Legacy to IP: What’s in it for me?  
The Culver City Experience

2017 Western District ITE Annual Meeting

Presenter:  
John Dorado, PE

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Technical Session 9A:  
Traffic Signal Systems for Small Cities
Presentation Agenda

What’s the difference?
What does this mean to me?
What are the benefits?

The Culver City Experience

How do I prepare?
Legacy Systems vs. Ethernet/IP Systems

**Legacy Systems**
- Early/Mid 2000’s and older
- Analog communications
- Closed source
- Add-ons are limited

**Ethernet/IP Systems**
- Early/Mid 2000’s and later
- Digital communications
- Open source
- NTCIP compliance
- Better system management
  - Building VLANs
- Redundancy
- Better sharing capabilities
- Better data reporting
What does this mean to me?

- New software
- New hardware/equipment
- IT Department involvement
- Operations and maintenance
- Upper Management
- Other Resources
What are the benefits?
The Culver City Experience

• Background
• The Projects
• Project Coordination
• Challenges and Solutions
• Best Practices and Lessons Learned
City of Culver City

Incorporated 1917 - 5.14 sq mi - Population: Over 40,000 - Daytime Population: Over 150K
Existing Legacy CCTV Camera System

- CCTV Camera System
  - 14 CCTV cameras (Pelco)
  - Fiber (point to point)
  - Communications via modems
Existing Traffic Management System

- Traffic Management System
  - KITS system
    - 170E controllers with 233 BiTrans (Legacy)
  - Communications via twisted pair (Legacy)
New Project Improvements Requires Ethernet/IP Communications

- CCTV Gap Closure Project
- Adaptive Traffic Control System (ATCS) Project
- Bus Signal Priority System Project
- Construction Management and Inspection
Project No. 1
CCTV Gap Closure

• 18 new CCTV cameras
• New video management system
• CCTV pole installation and traffic signal modifications
• 4 miles of new fiber
• New Ethernet/IP-based communications system
  ─ TMC, City Yard, and Fire Station No. 1
Project No. 1
CCTV Gap Closure

- Technology Assessment
  - Intelligent CCTV Camera System with Analytics
  - Video Management System
  - Ethernet switches

High Definition Internet Protocol CCTV Cameras
Managed Ethernet Switches
Technology Assessment

CRITERIA

Camera Assembly
Functional > Sensors
Operational > Analytics
Reliability
Ease of Use
Cost

Technology Assessment, Evaluation and Selection: High Level Design / Detailed Design

System Requirements
- Selection of Alternatives
- Evaluate Alternatives
- Document the Results
- Select System

Off-the-Shelf Technology
- Selection Criteria & Ranking System

Detailed Design
The Selection

- Bosch CCTV Camera System and Video Management System
- Hirschman Managed Ethernet Switches
ADDED VALUE

Project Assessment

- LA Metro Grant
- Preliminary Engineering Cost Analysis
  - Additional $$$
- Replace 14 existing CCTV cameras
- Remove entire legacy VMS
- Justification letter to LA Metro
Project No. 2
Adaptive Traffic Control System

- Technical Review of ATCS
- Evaluation of Culver City ATCS
- Technical Specifications
- Performance Specifications
- RFP for ATCS
- Evaluation Scoring Criteria
- Acceptance Test Plan Framework
- Review Proposals
# Project No. 2
## Adaptive Traffic Control System

<table>
<thead>
<tr>
<th>Item Evaluation Criteria</th>
<th>Score</th>
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<tbody>
<tr>
<td>Implementation of ATMS / ATCS in the past 5 years locally</td>
<td>20</td>
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<tr>
<td>Composition of project team, degree of sub-contracting, and availability</td>
<td>10</td>
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<tr>
<td>Performance record of ATCS implementation, including MOEs</td>
<td>10</td>
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<tr>
<td>Compliance towards technical specifications</td>
<td>25</td>
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<tr>
<td>Compliance with Concept of Operations</td>
<td>30</td>
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<tr>
<td>Contractor’s past record of on-time/within budget performance</td>
<td>5</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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Project No. 2
Adaptive Traffic Control System

• McCain “Transparity” ATMS/ATCS
• 104 traffic signal controllers
  – 2070 ATC with Omni eX
• Ethernet over copper switches
• Lane by lane detection
Project No. 3
Bus Signal Priority System

• Roadside equipment
  – Ethernet over copper communications
  – Wi-fi
  – 104 signals
• On-Board equipment
• Integration with ATMS / ATCS
Project No. 4
Construction Management and Inspection Services
Projects Timeline

1. CCTV Gap Closure Project
2. Adaptive Traffic Control System Project
3. Bus Signal Priority Project
4. Citywide IT Fiber Project
Project Challenges and Solutions

• Project Coordination
  – Each project mentioned
  – Citywide IT Fiber
  – Other projects
• Connecting to SIC or use new Fiber
• Existing SIC not working
Best Practices and Lessons Learned

• Testing existing communications
  – Twisted pair cable
  – Fiber optic cable
• Citywide ITS Master Plan
• Technology Assessment/Preliminary Engineering
• Plan for system expansion
• Funding for Operations and Maintenance
How do I prepare?

- Transportation Systems Management and Operations (TSM&O) Guidance and Programs
- Understand the regional ITS Architecture
- Local ITS Master Plans
- Technology assessments
- Feedback from other agencies, colleagues, and experts
Plan for the FUTURE....

- CVAG Regional Traffic Signal Interconnect Program
- LA County ITS Regional Architecture Update
- SCAG ITS Regional Architecture Update
Questions & Answers

Contact Information

John Dorado, PE – Senior Project Manager
ADVANTEC Consulting Engineers

jdorado@advantec-usa.com
Office: (949) 861-4999