SALT LAKE CITY TRAFFIC CONTROL CENTER.
BRYAN MEENEN

INTERAGENCY COOPERATION
DAILY DETECTOR ALARMS AND
Salt Lake City Factoids
(Communications)

- 237 signalized intersections maintained by Salt Lake City
  - 189 connected by fiber
  - 7 connected by radio
  - 41 not connected to communication
- 1 engineer/ 2 timing and operation technicians/ 5 maintenance technicians devoted to signals
- Intelight Central System
- 175 of signals collecting high resolution data
- 3 1/2 Years of experience with high resolution data
Salt Lake City Factoids (Detection)

- Length of stop bar detectors on minor movement
  - 35’ – 40’
- Use of dilemma zone or other detection on arterial main line
  - None
- Detection Technologies used
  - Inductive loop, Camera, FLIR, Radar, Sensys pucks
- “Lane by Lane” or “Lane Group Detection”
  - Varies by location and technology
Salt Lake City Factoids (Detection)

- Link to detection standard number scheme
  - Mostly contact closure cards, some click 600, All new installations will be click 650.
- Detection Testing and Maintenance Practices
  - Checked for proper operation during PMI
  - For the past 2 years we have been using the Daily Email Detector Alarms
- 15 of Signals with Emergency Vehicle Preemption
- 5 of Signals with RR Preemption
Salt Lake City UDOT Cooperation
Maintenance Example: Nighttime detection problem

BEFORE: Video detection not working at night

Minor street through & left turn max out at night only

Metric: Purdue Phase Termination
Detection Requirements: None
Maintenance Example: Nighttime detection problem

After: Detection repaired

Phases are rarely used at night

- Gap out
- Max out
- Force off
- Pedestrian activation (shown above phase line)
- Skip

Metric: Purdue Phase Termination
Detection Requirements: None
Alert Example

---The following signals had too many force off occurrences:
- 1019 - 300 West & 800 South - Phase: 2 (Force Offs 100%)
- 1019 - 300 West & 800 South - Phase: 4 (Force Offs 100%)
- 1019 - 300 West & 800 South - Phase: 6 (Force Offs 100%)
- 1019 - 300 West & 800 South - Phase: 8 (Force Offs 100%)
- 7070 - 3300 South & I-15 SPUI - Phase: 1 (Force Offs 100%)
- 7070 - 3300 South & I-15 SPUI - Phase: 5 (Force Offs 100%)

---The following signals had too many max out occurrences:
- 1035 - West Temple & 1700 South - Phase: 4 (Max Outs 100%)
- 1035 - West Temple & 1700 South - Phase: 8 (Max Outs 100%)
- 1122 - University St & 400 South - Phase: 5 (Max Outs 91.7%)
- 7635 - 600 South & 300 West - Phase: 2 (Max Outs 100%)

---The following signals had too few records in the database:
- 5297 - Main St. (SR-165) & 1700 S (Providence) - Phase: 0 (Missing Records)

---The following signals had unusually low detector hits:
- 6045 - US-6 (Spanish Fork) & Canyon Road - Phase: 2 (Has Unusually Low Counts.)
- 6045 - US-6 (Spanish Fork) & Canyon Road - Phase: 6 (Has Unusually Low Counts.)

---The following signals have stuck ped detectors:
- 5033 - 2100 South (Wilson) & 1100 West - Phase: 2
- 5507 - Lincoln & 25th - Phase: 2

- Force Offs
- Max Outs
- No Data
- Low Detector Hits
- Stuck Pedestrian Button

Daily email sent at 7 a.m.
Compare to previous day’s data. Only phases with new flags are reported.

Metric: Purdue Phase Termination
Detection Requirements: None
Detection Alert
Phase 4 at 400 E & 800 N, 4/8 & 9/2014

Phase 4 starts constant call

SPMs evaluated for % max outs

Alert email sent

4/8/2014

4/9/2014

Metric: Purdue Phase Termination Detection Requirements: None

Gap out
Max out
Force off
Pedestrian activation (shown above phase line)
Skip
My Process

• Receive email report
• Manually check each intersection
• Send appropriate work orders

“Data Dump”

Metric: Purdue Phase Termination
Detection Requirements: None
My Process

• Watch list
  • Eliminate duplication of work orders
  • Investigate further
  • Searchable history of events

• Troubleshooting
  • Verify Complaints
  • Review historical data

Metric: Purdue Phase Termination
Detection Requirements: None
Troubleshooting Example: Intersection at or near capacity

Before:

**Phase 3**

- Plan 4
  - 18.0 - 85 Percentile Split
  - 18.3 Avg. Split
  - 98.5% ForceOffs
  - 0.0% GapOuts
  - 0.9% Skips

**Phase 4**

- Plan 4
  - 37.0 - 85 Percentile Split
  - 33.2 Avg. Split
  - 50.9% ForceOffs
  - 48.5% GapOuts
  - 0.6% Skips

*Metric: Split Monitor*

**Leading Phase 3**

- Gap out
- Max out
- Force off
- Pedestrian activation
  (shown above phase line)
Troubleshooting Example: Intersection at or near capacity

After:

**Phase 4**
- 37.0 - 85 Percentile Split
- 31.8 Avg. Split
- 44.0% Force Offs
- 55.1% Gap Outs
- 0.0% Skips

**Phase 3**
- 30.7 - 85 Percentile Split
- 24.4 Avg. Split
- 79.0% Force Offs
- 21.0% Gap Outs
- 0.0% Skips

Troubleshooting Example:
Intersection at or near capacity

**Metric:** Split Monitor

Lagging Phase 3
Summary

• Proactive
• Basic operation/history
• Trains
• Operational knowledge vs. out of sight, out of mind