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

2017 Western District ITE Annual Meeting

Presenter:

John Dorado, PE

June 21, 2017

Technical Session 9A:
Traffic Signal Systems for Small Cities

ADVANTEC Consulting Engineers

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?

Upper Management

New software

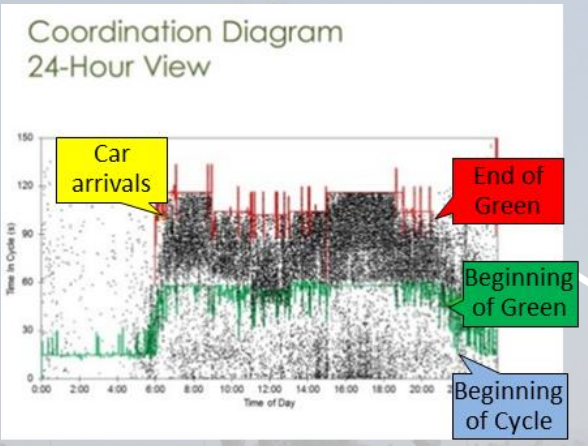
IT Department involvement

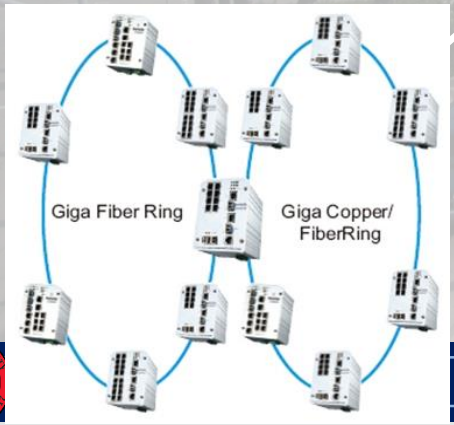
New hardware/ equipment

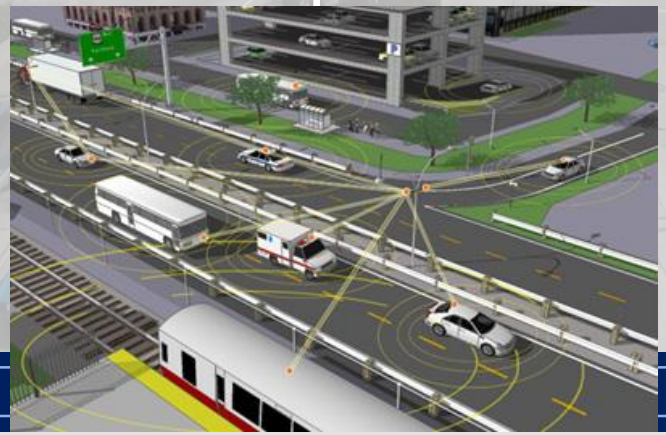
Operations and maintenance

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

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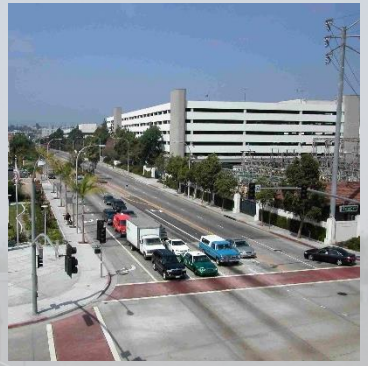
Existing Legacy CCTV Camera System

