physical processes and facilities necessary to achieve results;
- **The Monitoring & Review Phase:** Once all or some of the target results of the plan have been implemented, the function of the resulting MWM system (or its individual components) must be closely monitored to assure that the plan results are sustainable and remain effective over time. In addition, the municipality should also recognize that a successful planning process is dynamic and ongoing and requires periodic review to update the plan in accordance with evolving conditions and what has been accomplished since the adoption of the initial MWM plan. (The Law "Waste Management Code" stipulates that the MWM plans should be developed for a 5 year planning term. This will establish the need to review the accomplishments of the municipality after five years and update the Plan to continue progress in accomplishing the municipality's MWM objectives as well as the long term objectives of the "Waste Management Code".)

### **Basis for the MWM Planning Guidelines**

These guidelines are intended to assist Georgian municipalities to develop their MWM plans in accordance with sound international practice and standards, and in accordance with the requirements of the Law "Waste Management Code". The guidelines seek to present an organized structure and description for the critical tasks that a municipality should accomplish to develop and implement its MWM Plan. While Figure 1 identifies the previously listed planning phases (or functions), it also provides a listing of specific recommended activities or tasks that a municipality should undertake in accomplishing each of the six basic functions. These activities are intended to help Georgian municipalities make sound MWM decisions that are in the best interest of the municipality and that seek to answer the following basic questions related to their specific waste management situations:

- What are the deficiencies that currently exist within the existing MWM system and how can these deficiencies be mitigated?
- What are the municipality’s priorities in enhancing its MWM program?
- Which materials can be recycled or composted in a cost effective manner based on access to the materials and the potential of available markets?
- What type of recoverable material collection system is best for the municipalities?
- How will the informal sector influence the ability of the municipality to develop a viable formal recovery program?
- How will the proposed regional landfills in Georgia affect the function and cost of municipal collection and transport systems in the future and will these impacts support the need for transfer stations?
- If transfer stations are required to optimize municipal waste collection and transport, who will be responsible for developing and operating these transfer stations?
- How much will an improved MWM system (and its individual components) cost and how will sufficient funds be derived to develop, operate and sustain the system?
- What technical and managerial resources does a municipality need to implement and sustain the results of its plan and what is the technical and managerial capacity of the municipality’s human resources that are currently available?
- How should local stakeholders and the public be engaged in the planning process to ensure their input and ownership of the planning results?
- How should cost recovery be accomplished and optimized in a manner that is meaningful to sustaining the planning results?
- What is the level of cost recovery that can be reasonably expected to be paid by residential and commercial waste generators, physical persons and organizations within the municipality?

**The Municipal Waste Management Plan Development Process**

Planning Functions	Planning Activities
<p><b>Preparing to Develop the Plan</b></p>	<ol style="list-style-type: none"> <li>1. Delegate responsibility for developing the SWM Plan</li> <li>2. Identify and secure the resources necessary to develop the plan</li> <li>3. Identify and initially engage relevant stakeholders</li> <li>4. Establish local stakeholder consultative group</li> </ol>

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	<ol style="list-style-type: none"> <li>5. Define municipal waste management planning objectives and target outcomes</li> <li>6. Identify the factors that influence waste generation and management</li> <li>7. Develop a detailed planning work plan with schedules and milestones</li> </ol>
<p><b>Determining and Assessing Existing Conditions</b></p>	<ol style="list-style-type: none"> <li>1. Define the waste stream that must be managed by the municipality</li> <li>2. Identify and evaluate existing waste management services and facilities</li> <li>3. Determine and characterize municipal SWM service deficiencies</li> <li>4. Define the full cost of waste management in the municipality</li> <li>5. Evaluate the existing means for deriving operating and development funds including normal budgeting and cost recovery processes</li> <li>6. Assess current public awareness and attitudes concerning waste management issues</li> <li>7. Assess the technical and managerial capacity of existing institutions to develop and manage an effective waste management system</li> </ol>
<p><b>Evaluating Options and Making Decisions</b></p>	<ol style="list-style-type: none"> <li>1. Define the priorities for municipal actions and processes</li> <li>2. Identify existing or future national and regional programs or infrastructure that will influence municipality SWM options.</li> <li>3. Project waste generation in the future</li> <li>4. Develop an effective public and stakeholder education and consultation program</li> <li>5. Define alternate means for increasing collection service coverage and efficiency</li> <li>6. Develop CAPEX and OPEX cost estimates for alternative SWM options</li> <li>7. Select preferred options and implementation process</li> <li>8. Develop an investment plan for selected waste management improvements</li> <li>9. Define means for increasing recycling and recovery in the municipality</li> <li>10. Evaluate regional opportunities and options</li> </ol>
<p><b>Developing and Adopting the Plan</b></p>	<ol style="list-style-type: none"> <li>1. Determine what should be included in the written municipal waste plan</li> <li>2. Secure political, stakeholder and regulatory concurrence with the SWM Plan</li> <li>3. Formally adopt the SWM Plan by the Municipality</li> </ol>

<b>Implementing the Plan</b>	<ol style="list-style-type: none"> <li>1. Move forward to implementing the services and facilities defined in the SWM Plan</li> <li>2. Monitor the implementation of required improvements and new programs</li> </ol>
<b>Operating and Sustaining The Results</b>	<ol style="list-style-type: none"> <li>1. Monitor the performance of the waste management system for continual effectiveness</li> <li>2. Periodically update SWM Plan based on evolving conditions</li> </ol>

The activities outlined in this guideline document are intended to help municipalities answer these questions and develop a strategy by which to enhance the MWM functions that they are responsible for. The following is a description of the activities within each of the six general functions that municipalities should consider in developing their MWM plans and action strategies.

### **FUNCTION 1 - PREPARING TO DEVELOP A MUNICIPAL WASTE MANAGEMENT PLAN**

As is the case with any planning initiative, the process by which a strategic plan is developed must be initially defined to ensure that sufficient technical and financial resources are available to accomplish all required planning and assessment tasks. Preparation for planning also includes making initial decisions related to the manner by which public and stakeholder input will be solicited and brought into the planning process. At a minimum, this planning preparation function should include the following activities:

#### **Activity 1.1 - Delegate responsibility for developing the MWM Plan**

The responsibility for managing the municipality’s MWM Plan development process should be delegated to a specific department/structure within the municipality (and to a specific individual within that department who will serve as the MWM planning project manager). The designated planning process manager should then be responsible for coordinating all of the required activities on behalf of the municipality. This should include possible coordination with other municipalities regarding potential regional initiatives as well as with the Ministry of the Environment and Natural Resources Protection to assure that the planning process and its target outcomes comply with the requirements of the Law “Waste Management Code”. The planning process manager should be empowered to coordinate the activities of all other participants including, at a minimum, other municipal agencies and officials, elected officials, the stakeholder consultative group and any engaged subject experts (consultants, NGOs, etc.) that may be involved in the planning process.

### **Activity 1.2 - Identify and secure the resources necessary to develop the plan**

Municipal financial and technical resources will be required to successfully accomplish all necessary planning activities. This will likely include the dedication of sufficient municipal funds through establishing sufficient budget for the planning process (or securing outside assistance from external sources such as donor agencies and NGOs.) In some cases, municipalities may seek to utilize outside technical assistance (consultants, NGOs, etc.) for the planning process to provide the knowledge and experience required to achieve some of the more complex planning activities. For example, outside technical assistance may be required to identify and determine the local viability of alternative municipal waste management approaches since municipal government staff may not be knowledgeable or have sufficient or any experience with some of the alternative approaches, particularly as they may relate to developing a municipal recovery program. Consultants or other outside assistance such as NGOs with relevant experience could be considered for active participation as a technical resource throughout the planning process or even managing the entire planning process as is often the case in the United States and E.U. Outside technical assistance may also be utilized during the planning process to provide specific expertise associated with individual activities such as a waste characterization study or development of an effective public awareness and communication program.

### **Activity 1.3 - Identify and initially engage relevant stakeholders**

Developing an effective MWM planning process requires the active participation of the public and other relevant stakeholders. Accordingly, a key element of the planning preparatory process is securing the active and ongoing participation of the public and relevant stakeholders in the planning effort, since they can significantly affect that process and the implementation and support of its results.

