

**Joint OCTEC / ITS-CA Southern Section
Luncheon Meeting**

February 22, 2018

**Advanced Transportation Controller (ATC)
How did we get here?...Where are we going?**



Introduction

- OCTA has a county-wide traffic signal synchronization program known as Project P of the Measure M Transportation Investment Plan (M2)
- The program provides optimized signal timing and required infrastructure modifications to provide drivers with better travel experience
- **The program also provides the baseline foundation for all things related to Intelligent Transportation System/Internet of Things (ITS/IoT)**

Traffic Signal Synchronization Master Plan – 2008/2009

- Held ITS Roundtable to provide ITS training and discuss program
- Set up structure for stakeholder involvement
- Roles and responsibilities for OCTA and local agencies
- Set vision for improving traffic flow by developing and implementing regional signal coordination that crosses jurisdictional boundaries
- Local agencies must adhere to the guidelines and requirements contained in the plan to be eligible for funding

Strategic Deployment Plan 2013 Update

- Update to the 2007 SDP
- Purpose is to Establish, Program and Communicate strategies for ITS deployment – 10 year horizon
 - Traffic Management
 - Transit Management and Multi-Modal Transportation
 - Incident Management and Emergency Response
 - Traveler Information
 - Performance Monitoring
 - Communications and Connectivity
 - Safety
 - Institutional

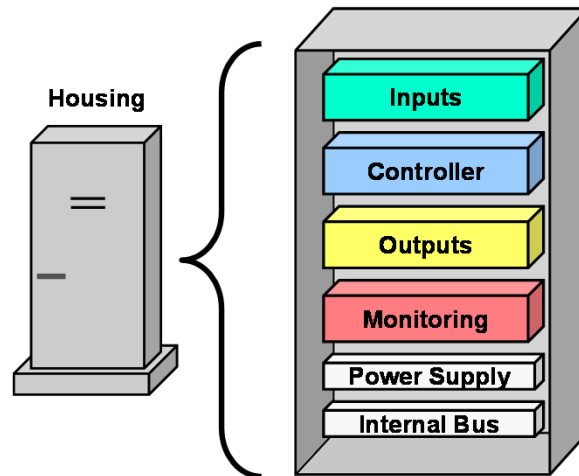
County-Wide Communications Study 2015

- Regional intelligent transportation communications network for all agencies and stakeholders in the county
- Examined region's existing fiber communications infrastructure
- Identified opportunities to close physical/municipal gaps
- Resulted in 7 suggested projects including those pertaining to field equipment:
 - Advanced Transportation Controller (ATC) standards
 - National Transportation Communications for ITS Protocol (NTCIP) standards

Advanced Transportation Controller (ATC) Standards

- **Advanced Transportation Controllers (ATCs)** as defined by ATC 5201 Standard v06
- **Application Programming Interface (API) Software** as defined by ATC 5401 Standard v02
- **ATC Cabinets (ATCCs)** as is being defined by ATC 5301 Standard v02