- 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

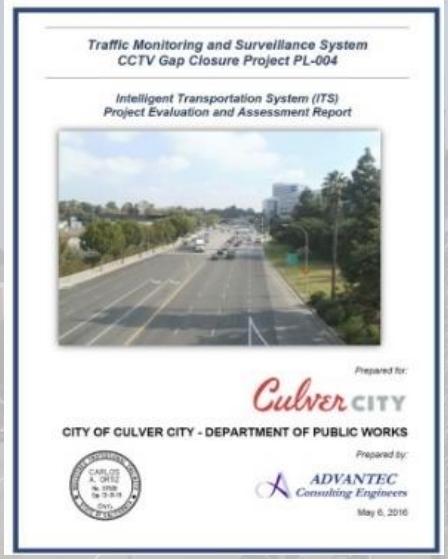
Project No. 1
CCTV Gap Closure

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

High Definition Internet Protocol CCTV Cameras

Managed Ethernet Switches

Technology Assessment

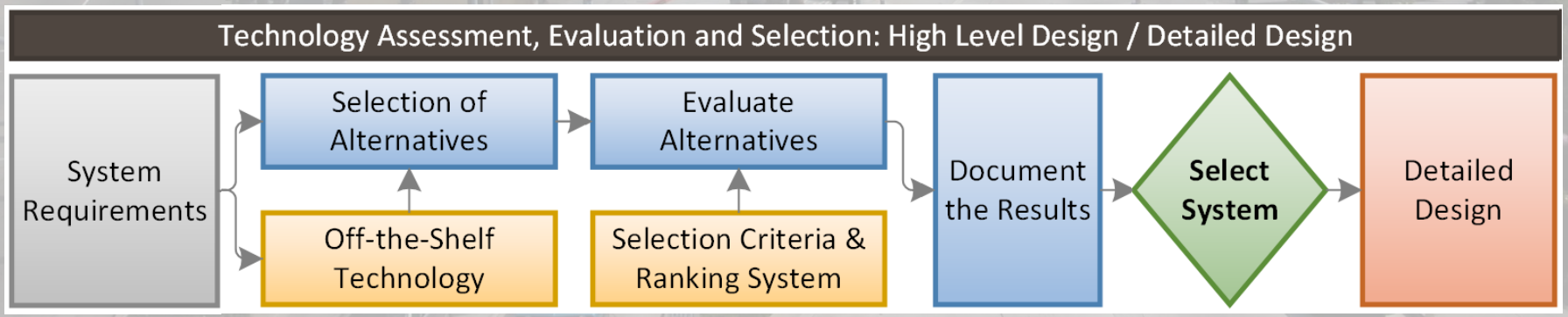

Traffic Monitoring and Surveillance System
CCTV Gap Closure Project PL-004

Intelligent Transportation System (ITS)
Project Evaluation and Assessment Report

Prepared for:
Culver CITY
CITY OF CULVER CITY - DEPARTMENT OF PUBLIC WORKS
Prepared by:
ADVANTEC Consulting Engineers
May 6, 2016