Generically, a stakeholder is defined as a person, group, institution or organization that has a direct or indirect stake in an activity or project or that has the ability to influence the activity or project either positively or negatively. The list of potential WM stakeholders will vary from municipality to municipality and, as a result, needs to be individually developed for each MWM planning initiative. Potential relevant stakeholders in Georgian municipalities may include:

1. Institutions and companies that currently have functional responsibility for some aspect of the WM system in the municipality such as political or other municipal officials, existing service providers (including local LLCs), and inspections/enforcement agencies. This could also include other entities such as the Ministry of Environment and Natural Resources Protection (including its Service of Waste and Chemicals Management, National Forest Agency, Agency of Protected Areas and Department of Environmental Supervision); the Ministry of Regional Development and Infrastructure; the Ministry of Labour, Health and Social Affairs; the Ministry of Agriculture; the Solid Waste Management Company of Georgia; and healthcare waste management companies;
2. Organizations that may have a direct economic interest in waste management in a municipality such as commercial/industrial waste producers, recycling companies and



consolidators, and potential donors or funders of waste management or ancillary programs;

3. Organizations or individuals with other interest in waste management within the municipality such as environmental NGOs, academia and or research institutes;
4. Organizations or individuals directly affected (positively or negatively) by current waste management practices or facilities in the municipality, including housing co-operatives, village areas with ineffective or no collection service, etc.;
5. Organizations or individuals who may be affected in the future by improved municipal practices and facilities such as agricultural or horticultural producers who may use compost derived through waste processing in the future, local/regional/national markets for recovered materials, etc.

This activity seeks to define the relevant stakeholders within each municipality. Their participation in the planning process will help to assure that there is a full spectrum of interests and knowledge represented in the development of the MWM plan. Also, their active participation may help to ensure their ultimate acceptance of the planning results. At best, their active participation could lead to their active support of the waste policy and investments that may be required to implement the recommended MWM Plan outcomes. This will help increase the level of cost recovery through future tariff reform, and be important for sustaining the upgraded systems, processes and facilities required for the MWM Plan.

Once the municipality has identified its relevant stakeholders, they should be directly engaged to request their active participation. While this engagement activity should include soliciting their ongoing input and opinions related to the planning process, it should also seek their active assistance in gathering the necessary information that will be required to make planning decisions and develop the action strategy contained in the prospective MWM Plan.

The task of initially engaging stakeholders can be accomplished by sending them an official letter with a brief summary of the anticipated planning process and its desired outcomes. This official letter (if possible, from the local government) should serve as an invitation to participate in an initial stakeholder meeting as an indication that they are interested in being involved in the municipality's MWM Plan development process.

#### **Activity 1.4 - Establish local stakeholder consultative group**

Based on the interest shown at the initial stakeholder meeting, a consultative working group should be formally established to regularly meet and provide input to the ongoing planning process. Additionally, the working group should be specifically engaged at critical milestones during the planning process such as upon completion of the existing conditions assessment work or during the evaluation of alternatives for the municipality's future MWM system and its individual elements.

#### **Activity 1.5 - Define municipal waste management planning objectives and target**

### outcomes

Clearly, any “plan” is intended to achieve a desired result. Therefore, a critical element of developing a MWM Plan is the need to clearly understand exactly what the municipality is trying to achieve. To a degree, this is already defined for Georgian municipalities through the criteria of the Law of Georgia “Waste Management Code” which stipulates both the required MWM Plan content (as previously presented) as well as the responsibilities that municipalities must bear in providing effective MWM services within their jurisdictions. (An important secondary objective for any municipality will be to accomplish the requirements of the Law in the most cost-effective and sustainable manner).

During the planning preparation process, the municipality’s objectives and desired outcomes should be clearly defined and stated to establish measurable results which will be important in monitoring progress of implementing the planning outcomes. The initially defined target objectives and outcomes will serve as the starting point for the overall planning process and define the intended scope of the MWM Plan. This will also help define the actual work that must be accomplished during the various planning process activities. Common Georgian municipal planning objectives and results will, likely, include initiatives to:

- Optimize and expand a municipality’s collection services;
- Provide cost effective waste transport to new regional disposal facilities through direct haul or the implementation of transfer stations developed by the national government or the municipality;
- Develop formal municipal programs for increasing recovery of municipal waste content as a means of diverting municipal waste from landfill disposal and recovering the value of certain municipal waste stream components; and
- Establish a basis for optimizing cost recovery to help support and sustain the implemented improvements.

The definition and adoption of the MWM planning objectives and target outcomes should be an important initial undertaking by the municipality, with the active participation of a stakeholder consultative group and potential concurrence by the municipality’s elected officials. Matching available development resources to target outcomes may lead to a prioritization of desired outcomes. This will, likely, place the need to improve core collection and disposal functions as a higher initial priority for the municipality than higher order functions such as the development of formal recovery programs.

Specific plan performance targets will need to be identified that establish the basis for determining whether the design and implementation of the municipality’s MWM Plan has been successfully achieved. The criteria for identifying these performance targets should be based on a “**SMART**” concept where identified targets must be **S**pecific, **M**easurable, **A**chievable, **R**ealistic, and **T**ime sensitive.

- **Specific** targets are straightforward and unambiguous and can be clearly recognized when they have been achieved.
- **Measurable** targets are explicitly defined so you know when you have achieved them by being able to measure the results.

- **Achievable** targets are reasonable and can be developed by the municipality within the limitation of its available resources.
- **Realistic** targets are those that municipal leaders and the public are willing and able to work to implement (this assumes that the requirements of the Law of Georgia “Waste Management Code” and a subsequent national strategy support municipal initiatives, allowing them to derive additional financial and technical resources to achieve the desired results particularly as they relate to issues such as the development of transfer facilities to optimize waste transport to regional landfills.)
- **Time sensitive** targets are set within a planning and implementation timeframe and schedule to ensure that the work can be done within a specific and realistic period of time. The implementation timing aspects of performance targets may be considered as implementation milestones which establish the basis by which the municipality’s progress in achieving its MWM planning outcomes is monitored.

Identifying these SMART performance targets early during the planning preparatory process will provide a focus on the specific information that must be generated during the planning process. The explicit and detailed definition of target results is important in assuring that the municipality will know whether their Plan development and implementation efforts have been successful or are progressing in the desired manner. Initially, setting these target accomplishments also provides an excellent opportunity by which to initially engage stakeholders and elected officials in the planning process. As a result, these objectives and target outcomes should be officially approved by the municipality/city council as a milestone of the planning process.

#### **Activity 1.6 - Identify the factors that influence waste generation and management**

In preparing to begin the planning process, the municipality should also identify the factors that will influence the decisions that they must make to improve their MWM conditions. This activity should be included in the preparatory function because it will likely determine the content of the detailed work plan to be developed under the next Function 1 activity. The factors that are expected to influence a municipality’s current and future MWM conditions include:

- Municipal Demographics;
- Waste generation data (to quantify both the amount and composition of the municipal waste);
- Socio-economic conditions (that affect both the generation of municipal waste as well as the means for enhancing cost recovery (and possibly the level of informal recycling currently experienced in the municipality));
- Current local and national laws and regulatory requirements and policies;
- Existing institutional responsibilities and capacities for providing MWM services;
- Detailed information on current MWM practices, assets, staffing and infrastructure to identify both the current level of service and existing system deficiencies;

- Economic factors such as 1) the full direct and indirect costs of the existing municipal system, 2) cost recovery levels and collection rates and 3) budgeting levels and processes; and
- Factors affecting recovery processes such as informal sector activities and the existence of markets for recovered materials and compost.

### **Activity 1.7 - Develop a detailed planning work plan with schedules and milestones**

Working with the stakeholder consultative group and with consideration of the relevant MWM factors identified during Activity 1.6, the municipal planning manager should develop a detailed work plan for all of the subsequent activities that must be completed to develop the final MWM Plan and its implementation strategy. This work plan should seek to address all of the issues identified as relevant to the function of the MWM system in the municipality. The work plan should define responsibilities for subsequent activities, required economic and technical resources, and a timeframe (with milestones) for the work necessary to accomplish all tasks to develop the MWM Plan. The timeline and milestones presented in this work plan will serve as a basis for monitoring the progress of the planning process to achieve its target result which is the development of a comprehensive MWM Plan and strategy.

Following the development of the work plan by the planning process manager, it should be reviewed with the stakeholder consultative group for their input and concurrence followed by the formal presentation and adoption by municipal officials (who must commit sufficient resources to accomplish all of the activities defined in the work plan.)

## **FUNCTION 2 - DETERMINING AND ASSESSING EXISTING CONDITIONS**

This is one of the most critical functions of the MWM planning process. An effective MWM Plan must be based on baseline conditions that define the existing structure and function of the municipality's MWM system. A thorough assessment of existing conditions will help identify and quantify system deficiencies and the improvements that must be made to eliminate the deficiencies.

Defining existing MWM conditions will require collecting accurate and sufficient information to provide a clear understanding of municipal waste sources, quantities, composition, current system assets, relevant institutional structures, costs, environmental impacts and any other factors affecting existing MWM system performance. The basic information that will be required includes the following:

- Types and quantities of municipal waste generated in the municipality (including waste generated by the population and organizations/companies within the municipality)

- Information related to waste generating organizations in the municipality that manage their waste exclusive of the municipal system (type and quantity, composition and manner in which the material is managed);
- Composition and physical properties of the waste generated in the municipality;
- Current WM institutional arrangements and characterization of service providers;
- Identification, characterization and status of existing formal and informal waste disposal facilities;
- A database of existing municipal assets (number and condition of vehicles and containers, street sweepers, staffing, etc.) dedicated to the collection, transport and disposal processes;
- Characterization of the physical processes of collection, transportation, street sweeping etc.;
- Deployment information related to container locations and other municipal WM infrastructure;
- Coverage of existing collection services including the identification and characterization of unserved or poorly served areas within the municipality;
- Coverage and frequency of street sweeping;
- Current full direct and indirect costs of waste collection, transport and disposal;
- Current budgeting and financial management processes including the current level of cost recovery (if any) and the cost accounting system utilized within the municipality;
- Level of local satisfaction with existing waste management services in the municipality (based, for instance, on the results of a survey if available or implemented through the planning process).

