ATC Architecture
Converging Signal Controller Architectures:
1. Closed: Signal Control software included
2. Open: Software procured separately, single app
3. ATC: Software procured separately, concurrent apps
### Controllers in Service, 2011:

<table>
<thead>
<tr>
<th>Line</th>
<th>Controller Type</th>
<th>Speed</th>
<th>Comm</th>
<th>OS</th>
<th>API</th>
<th>In Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ATC 5.2b</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>8,000</td>
</tr>
<tr>
<td>2</td>
<td>Model 2070LX</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Model 2070E</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Model 2070L</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>52,000</td>
</tr>
<tr>
<td>5</td>
<td>NEMA, Modern</td>
<td>Yes</td>
<td>Yes</td>
<td>33%</td>
<td>No</td>
<td>36,000</td>
</tr>
<tr>
<td>6</td>
<td>NEMA, Legacy</td>
<td>No</td>
<td>Adaptor</td>
<td>Yes</td>
<td>No</td>
<td>91,000</td>
</tr>
<tr>
<td>7</td>
<td>Type 170, Modern</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>12,000</td>
</tr>
<tr>
<td>8</td>
<td>Type 170, Legacy</td>
<td>No</td>
<td>Adaptor</td>
<td>No</td>
<td>No</td>
<td>102,000</td>
</tr>
<tr>
<td>9</td>
<td>Electromechanical &amp; Other</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>6,000</td>
</tr>
<tr>
<td></td>
<td><strong>Total:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>307,000</strong></td>
</tr>
</tbody>
</table>
The Federal Role: A 50-State Standard

Bring together the two best & most widely used standards

CALTRANS

NEMA

Controller: 2070 & ATC 5.2b
Cabinet: Expandable ITS + Existing Cabinet Styles
Software: Linux apps, signal control & others
Memorandum of Understanding with Standards Development Organizations

STATE AGENCIES
Including Caltrans

LEADING MANUFACTURERS

NEMA
National Electrical Manufacturers Association

TRANSPORTATION PROFESSIONALS

AASHTO
The Voice of Transportation

ITE
Specializing in Intelligent Transportation Systems and Connected & Autonomous Vehicles
Joint Committee on the Advanced Transportation Controller:

Sponsor and Funding

18 Voting Members, 2/3 Majority Executive Decisions

6- AASHTO APPOINTEES

6- ITE APPOINTEES

6- NEMA APPOINTEES
Systems Engineering Process:
Joint Committee Results (www.ite.org/standards):

Controller Working Group
- ATC 5202 Model 2070 Controller Standard v03 (Published)
- ATC Standard 5.2b (Published, at 5-Year Review)
- ATC 5201 ATC Standard v06.xx (Comment Disposition)

Cabinet Working Group
- ITS Cabinet Standard v01.02.15 (Published, Superseded)
- ITS Cabinet Standard v01.02.17b (Published)
- ITS Cabinet Standard v2.0 (Requirements complete, in Design)

API Working Group
- API for ATC Version 1 (Published, Superseded)
- API for ATC Version 2 (Published)
- API Reference Implementation (Requirements complete, in Design)

Strategic 2-Year Planning:
- Connected Vehicle Roadside Equipment
- Network Security
Area Context of ATC within the ITS Architecture

Published Standards:
1. ntcip.org
2. sae.org/technical/standards/J2735
3. ite.org/standards/ITScabinet/
4. ite.org/standards/ATCcontroller/
5. ite.org/standards/atcapl/
6. ite.org/standards/Led.asp
ATC Standards Requirements: Mandatory and Optional

- **Ethernet Ports** (4 Mandatory)
- **NTCIP Network**
- **Network Diagnostics**
- **Roadside Equipment**
- **ATC Diagnostics**

**ATC CORE** (Mandatory)

- **USB Port** (1 Mandatory)
  - **USB 2.0**
  - **ASCII Characters**
  - **ASCII Keystrokes**

**Housing** (Optional)

**Media**

**Communications Slot(s)**
- **(1) Mandatory**

**Input States & Output States** (EIA-485)

**Serial Ports**

**Field I/O** (Optional)

**Field Devices**

Specializing in Intelligent Transportation Systems and Connected & Autonomous Vehicles
ATC Hardware: 3 Mandatory Modules
ATC Software: Mandatory and Optional Modules

Board Support Package

Diagnostic Acceptance Test
Interoperable Engine Board & Software for All Cabinet Types

2070 HOST MODULE

NEMA HOST MODULE

INTERCHANGEABLE ENGINE BOARD

Specializing in Intelligent Transportation Systems and Connected & Autonomous Vehicles
Multiple Concurrent Software Apps

- Ramp Meter
- Video Detection
- Mesh Network
- Preemption
- Bus Rapid Transit
- Light Rail Transit
- Collision Avoidance
- Signal Control
- Travel Time
- Adaptive i.e. ACS Lite
- Engine Control
- Violations