SPM Basics & Applications Overview

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January 27, 2016

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SPM Basic Concept

Automated Data
Collection

- Signal controller
- Probe source

Useful Information
about Performance

- Signal
- Corridor
- System

System Requirements for SPM's

1) High-resolution Controller

- Econolite Cobalt: Any Version
- Econolite ASC3 NEMA: V. 2.50+ & OS 1.14.03+
- Econolite 2070 with 1C CPU Module: V. 32.50+
- Intelight Maxtime: V. 1.7.0+
- Peek ATC Greenwave 03.05.0528+
- Trafficware 980ATC V. 76.10+
- Siemens M50 Linux & M60 ATC
 - ECOM V. 3.52+
 - NTCIP V. 4.53+
- McCain ATC Omni eX 1.6+

2) Communications

3) Server

4) Website

5) Detection

(optional)₃

Can be done independent of a central system!

Active Phase Events:

0	Phase On
1	Phase Begin Green
2	Phase Check
3	Phase Min Complete
4	Phase Gap Out
5	Phase Max Out
6	Phase Force Off
7	Phase Green Termination
8	Phase Begin Yellow Clearance
9	Phase End Yellow Clearance
10	Phase Begin Red Clearance
11	Phase End Red Clearance

Detector Events:

81	Detector Off
82	Detector On
83	Detector Restored
84	Detector Fault- Other
85	Detector Fault- Watchdog Fault
86	Detector Fault- Open Loop Fault

Preemption Events:

101	Preempt Advance Warning Input
102	Preempt (Call) Input On
103	Preempt Gate Down Input Received
104	Preempt (Call) Input Off
105	Preempt Entry Started

Controller Enumerations

Event Code, Event Description, Parameter

Detector 5 ON

06/27/2013 01:29:51.1	10	8
06/27/2013 01:29:51.1	82	5
06/27/2013 01:29:52.2	1	2
06/27/2013 01:29:52.2	1	6
06/27/2013 01:29:52.3	82	2
06/27/2013 01:29:52.8	82	4
06/27/2013 01:29:52.9	81	4
06/27/2013 01:29:53.3	81	6
06/27/2013 01:29:54.5	81	2
06/27/2013 01:30:02.2	8	2
06/27/2013 01:30:02.2	8	6
06/27/2013 01:30:02.2	33	2
06/27/2013 01:30:02.2	33	6
06/27/2013 01:30:02.2	32	2
06/27/2013 01:30:02.2	32	6
06/27/2013 01:30:06.1	10	2
06/27/2013 01:30:06.1	10	6
06/27/2013 01:30:08.1	1	8
06/27/2013 01:30:13.1	32	8
06/27/2013 01:30:15.8	81	5
06/27/2013 01:30:18.5	82	6
06/27/2013 01:30:27.5	81	6
06/27/2013 01:30:30.4	8	8

Phase 8 GREEN

Detector 5 OFF

High-resolution Data

Timestamp, Enumeration Code, Parameter

->Signal Metrics

Selected Signal
7379 5600 West 2700 South

Signals

Region

Metric Type

Filter

Signal List

Map

Create Metrics

Metric Settings

Metric Type

- ☐ Approach Delay
- ☐ Approach Volume
- ☐ Arrivals On Red
- ☐ Purdue Coordination Diagram
- ☒ Purdue Phase Termination
- ☐ Speed
- ☐ Split Monitor
- ☐ Turning Movement Counts
- ☐ Red Light Monitor

Consecutive Count

- ☒ Show Plan Stripes
- ☒ Show Ped Activity
- ☐ Upload Current Data

Dates

Start Date AM

End Date PM

Reset Date May 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

Coordination Optimization Example: Progression Quality

One approach shown

Vehicles arrive on green

Vehicles arrive on yellow

Vehicles arrive on red

Metric: Purdue Coordination Diagram 7

Detection Requirements: Advance Counters

Purdue Coordination Diagram

Bangerter & 5400 S (3/7/2013)

Bangerter Hwy (SR-154) 5400 South (SR-173) Signal 7063 Overlap: 10 Northbound
Thursday, March 07, 2013 12:00 AM - Thursday, March 07, 2013 11:59 PM

- Detector Activation
- Change to Green
- Change to Yellow
- Change to Red
- Volume Per Hour
- AoG - Arrival On Green
- GT - Green Time
- PR - Platoon Ratio

Metric: Purdue Coordination Diagram
Detection Requirements: Advance Counters

Approach Speeds

Bluff & 100 S, St. George, NB

Metric: Approach Speeds

Detection Requirements: Wavetronix Advance Radar

Operations & Traffic Study Example:

Vehicle Speeds at Intersections

Metric: Approach Speeds

Detection Requirements: Wavetronix Advance Radar

Approach Volumes

- When to take a lane for maintenance
- Directional splits for offset optimization
- Network models

Metric: Approach Volumes

Detection Requirements: Advance Counters

Lane-by-Lane Volume Counts

Use for traffic studies, models, adjust splits, coordination balance

US-89 Main Street (American Fork) SIG#6023
Tuesday, October 22, 2013 12:00 AM - Tuesday, October 22, 2013 11:59 PM

Westbound Thru

TV: 7566 PH: 5:15 PM - 6:15 PM PHV: 721 VPH
PHF: 0.9 fLU: 0.96

US-89 Main Street (American Fork) SIG#6023
Tuesday, October 22, 2013 12:00 AM - Tuesday, October 22, 2013 11:59 PM

Southbound Left

TV: 5590 PH: 1:00 PM - 2:00 PM PHV: 533 VPH
PHF: 0.89 fLU: 0.87

US-89 Main Street (American Fork) SIG#6023
Tuesday, October 22, 2013 12:00 AM - Tuesday, October 22, 2013 11:59 PM

Eastbound Thru

TV: 8076 PH: 5:00 PM - 6:00 PM PHV: 757 VPH
PHF: 0.95 fLU: 0.74

— Total Volume — Lane 1 — Lane 2

— Total Volume — Lane 1 — Lane 2 — Thru Right

Metric: Turning Movement Counts

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Detection Requirements: Stop Bar Counters

Red Light Monitoring

Use for identifying safety trends and engineering countermeasures

Metric: Red Light Monitoring

**Detection Requirements: Stop Bar Counters
with speed filter or detectors in intersection**

Red Light Monitoring

Analysis: 7:00 AM to 8:15 AM - May 18, 2015

- Is green time too short? – Would increasing the split fix the problem?
- Is coordination poor? – More vehicles arriving on green could fix this?
- Is sight distance poor? – Are their trucks or other obstructions blocking signal?
- Is law enforcement needed? – Time can be pinned down for law enforcement.

2013

Purdue Coordination Diagrams

2015 Purdue Link Pivot