Thinking Inside the Box
Leverage What You Have in the Cabinet

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Topics

- Signal Timing Process
  - Implementation and Fine Tuning
- Isolated Intersections Features
- Coordinated Intersections Features
- Any Intersection Features
Set it and Forget It?

- Signal Timing is Not a “Set it and Forget It” solution
Overarching ideas/principles

- “The industry often promises what it cannot deliver, and then fails to deliver what it could, with better commitment and resources” - Improving Traffic Signal Management and Operations: A Basic Service Model, Richard Denney

- “If you think it's expensive to hire a professional to do the job, wait until you hire an amateur.” - Red Adair
Signal Timing Process

1. Determine Project Goals, Define Success, Determine Schedule
2. Data Collection and Analysis
3. Develop Signal Timing Plans
4. Deploy Signal Timing Plans
5. Fine-Tune Field Operations
6. Performance Evaluation
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Develop Signal Timing Plans
Software Tools

- **Traditional Tools**
  - Transyt 7-F
    - Network and Arterial Optimization
  - Passer II-90
    - Arterial Optimization
  - Sicap / HCS / SOAP
    - Isolated Intersection
  - Arterial Analysis Package (AAP)
    - Data Exchange
  - Traf-NETSIM
    - Test – Simulate Proposed Timings
  - TS/PP-Draft
    - Create TSD / Fine-Tune
Software Tools

- "Recent" Tools
  - Synchro / Vistro
    - Network and Arterial Optimization
  - HCS / TEAPAC
    - Isolated Intersection
  - Vissim, SimTraffic Others
    - Test – Simulate Proposed Timings
  - Tru-Traffic
    - TSD / Optimize / Fine-Tune / TT Studies / QC
Software

- Software is **40 to 50%** of the final signal timing solution (a very important start)
- Software may not mimic all controller features
- Interpreting software output to controller input is critical
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Deploy Signal Timing Plans
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- Fine-Tune Field Operations

Fine-Tune Field Operations
Fine-Tune Field Operations

- Fine-tune patterns and plans
- Monitor critical intersections
- Drive the corridor
  - More than just Cycle / Offset / Split
  - Use controller features to achieve goals
  - Know the hardware
- Use the system to troubleshoot operations
  - Queue spillback, cycle failures, “excess” green time
Isolated Controller Features

- Intersection in Free Operation
  - Volume Density
    - Gap Reduction
    - Variable Initial
  - Multiple Max Times
  - Dynamic Maximum
Coordinated Controller Features

- Coordinated Intersection
  - Inhibit Max
  - Adaptive Splits/Split Demand
  - **Force Mode** (Fixed/Float)
  - Actuated Coordinated
  - Alternate Phase Sequence (lead/lag TOD)
  - Traffic Responsive
Example Controller Option

- Floating Force Off
Example Controller Option

Floating Force Off

Shopping Center

Phase 4
24 Seconds

Phase 3
18 Seconds

School

Phase 4
Phase 3

Complaint: Need more green coming out of the school at the stoplight

Solution: Set Floating FO to “NO” (i.e., Fixed FO)
Any Intersection

- Twice per Cycle Left
- Conditional Service Left
- Detector Features
  - Delay, Extend
  - Queue
  - Detector Switching
- Flashing Yellow Arrow
- Alternate Basic Timings
  - Clearance Intervals
  - Extension Times
- Leading Pedestrian Interval (LPI)
- Automated Traffic Signal Performance Measures
TSM&O Technology Platforms: Automated Traffic Signal Performance Measures (ATSPMs)

- FHWA Every Day Counts initiative for 2017-2018 (EDC-4)
- Real-time and historical functionality at signalized intersections. This allows traffic engineers to measure what they previously could only model.
  - Approach delay, approach volume, arrivals on Red, Purdue Coordination Diagram, Purdue Phase Termination, Speed, Split monitor, turning movement counts
  - Availability of various reports depends on detection
- Used to identify operational deficiencies, optimizing mobility and helping manage traffic signal timing and maintenance. All in an effort to reduce congestion, save fuel costs and improve safety.

http://spm.seminolecountyfl.gov/signalperformancemetrics/
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Flashlight Yellow Arrow

- Direct replacement for a PPLT phase
  - Studies show that FYA is better understood by motorists
  - Eliminates the left-turn trap
- More intuitive to motorists
- Operational flexibility and versatility
  - Lead/lag and left-turn re-servce
  - Protected-only, PPLT, or permissive-only by time-of-day
  - Conditional based on adjacent crosswalk activity
Flashing Right Arrow

- Change operation based on pedestrian demand
  - Flash, Red arrow, Green arrow
Thanks!

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