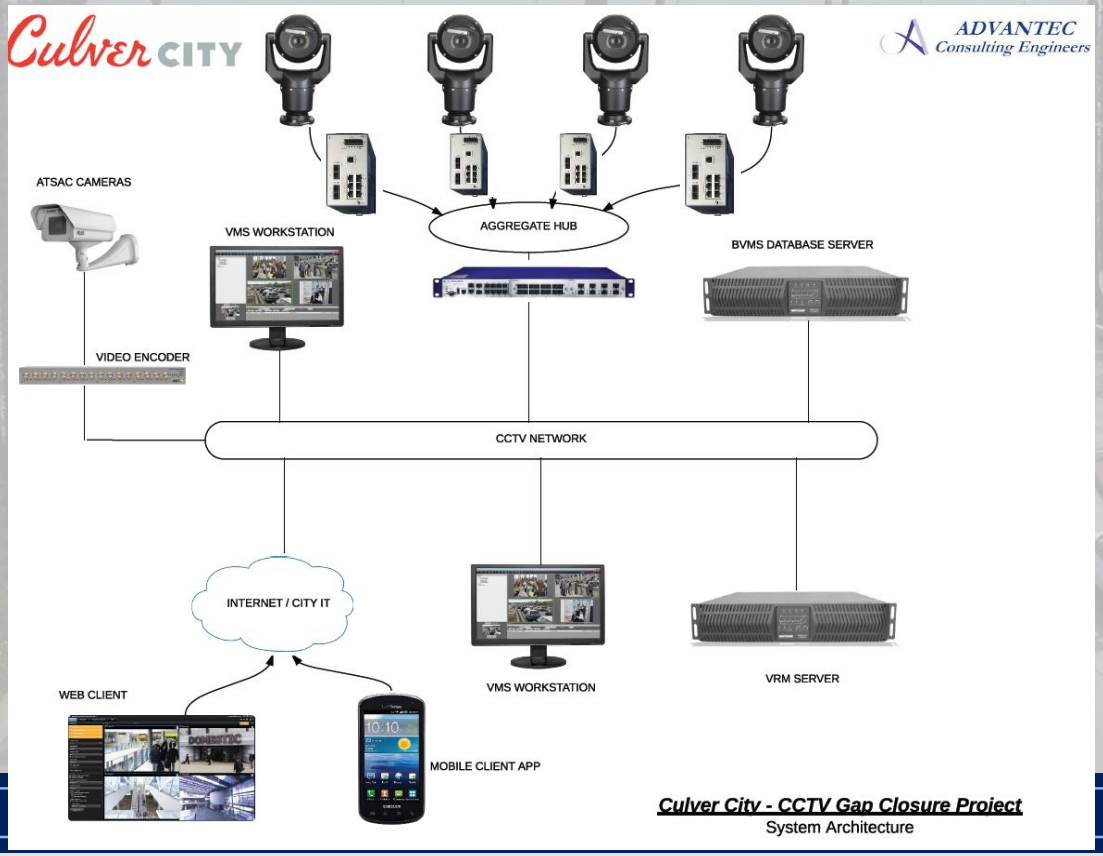
CRITERIA

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



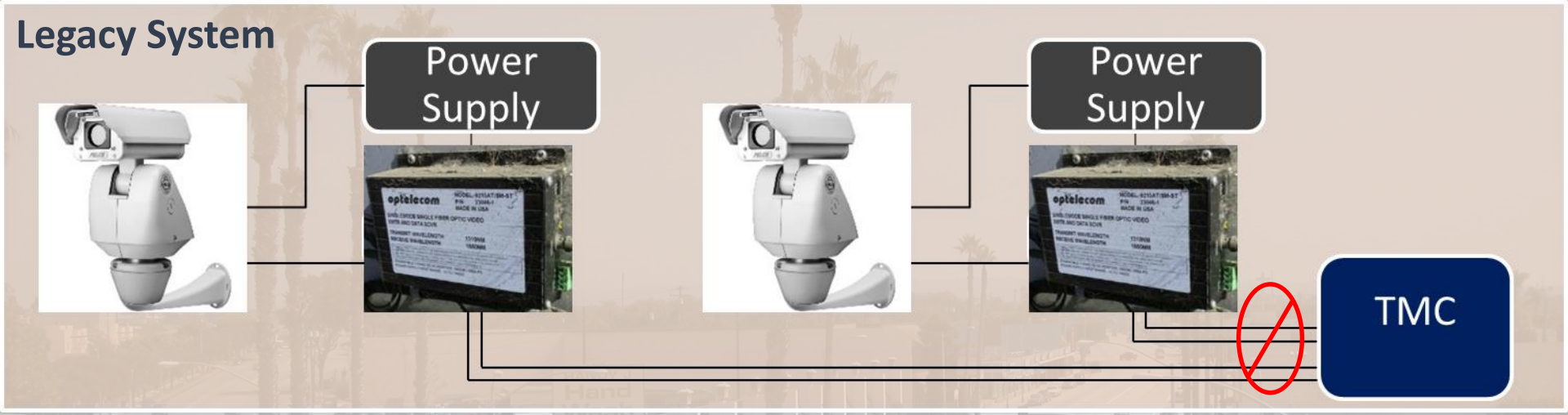
The Selection

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

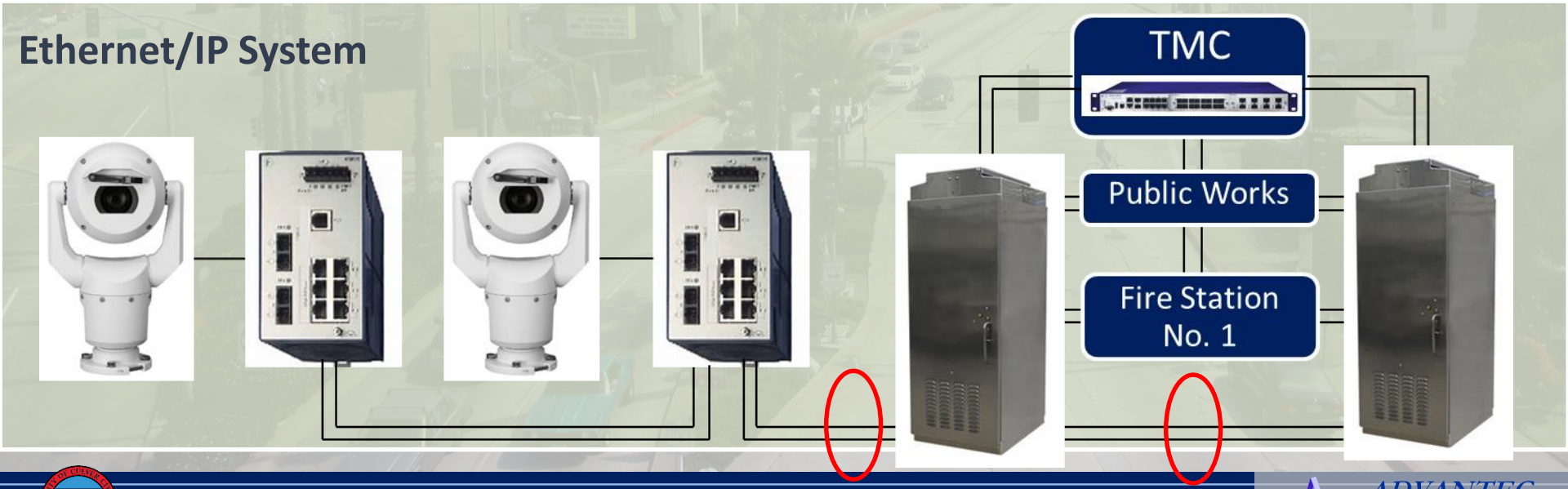


The Conversion

Legacy System



Ethernet/IP System

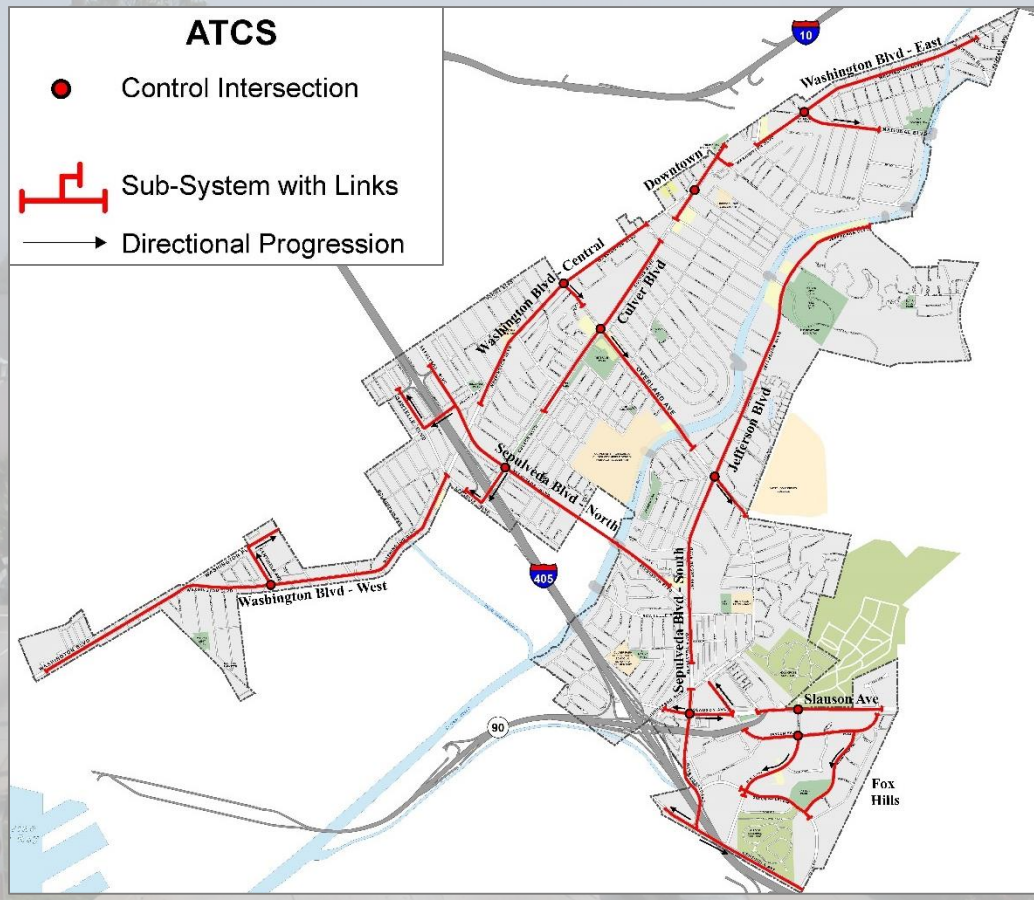


ADDED VALUE
Project Assessment

