

The Evolution and Application of the ATC Standard

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Meeting With You Today



Joseph R. Herr, PE, PTOE

Senior Engineering Manager

Presentation Agenda

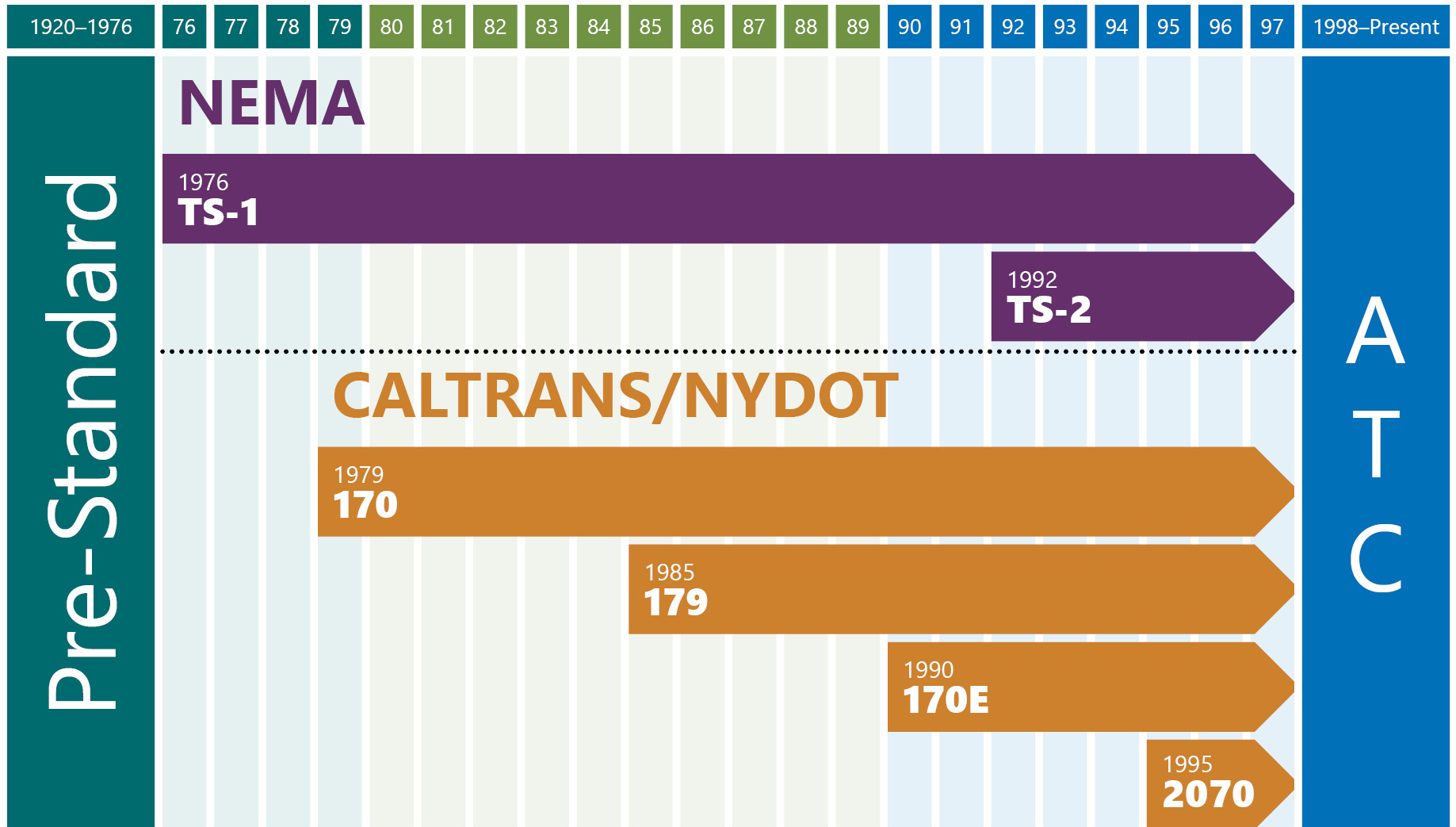
Controller/Cabinet Background

ATC Standards Development Process

ATC Standards Overview

State of the Practice in the use of the
ATC platform

Evolution of Traffic Signal Controllers and Cabinet Architectures





TRANSPORTATION ELECTRICAL
EQUIPMENT SPECIFICATIONS

TEES



March 12, 2009

STANDARDS PUBLICATION/NO. TS 1-1976

Includes: Rev. No. 1—July 1975
Rev. No. 2—September 1978
Rev. No. 3—April 1981

nema

traffic
control
systems

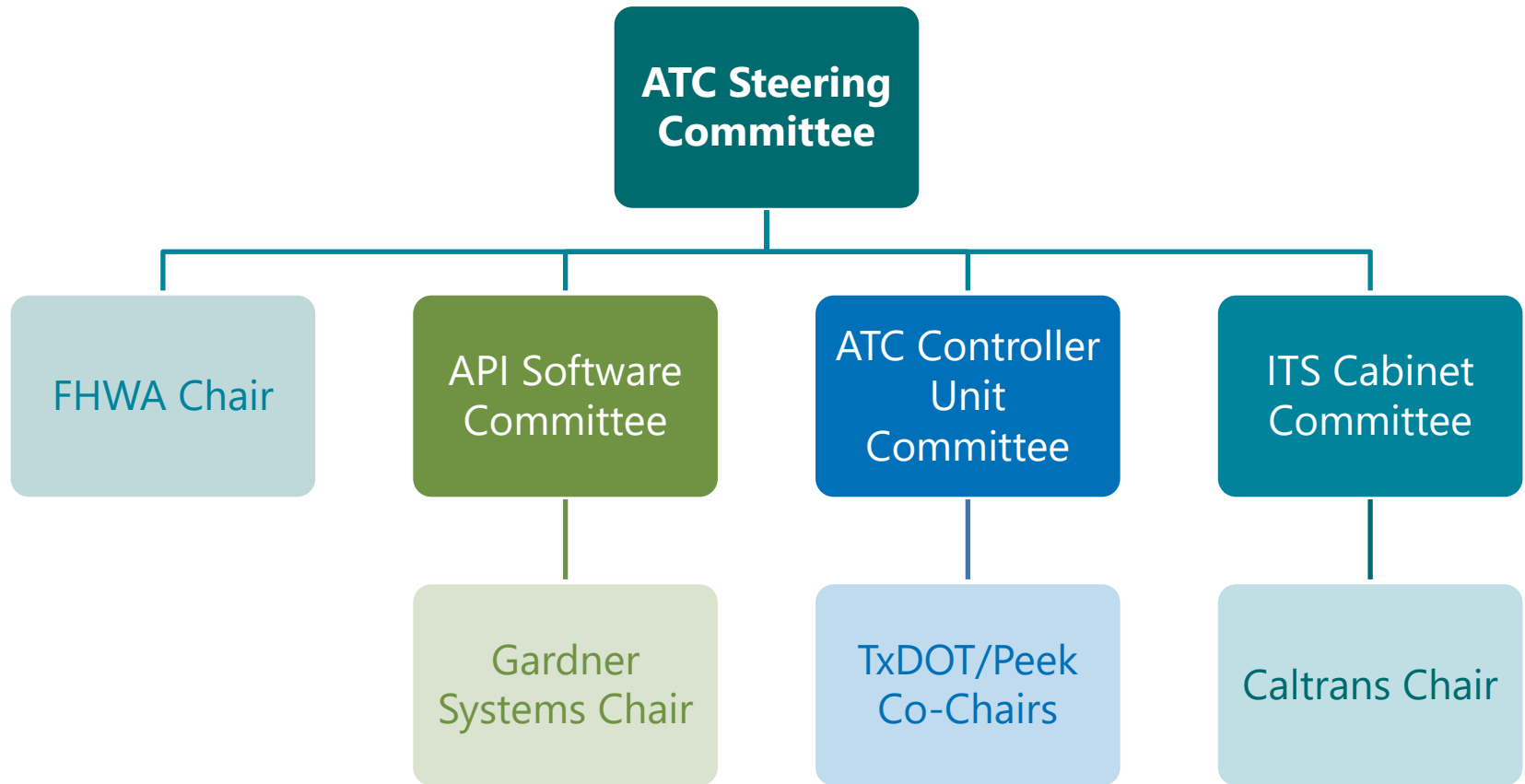


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ATC Development Process

- ATC effort built on the existing Caltrans 2070 and NEMA TS-2 work
- August 21, 1998 an ATC Steering Committee was formed
- Mandate on defining interface, not physical specifics
- Strong support from FHWA, ITE, AASHTO and NEMA
- Organizational structure same as the NTCIP standards development

ATC Committee Structure



Advanced Transportation Controller - Standards

API

Application
Programming
Interface

ATC

Advanced
Transportation
Controller

ATCC

Advanced
Transportation
Controller
Cabinet

Advanced Transportation Controller - Standards

API

ATC

ATCC

Application
Programming
Interface

Advanced
Transportation
Controller

Advanced
Transportation
Controller
Cabinet

A Joint Standard of AASHTO, ITE and NEMA

ATC 5201 v06.25

**Advanced Transportation Controller (ATC)
Standard Version 06**

January 12, 2018

Published by

American Association of State Highway and Transportation Officials (AASHTO)
444 North Capitol St., NW, Suite 249
Washington, DC 20001-1539

Institute of Transportation Engineers (ITE)
1627 I (Eye) Street, NW, Suite 600
Washington, DC 20005-4087