An information checklist and template is presented in Annex 1 of this guidance document to help facilitate the generation of sufficient information for planning purposes. Based on the above information, an existing conditions report should then be prepared describing present WM conditions and deficiencies in the existing municipal system. This report should be prepared by the MWM planning team (possibly with support from outside technical experts) to establish the baseline for determining the improvements that must be made to accomplish the target objectives of the planning process. Once the activities below are completed, an existing conditions report should be prepared to serve as a basis for engaging the stakeholder consultative group and municipality in anticipation of evaluating the best option to overcome identified deficiencies and meet the emerging requirements of the Law of Georgia “Waste Management Code”. The following activity descriptions are intended to define the manner by which the necessary planning and decision-making information can be generated and assessed to fully understand existing conditions within the municipality:

### **Activity 2.1 - Define the waste stream that must be managed by the municipality**

Defining the quantity and composition of waste to be managed in the municipality is an important planning activity. Typical waste generators within any municipality will likely

include residential households, municipal service providers that generate waste as a result of street cleaning, commercial establishments, construction organizations, agriculture. Each of these potential waste sources must be considered in the development of the Plan irrespective of whether the waste generated is directly managed by the municipality's WM system (it should be noted that according to "Waste Management Code", physical persons and legal bodies generating more than 200 tones of non-hazardous waste or more than 1000 tones of inert waste or any amount of hazardous waste per year, are bound to develop a waste management plan for the company).

**Waste Stream Quantities** - The quantity of waste managed by any component of a comprehensive waste system is the parameter that determines the capacity and number of functional units (trucks, containers, etc.) required to manage the material. Amount and type of waste managed directly by the municipal waste collection program is first and foremost the function of household and organizational/commercial waste generators that carry waste to sites where municipality dustbins are located.

Waste quantities are normally measured in terms of weight or volume. If possible, waste quantities for planning purposes should be based on past records of the amount of waste managed preferably based on scale records. However, accurately determining the amount of waste to be managed in many locales can be problematic. In countries where there are well-developed waste management systems, truck scales are commonly utilized at disposal or transfer stations to accurately measure (by weight) the amount of waste actually received for disposal or transfer. This allows accurate and ongoing data to be generated that defines the amount of waste received from various sources. Existing commercial vehicle scales in a municipality may be utilized on a temporary basis to create a sufficient data sample to interpolate an approximate daily or annual quantity of waste generated and managed. However, without the means for directly weighing collection or transfer vehicles, calculations can be made that will allow an estimate the amount of waste managed based on data from the equipment currently in use within the municipal collection program. This could include measurable parameters such as number and frequency of containers emptied, number of trucks transporting waste to disposal area, etc.

In cases where waste receipt records do not exist (as is the case in most Georgian municipalities), demographic and socio-economic information can also be used to create an approximation of waste quantities to be managed within a municipal system. This can be accomplished by applying an approximate unit waste generation rate (kg/person/day or per year) to population data, thereby allowing the calculation of an approximate amount of waste to be managed. Based on existing estimations, per capita waste generation in Georgia varies from 100 to 300 kg/person/day. The specific unit generation rate for any given municipality can be obtained from the National Solid Waste Management Company. These figures may be sufficient for initial projections of municipal waste quantities. Such calculations also allow projections to be made of the possible growth in the amount waste to be managed as a municipality's population increases. The estimated increase of a waste stream to be managed over time will allow projections to be made of the equipment and staff that will be required to provide effective service on a continuing basis. Accordingly, an approximate projection of the municipality's waste stream growth rate during a MWM planning term (stipulated as five

years in the Law “Waste Management Code”) will be important in planning the technical needs to the optimized program.

It may also be possible to correlate the unit generation rate utilized in waste projections with individual socio-economic conditions within the municipality. Socio-economic data and information related to individual segments of the municipality’s population can help to increase the validity of the waste stream projection calculation. Typically, waste generation rates in urban type settlements are higher compared to rural type settlements. This may be important in assessing the means for providing collection service to outlying village areas currently not served by the municipal program.

In addition to determining the average quantity of waste to be managed, the planning process must also consider potential daily and seasonal fluctuations in the amount of waste to be managed in some municipalities. Tourism or the seasonal generation of agricultural waste can be a significant source of seasonal variation of the amount of waste to be managed. This should be factored into the planning process.

For purposes of assessing the characteristics of the municipal waste stream, the following basic statistical information should be collected:

- Current population and the projected growth of the population within the municipality during the planning term (demographic information can be obtained from the National Statistics Office of Georgia).
- Geographical size of the area from which municipal waste is collected. These areas may be categorized as residential, industrial, or commercial areas if there is a difference in the manner by which municipal waste is managed within the individual areas. Mapping that shows this type of information would be advantageous in the planning process (land use maps and land ownership maps can be obtained from the National Public Registry of Georgia.)
- Geographical location and extent of populated locations such as outlying villages where municipal collection services are limited or not provided. Base maps of the municipality’s area of jurisdiction should be prepared to delineate the areas with limited or no service, as well as the population affected in these areas.
- A detailed characterization of the size and number of principal industries, commercial establishments including agriculture and tourism that can be categorized as major waste generators and that may or may not provide independent waste management services outside of the municipality’s collection program.

The estimated quantity of waste to be managed by a municipality will help determine the extent of collection assets (containers, trucks and staff) required to achieve an adequate level of service (ultimately, weighbridge information from the new regional landfills will be important for future and ongoing planning efforts).

**Waste Composition** - In addition to determining the quantity of waste to be covered by the municipality’s MWM plan, knowledge of waste composition will also be important.

Information about waste composition defines the potential that may exist for developing formal recycling and composting programs by determining the proportion of recoverable materials (such as recyclables of value and organic content) contained in the municipal waste stream. Most waste composition assessments will, in particular, seek to determine the waste stream content of organic, paper and cardboard, plastic, glass, and metal materials.

Information concerning the normal physical composition of the municipal waste stream will be important in defining the technical and economic viability (and design) of recovery processes and facilities. For example, the extent of recyclable or compostable materials in a municipal waste stream that can be recovered in a cost effective manner will be important in determining the economic viability of recovery initiatives (one of the significant issues that will need to be explored in each municipality during the assessment phase of waste composition is the impact that informal recyclers may have on the physical characteristics of the municipality's waste stream).

### **Activity 2.2 - Evaluate existing waste management processes, services and facilities**

The current operating characteristics and function of the municipality's existing MWM service and facilities will help define existing system deficiencies and the improvements that are necessary to eliminate them.

**Collection/Transport** - Normally, collection and transport services are the most costly and visible element of a municipality's waste management program. People's perceptions of whether a municipality's MWM program is effective or not is largely based on their observations of the collection process. This can include their observations of the conditions around collection containers, frequency of collection of containers, the extent of litter and the general condition of collection system vehicles and containers. The municipality's current waste collection system and its components should be described in terms of their physical, financial, and organizational functions. Collection of information related to the collection and transport system should include the identification and physical assessment of existing collection and transport assets including the number, type and condition of vehicles and containers as well as the staffing levels dedicated to the collection and transport process. Operational factors such as container deployment locations, collection frequency and equipment maintenance procedures should also be defined and assessed.

**Recovery (recycling, composting, etc.)** - A fundamental premise of the Law of Georgia "Waste Management Code" is the need to enhance the recovery rate of waste components as a potential resource and, thereby, reduce the amount of waste requiring final disposal. The economic viability of any formal municipal recovery program will often be determined by the availability or creation of markets for recovered materials including recyclables and compost derived from waste organic content. The existing conditions assessment phase should determine the extent of recovery activities within the municipality, if any. This should include the activities and effect of the informal sector in recovering materials from collection containers or disposal sites. The nature and extent of existing recovery processes will be important in determining the viability of formal municipal recovery programs that may be developed in the future. Any existing recovery activities should be defined and assessed by gathering information relative to:



- Material recycled (paper, metal, plastics, etc.);
- Existing recycling facilities (location, capacity, treatment process, age etc.);
- Organized collection of recovered material (area served, waste type, quantity, collection method, frequency of collection);
- Informal collection of recyclable materials including what is typically collected;
- Composting operations;
- Markets for recycled materials and compost, if any including type of material collected, and market chain structures;
- Economic factors associated with recycling and composting activities including prices paid for recovered materials and historical fluctuation in pricing;
- Identification and characterization of local, regional, national or international recycling companies and consolidators currently servicing the municipal area.

