Transportation Research Board National Roundabout Conference

Using Design Visualizations to Address Safety Issues

presented by
Marilyn Kuntemeyer, P.E.
Senior Transportation Engineer
David Evans and Associates
Denver, Colorado
May 23, 2005
Initial Application of Design Visualization

Intersection of Douglas/North Douglas Highway, Juneau AK

Victor Salemann, PE, Project Manager
Scott Soiseth, PE, Project Engineer
Victor Vaskelis, Designer
Ourston Roundabout Engineering Subconsultant
Visualization Basics

- Plan View
- Grading
- 3D Modeling
- Surface Rendering
- Surface Textures
- Obtain Viewpoint
- Insert Model into Viewpoint
Plan View
Grading
3D Modeling
Rendering
Texturing
Obtain Viewpoint
Insert Model into Viewpoint
Design Visualization Applications

• Grading
• Sight Distance
• Signing
• Utilities and Structures
Grading Review

- Roundabout cross-slopes
- Integration of approach grades
- Wall requirements
Roundabout Cross-slope
Juneau, AK
Roundabout Cross-slope
Woodinville, WA
Approach transitions

Juneau, AK
Approach Transitions
Woodinville, WA
Sight Distance

LEGEND

\( d_1 \) Entering stream distance
\( d_2 \) Circulating stream distance

15 m (49 ft)
Approach Sight Distance
Juneau, AK

- Sight distance easily reviewed using model
- Visibility of central island, circulation vehicles, and signing easily checked
Entering Sight Distance
Woodinville, WA
Circulating Sight Distance
Woodinville, WA
Pedestrian View
Juneau, AK
Pedestrian View
Woodinville, WA
Signing and Pavement Marking

- 200 mm (8 in) solid white
- 200 mm (8 in) solid yellow
- 300 mm (12 in) broken white
- 1 m (3 ft) stripe, 1 m (3 ft) gap
- White legend (optional)
- 600 mm x 3 m (24 in x 10 ft) Zebra crosswalk,
  600 mm (24 in) spacing (typical)
- 200 mm (8 in) solid yellow, 5 m (20 ft) spacing
- 200 mm (8 in) broken white (bike lane);
  consult local standards for other situations
- 200 mm (8 in) solid white (bike lane);
  consult local standards for other situations
Signing and Pavement Marking
Juneau, AK
Impacts to Adjacent Development

- Circulating roadway proximity to structures
- Wall requirements
- Business signage
- Access issues
Proximity of roundabout to structure a major concern
Proximity of roundabout to structure a major concern
Retaining wall, service station sign and access
Woodinville, WA
Other Applications

- Project in San Diego County
- Client requested a rural treatment with shoulders
- High speed approaches and significant peak hour volumes
- Vertical barrier defining outside edges of the roundabout desired for safety
San Diego County

- Client requested a rural treatment with shoulders
- High speed approaches and significant peak hour volumes
- Vertical barrier defining outside edges desired
- Community interest high
San Diego County

- Raised barrier curb proposed with shoulders
- Used by WSDOT in rural application
- Roundabout edges defined maintaining rural feel
- Community acceptance high
San Diego County
Drivers Eye View
Conclusions

• Design visualization can be an effective tool for checking roundabout designs
• Sight distance, signing, and pavement markings are easily checked
• Grading and ride issues can be more fully investigated
• The public responds well to driver’s eye viewpoints, often relieving concerns about how to drive roundabouts
Juneau Roundabout Status
May 19, 2005
Questions?

Please contact:

Victor Salemann, P.E.
Transportation Group Manager
Bellevue, Washington Office
David Evans and Associates, Inc.

Phone: 425 / 586-9761 (Office)
425 / 922-7278 (Cell)

E-mail: vls@deainc.com