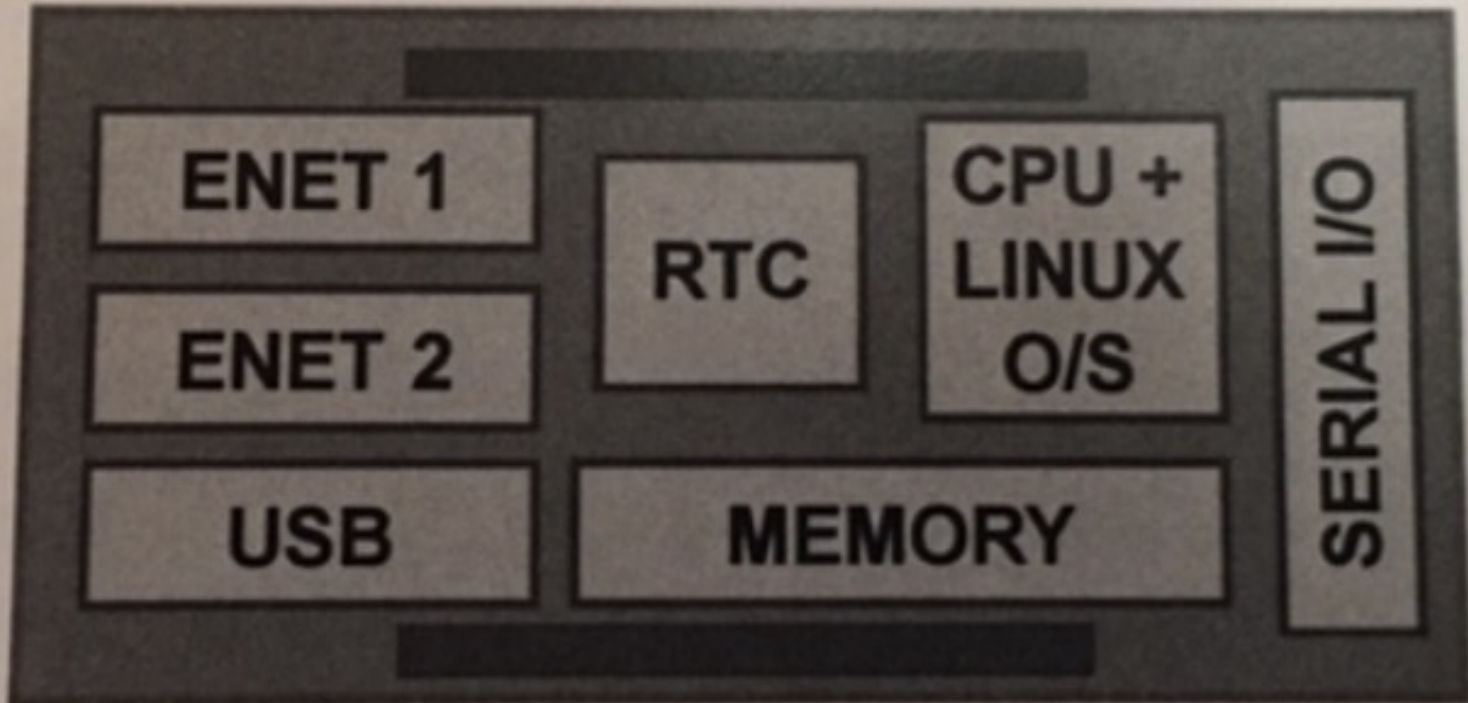
National Electrical Manufacturers Association (NEMA)
1300 North 17th Street, Suite 1752
Rosslyn, VA 22209-3806

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Key Elements of the Advanced Transportation Controller

- Based on the concept of a standardized “engine board”
- Engine boards have defined pin assignments
- Future boards may plug into existing host boards
- Capability can grow with technology; the processor is not defined
- Requires a Linux operating system; open source, multi-process and multi-application
- Mechanical requirements only for physical interfaces
- Works with all major transportation field cabinet systems

