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## Workshop on Best Practices for Signal Operations

### Monday, July 28, 2003

### Benson Hotel, Portland, Oregon

The Committee on Traffic Signal Systems is holding its summer meeting in conjunction with a workshop designed to expand the understanding of traffic signal operations. Many of the references on traffic signal operations such as detector layout and timing parameters are not widely used or agreed upon. This workshop is an attempt to share field experiences in an attempt to develop best practice operations. The program will include technical presentations from traffic signal engineers and researchers in the field with the intent of helping establish a framework of understanding for discussion. This workshop is intended to be a dialog between the presenters and the audience with the goal of expanding everyone's understanding of the issues involved and potential solutions. The sessions scheduled include the following: Detector Layout and Purpose, Basic Traffic Signal Timing Parameters, Advanced Detector Operations and Research. The workshop is intended to be a presentation of what is being done in this field, with some discussion to discuss approaches that represent a "best practice".

### **Welcome to Portland/Perspective on Transportation Operations**

8:00 – 8:30                      Brian Newman, Metro Councilor  
Portland-Metropolitan's Overall Transportation Policies

### **Welcome to the Workshop**

8:30 – 8:40                      Peter Koonce, Kittelson & Associates, Inc.  
Speaker Guidelines

### **Session 1 –Detector Purpose and Layout**

Each presenter will briefly explain and provide (standard drawings, graphs, or spreadsheets) to their detection layout approach and discuss methodology used to determine the number of detectors and the criteria for detector layout. This first session is intended to be a brief primer on detector purpose and layout and should briefly consider the following:

- What is the procedure for determining whether detection is necessary? State the objectives and compare and contrast the need for Efficiency vs. Safety (dilemma zone). Consider both the operation under isolated and coordinated operation.
- What are the primary considerations for detector layout? Discuss detector spacing standards and the methodology used to determine detector placement.
- If you were going to design a new intersection, where would you place detectors (do you have a standard approach)? Is the design different between isolated and coordinated intersections? Protected-permissive left turn case.
- What technologies do you use and why?
- Any special considerations for pedestrians and cyclists?



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- How do you wire the detectors in the field and/or cabinet?
  - What questions do you have of the research community?

### **Session 1 Speakers**

8:40 – 9:00	Dave Hatch, City of Portland Local Layout Practice – Urban Coordinated Systems (efficiency?)
9:00 – 9:20	Jason Kesler, WSDOT Eastern Region Local Layout Practice - Rural Conditions (Dilemma Zone, safety?)
9:20 – 9:40	Denny Eyler, SRF Consulting Other considerations – Pedestrians, Left Turn Issues
9:40 – 10:00	Best Practices Discussion
10:00-10:15	Break

### **Session 2 – Basic Timing Parameters**

This session is intended to be a brief primer on basic timing parameters. The speakers have been chosen to establish the relationship between the speakers in Session 1 and build upon the detector layout discussed previously.

Each presenter is asked to briefly explain their approach to detector timing and discuss the timing functions used and compare and contrast differences between detector layout and purpose and practice in the field. It is intended that some of the following topics be addressed:

- What are the basic parameters that are used for detection timing and what is their purpose? Min Gap, Min Green, etc. (See sample timing sheet)
  - How is the min gap defined?
  - Do you use added initial features?
  - Do you use volume-density functions and if so how do you establish thresholds for the time to reduce (TTR) and time before reduction (TBR)?
- What effect does speed changes have on your approach?
- What detector timing parameters are most important?
- Do you change parameters depending on the operation of the intersection (isolated and coordinated or by time of day)?
- How do additional through lanes (2 or more) effect your approach to timing (gap settings, dilemma zone)?
- How much does the public effect what you do and what effect exists?
- Are the detectors wired separately? Phase vs. Channel
- How do different technologies change what you do?
- What maintenance issues are considered for field hardware, wiring, and timing?



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## **Session 2 Speakers**

- 10:30 – 10:50 Bill Kloos, City of Portland  
City Traffic Engineer Perspective
- 10:50 – 11:10 Ken Heale, WSDOT Eastern Region  
County Signal Engineer Perspective
- 11:10 – 11:30 Montasir Abbas, Texas Transportation Institute  
Research Perspective
- 11:30 – 11:50 p.m. Best Practices Discussion

## **Session 3 – Advanced Operational Issues**

This session is intended to look forward toward advanced topics. What is the industry doing to advance the state of the practice? Are new practices being developed?

- 1:30 – 1:50 Tom Potter, Reno A&E  
New Opportunities for Loop Detectors
- 1:50 – 2:10 Jim Sturdevant, Indiana Department of Transportation  
INDOT Detection Test Facility
- 2:10 – 2:30 Dan Shamo, URS  
Red Light Violation Logging with Video Detection Systems
- 2:30 – 2:50 p.m. Best Practices Discussion

## **Session 4 – Research Topics & Wrapup**

This session is intended to look forward toward what the research community may contribute and what practitioners believe would advance the state of the practice. Is there a role for the Committee? Is there such a thing as best practice?

- 3:30 – 4:00 Summary of Presentations  
Session 1: TBD  
Session 2: Jim Williams, University of Texas at Arlington  
Session 3: TBD
- 4:00 – 4:45 Identification of Research Topics and Wrapup  
Tom Urbanik, University of Tennessee