INTERNATIONAL ITS COOPERATION

Standards Gap Analysis for Cooperative Intelligent Transportation Systems

Results: Solution Perspective: United States

Document HTG7-3-1-US
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Standards Harmonisation Working Group
Harmonisation Task Group 7

MLIT Ministry of Land, Infrastructure, Transport and Tourism

European Commission

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U.S. Department of Transportation

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1. Introduction

1.1 Background

Advancements in transportation technologies are rapidly transforming the world's strategies for increasing safety; gaining operational, mobility, and cost efficiencies; opening access to underserved communities; and reducing environmental impacts from transportation. Using new forms of short-range communications, vehicles and devices are now capable of broadcasting or receiving data that allow them to sense the movements and status of other surrounding devices. These cooperative exchanges create a three hundred sixty degree awareness that, when further fused with other open data, can enable drivers and other users of the transportation system to receive alerts and warnings regarding the formation of threats and hazards. The alerts and warnings created through these communication technologies provide the opportunity to prevent some crashes, thereby reducing fatalities, injuries, and property damage. The cooperative exchange of data in this manner can also enhance the benefits of automation.

Access to new data sets can also transform network operations and minimize the capital investment costs of infrastructure owners and operators. Broadcast data sets from users within a highly mobile environment can complement or potentially supersede the need for significant roadside equipment on major roads. These new data can also form a more complete representation of conditions on the arterial network, including road weather impacts, effects of traffic signal timing, support for incident and emergency responders, or changes in traveller decisions, among other conditions.

Standards for interfaces in the public interest can play a key role in delivering these benefits to communities that implement cooperative-ITS technologies. Technical standards are developed to address coordination problems and overcome technical barriers that exist when different organizations need to work together while preserving their institutional and proprietary processes. The International Organization for Standards (ISO) defines a standard as, "… a document, established by a consensus of subject matter experts and approved by a recognized body that provides guidance on the design, use or performance of materials, products, processes, services, systems or persons." The end documents, which frequently represent the interests of the experts and parties that gather to develop them, are vetted by experts. Recognized benefits include improved safety, mobility, and sustainability for the travelling public and enhanced interoperability within an open market environment.[1]

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[1] See definitions at: the European Committee for Standardization (CEN): https://www.cen.eu/work/ENdev/whatisEN/Pages/default.aspx; the International Organization for Standards (ISO): https://www.iso.org/sites/ConsumersStandards/1_standards.html; Wikipedia: https://en.wikipedia.org/wiki/Technical_standard; the National Institute of Standards and Technology (NIST): https://www.nist.gov/services-resources/standards-and-measurements.

1.2 History

In 2011, the United States (US) Department of Transportation (USDOT) and the European Commission (EC) approved a **Harmonisation Action Plan** to guide EC-US standards development via Harmonisation Task Groups (HTGs). The plan recognises that successful, interoperable, nationwide or regional, cooperative technology implementations are critically dependent upon consistent application of complete, technically sound standards and policies for critical functions, interfaces, and **information flows**[2]. This worldwide need applies to the common services of a cooperative systems environment as well as to global markets for vehicles, devices, and applications. While the envisioned end state appears very similar in many parts of the world, past analyses have been regional and independent in nature and have proceeded with varying levels of coordination. The HTGs allow participating countries to collaborate on technical ITS issues that are of common interest and thus leverage critical expertise and resources while potentially realizing more compatible worldwide solutions.

Transport Certification Australia (TCA) joined the HTG initiatives in January 2014 by bringing security expertise and co-leadership to the sixth HTG (HTG6).[3]

1.3 HTG7

With the emergence in 2015 of plans in the US, Europe, and Australia to develop pilot **Cooperative Intelligent Transportation Systems** (**C-ITS**)[4] projects, a new HTG was established to identify how existing standards could support new C-ITS installations (i.e., "standards solutions for C-ITS") and, in doing so, identify the issues in standards that could pose risks for deployers. This seventh HTG (HTG7) began in late 2015 as a joint effort between the EC, the USDOT, and TCA, with the Japan Ministry of Land, Infrastructure, Transport and Tourism (MLIT) joining in 2017.

