Smart Signals

Presentation to the BRTB on July 25, 2017
What is a Smart Signal?

• Official announcement from Governor and Secretary soon.
  • Adaptive
  • ATMS
  • CV/AV
  • Performance Monitoring
  • Ramp Metering
Adaptive

- 36 adaptive signals in 4 systems
- US 1 Elkridge since October 2015
  - Centracs Adaptive – split and offset only
  - Measured mainline and key side streets
  - 3 % reduction in travel time
- MD 24 Bel Air - 2016
  - Centracs Adaptive
  - Measured mainline only
  - >10 percent reduction in travel times during some periods
MD 2 Brooklyn Park
• 4 signals operating Synchro Green(Naztec) since April
  • Adaptive cycle
• Before/after study nearly complete
  • TM counts + Hourly split/cycle reports → Infer side street delay
  • GPS Travel time runs for mainline delay
  • Changed cycles frequently
• No complaints about side streets
Adaptive

Adaptive Cycle Length by Time of Day

![Graph showing adaptive cycle length by time of day with various time slots and cycle lengths indicated.]
Adaptive

• Underway
  • MD 139 Towson (3) – Activated July
  • US 301 Bowie (6) – Programming nearly complete

• Another 50+ intersections in FY 2018
  • Adaptive priority list
Adaptive

• Challenges in operating
  • Need to check regularly and keep communications running
  • Portions of US 1 and MD 24 down due to construction or equipment failures
  • Need to reprogram for added, removed, or rebuilt signals

• Training
  • Program small systems in-house
  • May have to learn 2 ATMS and adaptive systems (Econolite and Naztec)
Performance Monitoring

• Current Measures
  • Traditionally delay (through models) and travel time
  • ATMS adds more tools - delay, Perdue Reports, travel time, percent arrival on green, cycle failures...

• Consider goals for the corridor
  • Safety
  • Pedestrian accessibility
  • Multi-modal

• Goals becoming more individual and qualitative
ATMS

• Currently 99 signals in Centracs
  • 74 at last BRTB Traffic Signal Subc meeting
  • Targeting adaptive priorities
  • Systems without communication
  • High profile corridors

• Enhanced monitoring
  • Signal status at a glance
  • Split reports

• Still working on:
  • Video
  • TM counts
  • Integrated travel time
CV/AV

• Secretary wants Maryland to be a leader in supporting CV/AV development
  • US 1 between MD 32 and I-195 has been identified as a demonstration corridor.
  • Testing 12 CV/AV-ready Cobalt controllers on MD 2

• Challenges
  • Vehicle data backhaul can’t be supported with 4G
  • Looped fiber for redundancy
  • Institutional – OOTS, CHART, IT
Ramp Metering

- I-270 Innovative Congestion Management
- FHWA Ramp Metering Workshop
  - Significant physical improvements – ramp storage/widening
  - Limit arterial impacts
  - Adaptive
  - Case studies – Portland, Minneapolis, Atlanta, Sydney
- TBD
  - Who monitors and operates
  - Hardware and algorithm