UNDERSTANDING THE NEED FOR SOLID WASTE MANAGEMENT

Solid waste management systems are designed to protect the environment and improve conditions in cities worldwide.

Why Is Solid Waste Management Important?
Inadequate solid waste management can impact cities and their residents in myriad ways. These impacts can generally be categorized into three categories:

1. Human health. The improper handling of waste can impact human health (e.g., decomposing organic waste attracts rodents, insects, and stray animals). In some cities, human fecal matter and urine are not separated from solid waste, which attract insects and germs that spread disease (e.g., typhoid, cholera). Mosquitos also pose a concern when they breed in solid waste (e.g., used tires); mosquitos can be vectors for diseases such as malaria, dengue, and the Zika virus.

Mismanaged solid waste and open dumpsites can lead to environmental contamination of surface and groundwater, which are common sources of drinking water. Uncontrolled burning of waste may result in emissions of air pollutants including dioxins, furans, black carbon, heavy metals, and particulate matter, many of which can be toxic for human health. For populations living in direct contact with or close proximity to waste disposal sites, these health effects can be particularly severe.

2. Environmental. Inadequate control of leachate, water that filters through waste and draws out chemicals, at disposal sites can lead to environmental contamination of soils and waterbodies, impacting local ecosystems. Mismanaged waste is also a threat to stray animals and wildlife as animals may try to consume waste that contains food residue or scraps. Open burning of waste produces emissions of black carbon, a component of particulate matter that has a significant impact on regional air quality and global climate. Waste disposal sites release methane, which contributes to the formation of ground-level ozone. In addition, methane is a greenhouse gas that contributes to climate change.

3. Socioeconomic. Inadequate solid waste management can be costly, both in terms of direct expenses and indirect costs. Mismanaged solid waste systems are a missed opportunity for economic growth, including increased property values and tourism benefits from having clean streets and beaches. Programs reducing waste can lead to cost savings in transportation and fuel costs, and cost recovery if implemented correctly. Improved solid waste management can especially benefit highly vulnerable populations through cost savings on public health systems by preventing respiratory issues, skin diseases, and other health care concerns associated with inadequate solid waste management.

Common Challenges
Cities recognize the many health, environmental, and other concerns associated with inadequate solid waste management; however, they face many challenges in properly managing this waste. Common challenges include:

a) Limited financial resources and capacity. Many cities have limited capacity for sustainably funding infrastructure or operations. Cities are often responsible for implementation but do not have the finances or financial expertise and struggle with investment costs, the upkeep of facilities, establishing a sufficient budget for solid waste projects, or rising costs and inadequate revenues as the volume of waste continues to increase. Prioritizing solid waste management, researching cost-cutting strategies, incorporating pay-as-you- throw programs or taxes, and partnering with

international investment organizations are all options for funding a viable solid waste program. Although some programs, taxes, or fees will face resistance when introduced, finding a sustained source of funding for solid waste management is an integral part of a successful program.

b) Limited access to and technical knowledge of equipment. Equipment to handle solid waste often needs to be imported, and operators may not have the technical knowledge or resources for proper and consistent maintenance. If the equipment is not designed for local conditions, this incompatibility can add further challenges because frequent repairs may be needed, and spare parts may be difficult to find. In tropical areas, local conditions such as humidity and heat can negatively affect equipment, leading to frequent repairs. In many cases, there are multiple equipment options, some of which may be better suited to local conditions.

c) Limited technical expertise and awareness of best practices. Local governments often lack the expertise needed to evaluate technologies or solutions in order to identify the most appropriate ones for their situation. Difficult situations can arise when private companies contract with cities to provide a technology or implement a project but abandon the project if the city cannot meet the terms of the contract. For example, many waste treatment project contracts include requirements that the city guarantee a clean or consistent feedstock. Private companies can and will abandon the work if the city fails to meet these requirements. Cities do not always anticipate these challenges, and projects can fail as a result. Decision-makers and staff at the local level are often not aware of best practices that other cities in similar situations have implemented successfully. Technical knowledge and awareness of best practices can be improved by participating in domestic and international exchanges such as conferences and webinars organized by the International Solid Waste Association. Centers of excellence – such as those identified in the text box to the right – can also be valuable resources for disseminating lessons and experiences.

