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TRB Signal Systems Committee Meeting
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Objectives

- Develop a resource for professionals involved in traffic signal timing that:
  - integrates consideration of planning, design, operations, and maintenance
  - considers the needs of technicians, engineers, and planners
- Improve traffic signal timing terminology
- Document signal timing fundamentals and nuances that are not adequately understood
Approach to Development

- Identify existing materials (FHWA)
- Review State of Practice (ITE effort)
- Provide an outline for the materials
- Review ongoing and future efforts with FHWA
- Compile Best Practices from Workshops and other research
  - Ask Committee to review the document (more formalized effort)
- Identify Research Problem Statements and potential funding sources
NCHRP Support of Other Manuals

- Highway Capacity Manual has a $16,000,000 10-year plan
  - NCHRP recently completed an HCM Applications Guide for $400,000

- Highway Safety Manual has a $2,000,000 plan
  - Upcoming $600,000 effort for Manual creation
Traffic Signal Timing Materials – 5 Basic Parts and (Subcommittees)

- Principles of Traffic Signal Timing (Policy)
- Isolated Intersections and Timing Parameters (Rural)
- Coordinated Intersections (Urban)
- Advanced Concepts (ITS)
- Policies and Practices (Policy)
Initial Estimated Research Effort for Each Part of the Traffic Signal Timing Manual

- Principles ($50,000)
- Rural ($150,000)
- Urban ($300,000)
- ITS ($200,000)
- Policies ($50,000)
- Final Production ($250,000)

Total Estimate - $1,000,000
Principles of Traffic Signal Timing

1.0 Terminology

2.0 Planning
   - Signal Warrants, Spacing, other considerations

3.0 Operations
   - Relationship to the HCM
     - Resolve some issues this summer
   - Performance measures

4.0 Design
   - Phasing, Vendor Neutral Detection design

5.0 Maintenance

- Integration of the Principles
Isolated Intersections and Timing Parameters

1.0 Phase Parameters
- 1.1 Vehicle change and clearance intervals
- 1.2 Pedestrian timing
- 1.3 Minimum greens
- 1.4 Maximum greens
- 1.5 Recalls
- 1.6 Detector timing

2.0 Detector Timing and Design
- 2.1 Gap settings and volume density functions
- 2.2 Detector placement
- 2.3 Dilemma zone concepts
- 2.4 Examples
Coordinated Operations

1.0 Basics of Coordination
- 1.1 Cycle Length
- 1.2 Split
- 1.3 Offset
- 1.4 Time-Space Diagram Concepts

2.0 Coordination Operations
- 2.1 Operating Mode
- 2.2 Coordination Concepts
- 2.3 Bandwidth
- 2.4 Performance Measures and Other Considerations

3.0 Interpretation of Signal Timing Sheets
Advanced Concepts

1.0 Adaptive Traffic Signal Control
2.0 Preemption Concepts
3.0 Transit Signal Priority
4.0 Relationships to ITS
5.0 Applicable Standards
Policies and Practices
Other Related Efforts

- MOST – Field Implementation of Signal Timing
- FHWA Traffic Signal Timing
- ITE Efforts
- NHI Courses
- TMC Pooled Fund Study? Idea at TRB 2005
Next Steps

- Develop a Research Program that:
  - Documents lessons from the field
  - Incorporates information from:
    - Basic Signal Timing Workshops
    - NCHRP Projects (3-66, 3-79, etc)
  - Assimilates various activities that are ongoing
  - Seek support with State DOT
    - NCHRP Participants
    - TMC Pooled Fund Study