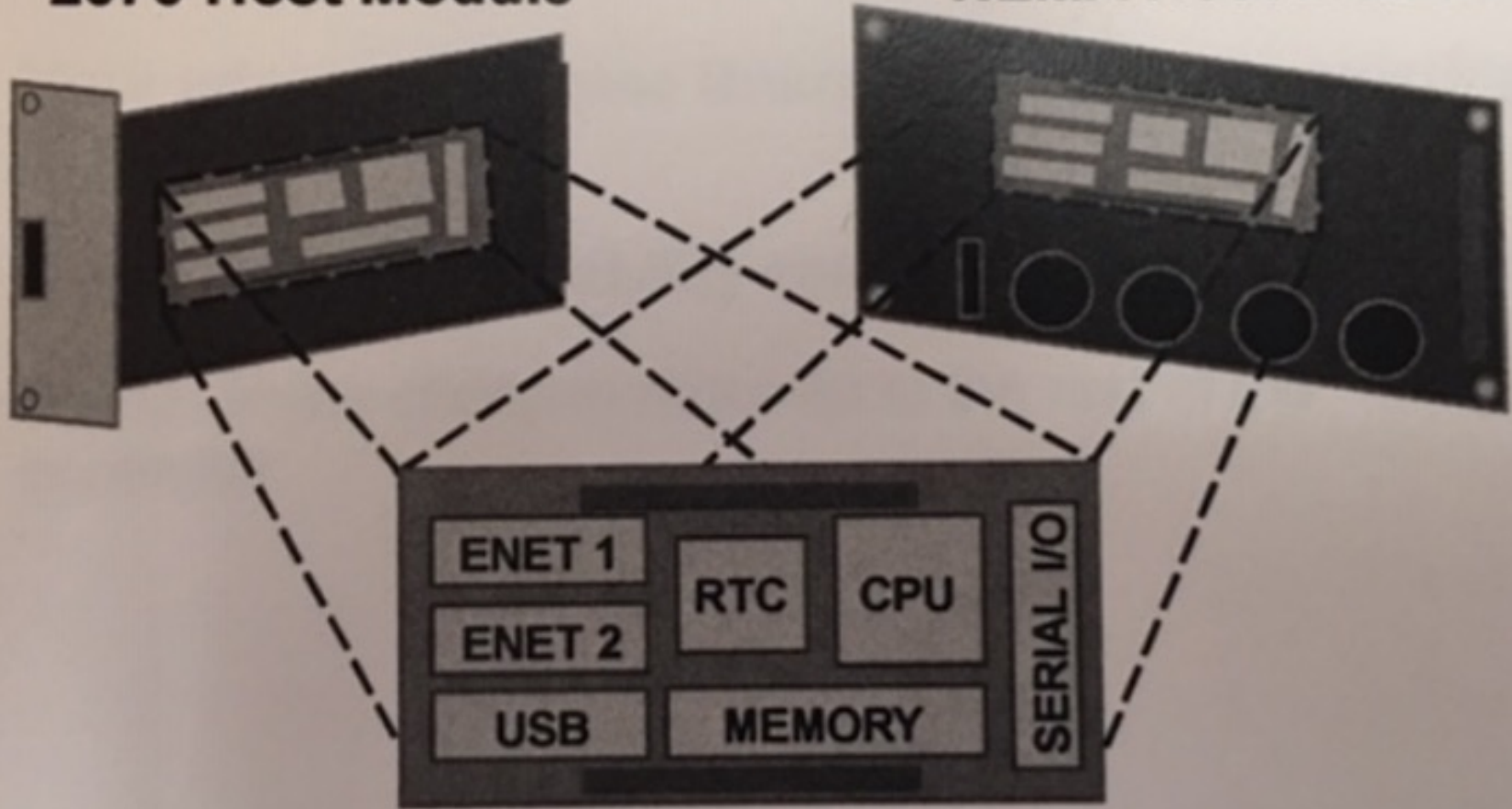
ATC Engine Board Concept



ATC Engine Board Used with Other Standards

2070 Host Module

NEMA Host Module



Engine Board Upgrade

- Engine boards have identical, defined pin assignments
- Advanced engine boards can plug into existing ATC units
- Computational capability can grow with technology
- No hardware changes required to the rest of the controller

Advanced Transportation Controllers (ATC)



Advanced Transportation Controller - Standards

API

Application
Programming
Interface

ATC

Advanced
Transportation
Controller

ATCC

Advanced
Transportation
Controller
Cabinet

Advanced Transportation Controller Cabinet (ATCC)

- The standard was created with input from various state, county and local DOT's, as well as cabinet and hardware manufacturers
- ITS Cabinet Standard Version v01.02.17b (Version 1)
Published November 2006
- Cabinet was deployed in Harris County, Texas
- Work on Version 2 of the standard 2008-2010; formal concept of operations based on user needs
- Funding ended 2010, work continued by the committee on a volunteer basis through 2011
- Project funding resumed in 2015

Advanced Transportation Controller Cabinet (ATCC)

- Project funding resumed in 2015
- Name changes from “ITS Cabinet” to “ATC Cabinet”
- ATC Joint Committee recommended Standard – October 2018
- Joint Standard of AASHTO, ITE and NEMA – March 2018
- ATC 5301 v02.02 – Published October 23, 2018

*A Recommended Standard of the Joint Committee on the ATC
Ballot Copy for Joint Adoption by AASHTO, ITE and NEMA*

ITS Cabinet Standard v01.02.17b

Intelligent Transportation System (ITS)
Standard Specification for
Roadside Cabinets

November 16 2006

Published by

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*A Recommended Standard of the
Advanced Transportation Controller Joint Committee*

ATC 5301 v02.02

**Advanced Transportation Controller (ATC)
Cabinet Standard Version 02**

October 23, 2018

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Advanced Transportation Controller Cabinet Design Guidelines

- ✓ Functional standard except where component interchangeability is desired
- ✓ Double the number of channels per switch pack and require the switch pack to be smaller
- ✓ Eliminate arc flash per NFPA 70E
- ✓ Provide for a low voltage cabinet option
- ✓ Allow for modular assemblies to be replaceable while the intersection remains on flash
- ✓ Load current monitoring

Advanced Transportation Controller Cabinet Design Guidelines

- ✓ 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
- ✓ Enhanced LED compatibility