**Disposal** - Historically, disposal sites in Georgia have consisted primarily of open dumps and random informal dumpsites often located in proximity to waste generators with limited or no collection service. This assessment activity should identify and characterize the formal disposal areas currently in use by the municipality. While these sites will be replaced by regional landfills developed by the national Solid Waste Management Company or enhanced by them to improved operating conditions for continued use, the municipality will retain the responsibility for transporting collected waste to new disposal locations. Increased transportation distances will need to be identified to determine their impact on the cost and function on the municipality's collection program. The existing conditions assessment process should also inventory and profile all informal dumping areas located within the municipality. Data to be collected concerning these random dumping sites should include their location (GPS, maps, etc.), the approximate amount of waste placed in them, physical characteristics (surface area, depth, etc.) and any unique aesthetic or environmental issues associated with them. Ultimately, the MWM Plan implementation strategy will need to include a means for closing (and, if necessary, remediating) these sites and preventing their renewed use after closure.

**Waste Management Institutions** - The existing system assessment phase needs to evaluate the institutional structure and managerial function of the existing MWM system. This should include an objective assessment of the technical and managerial capacity of the entities currently responsible for providing waste related services. Terms and conditions of existing contractual agreements between the municipality and waste service providers and contractors should also be reviewed in terms of comprehensiveness and clarity of all tasks and responsibilities including historical performance in providing the contracted services. This will help to define required capacity enhancements that may be necessary to successfully manage and operate an upgraded MWM system, as a result of implementing the Plan results.

### **Activity 2.3 - Determine and characterize MWM service deficiencies**

Based on the criteria stipulated in the Law of Georgia "Waste Management Code" (including the "Municipal Waste Collection and Treatment Rules" to be developed before 1 February

2016, and on the information gathered regarding the existing municipal collection system, the planning process should identify the deficiencies that must be addressed by the implementation of their MWM Plan results. At a minimum, the MWM Plan development process should seek to define and quantify the following probable deficiencies:

- **Collection service coverage** - In many cases, a basic deficiency in Georgian municipal collection programs is the service coverage provided by the formal collection programs. Identifying the location and physical characteristics of unserved areas within the municipality will be important in identifying the manner by which to provide formal collection service to these unserved areas or to develop community based initiatives that provide a basic level of health and environmental protection. The expansion of service coverage will be a key element of desired outcomes of the MWM plan. If possible, the location of these unserved areas should be mapped and information generated concerning the estimated amount and characteristics of municipal waste generated in these areas, as well as their current means for disposing of that material. In addition, existing protected and forest areas in the municipality should be identified and the deficiencies related to waste collection services for these areas defined in cooperation with the Protected Areas Agency and the Forestry Agency. This should include the manner by which waste is managed within these areas and the manner by which each area may interface with the municipality's collection program.
- **Collection/transport operations and maintenance** - The assessment of the existing municipal collection and transport system will be a function of the number, age and operating condition of the equipment (trucks and containers) utilized to provide the collection service. This will vary considerably from municipality to municipality and understanding the ability of the existing asset base to provide reliable current and future service will be an important element of defining the additional technical resources that may be required to enhance service effectiveness and coverage. Positioning of dustbins is another issue to be considered in assessment of the above aspect of the current municipal program in order to determine if there's a sufficient quantity of those and if their location is convenient for generators of household and organizational/commercial waste (normally, a dustbin must be positioned at a distance of 100m from a waste generator).
- **Location and characteristics of Informal uncontrolled dumpsites** - Uncontrolled dumpsites in each municipality have to be identified so that they can eventually be closed and, if necessary, remediated to eliminate environmental and health risks. Importantly, the MWM Plan must also consider the means by which their continued use is prevented after closure. This will require development of an effective local enforcement structure that will assure that waste is properly managed through the municipality's collection system as it may be expanded to serve areas that historically did not have collection service and, as a result, utilized these informal dumping locations.

#### **Activity 2.4 - Define the full cost of waste management in the municipality**

Understanding the full direct and indirect cost of the municipality's existing MWM system is very important in establishing a baseline for the future costs associated with an enhanced system. For this reason, a full accounting of all costs associated with existing services and facilities is necessary. This full cost accounting assessment should allow the determination of incremental costs associated with individual core collection, transport and disposal functions. This cost accounting activity should determine total direct costs covered by current budgets as well as a calculation of unit costs such as the cost per tonne of municipal waste collected. The determination of full costs will also allow for a benchmarking analysis that will allow municipalities to gauge their costs to service levels in comparison to other municipalities in the region.

It is expected that additional financial resources will be required to achieve the results of the municipality's MWM Plan and to sustain the target level of performance. Accordingly, the difference between existing costs and the cost coverage required for the upgraded MWM system will be important in determining the additional resources necessary to accomplish the requirements of the Law of Georgia "Waste Management Code" and the results of the Plan.

#### **Activity 2.5 - Evaluate the existing means for deriving operating and development funds including normal budgeting and cost recovery processes**

Municipalities will need to define the means by which they will derive the financial resources that will be required to implement the outcomes of the MWM Plan and improve its MWM program. Potential sources of budget, including the national budget, municipal budget and other resources will need to be defined during the planning process. While municipalities typically utilize a number of financial vehicles to implement, operate and sustain their MWM systems, the manner by which the municipality currently derives its MWM related funds should be defined and assessed. This will be important in determining the ability of the current funding mechanisms to implement any of the results of the Plan. Currently, the financing of MWM system depends heavily on the municipal budgeting process and additional assistance by the national government. Municipality WM budgets are developed based on transfers from the national budget and the incomes from collection of local waste service fees. The share of collected service related fees in the total MWM budget is still insignificant, providing the low amount of economic support. This is due both to a low fee level and poor collection rates for even these low fees. More specifically, funding levels of the existing MWM system should be described in this activity including the following elements:

- Funding mechanism for collection and disposal including user charges, budget sources and other funding sources.
- Current unit fees/user charges and collections for all types of generators (residential, commercial, etc.)
- Current major problems experienced in funding waste management services, such as non-payment of user fees; money raised for waste management used to cover shortfalls in other services; etc.

**Activity 2.6 - Assess current public awareness and attitudes concerning waste management issues**

Residential, commercial, institutional and industrial waste generators will have an important and ongoing role in the function of any successful WM system derived as result of a MWM Plan. Waste generator attitudes about existing WM functions can be important in gaining their support for new programs and important financial elements such as tariff reform and a greater level of enforcement. Successful WM Plan development projects have utilized surveys to gauge waste generator attitudes regarding current WM practices and their willingness to pay for upgraded services and facilities. Extensive public awareness campaigns will be needed in order to ensure public understanding and support for possible tariff reforms. (It should be noted that any effective municipal waste management program should have an ongoing public awareness element to help assure sustainable performance.

**Activity 2.7 - Assess the technical and managerial capacity of existing institutions to develop and manage an effective waste management system**

The design, implementation and management of an effective WM program requires sufficient technical and managerial capacity within the municipal institutions that will be responsible for overseeing and providing WM services. This required that the municipality critically self-assess its available technical and managerial capacity to implement the objectives of the MWM Plan and manage the upgraded municipal system. At a minimum, this includes assessment of existing municipal waste collection and transportation infrastructure, as well as tender procedures, terms and conditions of contractual agreements with waste service LLCs, personnel capacity assessments. Capacity deficiencies should be identified during the assessment phase of the planning process so that the required capacity can be developed during the development and implementation of the Plan. Many of the planning activities identified in this guidance document can serve as good training and capacity building opportunities for the municipal staff involved in the planning process. Outside capacity building programs from donor agencies, NGOs, the Ministry of Environment and Natural Resources Protection, academia, etc. should be identified and utilized throughout the planning process and after implementation of the Plan outcomes. This will be especially important to maintain institutional capacity in spite of personnel turnover.