- 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



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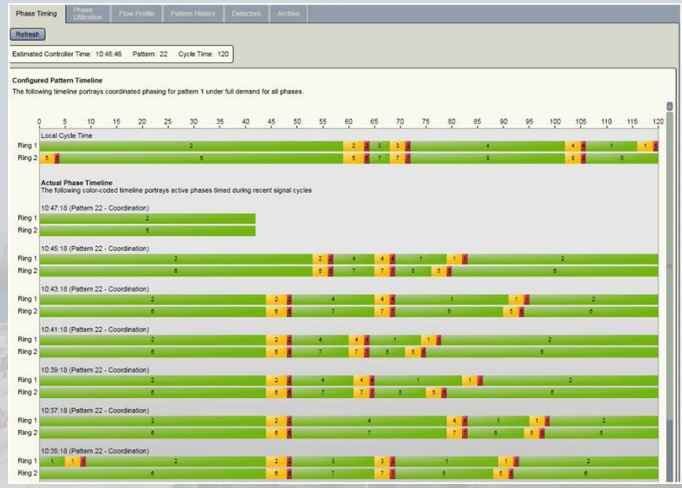
Project No. 2
Adaptive Traffic Control System

Item Evaluation Criteria	Score
Implementation of ATMS / ATCS in the past 5 years locally	20
Composition of project team, degree of sub-contracting, and availability	10
Performance record of ATCS implementation, including MOEs	10