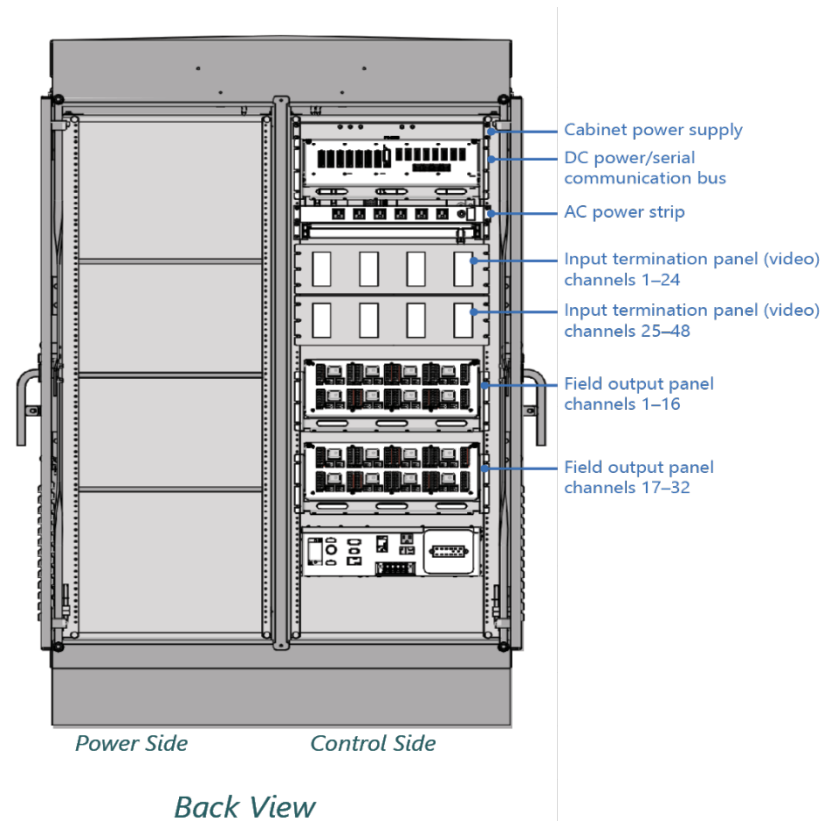
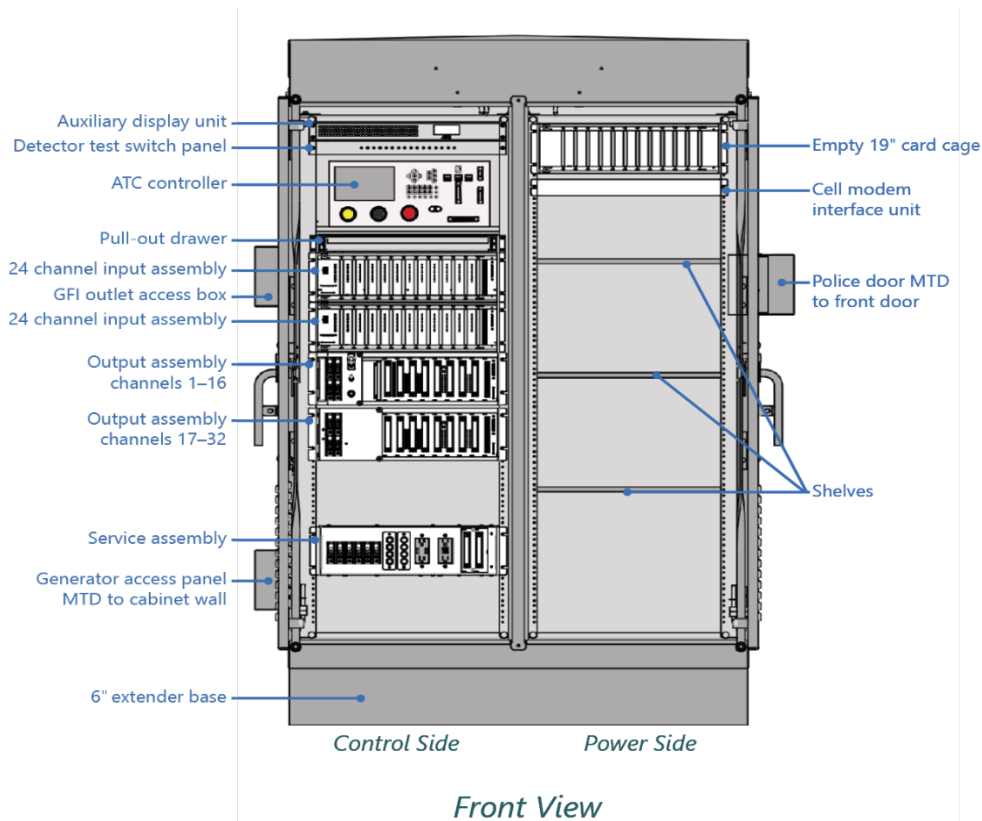
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