

An Integrated Water Resources Management Approach to Evaluate Effects of Transportation Projects in Urbanized Territories

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Abstract : The integrated water management is a collaborative approach to planning that brings together institutions that influence all elements of the water cycle, waterways, watershed characteristics, wetlands, ponds, lakes, floodplain areas, stream channel structure. It encourages collaboration where it will be beneficial and links between water planning and other planning processes that contribute to improving sustainable urban development and liveability. Hydraulic considerations can influence the selection of a highway corridor and the alternate routes within the corridor. Widening a roadway, replacing a culvert, or repairing a bridge. Because of this, the type and amount of data needed for planning studies can vary widely depending on such elements as environmental considerations, class of the proposed highway, state of land use development, and individual site conditions. The extraction of drainage networks provide helpful preliminary drainage data from the digital elevation model (DEM). A case study was carried out using the Arc Hydro extension within ArcGIS in the study area. It provides the means for processing and presenting spatially-referenced Stream Model. Study area's flow routing, stream levels, segmentation, drainage point processing can be obtained using DEM as the 'Input surface raster'. These processes integrate the fields of hydrologic, engineering research, and environmental modeling in a multi-disciplinary program designed to provide decision makers with a science-based understanding, and innovative tools for, the development of interdisciplinary and multi-level approach. This research helps to manage transport project planning and construction phases to analyze the surficial water flow, high-level streams, wetland sites for development of transportation infrastructure planning, implementing, maintenance, monitoring and long-term evaluations to better face the challenges and solutions associated with effective management and enhancement to deal with Low, Medium, High levels of impact. Transport projects are frequently perceived as critical to the 'success' of major urban, metropolitan, regional and/or national development because of their potential to affect significant socio-economic and territorial change. In this context, sustaining and development of economic and social activities depend on having sufficient Water Resources Management. The results of our research provides a workflow to build a stream network how can classify suitability map according to stream levels. Transportation projects establish, develop, incorporate and deliver effectively by selecting best location for reducing construction maintenance costs, cost-effective solutions for drainage, landslide, flood control. According to model findings, field study should be done for filling gaps and checking for errors. In future researches, this study can be extended for determining and preventing possible damage of Sensitive Areas and Vulnerable Zones supported with field investigations.

Keywords : water resources management, hydro tool, water protection, transportation

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