d) Limited staff capacity. Many cities lack sufficient staff who are dedicated to addressing solid waste management issues. These staff are often focused on addressing immediate waste emergencies and have limited time or capacity to engage in longer- term planning and strategy development.

e) Political turnover. Changes in administrations can result in projects being shut down or radically altered by incoming officials and key staff reassignments on large capital projects, including solid waste management projects. As a result, many project champions who possess considerable technical expertise are not available to see projects through to completion. Solid waste management legislation, either national or subnational, which establishes long-term, sustainable systems that continue across administrations, can help overcome this barrier. Maintaining staff continuity on solid waste management projects and operations can also help minimize these disruptions.

f) Lack of planning and evaluation at both national and municipal levels can negatively affect the success of a solid waste management system. National frameworks or regulations are important to facilitate long-term planning; establish national standards; and provide incentives for programs to reduce, recycle, or compost their waste. Planning at the municipal level where implementation occurs is often overlooked and can create challenges later. This is especially prevalent when there are unplanned disruptions such as natural disasters. Creating a national and local plan, which includes a monitoring and verification system, will help create a stable solid waste management system.

g) Limited or lack of vertical and horizontal government coordination. Solid waste management usually falls under the jurisdiction of multiple ministries or agencies at various levels of government. For example, the government agencies responsible for the environment, urban and housing development, or agriculture may all be involved at different parts of the solid waste management system, but may not have formal frameworks for collaboration. In addition, local

governments are responsible for the implementation of national regulations, and national governments can play a significant role in creating enabling environments for successful local projects. A mechanism that enables coordination between agencies or departments and between the layers of government can assist in creating a holistic system.

h) Difficult working conditions. Solid waste management workers in developing countries may be underpaid and undertrained. Without proper training and personal protective equipment, these workers are at risk of injury or disease. Studies show that a high percentage of workers who handle waste, and individuals who live near disposal sites, are at risk of being infected with worms or parasites. Difficult working conditions also result in a lack of motivation for workers and low employee retention rates.

i) Limited or lack of communications with relevant stakeholders, including residents, can lead to illegal dumping, misuse and damage of containers, resistance to service fees, improper waste segregation, among other things. Coordinated communications and outreach campaigns can help ensure that relevant stakeholder groups are informed and equipped to comply with local solid waste management requirements. The informal sector is an important stakeholder group to consider and include during specific steps while planning a solid waste management program. In general, the informal sector consists of individuals, groups, and small businesses that perform informal waste services involving the collection and sale of recyclables, usually through middlemen or intermediaries. Workers earn income by selling the recyclables they collect to a network of dealers and recycling industries that work within the formal private sector; in other cases, workers may sell to other informal sector workers that reuse the material as input in another process or product (e.g., use of used parts to repair equipment). This sector can play a large role in separating materials and determining what waste will be collected.

j) Limited available land. As urban areas and populations continue to grow, the amount of available space for solid waste facilities, local collection locations, and transfer stations decreases. There may not be space, the available parcels may be too expensive, or local residents may prevent facilities from being developed due to fears of smell depreciating their living conditions or property prices. However, siting these facilities at a distance from cities, where land is more available and less expensive, creates a new set of challenges because hauling waste long distances can be time-consuming and expensive. Solid waste managers can work with local and regional leaders to create a solid waste management plan that emphasizes the importance of route and city planning. Diversion or separation programs will also play a large role in reducing the amount of waste that needs to be collected at one time.

k) Climatologic, geographic, and topographic conditions all influence the availability and cost of equipment, the feasibility of technologies, operating costs, and other aspects of solid waste management. For instance, cities in tropical zones might adapt solid waste management strategies to account for higher temperatures and faster organic waste decomposition rates than cities in cooler climates. Geographic and topographic features can pose challenges for solid waste management as well. Islands, in particular, face significant challenges due to limited space for waste disposal, disposal sites that are resilient to slope failure.

l) Cultural norms. Cultural preferences and tendencies can complicate solid waste management efforts. For example, increasing wealth and lower prices for goods have led to a dramatic growth in material consumption and waste generation worldwide. Solid waste managers are faced with the implications of these trends. Addressing cultural norms during solid waste management planning requires a coordinated stakeholder engagement approach.

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