Active Traffic Management Workshop
Merrillville, IN
Jim Sturdevant PE
INDOT
Dec 2011
Detection needs- Lane by lane and advance
Controller features- Event Logging
Communication requirements:
Down in the weeds: Looking into performance & lessons learned...
Regional/ Statewide Signal Management

Geographical/ Organizational Challenges

INDOT: ~2,600 signals in 300 systems

Large geographical areas increase the benefit of remote monitoring and traffic management
Progress towards Active Signal Management

- 100 High Resolution Event Data controllers on line
- ITS Fiber, Commercial Cellular, FHSS Radio, Broadband Radio
- Peek, Econolite, Seimens (soon)
- 4.5 Billion Event Data Records (400 million/month)
Progress towards Active Signal Management

1. 32/37 - Noblesville
2. +1 Pleasant St
3. +2 System -- Completing the "Ville"
4. +4 Fishers
5. +8 US31
6. +16 SR37 S
7. +32 Ft Wayne, NW IN
8. 2011 and beyond...

All new contracts
The other "Ville’s"- Merrillville (31)
The other “Ville’s”- Louisville (9) Area
Eyes and Ears - Communications and Detection
Lane by lane, advance, count capable

**Loop Tagging Table**

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Controller Capabilities for event logging

Log Events
Standard Enumerations
100 ms
30 hours storage
Ethernet
FTP Protocol

Translate to CSV
Communications Migration
Communications Security

- Friends List
- VPN’s
- Private IPs
- …#2 key?
PCD Overview
Original Instrumented Intersection
SR37/SR32
Flow Profiles Overview
SR37 Fishers/Noblesville- (9)

Very good 2 way progression
US31 N @ 116th

Full split utilization
Opportunity for offset adjustment

Phase failure

Time of Day
US 31 @ 126th (8 in system)
SR 37 South

3 mile from adjacent intersection to north

Random arrivals from south
Indy-Bloomington
SR 37- Martinsville

Actuated coordination
Lead/Lag
SR 14- Ft Wayne

Cycle time (seconds)

Time (Hour of day)
Architecture for Active Management of Geographically Distributed Signal Systems

INTRODUCTION
Signalized arterials represent a substantial component of the highway transportation network in the United States. The National Transportation Operations Coalition (NTOC) in its 2007 Traffic Signal Report Card noted that, nationally, five to 10 percent of all traffic delay is caused by improper traffic signal timings along major roadways. In 2007, the National Report Card score for overall traffic signal systems operations was 63.

Upgraded intersection controllers, communication, detection equipment, closed loop systems, and/or central systems can provide modest improvements. However, there are more significant improvement opportunities for traffic operations and agency manpower efficiency by defining active management practices and implementing alternative traffic signal architectures that go beyond traditional closed loop and central system models. The following sections document the state of Indiana’s vision and green time to ensure that all movements have sufficient capacity. However, there are clearly other objectives that may or may not enter into consideration, such as pedestrian service, transit priority, and emergency vehicle operations. Although this is an obvious step, agency staff responsible for managing the system will not have clear guidance on how to prioritize competing demands unless there is clear consensus on an agency’s priorities.

1. Collect fundamental signal operations data. Historically, central and closed-loop monitoring systems have displayed near real-time status of phase indications and detectors, but only archived five- or 15-minute flow rates. For any substantive analysis of the signals operation, high-resolution phase indication and detector status must be collected.

2. Analyze data using theoretically...
Develop a network of transportation agencies to:

1) **Performance Measures**: develop consensus on operational standards of performance,

2) **Central System Architecture for Distributed Wide Area Systems**: define a central management model that can leverage commercial wireless IP offerings that can be competitively outsourced, and

3) **Management Concepts and Guidelines**: for using a central system, identify when and where resources are most needed to maximize return on investment.
Wrapping up:

- Communications and Performance Measures Prototyping: Reliability and Scalability (Easy Button?)
- ~100 controllers by end of year is a start, but only a fraction of the whole.
Questions?

Thank you!!

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