

A Suite of GIS-Based Tools for Siting Low Impact Development in an Urban Watershed

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ABSTRACT: Low impact development (LID) -- a comprehensive land use planning and design approach with the goal of mitigating development impacts on hydrologic/nutrient cycles and ecosystems -- is increasingly being touted as an effective approach to lessen overland runoff and pollutant loadings. Examples of LIDs include riparian buffers, grassed swales, detention/retention ponds, rain gardens, green roofs and rain barrels. Broad-scale decision support tools for siting LIDs have been developed for agricultural watersheds, but are rare for urban watersheds, largely due to greater land use complexity and lack of necessary high-resolution geospatial data. Here, we develop a framework to assist city planners and water quality managers in siting LIDs in urban watersheds. One key component of this research is a framework accessible to those interested in using it. Hence, development of the framework has centered around 1) determining optimal data requirements for siting LID in an urban watershed and 2) developing a tool compatible with both open-source and commercial GIS software. We employ a wide variety of landscape metrics to evaluate the tool. A case study of the Lake Thunderbird Watershed, an urbanized watershed southeast of Oklahoma City, illustrates the effectiveness of a tool that is capable of siting LID in an urban watershed.

IMPACT STATEMENT: Identifying suitable sites for implementation of BMP or LID practices is critical for maximizing the effectiveness of respective practices and minimizing costs of construction. This poster presents a simplified means of identifying optimal sites using a GIS-based approach and readily available geographic data. The Best Locator Tool (BLT) is intended for use in urban ecosystems especially by communities with limited management resources.