Basic Transportation Field Cabinet System (TFCS) Components



Graphics: Ralph W. Boaz

The Problem with Traditional Controller Models

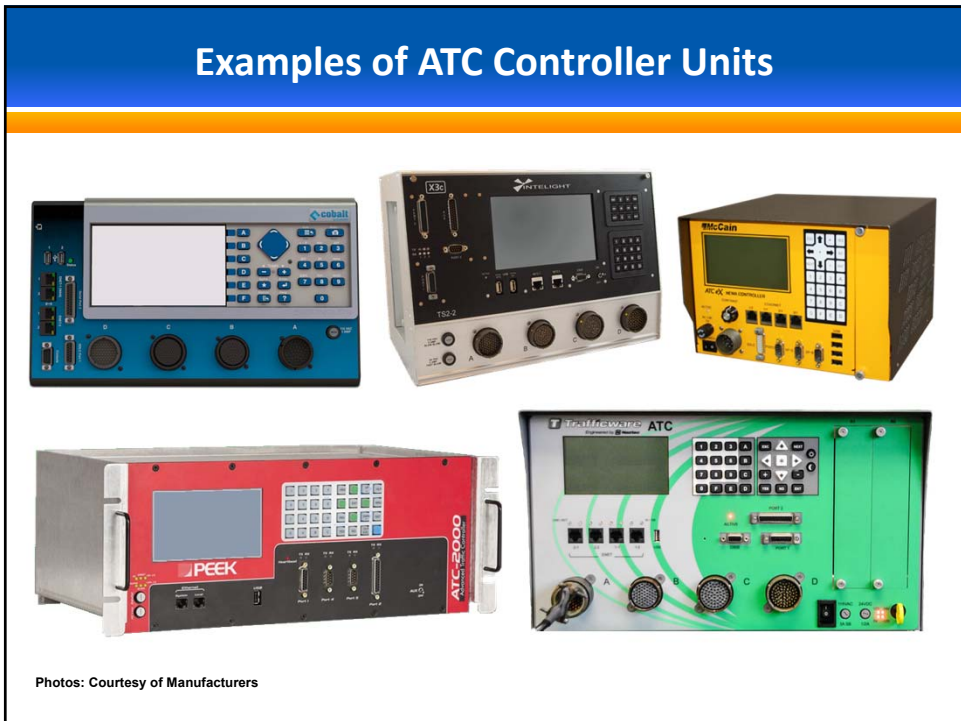
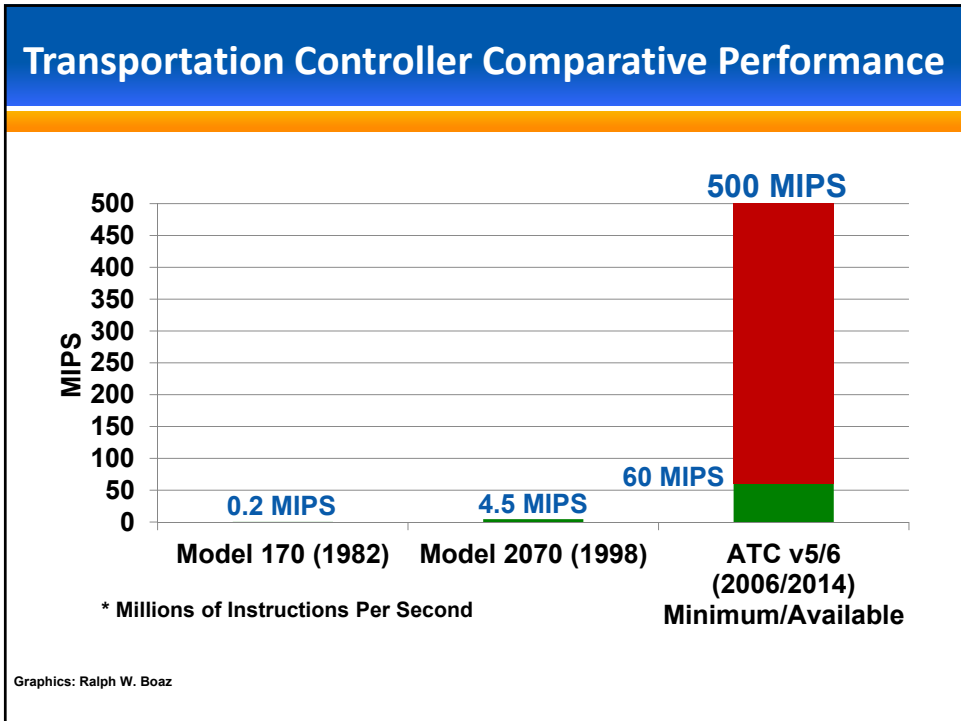
- **Run one application program** and uses all of the resources of the cabinet system
- **Model 170** and **most Model 2070** controllers **require** particular **obsolete processors**
- **Traditional NEMA TS 1 and TS 2** controllers **not open architecture**
 - Purchase software from the original manufacturer only
- Doing anything other than originally intended is “outside the box”

Numerous Application Areas

- Strategies from SDP are also application areas for field equipment
 - Traffic Management
 - Transit Management and Multi-Modal Transportation
 - Incident Management and Emergency Response
 - Traveler Information
 - Performance Monitoring
 - Communications and Connectivity
 - Safety

Purpose of the ATC Family of Standards

- Provide a general purpose field computing platform for transportation applications that is:
 - Open architecture
 - Modular
 - Multi-process / Multi-application
 - Can grow with technology
 - Upgrade legacy transportation cabinet systems



