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MAXTIME adaptive

Overview

Built on Intelight's award winning MAXTIME ATC Framework, MAXTIME adaptive local controller software is a system-free traffic adaptive solution that runs on local traffic signal controllers and optimizes cycles, splits, and offsets along traffic signal corridors in real-time. Contrary to black-box solutions, MAXTIME adaptive algorithms are based on the signal timing performance metrics developed by Purdue, Indiana DOT, and Utah DOT. Contact Intelight today to see how MAXTIME adaptive can help update your signal operations system to 21st century technology.

Arterial Links

Link	Link From Peer	Link To Peer	Stop Allowed	Saturation Speed	Traffic Speed	Free Flow Speed	Distance
1	0	153	No	30	40	50	0
2	153	165	No	30	40	50	3370
3	165	170	No	30	40	50	1584
4	170	104	No	30	40	50	
5	104	61	No	30	40	50	
6	61	0	No	30	40	50	
7	0	61	No	30	40	50	
8	61	104	No	30	40	50	
9	104	170	No	30	40	50	
10	170	165	No	30	40	50	
11	165	153	No	30	40	50	
12	153	0	No	30	40	50	
13	0	0	No	0	0	0	
14	0	0	No	0	0	0	
15	0	0	No	0	0	0	
16	0	0	No	0	0	0	0
17	0	0	No	0	0	0	0

Operational Mode	COS
Data Collection Cycles	2
Minimum Cycle Length	50
Maximum Cycle Length	200
Min Required Score	0
Req. Offset Gain	2
Add. Cycle Gain	2
Forward Bound Weight	1
Backward Bound Weight	1

Adj. Num	Start Time	Adapative Cycle Length	Adapative Offset	Score	Sent To Controller
1	Tuesday February 16 2016 11:24:18	120	90	53	Yes
2	Tuesday February 16 2016 11:12:17	120	90	51	Yes
3	Tuesday February 16 2016 11:06:17	120	90	50	Yes
4	Tuesday February 16 2016 10:56:16	120	90	62	Yes

Highlights

- Adaptive cycle, offset, and split optimization
- Uses high resolution data (1/10th second logged on local controller)
- Uses distributive processing to optimize signal timings. No need for a master or system processor
- Runs alongside MAXTIME local signal control software on the industry standard ATC API
- Dedicated web and text user interfaces
- Robust peer-to-peer sync. mechanisms
- Compatible with MAXTIME transit priority, preemption, advanced phase and coord options, user logic, etc.
- Quick and efficient transition between plans when coupled with MAXTIME critical path transition algorithm
- Detection requirements consistent with Purdue, INDOT, UDOT Signal Performance Metrics (SPM) requirements

Unique platform

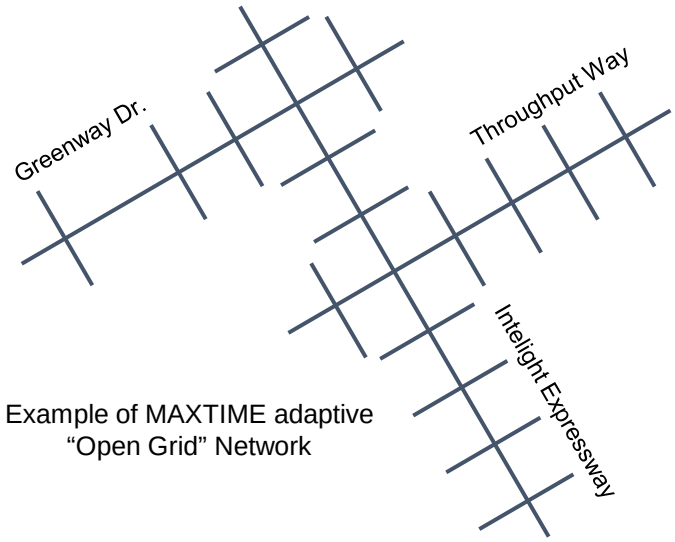
- Peer-to-peer communications between controllers
- No system/master field processor
- Onboard web server (edit database through web browser, no proprietary database editor)
- Monitor and modify configuration from Windows and Apple computers, IPADs, tablets, smart phones without special software
- Store and load hundreds of configuration databases on controller
- Easy, automated software updates via network or USB flash drive while intersection continues to run traffic signal operations
- Writes optimized timings to MAXTIME coordination pattern via NTCIP protocol

Infrastructure Requirements

- Detection requirements (lane by lane)
  - Cycle/offset optimization – advanced detection on coordinated/mainline (300 to 600 feet from stop bar-should be placed in advance of normal queueing)
  - Split optimization – stop bar detection on all approaches
  - Compatible with radar, video, inductance loop, magnetometer and various other detection technologies
- Hardware
  - Currently requires Intelight ATC with 1883 engine board or newer (NEMA or 2070) with ATC API
  - Currently requires Intelight's MAXTIME signal control software
  - Ethernet communications via fiber, wireless, or Ethernet over copper between signal controllers

Theory of Operation

- Cycle/offset optimization
  - Based on 1/10th second high resolution data: cycle-by-cycle optimization of vehicle capture rates based on detector calls and coordinated window
  - User-defined calculation period, cycle length optimization range, percent improvement required to change
  - Calculates and protects minimum corridor cycle time from MAXTIME databases (optional pedestrian protection
  - Every controller optimizes the corridor and results are synced via peer-to-peer (distributive processing) – no master or lead controller in network
- Split optimization
  - Balances splits using approach/stop bar occupancy at local intersection
  - Uses combination of green occupancy (OCC_{GRN}) and detector occupancy during first five seconds of phase movement red ($ROCC_{5\text{-sec.}}$)
  - Balances across rings and barrier groups
  - Incremental adjustments made on a sliding scale



Example of MAXTIME adaptive "Open Grid" Network

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