**FUNCTION 3 - EVALUATING OPTIONS AND MAKING DECISIONS**

Once there is a clear understanding of existing services and facilities within the municipality, decisions need to be made as to the best options for eliminating system deficiencies and improving the municipality's MWM system. In addition to decisions related to core services, decisions will have to be made on developing the new recovery initiatives established as a priority of the implementation of the Law of Georgia "Waste Management Code". All potential development alternatives related to the various elements of the municipality's integrated WM program should be evaluated to determine that are in the best interest of the

municipality and that they comply with the requirements of the “Waste Management Code” and its sub laws as well as the evolving national strategy and action plan. Many of the advanced processing and treatment technologies that have been successfully implemented in the European Union may not be immediately viable in Georgia because of the need to improve core services and the high costs related to these advanced technologies. Service and facility options that need to be evaluated in the development of the initial MWM Plan can be categorized into:

- **Technical options** - Technical options will exist for all elements of a municipality’s MWM program. This will include options for optimizing and expanding collection services. In particular, access to village and settlement areas where formal collection will help determine the best options to collect municipal waste from those locations. Alternatively, the municipality’s best option may be to assist in the development of village scale management systems that minimize health and environmental risks to people living in these areas. For the bulk of the waste generated in the municipality, alternative approaches will exist for developing new recovery processes and facilities. For example, decisions related to how access will be gained to recoverable materials will be an important consideration. While source separation of recoverable materials can significantly enhance marketing and reuse opportunities by providing access to uncontaminated higher quality materials, the cost of establishing a separate collection process must be considered. This must be considered in developing the MWM Plan since the “Waste Management Code” stipulates that the plan shall evaluate *“planned measures to be taken for the establishment of separate collection and recovery of municipal waste, including biodegradable and packaging waste”*;
- **Institutional options** - Evaluation of institutional options seeks to identify the institutional structure that should be responsible for implementing and operating the target outcomes of the municipality’s MWM Plan. This could include the current municipal entities responsible for providing existing services or new system participants such as private sector companies or regional public agencies;
- **Financial options** - Achieving the objectives and targets of the MWM Plan will likely require increased investments. It will also require sufficient financial resources to assure that the resulting MWM system is kept at an effective and sustainable level of performance. A key element that should be part of the MWM planning decision-making process is the consideration of tariff reform as a means of securing greater cost recovery from waste generators to support the upgraded program. While the existing legal framework in Georgia provides a basis for a tariff and cost recovery process, it contributes little to the actual cost coverage of existing services and facilities. However, increasing the amount of municipal waste charges for residential waste generators as well as organizations/companies may be limited by affordability issues. The local self-governance bodies (who are authorized to define local waste charges) may need to revise the existing waste tariff system including the means for enforcing collection as an important step in meeting the requirements of the improved MWM system (this is often one of the most difficult political realities faced in upgrading MWM services and facilities.) Outside of the possible contribution of a reformed tariff structure, municipalities will have to also evaluate their alternative means for financing and procuring the necessary assets and infrastructure that are required to achieve the MWM Plan results.

In evaluating all of its options, a municipality will have to consider a number of factors including cost effectiveness, affordability, whether the option achieves the MWM Plan objectives and, importantly, whether an option complies with the “Waste Management Code”. The final MWM Plan should provide an evaluation of the pros and cons associated with MWM options and the justifications for the recommended options. The following activities can assist in this matter:

**Activity 3.1 - Define the priorities for municipal actions and processes**

The Law of Georgia “Waste Management Code” and its resulting national sub laws and strategy will define the actions that the national government will take in their role supporting an effective nationwide waste management system, including elements that are municipal responsibilities. For example, the pace of developing regional landfills may influence the pace that the municipality takes in enhancing its collection and transport services. Additionally, the processes and facilities aimed at eliminating deficiencies within the current municipal system may need to be implemented based on the availability of financial resources. This need for coordination of actions will help to define the priorities that should be defined in the implementation phase of the municipality’s MWM plan. These priorities should help create a timeline in the MWM Plan for actual implementation of the plan outcomes. For example, improving core collection and disposal services may initially have a higher priority than the development of new processes and facilities that enhance recovery rates because of economic resource limitations. Therefore, based on the actions of the national government in moving forward with their support of the “Waste Management Code” objectives and on the financial resources available to the municipality, priorities should be established as to which element of its waste program the municipality will address first.

**Activity 3.2 - Identify existing or future national and regional programs or infrastructure that will influence municipality WM options**

As the national waste management framework evolves, national and regional initiatives will be developed that will affect the content and results of the MWM plans. For example, the development of new E.U. landfill standards by the national government in each region of Georgia will significantly influence collection and transport service planning and the content of a municipality’s MWM plans. The physical location of the landfills in each region may significantly increase the transport distance that some municipalities may face in delivering their waste to the regional disposal sites. The distance between municipal collection areas and disposal sites (and the time required for waste transport) will likely define whether transfer stations should be built to optimize the collection and transport process. Also, the possibility that the national government will charge municipalities disposal fees (likely based on the quantity of municipal waste actually delivered to the landfills as measured by scales) may affect municipal budgeting for overall MWM functions.

### **Activity 3.3 - Project waste generation in the future**

The Law of Georgia “Waste Management Code” stipulates that the MWM plans should be developed for a five-year planning term. During that time period, the amount of waste to be managed by a municipality may change due to an increase or decrease in population. Accordingly, the various system options evaluated during the planning process should be based on an estimate the quantity of municipal waste that may be generated throughout the five-year planning term. This activity should result in a projection of municipal waste generation for the entire planning term and the impact that the municipal waste quantity will have on the design and operation of the various municipal program elements.

### **Activity 3.4 - Develop an effective public and stakeholder education and consultation process**

Thorough and ongoing public awareness and communication are critical in developing any effective WM program. The public awareness and communication process has to be an important element of developing the municipality’s MWM Plan since the plan, and its results, must have the consent of the public, since the public is going to implement the Plan and determine to a significant extent its success or failure. To accomplish this, the planning process should make full use of communication elements such as periodic newsletters or mailings that advise the public of the planning process and its intended results. In addition, media coverage of the planning process (including stakeholder consultations, public awareness events, etc.) should be encouraged to provide a growing understanding of the part of the public in achieving the desired results of the planning process, and the potential role that they will have in assuring its effective function (including their need to participate in enhanced cost recovery processes.) To help ensure its ongoing effectiveness, the improved MWM system resulting from implementing the Plan should include an ongoing public awareness and communication program related to waste management issues. This will be particularly important as the municipality seeks to implement recovery programs where generator participation is necessary.

Periodically during the planning process, public presentations should be made to present the status of the MWM Plan development process to help the public understand and provide input into the issues associated with enhancing the municipality’s MWM system.

Once an effective public awareness and communication element of the planning process is created, the structure of this program should be adopted by the municipality as a permanent component of its waste management program.

### **Activity 3.5 - Define alternative means for increasing collection service coverage and effectiveness**

Through this activity, the planning process must define the alternate means for optimizing the collection level of service and increasing service coverage to unserved remote locations in the municipality. Accordingly, decisions concerning the alternate means for providing services to these unserved areas should be made to, if practical, incorporate these unserved areas into the formal collection program. In areas where access prevents the use of standard

collection equipment, consideration may need to be given to alternative vehicles that can provide limited service to these remote areas. The Plan should also recognize the possible need to provide information to waste generators are not capable of being served by the formal collection program as to the manner by which they can manage their waste without significant environmental or health consequences. This could include assistance by the municipality in developing community based systems in these inaccessible areas.

**Activity 3.6 - Develop CAPEX and OPEX cost estimate for alternative waste management options including life cycle financial implications**

Based on the viable options that the planning process will define for each element of the municipality's waste management system, a detailed assessment of capital and operating costs should be developed to determine the cost impact of all technical viable options. These cost estimates will also be important to determine the option that is in the best interest of the municipality and to determine the economic resources that will be needed to implement and sustain the MWM Plan results. This financial analysis should include an analysis of life cycle cost implications of the alternative technical approaches for the MWM elements including such considerations as the periodic replacement of collection and transport vehicles when they have reached the end of their service life.

**Activity 3.7 - Select preferred options and implementation process for implementation**

Based on the technical and economic evaluation of all viable alternatives for eliminating or reducing MWM system deficiencies and creating new recovery processes and facilities, recommendations should be made presenting the preferred options for achieving the target planning outcomes. The options' evaluation information provided in the MWM Plan must be sufficiently detailed to present a clear justification for the recommended systems and processes. This presentation of evaluation information and recommendation justifications will be important in securing the necessary approval of the resulting MWM strategy and the dedication of financial resources necessary to achieve it. The conclusions related to the recommended options can serve as a good milestone for securing stakeholder and political concurrence within this phase of the planning process. This concurrence can then lead to the development of a detailed investment plan to implement the recommended options.

**Activity 3.8 - Develop an investment plan for selected waste management improvements**

Once decisions have been made as to which options are to be developed to enhance waste management services and functions within the municipality, an investment plan should be developed to derive sufficient funds to implement the intended results. The needed funds should be incorporated into the annual municipality budget to be approved by the municipality/city council.<sup>2</sup> Part of the needed resources may also be derived from outside

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<sup>2</sup> Currently the national as well as municipal budget is approved for 1-year period. Correspondingly, the 5-year municipal waste management budget, defined by the Municipal Waste Management Plan will be incorporated into the annual municipality budgets. On the other hand, the multi-year budget framework would allow municipalities to produce mid-term expenditure and revenue forecasts, perform routine expenditure and revenue analysis, create annual budget requests for approval, and develop baseline budget for the following budget year. In case the multi-year budget system in place, the five-



sources including national government and donor sources. (The information presented in support of the investment plan and the justification for its proposed development options can be particularly important in securing outside assistance from donor agencies since they will be interested in the strength of the justification for the planned investment.)