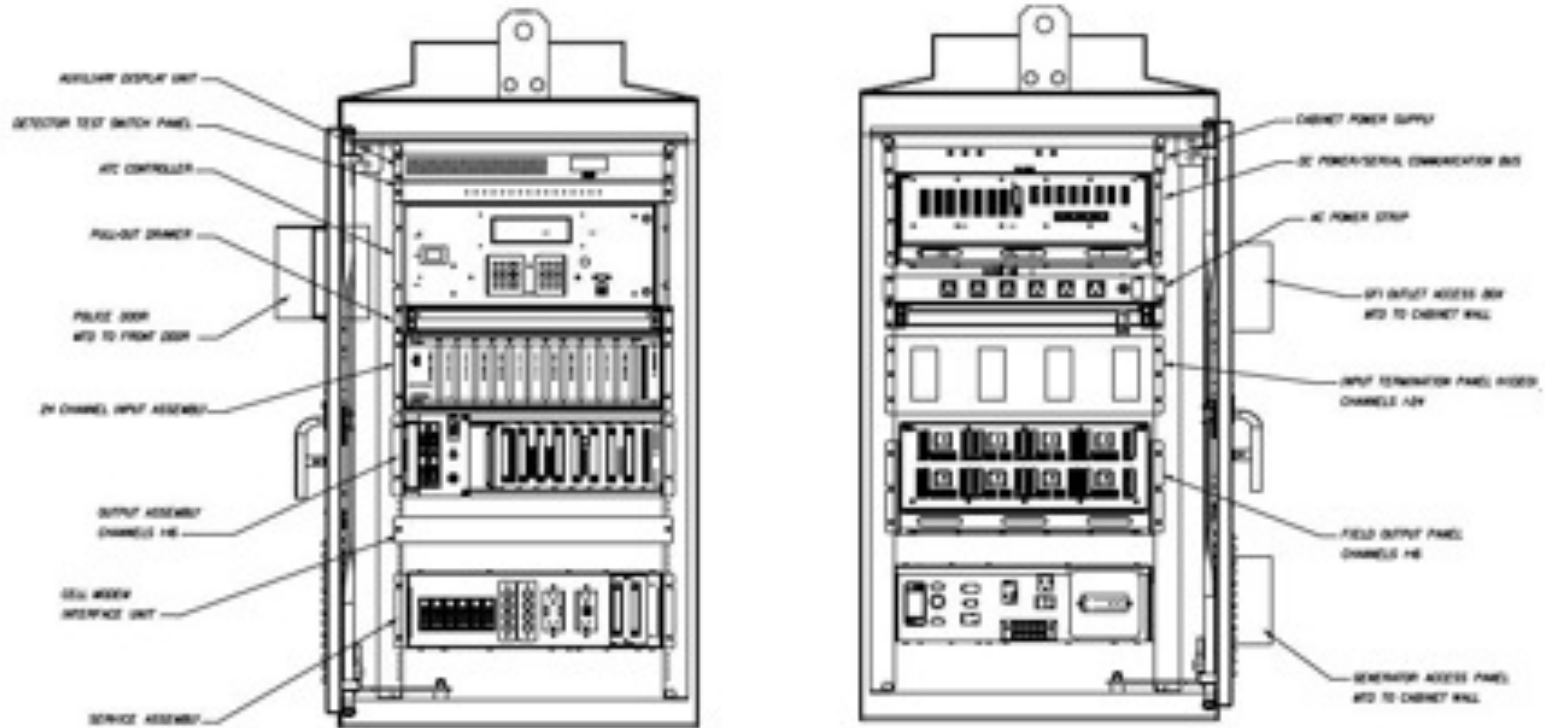
Advanced Transportation Controller Cabinet Components

