Introduction

Recreational behaviors can be complex and dynamic. This is particularly true when recreation areas are large, experiential opportunities diverse, and use volume high. Freedom of movement and freedom from interference of others are key elements of high quality recreation. Influenced as much by site design and management as by the magnitude of use, these freedoms often underlie quality objectives for parks and protected areas. When seeking to manage large, complex and diverse areas in a holistic and systematic way, area-wide use patterns must be linked with site-specific crowding related impacts. This research presents an integrated approach to modeling pedestrian travel and experiential quality at multiple spatial scales.

Macro Scale Models

At a macro scale, the trail systems allow visitors to travel from origin to destination. GIS-based network models analyze the efficiency and quality of routing within the trail system. Network models identify trail features or patterns of visitor behavior that may compromise the capacity of the trail system in terms of function and/or experiential quality.

Meso Scale Models

Meso scale models use the outputs of the network model to examine capacity related challenges at the activity center level. They are designed to develop more refined capacity assessments for regions of the trail network and activity centers to guide site development, user programing, and travel management strategies.

Micro Scale Models

The macro scale network models estimate the level of pedestrian demand placed on critical links and nodes of the trail network throughout the day. These outputs are used as inputs for micro scale simulation models. Simulation models estimate the levels of service provided by pedestrian facilities and the recreation quality experienced by pedestrians under alternative levels of use. Analysis of simulation modeling results informs carrying capacity and management decision making to optimize both transportation system function and user experiential quality.

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