### **Activity 3.9 – Define means for increasing recovery rates in the municipality**

The success of any formal municipal recovery program will be a direct function of available markets for the materials that are recovered. This will include potential markets for recyclable materials such as metal, glass, paper, etc. or compost derived through processing municipal organic waste. Existing markets should have been identified and characterized during Function 2 of the planning process. If insufficient markets exist for recyclables and compost that could be derived from a formalized municipal recovery program, the planning process should investigate the means by which to increase market opportunities. This could include the potential regionalization of recovery programs with other nearby municipalities to create an enhanced economy of scale that would be more attractive to companies that could increase market capacity. As required by the Law of Georgia “Waste Management Code”, this activity should also investigate alternative means for collecting and gaining access to source separated recoverable materials to enhance recovery process output quality. (Experience has shown that source separation program and independent collection systems enhance the value of recovered materials by preventing the contamination of these materials that could occur if the recoverable material came into contact with other waste forms during conventional collection processes.)

### **Activity 3.10 - Evaluate regional opportunities and options**

Experience throughout the world shows that there is an economy of scale to achieving many waste management functions or developing and operating new facilities such as landfills and processing/recycling plants. The regional landfills implemented by national Solid Waste Management Company will provide disposal services for all municipalities within that region. This helps create an economy of scale to support the higher design and operating standards envisioned for these disposal facilities. In developing its MWM plan, a municipality should investigate other opportunities that may exist to work with other municipalities in regional approaches that would create an economy of scale that is to the benefit of all participating municipalities. An example of such an initiative may be the development of processing facilities for sorting of municipal waste stream for materials recovery or composting facilities aimed at processing source separated organic material. Given the fact that all municipalities in Georgia are required to develop MWM plans as a result of the “Waste Management Code”, regular communication with MWM planners in other municipalities will help to identify potential opportunities for regional cost effective approaches and for increasing the knowledge of different approaches that have been successfully used in some municipalities. In addition, regional workshops aimed at discussing common waste management issues may provide a means for identifying regional opportunities to enhance MWM functions throughout the regions.

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year waste management planning should correspond to the multi-year budget framework (on the national and local levels) to address the capability of capital investments beyond the annual budget cycle.

## **FUNCTION 4 - DEVELOPING AND ADOPTING THE MUNICIPAL WASTE MANAGEMENT PLAN**

Once the assessment of local conditions and the evaluation of alternatives to eliminate system deficiencies or create new recovery processes has been completed, the formal written MWM Plan report should be prepared that will serve as a basis for soliciting public and relevant decision making structures support for the Plan and the implementation of its recommendations. Additionally, the written MWM report will also serve as a basis for securing any required regulatory approval from the Ministry of Environment and Natural Resources Protection to verify compliance with the “Waste Management Code” requirements.

### **Activity 4.1 - Determine what should be included in the written municipal waste plan**

The written MWM Plan should present the background and justification for all recommendations contained in the written Plan including the basis for the decisions that were made in deriving its recommendations. The Plan should be written clearly and focus on the most important implementation priorities defined during the planning process. Tables and graphs should be utilized to summarize data and results. At a minimum, the MWM Plan document should contain the following elements:

- Objectives of the Plan, vision statement and time frame for implementation of its results (the Plan achievement of the SMART objectives defined early in the planning process should be clearly outlined.);
- Description of the methodology applied in developing the strategy contained in the written Plan;
- Description of the municipality’s existing waste management system;
- Summary of current deficiencies including their effects and priority considerations;
- Summary of the objectives to be achieved as a result of the MWM plan;
- Description of the options available for eliminating existing system deficiencies and developing new programs to increase recovery rates;
- Results of the evaluation of options including the technical, economic and institutional aspects of each option;
- Presentation of the Plan recommendations and action plan for the results to be achieved during the planning term.

An example MWM Plan table of contents is presented in Annex 1 of this guidance document.

### **Activity 4.2 - Secure relevant decision making structures and stakeholders’ consent and**

### **regulatory concurrence with the MWM Plan**

After the planning goals have been achieved, the report on MWP Plan has been prepared and presented to the Ministry of Environment and Natural Resources Protection of Georgia, the report must be submitted to a municipality / local assembly for approval, in order to obtain an agreement regarding the results and allocation of necessary funds.

### **Activity 4.3 - Formally adopt the MWM Plan by the Municipality**

After the MWP Plan has been prepared and presented to the Ministry and local assembly, its implementation must start. This means obtaining the funds that may need to be raised from external sources in order to implement the improvement activities provided by the Plan.

## **FUNCTION 5 - IMPLEMENTING THE PLAN**

Once the MWM Plan has been developed and ratified by the Ministry and municipal elected officials, implementation of the plan results can commence. This will include an initial effort to secure the necessary financial resources that may be required from outside sources to implement the various improvements identified in the plan.

### **Activity 5.1 - Move forward to implementing the services and facilities defined in the MWM Plan**

An effective MWM Plan is one that can be successfully implemented to achieve the SMART targets defined during the initial phases of the planning process. Various instruments may be required to implement the individual elements of the municipality's program, including policy, legislative, economic communication and organizational/institutional instruments. The MWM planning process must identify these instruments so that they can be included as the target results of the implementation action activities that will commence upon formal adoption of the MWM plan. The Action segment of the MWM Plan should define what must be accomplish and when. (Throughout the implementation process, consideration needs to be given to any opportunities that may exist in the future for increasing the technical and managerial capacity of the institutions that will administer and/or operate the upgraded systems or new programs.)

### **Activity 5.2 - Monitor the implementation of required improvements and new programs**

The MWM Plan should define the means of measuring the progress made in achieving the planning results once the implementation phase commences. Examples of progress monitoring elements may include:

- A timeline by which MWM Plan outcomes and implementation milestones are to be achieved;

- The extent of economic resources allocated for implementation compared with the level of resource allocation expected and defined in the financial elements of the adopted MWM Plan;
- Physical accomplishments defined in MWM Plan implementation strategy (such as the expansion of collection services, worker and vehicle productivity improvements, increased rates of recycling or composting, reduction of citizen complaints, improved record keeping on waste quantities and service deliveries, closure and remediation of informal dumping sites, etc.);
- Public participation in source separation and recycling programs;
- Collection rate and enforcement of cost recovery charges (e.g. percentage of households paying user charges);
- Volume of recycled materials recovered and marketed;
- Volume of compost produced and marketed;
- Number of illegal dumpsites closed and remediated.

## **FUNCTION 6 – OPERATING, MONITORING AND SUSTAINING THE PLAN’S RESULTS**

The key to long term MWM planning success is to develop and utilize a means for continually monitoring the performance and results of the upgraded system. This is necessary to ensure the continued effectiveness and sustainability of the Plan’s results. This will help ensure that overall system performance (or the performance of any of its individual components) does not slip over time. Because of this, performance indicators for all system functions must be identified that provide the basis for continued functional monitoring. Information derived as a result of this monitoring process will be important in eventually updating the MWM Plan at the end of its planning term (5 years in the case of the planning term stipulated in the “Waste Management Code”).

### **Activity 6.1 - Monitor the performance of the waste management system for continual effectiveness**

Through this activity, the parameters and methodology to be used for monitoring the MWM Plan results should be defined to help ensure the sustainability of the planning results. Monitoring parameters that should be considered include:

#### **General system function issues**

- Level of continuing resource allocation to the MWM system;
- Performance reporting for MWM system services and facilities;
- The number of complaints received regarding poor MWM in the municipality.

#### **Collection and transportation**

- Implementation of collection services to unserved areas;
- Implementation of transfer stations;
- Cost recovery for collection and transport services compared to the actual cost of services.

**Recycling and composting**

- Annual reports on recycling and composting programs and facilities;

**Disposal**

- Implementation of new regional waste disposal facilities;
- Control or elimination of illegal extraction of waste from dustbins for its recycling;
- Elimination of informal dumping sites and prevention of continued dumping.

**Activity 6.2 – Periodically update MWM Plan based on evolving conditions**

An effective MWM Plan is a fluid mechanism that requires periodic update as MWM related conditions evolve. These changes will occur as a result of the implementation of initial planning results and the change in relevant factors (population, new markets for recyclables or compost, etc.) influencing municipal waste management in the municipality. The five-year term stipulated in the “Waste Management Code” will require a municipality to update its MWM Plan at the end of five year term. The planning process described in this guidance document can serve as a basis for updating the municipality’s MWM plan.