Compliance towards technical specifications	25
Compliance with Concept of Operations	30
Contractor's past record of on-time/within budget performance	5
Total	**100**

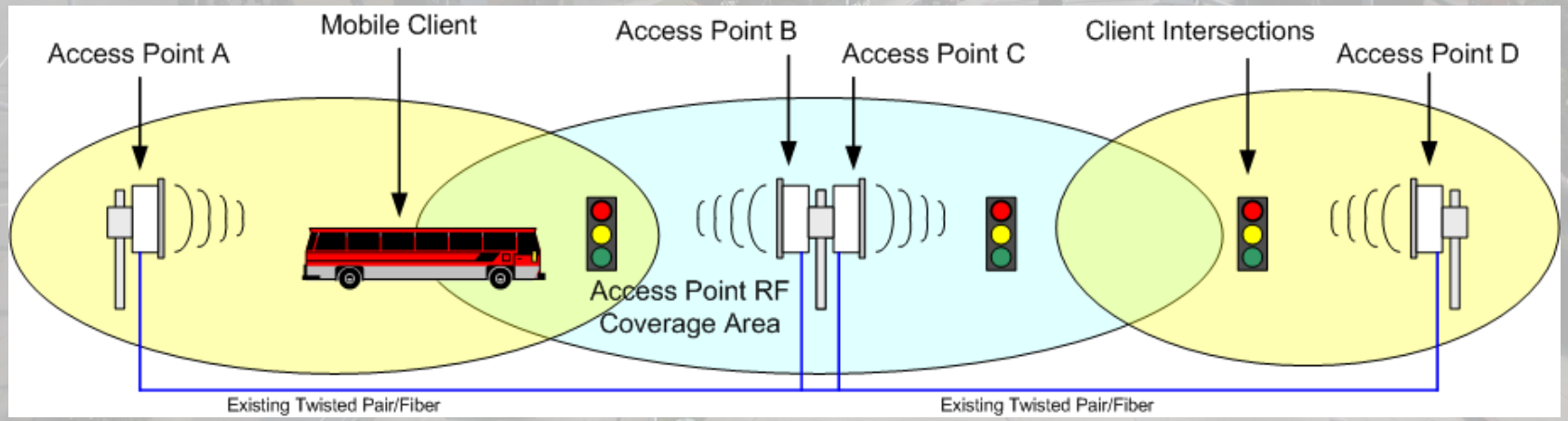
Project No. 2
Adaptive Traffic Control System

- McCain "Transparity" ATMS/ATCS
- 104 traffic signal controllers
  - 2070 ATC with Omni eX
- Ethernet over copper switches
- Lane by lane detection

