VISUALIZATION AND VISUAL SIMULATION: LOOKING AT CHANGE BEFORE IT OCCURS

Do you wish you could look at change *before* it occurs? Thanks to computer techniques known as *visualization* or *visual simulation*, you can. When applied to planning and design, visualization can sharpen public analysis and discussion, community visioning, and transportation planning by translating words into pictures and creating a common visual understanding for all participants. Unfortunately, visual simulation is still not routinely used in planning, leaving citizens with varying, and often inaccurate, images of what change will look like.

The Minnesota Department of Transportation (MnDOT) has long embraced both two-dimensional visual simulation and three-dimensional animated simulation as essential planning, design and public engagement tools. The department has established a visualization section within the agency whose mission is "*…to provide computer generated renderings of proposed roadway designs. [Their] products include photo simulations as well as animations that aid in the project development process and provide a valuable communication tool for [their] clients.*" (http://www.dot.state.mn.us/visualization/) MnDOT provided the examples on the following pages illustrating some of the possibilities for using visualization as part of the transportation decision-making process.

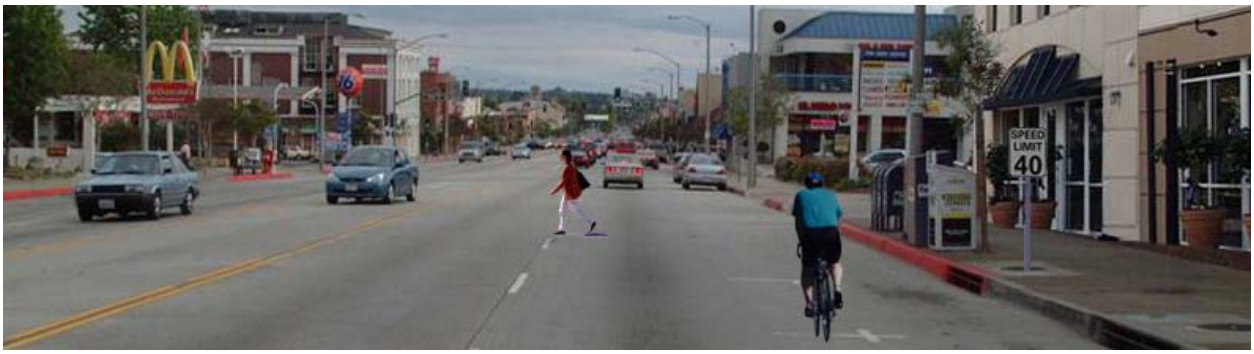
Photoshop can transform images so that neighbors and travelers can understand how proposed changes will affect their community and mobility. For example, a segment of State Highway 61 (London Road) at 36th Avenue in Duluth, MN (pictured below), is shown as it now exists and with one of a handful of improvement alternatives that have been explored with stakeholders and the public as part of a planning study. This particular alternative seeks to avoid adverse neighborhood impacts while improving multimodal safety and capacity within the existing London Road footprint with improved facilities for pedestrians and bicyclists; added, but narrowed, travel lanes; and intermittent raised and landscaped medians for protected left-turn lanes, pedestrian crossing refuges, and traffic calming.

Existing London Road and 36th Avenue, looking northeast

Visualization of 4-lane proposal (26th Avenue to 40th Avenue)

Pictorial representations of new facilities, such as the Wakota Bridge on I-494 between South St. Paul and Newport, MN shown below, foster greater understanding of how a proposed design will look and function in context. By establishing a common visual language, visualization encourages community participants to offer specific feedback in the early stages of design.

Visual simulation can also introduce new ways of thinking about streets, such as MnDOT's illustration of how a "Complete Streets" policy could affect a major urban thoroughfare.



Existing conditions show a street designed for cars only, with a 40 MPH speed limit, a pedestrian attempting to cross without any break in traffic, and a cyclist traveling without benefit of a marked bicycle lane.

A redesigned "complete street" alternative reallocates the existing street space to better accommodate mobility and safety for all users through narrowed travel lanes; enhanced streetscaping and traffic calming treatments; a lowered speed limit of 25 MPH; intermittent left-turn lanes; intermittent raised and landscaped medians with pedestrian refuge points; clearly-marked and visible pedestrian crosswalks with curb bump-outs and pedestrian-actuated signals; dedicated and clearly-delineated bicycle lanes; and relocation of sidewalk clutter to improve pedestrian travelways and sight lines while accommodating appropriate locations and spacing for additional pedestrian-level lighting and street trees, to fit this urban context.

Simulation is also effective for demonstrating how a new service will operate. For a new bus rapid transit line in the I-35W corridor, a QuickTime movie showed citizens how the improvements would operate prior to their completion in 2005. Both low- and high-resolution versions were available. http://www.dot.state.mn.us/projects/brt/35wbrt-high.mov

Citizens should request visual simulation early in the collaborative process to ensure that the best technology is informing their perspectives and understanding of proposed changes. To ensure that all simulations are accurate, trained professionals, not amateurs, should produce all simulations.