ATCC	NEMA
Advanced Transportation Controller (ATC)	NEMA Traffic Controller
Model 2212 CMU/ Model 2220 ADU (Data Key)	MMU (Compatibility Card)
Model 2202 Switch Pack/Flasher (HDSP/FU)	Load Switch
Model 2202 Switch Pack/Flasher (HDSP/FU)	Flasher
Model 2218 Serial Interface Unit (SIU2)	Bus Interface Unit (BIU)
Model 2205 High-Density Flash Transfer Relay (HDFTR)	Flash Transfer Relay
Model 2216/ Model 2217 Cabinet Power Supply	Cabinet Power Supply

Advanced Transportation Controller Cabinet (ATCC)



Advanced Transportation Controller Cabinet (ATCC)

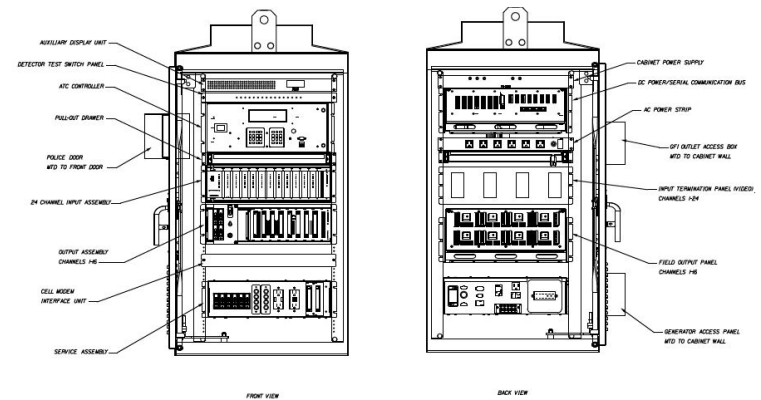


FRONT VIEW **2-Door ATCC** BACK VIEW

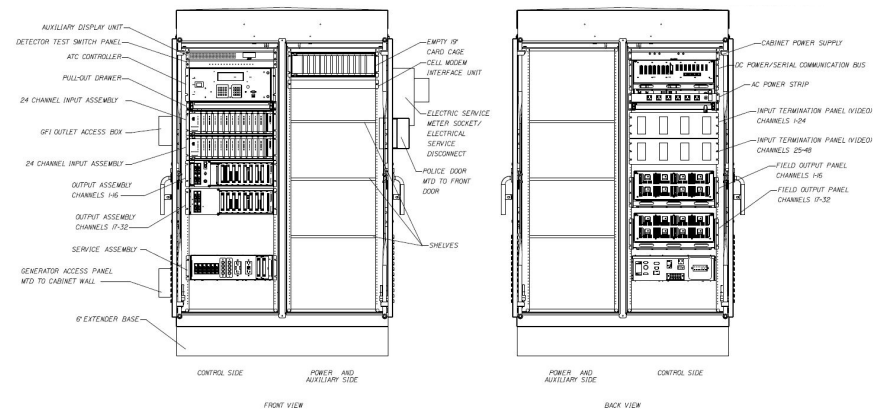
Advanced Transportation Controller Cabinet (ATCC) Replacement

4 Door and 2 Door installations

- High Voltage in the back
- Low voltage on the front
- Controls on left side (4 door version)
- Power meter/disconnect on right side