## **ANNEXES**

### **Annex 1- Example Written Waste Plan Table of Contents**

#### **SECTION 1 - EXECUTIVE SUMMARY**

- 1.1 Planning Background
- 1.2 Purpose of the Municipal Waste Management Plan
- 1.3 Plan Development Process
  - a. Stakeholder Meetings
  - b. Public Survey Results
  - c. Research and Analysis
- 1.4 Summary of Existing Conditions
- 1.5 Summary of Options
- 1.6 Summary of Findings and Recommendations
- 1.7 MWM Plan Report Organization

#### **SECTION 2 - INTRODUCTION AND BACKGROUND**

- 2.1 Regulatory and Legal Basis for the Municipal Waste Management Plan
- 2.2 Municipal Profile and Demographics
- 2.3 Planning Objectives and Target Outcomes
- 2.4 Description of the Planning Process
  - a. Planning Framework
  - b. Stakeholder Identification and Participation Process
  - c. Public Outreach and Participation Process

#### **SECTION 3– MUNICIPAL WASTE STREAM CHARACTERISTICS**

- 3.1 Introduction
- 3.2 Types of Waste Covered by the Plan
- 3.3 Waste Quantities
  - a. Residential Waste Generation
  - b. Waste generated as a result of the activities of organizations/ businesses
  - c. Industrial Waste Sources and Generation
  - d. Construction/Demolition Waste Generation
  - e. Summary of Waste Stream Covered by the MWM Plan
- 3.4 Waste Projections
- 3.5 Waste Composition Analysis

## **SECTION 4 - SUMMARY OF THE EXISTING MUNICIPAL WASTE SYSTEM**

- 4.1 Introduction
- 4.2 Description of Current Municipal Services
- 4.3 Collection and Transport Services
  - a. Institutional Framework
  - b. Collection and Transport Assets and Operational Processes
  - c. Collection Service coverage
- 4.4 Street Sweeping
- 4.5 Current Disposal Facilities
  - a. Formal Disposal Facilities
  - b. Inventory of Informal Dump Sites
- 4.6 Recovery (Recycling and Composting)
  - a. Markets and Market Chain Conditions
  - b. Informal Sector Activities
- 4.7 Legal and Institutional Framework
- 4.8 Cost and Cost Recovery
  - a. Current Program Costs
  - b. Existing Tariff Framework and Actual Cost Recovery/Collection Experience
- 4.9 Budgeting and Financial Processes
  - a. Operational/Maintenance
  - b. Capital Expenditures

## **SECTION 5- WASTE INDUSTRY SOUND PRACTICES AND TRENDS**

- 5.1 Collection and Transport
- 5.2 Recovery Processes
- 5.3 Public Education and Outreach

## **SECTION 6- ANALYSIS OF FUTURE WASTE MANAGEMENT OPTIONS**

- 6.1 Collection and Transport
- 6.2 Disposal
- 6.3 Recovery
  - a. Recycling
  - b. Composting
  - c. Source Separation and Independent Collection
- 6.4 Institutional Considerations



6.5 Funding of System improvements

**SECTION 7- FINDINGS AND RECOMMENDATIONS**

7.1 Infrastructure and Equipment Needs

7.2 Institutional Capacity Building

7.2 Procedures for implementation of recovery programs

7.3 Public Education Program

**SECTION 8 - IMPLEMENTATION ACTION PLAN AND SCHEDULE**

**EXAMPLE TABLES**

Table - Demographic Projections (for 5 year planning timeframe)

Table - Residential Waste Quantities

Table - Waste Generation Projections

Table - Waste Composition

Table - Capital and Operating Cost

Table - New Program Cost Estimates

Table - Life Cycle Cost Analysis of Proposed Improvements

**EXAMPLE FIGURES**

Figure - Demographic Trends

Figure - Residential Waste Quantity Projections

Figure - Base map - Waste Management Facilities

Figure - Base map – Collection Container Deployment and Collection Routing

Figure - Waste Composition

**EXAMPLE APPENDICES**

Appendix - Stakeholder Consultation Notes and Meeting Minutes

Appendix - Public Survey and Comment Results

**ANNEX 2 - Planning Information Checklist Template**

**DATA TEMPLATE  
Developing Municipal Waste Management Plans**

The following is intended to present a general categorization of the information that may be required to assess the existing municipal waste management program.

**GENERAL MUNICIPAL INFORMATION**

NAME OF MUNICIPALITY/CITY .....							
Area of Jurisdiction	Urban	..... km <sup>2</sup>					
	Rural	..... km <sup>2</sup>					
	Other	..... km <sup>2</sup> (Please specify .....					
	Total	..... km <sup>2</sup>					
Population		1990	1995	2000	2005	2010	Current
	Urban						
	Rural						
	Total						
Residential Units/Dwelling		1990	1995	2000	2005	2010	Current
	Urban - Single Family Residential Units						
	Urban - Multi-family Residential Units						
	Rural Village - Single Family Residential Units						
	Other						
	Total						

<b>CURRENT RESPONSIBILITY FOR WASTE MANAGEMENT FUNCTIONS</b>				
<b>Function</b>	<b>Who provides function</b>			<b>Remarks</b>
	<b>Municipality</b>	<b>LLC Contractor</b>	<b>Other Contractor</b>	
Collection service to residences				
Collection service to commercial/institutional				
Collection service to industry				
Collection service to hospitals				
Monitoring and supervision of waste collection				
Street sweeping				
Grass/ tree cutting				
Drain/river cleansing				
Removal of dead animals				
Removal of garden waste				
Removal of bulky waste				
Removal of Electrical/Electronic Waste				
Removal of Construction/Demolition Waste				
Removal of abandoned vehicles				
Procurement of vehicles/equipment				
Maintenance/repair of vehicles and equipment				
Recruitment of waste management staff				
Training of waste management staff				
Public education				
Special waste management projects				
Others (please specify)				

Are land use and topographical maps available?

.....  
.....  
.....

Are maps available that show areas with full, limited or no collection service locations?

.....  
.....  
.....

**COLLECTION AND TRANSPORT**

**General Collection/Transport Service Information**

Is there any policy to standardize the vehicles and equipment used by the municipality? (If so, please outline how policy is implemented.)

.....  
.....  
.....

Does the municipality have its own workshop to maintain and repair its vehicles and equipment? If so, how does the workshop purchase spare parts? What is the average time taken for the purchase? What is the policy on stock maintenance?

.....  
.....  
.....

Are maps available that show collection routes and container deployment locations? If not, how are routes and container locations determined during normal operations?

.....

.....

.....

Does the municipality have a storage bin/container standardization policy? If so, please briefly outline the policy:

.....

.....

.....

COLLECTION SERVICE COVERAGE FOR DOMESTIC PREMISES IN 2014		
Population Segment	% of Population Covered by Municipal Service	Frequency of Collection
Urban Population		
Rural Population		

COLLECTION SERVICE COVERAGE FOR COMMERCIAL/INSTITUTIONAL PREMISES		
Function	% of Premises	Frequency of Collection
Collected by municipality		
Collected by contractor		
Collected by Owner's contractor		
No collection service (done by owner)		

<b>MUNICIPALITY LOCALES WITH LIMITED OR NO COLLECTION SERVICE</b>				
<b>Area</b>	<b>Population Affected</b>		<b>Reason for Limited or Lack of Service</b>	<b>Prevalent Method of Disposal</b>
	<b>Limited Service</b>	<b>No Service</b>		

<b>AMOUNT OF WASTE COLLECTED (BY BOTH MUNICIPALITY AND CONTRACTORS IN 2014)</b>				
<b>Waste Type</b>	<b>Amount Collected by Municipaity - ton/ year</b>		<b>Amount Collected by Contractor - ton/year</b>	
	<b>Measured</b>	<b>Estimated</b>	<b>Measured</b>	<b>Estimated</b>
Domestic, institutional, commercial				
Street/park cleansing waste				
Infectious medical waste				
Bulky waste				
Others				
Total				

<b>CURRENT PRACTICE FOR WASTE COLLECTION AND COLLECTION POINTS</b>				
<b>Current Collection Practices</b>	<b>No of Collection Points</b>	<b>Frequency of collectiob</b>	<b>By Municipality</b>	<b>By Contractor</b>
Communal containers				
Door-to door collection				
Public area containers				
Protected areas and forest areas				
Separate Collection at Collection Point				
Separate collection at Source				

<b>ESTIMATED AMOUNT OF RECYCLABLES DIVERTED FROM WASTE STREAM (BY BOTH MUNICIPALITY AND CONTRACTORS) IN 2014</b>				
<b>Recyclable Fractions</b>	<b>Amount Diverted by Municipality – ton/year</b>		<b>Amount Diverted by Contractor – ton/year</b>	
	<b>Measured</b>	<b>Estimated</b>	<b>Measured</b>	<b>Estimated</b>
Paper/Cardboard				
Plastics				
Metals				
Glass				

VEHICLES INVENTORY OWNED BY THE MUNICIPALITY									
Vehicle type	Number	Average Capacity M <sup>3</sup>	No. of vehicle by condition (See note below)			No. of vehicle by age			
			G	F	B	>10 years	5-10 years	2-5 years	<2 years
Compactor Vehicles									
Tipping truck									
Open truck (no tipping)									
Open truck with Crane									
Tilt-frame or hoist truck									
Street Sweeping Vehicle									
Nightsoil tanker									
Vacuum truck									
Water tanker									
Tractor									
Vehicle for administration									
Others									

Note: G= Good condition, F= Fair condition, B= Bad condition

TYPICAL PURCHASE PRICE OF EQUIPMENT IN RECENT YEARS				
Equipment type	Number	Capacity	Purchase price	Year purchased
Compactor vehicle (for collection)				
Dump Truck				
Open truck without tipping mechanism				
Tilt-frame or hoist truck				
Service Monitoring Vehicles				





**DISPOSAL**

<b>CURRENT DISPOSAL LOCATIONS</b>			
<b>Items</b>	<b>Disposal Site</b>		
	<b>Site 1</b>	<b>Site 2</b>	<b>Site 3</b>
Name of Site			
Total area (ha)			
Year when disposal started			
Estimated life span remaining (year)			
Amount of waste deposited daily (ton/day)			
Number of Vehicles which deliver waste to landfill-per/day-week-year			
Distance from collection area to the site (km)			
Disposal method (see notes below)			
Existence of animals on site	Yes / No	Yes / No	Yes / No
Existence of waste pickers on site	Yes / No	Yes / No	Yes / No
Existence of open burning on site	Yes / No	Yes / No	Yes / No

Note: For disposal method, please specify as follow:

O= Open dumping - C= Controlled tipping (with occasional soil cover) - S= Sanitary landfill (with daily cover) - D= Dumping into water body (river, etc.)