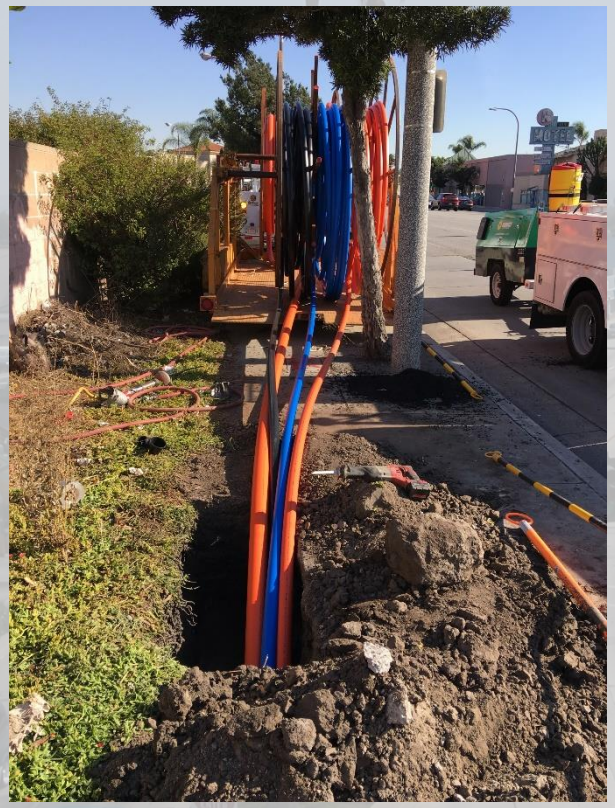


Project No. 3
Bus Signal Priority System

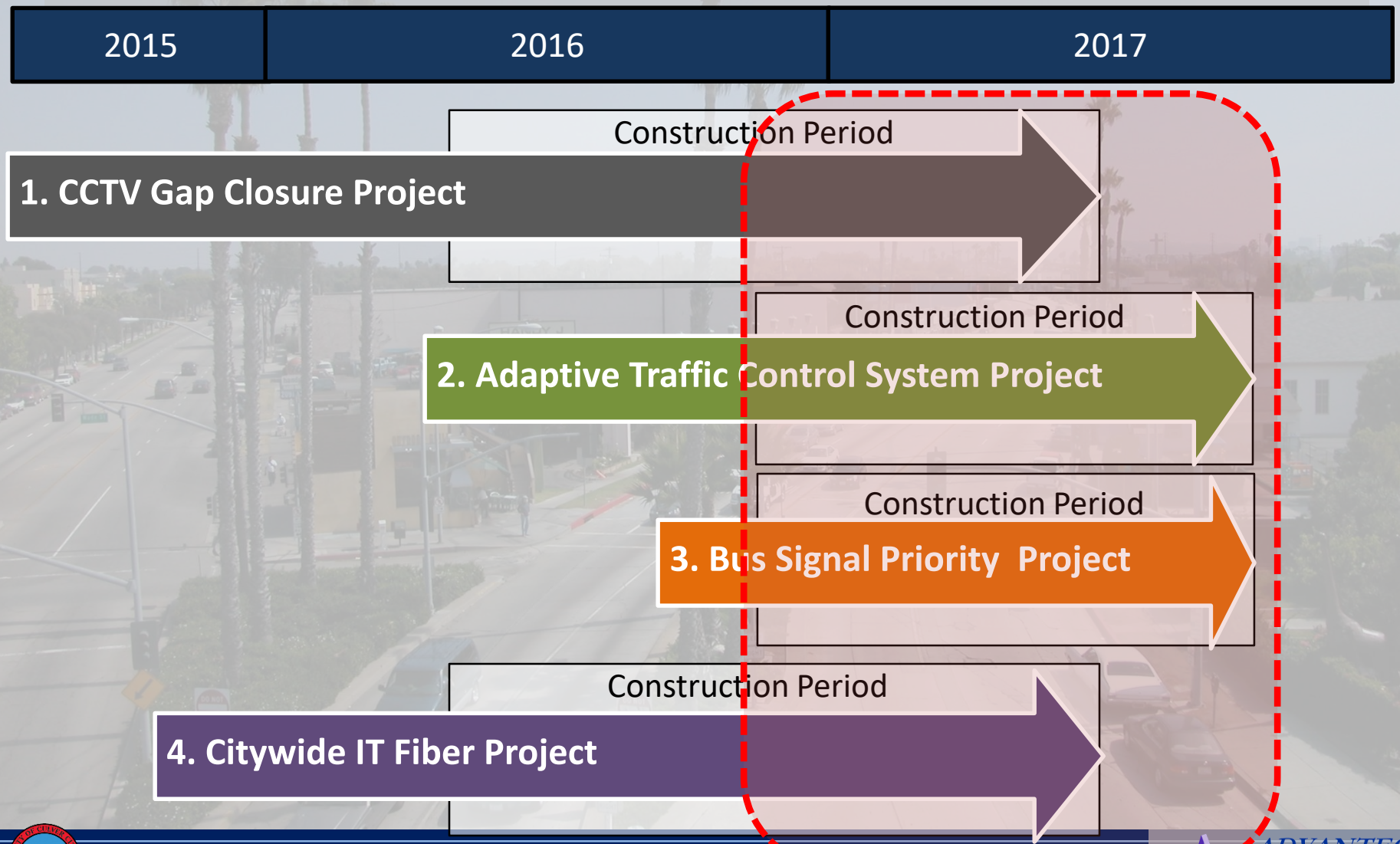
- Roadside equipment
  - Ethernet over copper communications
  - Wi-fi
  - 104 signals
- On-Board equipment
- Integration with ATMS / ATCS



