EVIDENCE-BASED PRACTICES FOR SUSTAINABLE SOLID WASTE MANAGEMENT IN A DESERT CITY (PHOENIX, AZ)

INTRODUCTION

The City of Phoenix has aspired to divert at least 40% of waste from the landfill by the year 2020. With increasing climate change impacts from greenhouse gas emissions as well as health hazards and pollution associated with solid waste land-filling, the need to transform how we view and use waste is as pressing as ever. This case study was developed as an initial report to inform such strategy development for Phoenix. We present here an overview of best practices from around the world of cities that have achieved inspiring rates of waste diversion, an initial list of indicators and sustainability targets to help track its future progress towards goals, and future recommendations for the city of Phoenix.

The climate of Phoenix as desert city poses issues for waste practices such as composting, challenges that have not yet been addressed in similar cities in the US Southwest. These types of challenges are difficult to address in our scope of work but we see Phoenix as potentially becoming one of the most innovative cities to address such challenges.

BEST PRACTICES

There are several best practices from municipalities that can be discussed in relation to the challenges the City of Phoenix faces. Undoubtedly, the most successful cities in terms of diversion and in encouraging residential and private sector recycling have all passed comparatively stringent measures for their populations. Recycling mandates have been passed in leading cities such as San Francisco, Seattle, and San Diego. The West Coast leads these efforts, have been highly committed in terms of policy. Plastic bag bans, Extended Producer Responsibility and more have all been symbolic and practical commitments made by these cities. However, even progressive cities have received some measure of opposition to these stringent municipal decisions. The City of Phoenix may not have as favorable of a political climate, so it is difficult to apply such models to the culture of the local area. However, mandates are always accompanied by a strong base in education and service offerings by the city. Mandates serve to reinforce a culture which already exists for adopting cities.

Mandates can also be progressive and begin with the more stringent regulation of large commercial entities, based on either the number of employees or the amount of waste produced. For example, the City of Chicago requires businesses to comply with a recycling threshold in order to receive a permit. Introducing regulation this way may be more favorable compared to the mandates leading cities have passed, which may be seen as too radical for Phoenix. This being said, public-private partnerships as well as incentives for the private sectors are offered in progressive areas as well. It is important to provide meaningful incentives for commercial entities, as well as the means for businesses to easily access city recycling services.

In terms of technology, cities have taken different approaches in sorting black bin waste as well as blue bin waste. However, it is much more conventional to sort recyclables only. In addition, several waste to energy and advanced thermal technology (ATT) plants have been constructed in cities around the world. These are also quite popular in Europe. In addition, since the City of Phoenix has recently launched a pilot program for organics, examining models such as San Jose’s food waste to energy facility would be helpful for long term planning. Investigation on such a facility’s applicability to Phoenix’s specifications would have to be completed.
**INDICATORS AND TARGETS**

Given the complex, integrated nature of sustainable waste management systems, assessing the sustainability of a current system or planning for a future system cannot be done with only looking at diversion and contamination rates for waste. Using these rates as the primary and only indicators to track progress does not address waste reduced at the source (upstream drivers) as well as additional drivers in the system (such as access to service, user/provider inclusivity in the SWM systems, and the degree to which reduction of solid waste is a priority for local governments)\(^1\). We provide in Figure 2 a list of compiled indicators to help assess the sustainability of waste management practices for Phoenix in the future\(^4\). The indicators were selected to address a set of goals for sustainable waste management. These goals and indicators are based on a review of scientific literature and reference documents.

**CORRELATION BETWEEN CONTAMINATION AND DIVERSION**

Cities with high diversion levels have struggled with reducing contamination. Stringent regulation and programs such as Pay as You Throw, less frequent garbage collection, and smaller black bin containers for garbage may result in high contamination rates, as well as illegal dumping. These issues can be mitigated somewhat with education initiatives. New programs and technologies are often met with higher rates of contamination until residents are able to adjust.

**RECOMMENDATIONS FOR PHOENIX**

Moving forward, the city of Phoenix would be best suited to pursue public-private partnerships in moving towards the city's "40 by 20" goal. Given the political environment of the Valley, a cultural shift in how the city and its residents view waste is essential to this program's success. Focus should be put on building a strong infrastructure of programs geared towards increasing diversion and decreasing contamination. Public-private partnerships can provide the city spaces for collaboration and innovation between government and businesses. Such partnerships can also provide strategies for addressing issues such as food waste and educational outreach. Some of the most challenging barriers in addressing waste streams throughout the city include the political environment as well as community and resident perceptions of issues of waste. In addition to providing economic incentives on a commercial as well as residential scale, education and outreach provide the most promising coping strategies for overcoming these barriers.

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4. Wilson, D; Rodic, L; Cowing, M; Velis, C; Whitman, A; Schienberg, A; Vilches, R; Masterson; D; Stretz, J; Orle, B. (2014). 'Wasteware' benchmark indicators for integrated sustainable waste management in cities. Waste Management.