The tables: *Machinery used in Landfill, including machinery owned by both the municipality and contractors and Inventory of informal dumping sites in the Municipality* is only related to Tbilisi and Adjara Autonomous Republic

MACHINERY USED IN LANDFILL, INCLUDING MACHINERY OWNED BY BOTH THE MUNICIPALITY AND CONTRACTORS								
Machinery type	No.	Number of machinery by condition			Number of machinery by age			
		G	F	B	>10 years	5-10 years	2-5 years	<2 years
Bulldozers								
Bucketloaders								
Excavators								
Backhoes								
Compactors								
Tractors								
Others								

INVENTORY OF INFORMAL DUMPING SITES IN THE MUNICIPALITY					
Location	Area	Estimated Amount of Waste	Population served	Years in use	Description or Unique Environmental Impacts

--	--	--	--	--	--

## FINANCE

REVENUE SOURCES					
Operating Fund Sources	2013		2014		2015
	Budgeted	Actual	Budgeted	Actual	Budgeted
Local budget					
National budget allocations					
Loan					
Grant by government					
Donor grant/aid					
User fee revenues					
Other user charge					
Fine/penalty					
Others					
<b>Total</b>					

EXPENDITURE FOR WASTE MANAGEMENT SERVICE					
Expenditure items	2013		2014		2015
	Budgeted	Actual	Budgeted	Actual	Budgeted
Wages and Salaries					
Materials&supplies					
Equipment/vehicle					

Others					
<b>Total for waste management</b>					
<b>% of total municipal expenditures</b>					

<b>TOTAL COSTS PRESENTED AS FULL COST OF THE COLLECTION OPERATION</b>					
	<b>Cost</b>	<b>Unit</b>	<b>Year: 2012</b>	<b>Year: 2013</b>	<b>Year: 2014</b>
	<b>Cost per amount of waste collected</b>	LAR/ton			
	<b>Cost per household served</b>	LAR/household			
	<b>Cost per person served</b>	LAR/person			
	<b>Cost per number of persons employed in MWM</b>	LAR/person			

## HUMAN RESOURCES

PERSONNEL INVOLVED IN MUNICIPALITY'S WASTE MANAGEMENT SERVICE							
Type of Personnel	Area of Work						
	A	CT	S	G	FD	O	Total
Administrator							
Health officer							
Inspectors							
Engineer							
Technical assistant							
Technician							
Mechanic							
Supervisor							
Driver							
Labourers for collection							
Labourers for street sweeping							
Others							
<b>TOTAL</b>							

A= Administration/supervision CT= Collection and transportation S= Street sweeping G= Grass cutting. If the same person carries out street sweeping and grass cutting, please indicate the number of persons in S column and write same in G column. FD = Final disposal O = Others  
In case where a person is responsible for other duties beside waste management, please put the number of such persons in parenthesis.

**EXISTING MUNICIPALITY WASTE MANAGEMENT PROBLEM AREAS**

<b>PROBLEMS ENCOUNTERED IN WASTE MANAGEMENT SERVICE</b>				
<b>Problem Description</b>	<b>Very serious</b>	<b>Serious</b>	<b>Not so serious</b>	<b>No problem</b>
Inadequate service coverage (some people not given service)				
Lack service quality (not frequent enough, spill, etc.)				
Lack of authority to make financial and administrative decision				
Lack of financial resources				
Lack of trained personnel				
Lack of vehicles				
Lack of equipment				
Old vehicle/equipment with frequent breakdown				
Difficult to obtain spare parts				
Lack of capability to maintain/repair vehicle/equipment				
No standardization of vehicle/equipment				
No proper institutional set-up for waste management service				
Lack of local legislation				
Lack of enforcement measure and capability				
Lack of planning (short, medium and long term plan)				
Rapid urbanization exceeding service capacity				
Uncontrolled proliferation of squatter settlements				
Village and settlement areas with difficult access				
Poor cooperation by Government agencies				
Poor public cooperation				
Poor response to waste minimization (reuse/recycling)				
Lack of qualified private contractors				

Difficult to control contractual service				
Lack of control of hazardous waste				
Illegal dumping of waste				
Complaints by population/other stakeholder				
Inadequate management of biodegradable waste				
Inadequate management of recyclable waste				
Insufficient control of landfill emission (leachate/ gas)				
Insufficient control of composting emissions (leachate/ odours)				
Insufficient control of medwaste				
Other (specify) .....				



## **ANNEX 3– Glossary of Acronyms / Abbreviations and Key Waste Management Terms**

### **Acronyms and Abbreviations**

CAPEX	Capital Expenditures
EIA	Environmental Impact Assessment
EU	European Union
GHG	Greenhouse Gas
GPS	Global Positioning System
LLC	Limited Liability Company
MW	Municipal Waste
MWM	Municipal Waste Management
NGO	Non-Governmental Organization
OPEX	Operating Expenditures
SMART	Specific, Measurable, Achievable, Realistic, Time sensitive
WM	Waste Management

## Definition of Terms

**Animal waste** – Waste associated with animals (animal body, animal body parts, manure, waste from meat production, waste generated as a result of animal testing and other).

**Biodegradable waste** – Any waste that is capable of undergoing anaerobic or aerobic decomposition, including food/animal food waste, waste from gardens/parks, paper and cardboard.

**Hazardous waste**– Waste that is dangerous or potentially harmful to human health or the environment. (List of hazardous wastes is provided in the Annex III of the Law of Georgia “Waste Management Code”).

**Healthcare waste** – Any waste produced by medical institutions, medical laboratories, medical research centres, nursing institutions and veterinary clinics and pharmaceutical industries and warehouses.

**Household waste** – Waste generated by households.

**Littering** – throwing in the environment, discarding and/or abandonment of waste outside of waste collection containers and facilities.

**Municipal waste** – Household waste, as well as other waste similar to household waste by their characteristics and composition.

**Prevention** – Taking measures before a substance, a material or a product has become waste, that reduce a) the amount of waste (e.g. through re-use or extension of the life span of a product), b) adverse impacts of the generated waste on the environment and human health, and c) the content of harmful substances in a material or a product.

**Recovery** – An activity, the main result of which is use of waste for useful purposes by replacing other materials that would otherwise have been used to fulfil a particular function. Recovery includes energy recovery and recycling. (List of recovery activities is provided in Annex I of the Law of Georgia “Waste Management”).

**Recyclable materials** – Common recyclable materials are glass, paper and cardboard, metal, plastic, textiles, food and garden waste and electronics.

**Recycling** – Recovery operation, by which waste is reprocessed into a product, a material or a substances, which is intended to be used for initial or other purposes. Recycling includes reprocessing of organic materials but does not include energy recovery and reprocessing into materials that are to be used as a fuel or filling material.

**Re-use** – Re-use of a product or its component for their initial purpose, before they become waste.

**Sanitary landfill** – A method of controlled disposal of municipal waste on land in a way that prevents any potential adverse emissions into surface waters, groundwater, soil or air.

**Stakeholder** – A person, group, institution or organization that has a direct or indirect stake in an activity or project or that has the ability to influence the activity or project either positively or negatively.

**Waste** – Any substance or object, which the holder discards or intends or is required to discard.

**Waste collection** – Collection of waste, which includes the preliminary sorting and preliminary storage of waste for the purpose of transfer to a waste treatment or disposal facility.

**Waste Separate collection** – Collection of waste, where waste streams are kept separately by type and characteristics, so as to facilitate their further treatment.

**Waste transfer station** – A facility where waste is reloaded for further transfer to a waste treatment or disposal facility.

**Waste Transport** – Transfer of waste to a waste storage, treatment or disposal facility.

**Willingness to pay** – The maximum amount an individual is willing to sacrifice to procure a good result or avoid something undesirable.