Project No. 4
Construction Management and Inspection Services



Projects Timeline



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Project Challenges and Solutions

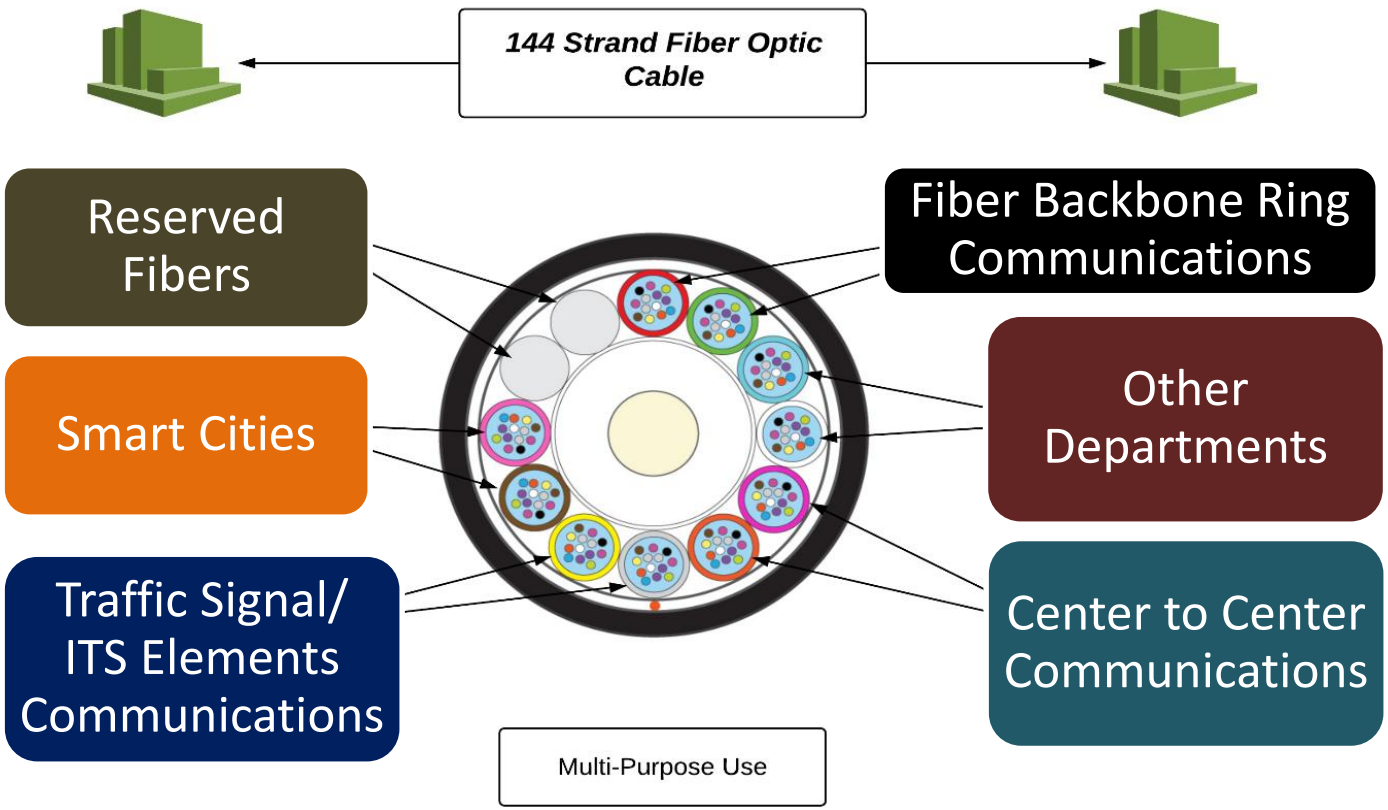
- Project Coordination
  - Each project mentioned
  - Citywide IT Fiber
  - Other projects
- Connecting to SIC or use new Fiber
- Existing SIC not working

