Chapter 30
3D Digital City Platforms as Collaborative and Decision-Making Tools for Small Municipalities and Rural Areas

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ABSTRACT

This chapter explores how the development and implementation of a 3D digital city platform can be utilized in the context of solid waste management and sustainable planning in a small municipality or largely rural areas with limited resources. By leveraging 3D visualization and Web 2.0 functionality to allow stakeholders to collaborate on equal footing, digital city platforms can help with day-to-day management of solid waste assets and facilities, planning for solid waste and recycling facilities and drop-offs, mapping and planning efficient waste hauler routes, and identifying issues such as underserved populations and illegal dumping.

INTRODUCTION

Initiatives to develop digital city models, or 'smart cities', have been gaining prominence within the past several years, as more people become aware of the power of GIS coupled with 3D visualization to allow government officials and managers to manage assets and perform day-to-day operations, develop sustainable planning initiatives, and collaborate between expert and non-expert groups. However, much of the focus of this new research and implementation has been on large cities, which already possess many of the tools and experts necessary to implement such digital city models. This paper will explore how the digital city platform can be utilized in the context of solid waste management and sustainable planning in a small municipality or largely rural area with limited resources.

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By leveraging 3D visualization and GIS functionality to allow stakeholders to collaborate on equal footing, digital city platforms can help with day-to-day management and long-range planning of solid waste assets and facilities, planning for solid waste and recycling facilities and drop-offs, mapping and planning efficient waste hauler routes, and identifying issues such as underserved populations and illegal dumping. 3D visualization can be utilized by community environmental courts and other efforts to engage citizens, by providing non-experts to interact with their community in the way that they understand it. Recent developments in the areas of software, cloud computing, and open web-enabled technologies have lowered the barrier of entry for regional and rural organizations to begin experimenting with these technologies.

This chapter discusses the potential of 3D digital city platforms as collaborative and outlines the development of a pilot 3D digital city platform for the small municipality of Star City, West Virginia. The main goal of the Star City pilot project was to demonstrate how geospatial technologies, such as GIS and 3D geovisualization, can be integrated with Web 2.0 collaborative technologies to create a digital city platform for local government decision-making, planning, and collaboration with citizens. The Star City digital city platform[1], built upon a GIS database generated for Star City and integrated with Web 2.0 based tools for public input on issues related to trash and recycling pickups, clearly demonstrated how such digital technologies can serve as a platform for more open and effective government in small municipalities.

BACKGROUND

At the heart of the movement to leverage the social media aspects of Web 2.0 for open government and public participation, known as Government 2.0 (Gov 2.0) is the belief that the relationship between government and citizen is a two way dialogue or a collaborative, transparent effort to create good government (O'Reilly, 2010). Technology, specifically Web 2.0, plays an integral role in establishing and encouraging this dialogue, making it accessible to anyone with access to the Internet at home, the public library, or increasingly on mobile phones. The central focus of Gov 2.0 is to build on the concept of government as a platform by leveraging the social networking aspects of Web 2.0 to develop data structures and applications that allow a dynamic, transparent relationship between government and its constituents (O'Reilly, 2010).

However, involving citizens in government does not begin when a technological application is launched to the public; it starts with the act of wanting to involve citizens in the government process. The more transparent a local government, the more likely that local government wants the public to actively participate in its policy process and in turn the more likely the public will want to participate. Internally, when local government officials support innovation and transparency, government employees feels more comfortable in extending the resources to do so. Externally, when the public feels wanted in the policy process, it strengthens their trust in the legitimacy of policy decisions. Quinn (2002) found that "The closer people are to the culture of the knowledge being transferred, the easier it is to share and exchange." If the willingness to involve the public in government processes does not exist, then technology cannot create it.

Geographic Information Systems (GIS) are often the first crucial step towards Gov 2.0 because local governments are already used to collecting geospatial data about their assets and citizens, and the demand for geospatial data by citizens has also spurred the adoption of GIS as a management and planning tool (Curtin & Meijer, 2006; Otenyo & Lind, 2004; Pina et al., 2007). Since the early 2000s, GIS has increasingly been seen as an integral part of the e-government process because it facilitates the exchange and analysis of