“Fixed Time, All The Time”
Central and Local

GDOT is upgrading Traffic Signal Software

- Local firmware
- Central software

GDOT Primary Needs

- Upgraded software platforms
- Support contracts
Central and Local

- The GDOT process
- Status of traffic signals in the State of Georgia
- Justification for a change
- Functional needs
- The next steps
The GDOT Process

SYSTEMS ENGINEERING

• System evaluation based on functional needs - not maintaining status quo

• Review of day-to-day interactions: Operational Scenarios
# The GDOT Process

## Systems Engineering

### Specification Development Team

<table>
<thead>
<tr>
<th>Alan Davis – GDOT</th>
<th>Eli Veith – City of Alpharetta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant Waldrop – GDOT</td>
<td>Keith Rohling – Clayton County</td>
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<tr>
<td>Keith Murphy – GDOT</td>
<td>David Smith – DeKalb County</td>
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<tr>
<td>Troy Galloway – GDOT</td>
<td>Brett Buchanan – Cherokee County</td>
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<tr>
<td>Tom Sever – Gwinnett County</td>
<td>Brook Martin – Cobb County</td>
</tr>
<tr>
<td>Dee Taylor – City of Gainesville</td>
<td>Eddie Curtis – FHWA</td>
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<tr>
<td>Michael Hunter – Georgia Tech</td>
<td>Keary Lord – Douglas County</td>
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</tbody>
</table>
Status of Traffic Signals in Georgia

- GDOT Maintained Traffic Signals: ~ 2,400
- Total Signals in Georgia: 9,000 +
- Number of Signal Systems: 300 +
- Number of Maintaining Local Agencies: 100 +
Status of Traffic Signals in Georgia

FUNDING AND RELATIONSHIPS

• Traffic signals on state routes controlled by permit
• Local agencies maintain and fund:
  • All off-system signals
  • Any on-system signals they desire (68%)
• GDOT does not directly compensate local agencies
• GDOT does assist local agencies through programs
Status of Traffic Signals in Georgia

Traffic Signal Operations in Georgia

Active Traffic Management

• Traffic Management Centers (TMCs)
• Traffic Control Centers (TCCs)
Status of Traffic Signals in Georgia

Traffic Signal Operations in Georgia

Regional Traffic Operations Program

Metro and Statewide Retiming Programs

GDOT District Signal Maintenance
Justification for a Change

GEORGIA SIGNALS IN THE LATE 90’S

• Standardized Platform on the 170 Controller
• GDOT maintained six different brands
• Lack of training
• Signal Retiming was needed
• Local agencies on several different types of controllers
• GDOT: $1 million per year budget; a dream.
Justification for a Change

The Dream of the 90’s is Alive in Georgia

• Applications for CMAQ funding
• Project support from GDOT executive management

• CMAQ funding approved: 3 Years
• Executive Management: $10 million per year
• Governor proposed additional bond funding
Justification for a Change

The Dream of the 90’s is Alive in Georgia


Year: 2001 2003 2005 2007 2009 2011

- Georgia NaviGAtor
- ITS Deployment Projects
- Software Development
- Advanced Traffic Controller
- Fast Forward Program
- Traffic Signal Maintenance Contracts
- Loop Repair Contracts
- LED Display Upgrades
- Metro Signal Timing
- RTOP

Georgia Department of Transportation
Justification for a Change

The Dream of the 90’s is Alive in Georgia

• Pre-2000:
  • 170 Controllers with BiTrans software
  • Most systems were closed loop with dialup masters

• Post-2000:
  • Specifications developed based on 2070 hardware
  • Stakeholders across Georgia selected a single vendor
  • GDOT purchased a statewide firmware/central license
Justification for a Change

SYSTEM CONSTRAINTS

• Current platform from 2001 specification
• Local firmware has build date of October 2003
• Built on OS-9 platform
• Demand for higher output from existing infrastructure
• Limited reporting features
Operational Scenario

INTERSECTION MAINTENANCE

Alarm received:
Signal is in Flash
• Technician Response
• Reports and alarms
Operational Scenario

CORRIDOR RETIMING

• Performance Metrics
• Coordination Options
• Short Transitions

Source: FHWA

Source: Johns Creek
Operational Scenario

TRAFFIC OPERATIONS PROGRAMS

• Multiple reports and alarms
• Actuated Coordination by time of day
• Adaptive splits

Source: Telegraph UK
Operational Scenario

Adaptive and Connected

- Adaptive Control at an intersection
- Integrated Corridor Management
- Connected Vehicles
- Driverless Vehicles

Source: Florida DOT
Functional Needs

LOCAL Firmware

• Must work with existing 2070 architecture
  • Multi-vendor (GDOT Qualified Products)

• Linux based operating system
• ATC 6.0 specification
**Functional Needs**

**Local Firmware**

- Transit Priority and Preemption Features
- A system that delivers fast transitions
- Advanced notification features - Alarms
Functional Needs

LOCAL Firmware

- Communication
  - NTCIP 1202
- Migration away from Master-Local setup
- Database management
Functional Needs

LOCAL Firmware

• Data Reporting
  • Interfacing with all components of signal
  • Failure reports and alarms
  • Data logging

• Performance Measures
  • Detector reports on a second – by – second basis
  • Exportable format for data sharing
Functional Needs

CENTRAL SOFTWARE

• Active management of connected traffic signals
• Archive data: reports, alarms, failures, changes
  • Purdue Coordination Diagrams
  • Device failure reports
  • System events log
• Asset management
Functional Needs

CENTRAL SOFTWARE

• System alerts and alarms
• Database management
• Data output for public interface
• Graphical User Interface
  • Viewing and managing TOD plans
• Assigning user profiles – user roles
• Navigator integration
Functional Needs
Beyond 2013

- Scalable system
  - Adaptive Signal Control
  - Connected vehicles
  - Navigator 3.0?
- Robust platform with room to grow
- Software development
- Technical support
The Next Steps

PROPOSED SCHEDULE

• Specification Development
  • Proposed completion by December 2013

• Industry Review

• GDOT Procurement

• Selection and Award

• Implementation by June 2014
Questions