ATC 5401 Application Programming Interface

- **ATC 5401 Standard** (aka API Standard) **specifies software** (aka API Software or “the API”)
- **API Software** operating on ATC units **allows** concurrently running **application programs to share** the **resources** of the controller and TFCS
- Provides for source code **portability, compatibility** and **interchangeability** of application software to any ATC unit

Front Panel Manager Window

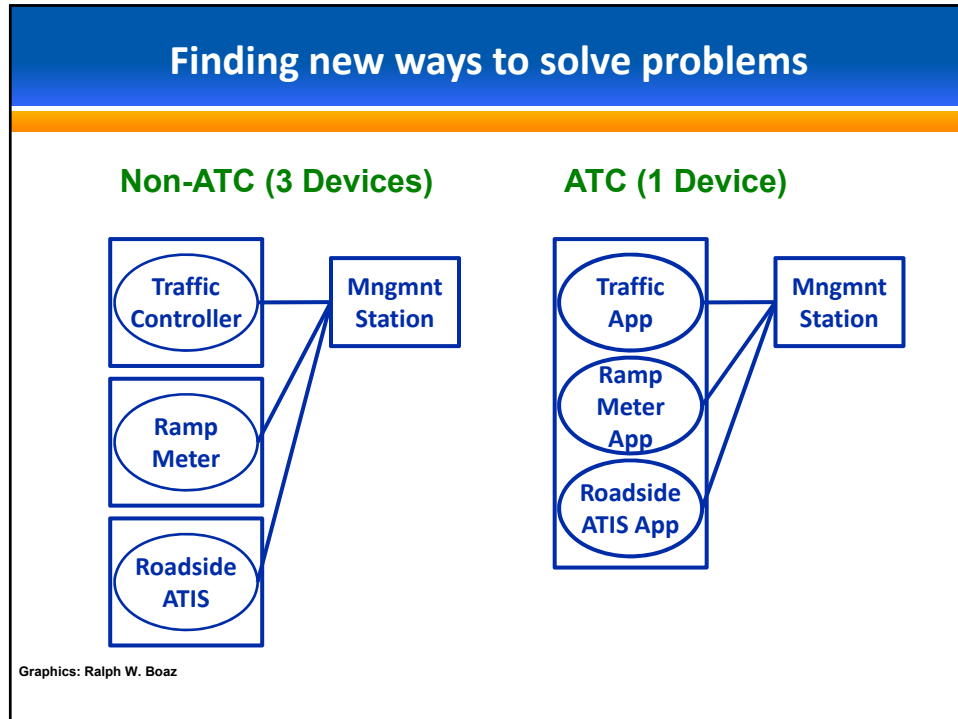


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FRONT PANEL MANAGER VER 1.00
SELECT WINDOW: 0 - F      SET DEFAULT: *, 0 - F
0 Ramp Meter Prgrm      1* Signal Program
2 Emergency Mngmnt      3 Data Distributor
4 System Checker        5
6                        7
8                        9
[ MORE - UP / DN ARROW ] [ CONFIG INFO - NEXT ]

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Graphics: Ralph W. Boaz



ATC 5301 Cabinet Standard v02 – Design Goals

- Focus on **increasing value** to end users
- **Flexibility** within the standard for **innovative designs**
- **Higher density** – More capability in a smaller space
- Increased **technician safety**
- Increased **public safety**
- **Enhanced monitoring** functionality
- Increased cabinet **power efficiency**
- Provide **LED signal compatibility**

Features of ATC Cabinets

- **Functional standard** except where component interchangeability is desired
- **Double** the number of **detector channels** in the same space
- **Double** the number of **channels per switch pack** and the **switch pack** is physically **smaller**
- **Eliminate arc flash hazard** per NFPA 70E
- **Touch safe** design
- **Low voltage option** for 48 Vdc on field wires
 - Electrically safe for humans

Features of ATC Cabinets (cont.)

- Most **assemblies replaceable** while intersection in flash
- **Load current monitoring** for detecting dark approaches
- **Better LED compatibility** – potential power conservation and alternative power sources

Example ATC Cabinets



Photos: Courtesy of Manufacturers

Needs

- **Champions** – At all levels
- **Ideas** – What can we do with a computer in the street?
- **Courage** – To do something differently
- **Model 170** controllers must be **replaced**
- **Model 2070** controllers must have **2070-1C** modules
- **ATC Controllers** with operable **API Software**
- **Migration plans** – There are **lots** of options

If you spec it, they will come!

Thank You !

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