Specifically, the objective of HTG7 was to identify standards that comprehensively support large-scale C-ITS deployments. HTG7 expects that fulfilling this objective will allow:

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[2] Terms that are in **bold italics** in this report are defined in a companion report, the **HARTS Reference Compendium (HTG7-5)**, which defines all of the terms used throughout this report set. Terms defined in the reference compendium are bold faced and italicised within each HARTS report upon their first use.

[3] Results of HTG6 are located here: https://ec.europa.eu/digital-single-market/news/harmonized-security-policies-cooperative-intelligent-transport-systems-create-international.

[4] C-ITS is a subset of ITS that requires the mutual, secure exchange of data between *independent* trusted entities (i.e., parties that have no contractual relationship). In other words, while traditional ITS typically deals with exchanges among system components owned and managed by a single or limited number of entities; these new ITS services expand this scope to include system components (e.g., vehicles) that may be owned and managed by any number of different entities. The scope of the HTG7 analysis included the C-ITS interfaces (i.e., exchanges between parties with no contractual relationship but with security and authentication as the basis for trust) as well as the more traditional "back-office" flows (between contracted parties) that enable the provision of the C-ITS services. This architecture presents a level of connectivity suggesting an "Internet of Things" for transportation.

1. **Governments, standards organisations, and other interested stakeholders** to track *issues* regarding those interfaces and information flows that are of significant public interest within the C-ITS *architecture*, facilitating engagement with experts to address them;

2. **ITS deployment teams, device manufacturers, and application developers** to identify candidate standards-based *solutions* that are available to them for planning, understand the issues associated with those solutions, and mitigate the risks associated with those issues in their deployments. Future ITS deployment teams around the world will have a clearer understanding about which system functions and interfaces are critical for *interoperability* and where standards are defined (or not yet defined) to support interoperability.

1.4 Globally Harmonised Reference Architecture

To establish a foundation for analysing standards, the international HTG7 team first developed the **Harmonised Architecture Reference for Technical Standards (HARTS).** HARTS facilitates the understanding of the applicability of standards (ITS standards and other Information and Communications Technology (ICT) standards) for the successful implementation of **C-ITS services**[5]. HARTS provided the framework for the HTG7 team to identify key interfaces that need to be standardised in the public interest and served as the basis for performing the *gap* and *overlap* analysis of C-ITS standards for those interfaces.

> **HARTS is an internationally harmonised reference architecture based on:**
>
> - **National ITS Architecture Framework (NIAF) from Australia**
> - **EU's Framework Architecture (FRAME) from Europe**
> - **Connected Vehicle Reference Implementation Architecture (CVRIA) from the US**
> - **C-ITS architecture constructs from Japan**

The body of work produced by HTG7 includes key resources for industry, such as HARTS and the accompanying HTG7 reports. These tools not only provide a starting point for the ITS community to address the technical and interoperability challenges that face wide-scale ITS deployment; but also provide tactical guidance on standards, solutions, and risks for current or near-term project teams planning and implementing ITS systems. Although the reports are based on a globally harmonised *reference architecture*, they formally recognise and accommodate regional and local approaches to ITS services, solutions, and standards.

1.5 Format of HTG7 Reports

The results summarized in this Executive Summary are presented in greater detail in the HTG7 series of reports:

- **Executive Overview (HTG7-1)** - A high-level summary of the approach, process and the key results of HTG7.

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[5] For the purpose of this report, the term "C-ITS service" is intended to include all ITS services encompassed by the HARTS service packages; at the time of publication 34 are available on the HARTS website (http://htg7.org).

- **Analysis Methodology (HTG7-2)** - Presents the HTG7 methodology used to develop HARTS, perform the gap analysis, and develop proposed resolutions.