Best Practices and Lessons Learned

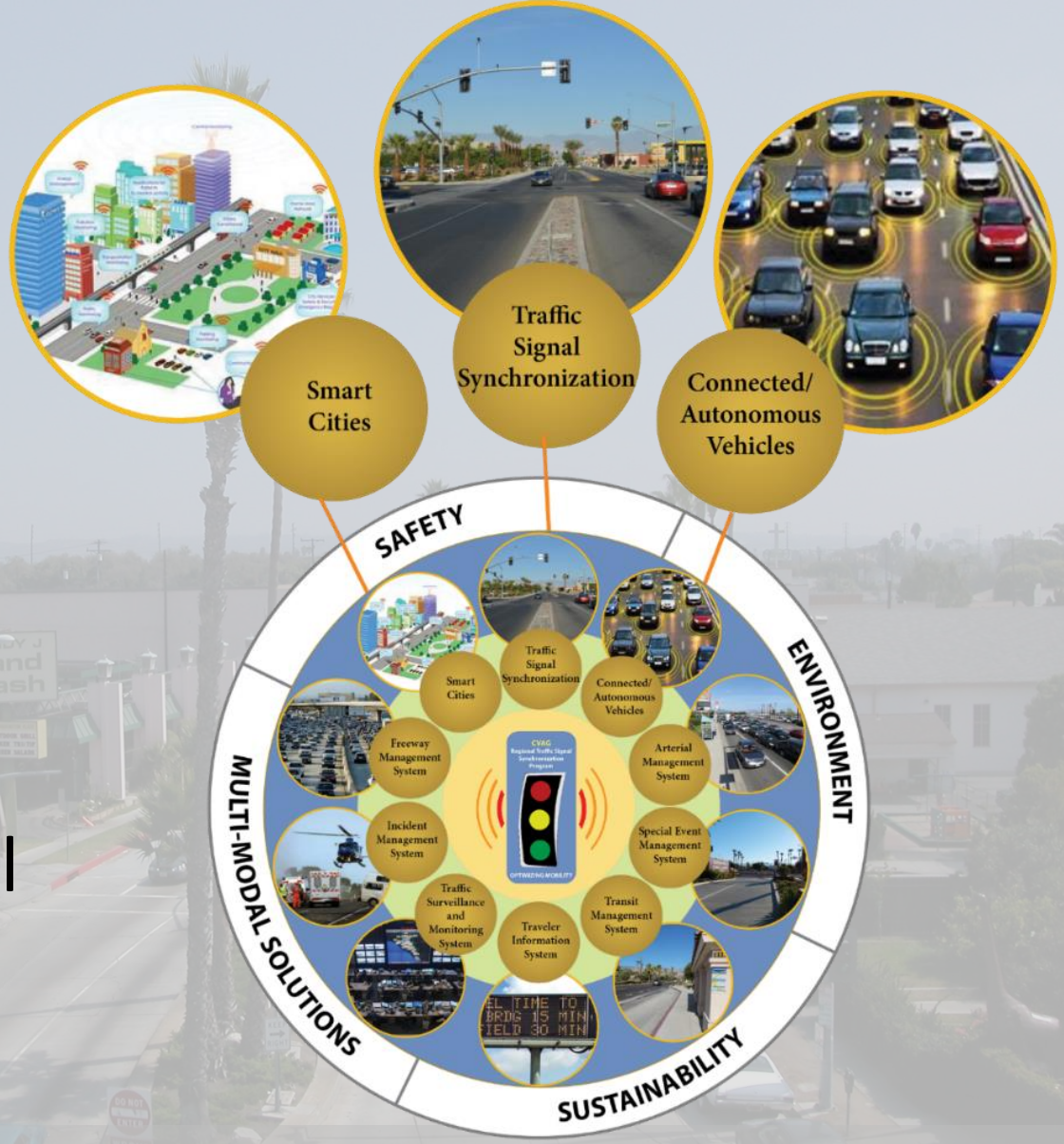
- Testing existing communications
  - Twisted pair cable
  - Fiber optic cable
- Citywide ITS Master Plan
- Technology Assessment/Preliminary Engineering
- Plan for system expansion
- Funding for Operations and Maintenance

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



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



Plan for the FUTURE….

& Questions Answers

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