Adaptive Traffic Control Systems
Real-Time Traffic Signal Technology
US 29, Albemarle County
Project Update

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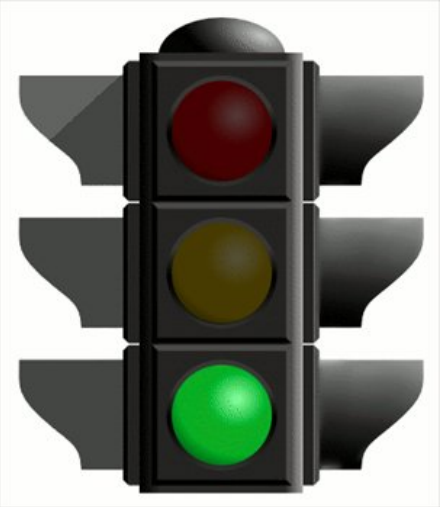
Teresa Gardner, P.E.
Regional Traffic Engineer
Culpeper and Staunton Districts

Traffic Signal Control Practices

Current Practice:

- Actuated Control
- Time-of-day Plans (by day of week)
- Relies on regular retiming
- Assumes consistent traffic flow patterns



Adaptive Control:

- Optimizes in real time (on the fly)
- Reacts to fluctuations in traffic flow
- Allows for variations in phase sequence

Goals & Benefits of VDOT's ATCS Initiative

Adaptive Traffic Control Systems (ATCS) Benefits:

- **Improve Congestion/Delay/Travel Time with better traffic flow**
- **Improve Safety with less stop and go conditions**
- **Improve Environment with reduced emission & fuel consumption**

InSync Adaptive Signal Control

- Functions as a plug-in to existing controller equipment
- Uses IP addressable video camera for detection, but can fuse with other types of detection
- Requires Ethernet communications between intersections

Using Technology to Move Forward

Intersection Web View

Challenges & Lessons Learned

- Effectiveness may be limited when intersections are “oversaturated”
- Spend time/money on collecting off-peak data to validate benefits
- Queues matter
- Broadband Communications is KEY

US 29 (Seminole Trail) Signal Locations

Int. #	Main Street	Side Street
1	US 29 (Seminole Trail) *	Airport Rd/Profitt Rd
2	US 29 (Seminole Trail)	Timberwood Blvd
3	US 29 (Seminole Trail)	Town Center Dr
4	US 29 (Seminole Trail)	Hollymeade Dr
5	US 29 (Seminole Trail)	Ashwood Blvd
6	US 29 (Seminole Trail)	Polo Grounds Rd/Rio Mills Rd
7	US 29 (Seminole Trail)	Hilton Heights Rd
8	Hilton Heights Rd	Walmart
9	US 29 (Seminole Trail)	Schewels/Better Living
10	US 29 (Seminole Trail)*	Woodbrook Dr
11	Woodbrook Dr	Lowes/Rio Hill Shopping Ctr
12	US 29 (Seminole Trail)	Albemarle Square Ct
13	US 29 (Seminole Trail) *	Rio Rd (Rte 631)
14	Rio Rd (Rte 631)	Fashion Square/Albemarle Square Ct
15	US 29 (Seminole Trail)	Fashion Square Dr
16	US 29 (Seminole Trail)	Shoppers World Ct
17	US 29 (Seminole Trail)	Premier Circle/Branchlands Blvd
18	US 29 (Seminole Trail) *	Greenbriar Dr
19	US 29 (Seminole Trail)	District Ave
20	US 29 (Seminole Trail)	Seminole Ct
21	US 29 (Seminole Trail) *	Hydraulic Rd (Rte 743)

Intersections directly impacted by widening project

Intersections directly impacted by Rio Interchange

* Key Intersections for green band with current system

Progress to Date

- Preliminary engineering and cost estimate completed prior to the Route 29 Solutions Project. A funding shortfall was identified.
- Adaptive equipment contract in place for use with State dollars.
- Communications plan was developed.

Next Steps

- Review infrastructure upgrades and communications plan vs. impact from construction of the US 29 widening, Rio Interchange and Berkmar projects.
- Revise design and cost estimate.
- Identify proper, existing contracting mechanism for infrastructure and communications work.
- Complete Systems Engineering Report that is now required due to federal funds being used.
- Federalize adaptive signal equipment contract.
- Re-design signal communications.
  - Assess IP broadband communications options that make sense with proposed construction sequencing
  - Recommend options based on reliability and cost-effectiveness

Goals

Phase 1 (complete by summer 2015)

- **Create a real-time traffic management corridor on US 29 with reliable and cost effective communications. The system will be monitored by the NWRO Signal Operations staff. VDOT Engineers will be able to remotely make timing adjustments that react to incidents, fluctuations in daily traffic, daily construction impacts, weather events and special events.**

Phase 2 (start-up after construction is complete 2016/2017)

- **Install adaptive signal equipment.**

Key Remaining Items

- Finalize preliminary engineering.
- Finalize cost estimate and schedule.
- Complete Systems Engineering report.
- Construct signal infrastructure upgrades and communications plan.
- Continue to work with City of Charlottesville on their project.

Thank you for this opportunity.

For questions or further information, please contact…

Teresa Gardner, P.E.
Regional Traffic Engineer
Teresa.Gardner@VDOT.virginia.gov

Joel D. DeNunzio, P.E.
Residency Administrator
Joel.DeNunzio@VDOT.virginia.gov