- **Issues and Proposed Resolutions (HTG7-3, this document)** - Summarises the issues identified through HTG7 analysis and proposes actions to resolve the issues. It introduces a series of more detailed reports, detailed below, each of which identifies the same set of proposed resolutions but adopts a presentation format and includes details relevant to a different perspective.

  o **Results: Solution Perspective for Deployers (HTG7-3-1-AU, HTG7-3-1-EU, HTG7-3-1-JP, HTG7-3-1-US)** - Addresses development or implementation teams in their planning and procurement processes. This detailed report lists each solution along with its associated issues and proposed resolutions and is divided into four regional sub-reports, one for each participating region. (The region is reflected by the appended 2-letter region code[6]).

  o **Results: Resolution Perspective for Standards Developers (HTG7-3-2)** - Presents each proposed resolution along with its associated issues and the data exchanges affected by these issues. This detailed report can assist standards development communities and governments in their planning and work processes.

  o **Results: Service Package Perspective (HTG7-3-3-AU, HTG7-3-3-EU, HTG7-3-3-JP, HTG7-3-3-US)** - Offers road operators the opportunity to evaluate the "readiness" of *service packages*. This detailed report lists each service package, the data exchanges contained within the service package, and the issues associated with each solution for each data exchange. In this respect, this report helps deployers understand the levels of risk due to the standards gaps. The report is divided into 4 regional reports, one for each participating region. (The region is reflected by the appended the 2-letter region code[6]).

- **HARTS Website Overview (HTG7-4)** - Provides an overview of the HARTS public website, available at http://htg7.org. It describes each aspect of the website and provides instructions on how to submit comments about the information on the website.

- **HARTS Reference Compendium (HTG7-5)** - Provides reference material including:
  o A glossary of terms and associated definitions
  o Acronyms and associated meanings
  o Graphic symbols and associated meanings
  o Explanations of key terms and their inter-relationships

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[6] As defined by ISO 3166-1:2013 *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes*

1.6 Conventions

While the HTG7 Report set was developed using United Kingdom (UK) English, the HARTS (toolset and website) was developed using US English. Whenever an extract from HARTS is presented within the HTG7 Report set, it will retain its US English spelling.

As noted in footnote 2 on page 2, this report is supplemented by the HARTS Reference Compendium (HTG7-5), which defines all of the terms used throughout this report set. Terms defined in the reference compendium are bold faced and italicised within each HARTS report upon their first use.

1.7 Purpose of this Document

This document, **Results: Solution Perspective: United States** (HTG7-3-1-US), is one of nine detailed reports designed to report the issues found and their proposed resolutions, each from a unique perspective. They are adjuncts to the Summary of Issues and Proposed Resolutions (HTG7-3) report, which summarises the results of the HTG7 analysis, summarises the key issues identified during the analysis, and provides a comprehensive set of proposed and prioritised resolutions. The nine detailed reports offer three different technical perspectives, with two of those perspectives further broken out into the four regions encompassed by the HTG7 analysis. The specific detailed reports are as follows:

- **Solution Perspective:** Assists implementation teams in understanding the issues surrounding each solution contained within the HARTS analysis; there is one detailed report for each of the four regions covered by the HARTS analysis. The name of each of the four reports will have a two-letter identifier (-AU, -EU, -JP or -US) at the end of the report identifier and the electronic filename.
- **Resolution Perspective:** Provides an overarching view of the work that still needs to be completed to provide a fully interoperable C-ITS environment and is intended primarily for standards development organisations and governmental entities.
- **Service Package Perspective:** For entities that are deploying C-ITS, such as governmental agencies, product vendors and others that are interesting in the complete end-to-end implementation of an ITS service package; there is one detailed report for each of the four regions covered by the HARTS analysis. The identifier of each of the four reports will have a two-letter identifier (-AU, -EU, -JP or -US) at the end of the report title and the electronic filename.

Please note that each of these detailed reports is extremely large and therefore not intended for printing.

2. Report Perspective

There is a separate regional report within this detailed report collection for each of the participating regions: Australia, the European Union, Japan and the United States. In accordance with guidance in ISO 42010-2011, "*Systems and software engineering — Architecture description*", this detailed report is designed to address a specific set of concerns, or perspective, of a specific group of stakeholders.

This detailed report provides the solution perspective for the United States. It provides a table of HARTS analysis results structured to provide insight to project teams within the United States who are tasked with assessing, designing, and deploying standards-based solutions when deploying new, or augmenting existing, service packages.

This detailed report is intended to assist these teams in the implementation of specific solutions. This guidance provides an awareness of the issues and associated risks associated with each potential solution. Once a project team is aware of the issues, they will be better prepared to develop appropriate and effective workarounds.

