NCHRP 3-65: Applying Roundabouts in the United States

Status Report

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Topics of discussion

- Project team
- Project scope and key objectives
- Highlights of recent data collection activity
- Upcoming activities
Project team

- **P.I.: Lee Rodegerdts (KAI)**
  - (Bruce Robinson, Co-P.I. Emeritus)

- **USA**
  - *University of Idaho*
  - *Rensselaer Polytechnic Institute*
  - *George Mason University*
  - *David Harkey*
  - *John Mason*

- **Australia**
  - *Rod Troutbeck*

- **Canada**
  - *Bhagwant Persaud*

- **Germany**
  - *Werner Brilon*

- **United Kingdom**
  - *Richard Hall*
Project objective

- Produce a set of operational, safety, and design tools, calibrated to U.S. roundabout field data.
Overview of research tasks

1. Summarize existing relationships
2. Model formulation
3. Data collection plan
4. Interim report
5. Execute the approved data-collection plan
6. Inventory U.S. roundabout sites
7. Operational performance methods
8. Safety performance methods
9. Design criteria
10. Final report

Completed Dec. 2002
Essentially complete
Beginning these tasks
TASK 7: Operational performance methods

- Evaluate existing operational analysis models using U.S. data
- Identify traveler behavior at U.S. roundabouts
- Refine or develop estimates of capacity, delay, and queues
- Develop new HCM procedure
TASK 8: Safety Performance Methods

- Comparisons of “before” and “after” safety performance
- Models relating crashes to traffic and geometric characteristics
- Explore speed-related models
TASK 9: Design Criteria

- Refine geometric and traffic control design criteria used for roundabouts
- Make assessments of pedestrian and bicycle behavior and effectiveness of observed treatments
- Upcoming NCHRP 3-78: Address visually impaired pedestrians at roundabouts
TASK 6: Inventory U.S. Roundabout Sites

- Update and expand inventory of U.S. roundabouts
- Provide in formats usable for future research
Data collection effort

- 350+ roundabouts in U.S.
  - Many are low volume residential – of little use to project
  - Most of the remaining are not operating with any periods of continuous queuing
  - Many are recently constructed

- Data collection effort is satisfying multiple purposes
  - Operations model
  - Safety model
  - Design guidance
  - Pedestrian and bicycle observations

- Model development is timely but is constrained by available data
Types of data collected

- **Geometric data**
  - Received for 140+ sites
  - Varying quality
  - Parameters extracted for 76 sites

- **Safety data**
  - Individual crash records or summaries received for 100+ sites

- **Speed data**
  - Spot speeds measurements in field

- **Video data**
  - Gap and delay data
  - Turning movement information
Video data collection tour

Location: X (Y)
X: Sites recorded on video (31 + 2 pilot)
Y: Sites where operational data extracted (13 + 2 pilot)
Overall video data (for all purposes)

- 262 DVDs (+ pilot study)
  - 166 approaches, 96 omni-directional

- Time segments containing periods of continuous queuing:
  - Single-lane: 915 minutes (15 unique approaches)
  - Double-lane: 1,038 minutes (9 unique approaches)
  - 1,953 minutes total

- Bicycle and pedestrian activity observed:
  - 649 bicycle events
  - 1,028 “naturally occurring” pedestrian events
Upcoming activities

- Identify gaps in data
- Test existing operational and safety models against data
- Identify behavior of U.S. drivers
- Examine possible model formulations if existing models are insufficient to describe observed behavior
- Identify potential changes to current design methods
  - Changes due to model findings
  - Current state-of-the-art thinking
- Project completion: June 2005
Questions?