2-Door ATCC



4-Door ATCC



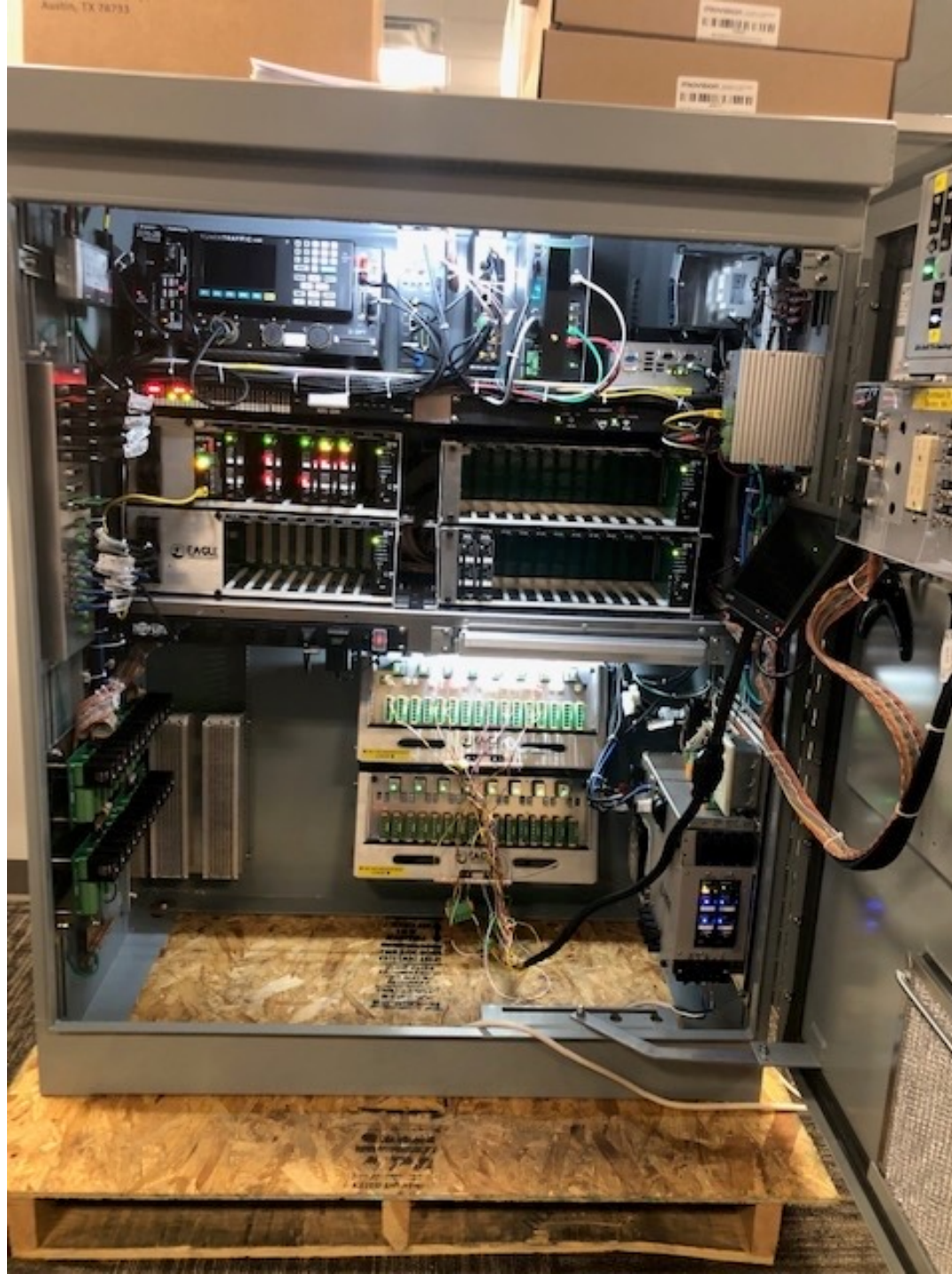
Typical Existing Cabinet

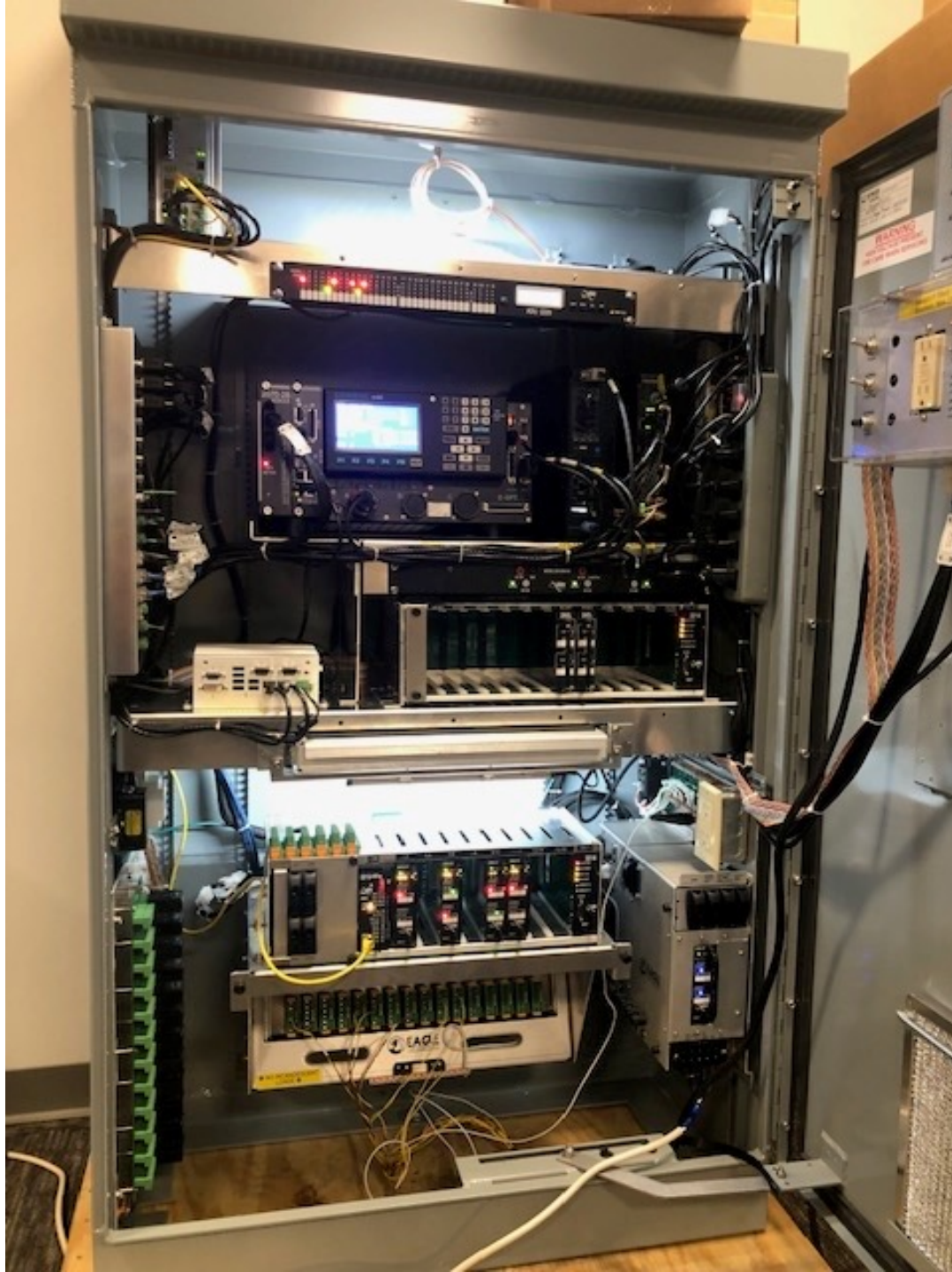


ATCC









ATCC Benefits

- 32 Outputs
- 120 Inputs
- NFPA-70E compliant
- Advanced troubleshooting and diagnostic tools
- Modular assemblies
- LED signal compatibility
- Increased power efficiency
- Supports advanced transportation technology applications (CV, Adaptive, ATSPM)
- Provides additional interior cabinet space for additional hardware (Battery-backup, FMU, Video Detection)

ATCC Benefits

- Load current monitoring for detecting dark approaches
- High density components
 - Double the number of detector channels in the same physical space
 - Double the number of channels per switch pack; switch pack is smaller
- Several sub-assemblies are replaceable when the signal on flash
- Functional standard except where component interchangeability is desired
- 48 VDC cabinet model available

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