Public Preferences on the Use of Visualization in the Public Involvement Process in Transportation Planning

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Background
- Public Involvement (PI) in the transportation planning process has been mandated by SAFETEA-LU.
- SAFETEA-LU requires transportation agencies to "employ visualization techniques to describe plans" to the public.
- How the public perceive the effectiveness of various visualization techniques remains uncertain.

Visualization
- Visualization may be defined as the simulated representation of proposed transportation improvements and their associated impacts in a manner sufficient to convey to the layperson the full extent of the improvement.
- Two-Dimensional (2-D) visualization technique
  - Maps, photographs, artist’s renderings, charts or graphs, architecture and engineering drawings
  - Uses graphics to portray horizontal and vertical references of an object or a scenario
  - Relatively low production time and cost
- Three-Dimensional (3-D) visualization technique
  - Incorporates horizontal, vertical and depth references of an object or a scenario to provide viewers the feel of depth
  - Usually produced from a 3-D model constructed in a software environment and then presented in static form in posters, display screens or scaled 3-D models
- Four-Dimensional (4-D) visualization technique
  - 3-D models that add time dimension to make the image dynamic
  - Includes animations, including videos or simulated movements
  - Relatively higher cost, effort, time, skills to prepare.

Objective and Scope
- The objective of this research is to address the gap by examining
  - How the public perceive the effectiveness of various visualization techniques in conveying a project’s design;
  - To what extent the use of better visualization techniques would encourage them to participate in the public involvement process;
- Two case studies are selected to build 2-D, 3-D and 4-D visualization models.
- The models were used to conduct questionnaire surveys at public meetings and the internet.

Project 1 – Proposed Spur 276 in El Paso, TX
- A Texas Department of Transportation (TxDOT) project.
- Initial PI revealed that the public wanted a mixed use recreation (bicycle cum jogging) path, and a channel lined with local materials.
- Visualization models were developed to convey the revised design.
- Models were constructed with GoogleEarth, then converted to 2-D, 3-D and 4-D (fly through) modes.
- Scenes were edited, and English and Spanish subtitles added using PowerDirector.

Project 2 – Bicycle & Pedestrian Pathway Along Lisa Dr., Chaparral, NM
- A El Paso Metropolitan Planning Organization (MPO) initiative to illustrate off-street and on-street bicycle lane to residents.
- VISSIM was used to simulate the traffic conditions with off-street and on-street bicycle lanes, then converted to 3-D and 4-D models.
- Scenes were edited, and English and Spanish subtitles added using PowerDirector.

Public Meetings and Surveys
- El Paso Main Public Library: 501 N. Oregon St
- Mission Valley Branch Library: 601 N. Yarbrough
- Chaparral Community Center: 109 Lisa Dr, Chaparral
- Ivan Schwartz Library: 1805feat Martin
- Norris Van Dorn Regional Library: 551 Reid Rd
- Mission Valley Library: 601 N. Yarbrough

Survey Response by Gender

Summary
- Majority of the respondents ranked the information presented by the 2-D, 3-D and 4-D visualization techniques in increasing order of their abilities to convey the proposed project concepts.
- More than 71% of the respondents thought that transportation agencies should devote more time and budget to develop advanced visualization models to encourage public participation.
- More than 75% of the respondents indicated that they would be more willing to participate and encourage others to participate in the transportation planning process if better visualization tools were used.
- Among the survey respondents, males outnumbered females by the ratios of 1.6 to 1 in the public meetings and 4.2 to 1 in the internet-based survey. It highlights a need to encourage more female in the community to participate in the PI process in transportation planning.
- More than 52% of the respondents from public meetings were above 45 years old. On the other hand, more than 57% of the respondents who took the internet-based surveys were 30 years old or younger. This imbalance in statistics indicates the different media preferences among the age groups in communicating with the transportation planning agencies.
- The high percentage of internet-based survey respondents who were 30 years old or younger indicates that internet may be a good medium to reach out to young residents.