

An Evaluation of the 3D/4D Visualization Process as Applied to the FDOT Roosevelt Boulevard PD&E Study

Ronald G. Hughes, Ph.D.
The University of North Carolina
Highway Safety Research Center

Carol Tan Esse, COTR
Federal Highway Administration

The Federal Highway Administration (FHWA) in conjunction with the Florida DOT sponsored an effort to 'document the process' involved in an operational application of 3D/4D visualization methods. Under the direction of the UNC Highway Safety Research Center (HSRC), a range of 3D and 4D visualization alternatives were incorporated into the North/South Roosevelt Blvd PD&E Study in Key West, FL. Methods ranged from conventional photo-composites, to displays based totally upon computer generated 3D models/environments, to highly realistic animations of both motorized and non-motorized traffic activity.

Public feedback was gathered through in-depth surveys that were developed and administered to public participants in the scheduled Design Alternatives Workshop. Other survey tools were developed to elicit design-oriented feedback from members of the PD&E study team, which included the FDOT Environmental Management Office in Miami, PHK & Associates, and MPI, Inc (the visualization consultant).

The images below show existing conditions at the entrance to Key West and a proposed roundabout. The 3D model of the proposed roundabout was used as the basis for an animation of proposed traffic operations. The animation raised interesting issues regarding the 'fidelity' of virtual displays of traffic operations. The Roosevelt Blvd project was



selected because of the importance attached to facility improvements having potential benefits to pedestrians and bicyclists. The figures to the right show existing and proposed views of treatments to the Smathers Beach area which included lane reductions, the provision of medians, bike lanes, and wide promenades for pedestrian use.

Federal Highway Administration Research



The project was also instrumental in being one of the first applications of commercially available software for the cost effective animation of human activity, such as pedestrian behavior.



In addition to documenting effectiveness from both a public involvement and a design perspective, the final report (FHWA-RD-98-173) also addresses key relationships between visual and operational 'fidelity,' cost, development time, and effectiveness. The CD-ROM based report contains the full length video used as part of the Design Alternatives Workshop as well as a video describing the technical aspects associated with the development of the 3D models and animations used in the project. A discussion of 'future directions' for 3D and 4D visualization is also contained in the report

The report discusses the need for similar efforts to 'document' operational applications of 3D and 4D visualization as a basis for an eventual capability to address the effectiveness of such tools from an objective benefit/cost standpoint.

For more information, please contact:

Ronald G. Hughes, Ph.D.
UNC Highway Safety Research Center
919-962-7411 (V) 919-962-8710 (F) or
E-mail: hughes@claire.hsrc.unc.edu

Carol Tan Esse
Federal Highway Administration
703-285-2071
E-mail: carol.tan.esse@fhwa.dot.gov