NEMA TS 10
Connected Vehicle Infrastructure
Roadside Equipment

CAT Coalition Technical Resources Working Group
February 12th, 2020
Who is NEMA?
Mission

Help Member Companies….

▪ Expand market opportunities
▪ Mitigate barriers and costs
▪ Enhance business performance

By…

▪ Developing Standards and promoting code adoption and use
▪ Advocating for Members and their products
▪ Providing exclusive industry data, customized research and economic forecasts
▪ Educating Members on evolving technologies, industry trends and legislative/regulatory conditions
NEMA Transportation Management Systems & Associated Control Devices (3TS) Section
Section Vision

The NEMA 3TS Section and its members are a principal source of technical, training, and educational information essential to the specification and manufacture of reliable transportation management products and their installation, performance, maintenance, and inspection.
NEMA TS10 Goals/Objectives

• Give Infrastructure Owners and Operators (IOOs) the confidence to proceed with “future proof” infrastructure deployment for CV.

• Procure on the basis of user needs and associated requirements

• Give effect to USDOT policy:
  - Preserve the spectrum…
  - Technology neutral…
  - Let the private sector figure it out and get on with deployment…

• Ensure Day One applications include Infrastructure applications
NEMA TS 10 Goals/Objectives

Support Infrastructure Owner/Operator Procurements

RSU device proposed is:
- Designed for extensibility
- Designed to implement future wireless technologies and applications without the need for replacement within RSU service life
- Aimed at reducing Long-Term Total Cost of Ownership

Standard recognizes there are multiple configurations of the RSU device depending on a user agency’s procurement needs

NEMA TS 10 supports present and future mobility
Scope of NEMA TS 10

• Describes the following attributes of roadside equipment
  o Physical: hardware platform, mechanical and environmental
  o Software: communications stack, security and minimum set of standard messages
  o Interfaces: terrestrial and wireless
  o Performance: latency and computational capacity
The CV Architecture
Gaps Addressed Via NEMA TS 10

- A Standard for procurement of roadside units (RSUs) that meets identified user needs
- Standardizing a minimal set of messages with a uniform interpretation for safety applications
- Standardizes RSU functions needed by vehicles and vulnerable road users (VRU’s)
- Harmonizes communication protocols from the RSU to the central system
- Supports multiple radios simultaneously
Example User Needs in NEMA TS 10

• Automatic emergency vehicle signal preemption
• Red light violation warning
• Pedestrian crossing ahead
• Collision avoidance
• Entering school zone
• Entering work zone
• Wrong way alert
• Slow speed zone alert
• Flooding ahead alert
Functional Requirements in NEMA TS 10

- Requirements traceability matrix back to the corresponding user need
- Minimum level of functionality requirements to support safety applications in a common message format
- Can be used by mobile devices
- Each requirement includes a prior state and a post state
## Operational Boundaries: Relating to Data Flows

<table>
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<tr>
<th>Flow</th>
<th>Source</th>
<th>Destination</th>
<th>Operational Boundary ID (OB#)</th>
<th>Message</th>
<th>Standard</th>
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<td>RSU</td>
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</table>
Requirements to Verification Traceability

- Is the justification/basis for the requirement clear and valid?
- Is the requirement well-formed?
- Is the requirement unambiguous?
- Is the requirement feasible
- Is the requirement verifiable
- Veritable by what method?
Summary and Key Takeaways

• NEMA TS 10 represents an industry lead effort by the private sector to advance the widespread adoption of connected vehicle infrastructure

• Addresses maintainability, connectivity, communications interoperability, and the ability to address future advances in communications

• Enables the coexistence of multiple communication technologies

• First draft of NEMA TS 10 was completed mid December

• Comments and feedback are welcomed

• Comment period is open until Friday February 28th, 2020

  Tuesday, March 31st
Thank You

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