To assist this type of project team, the results in this detailed report are organised by solution, listing each issue/proposed resolution pair that is applicable to the solution. Under each issue/ proposed resolution pair that is applicable to the solution, the detailed report then alphabetically lists each *information triple* (*source*, *destination* and information flow) that uses the solution and is associated with the indicated issue/ proposed resolution pairs. This is summarised in Figure 1.
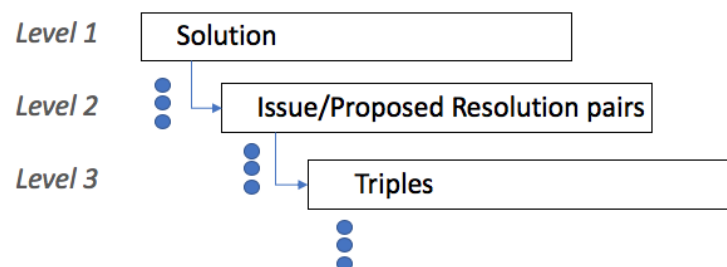

Figure 1: Solution Perspective Overview

3. Report Structure

As shown in Figure 1 above, there are multiple levels within the detailed report. Each level will consist of one, or possibly two, header rows followed by one or more content rows. Given the multi-level detailed report structure, higher-level sorting fields are typically displayed in header rows (e.g., at the start of the detailed report and when values change) while the lowest-level sorting fields may only appear in content rows. When the header field value is changed, the page header for each subsequent page is changed accordingly. Figure 2 below illustrates the detailed report structure, and each field included in the detailed report is subsequently defined in Table 1.

Level 1	Solution Name:	Text			Number of Issues:	5	Total Issue Severity:	54
	text							

Level 2	Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
	text	text	Ultra	text	text	Urgent	AU, EU

Level 3	Information Triples using this solution and affected by this issue that would be addressed by this Proposed Resolution		
	Source	Destination	Flow
	Source 1	Destination 1	Flow 1
	Source 1	Destination 2	Flow 1
	Source 2	Destination 5	Flow 23
	Source 3	Destination 9	Flow 45

Figure 2: Solution Perspective Report Structure

The following table contains the field name, its description and its value range for each of the detailed report fields in Chapter 4. They are listed in the table below according to the order in which they appear in the detailed report in Chapter 4. Additionally, the table also shows the sorting criteria used for the detailed report, including the order of sorting fields, the sorting method used, and the sort direction.

Table 1: Solution Perspective Report Field Descriptions

Report Level	Field Information			Sort Criteria		
	Title	**Description**	**Value Range**	**Order**	**Measure**	**Direction**
1	**Solution Name**	The name of the solution expressed as a hyphenated concatenation of the HARTS *data profile* and the HARTS *communication profile* that collectively define the solution.	ASCII[7]	1	Alphabetic	↓
	Number of Issues	A count of the issues that have been assigned to the solution.	Non-negative integer	–	–	–
	Total Issue Severity	The sum of the severity rating values of all issue instances associated with the solution. The severity rating value for each severity level is assigned below: 1. Low = 1 2. Medium = 3 3. High = 8 4. Ultra = 32	Non-negative integer	–	–	–
	Solution Description	A summary description of the information flow. NOTE: Only the description text is displayed; the title of this field is not shown.	ASCII	–	–	–
2	**Issue**	The name of the issue, which will correspond to one of the 43 defined issue types.	ASCII; See HTG7-5 for a complete list of issue types.	3	Alphabetic	↓
	Issue Description	A textual description of the issue type.	ASCII	–	–	–

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[7] ASCII (American Standard Code for Information Exchange)

Report Level	Field Information			Sort Criteria		
	Title	**Description**	**Value Range**	**Order**	**Measure**	**Direction**
	Issue Severity	An indication of how severe the issue is deemed to be. If the severity of the issue needs to be decided when assigning the issue, multiple issues can be created with slightly different names and definitions. For example, "Data may not be fully defined (low)" and "Data not fully defined (medium)".	Ordered List (Ultra, High, Medium, Low)	2	List Order	↓
	Proposed Resolution	The name of the proposed resolution, which will correspond to one of the 112 defined proposed resolutions.	ASCII	–	–	–
	Resolution Description	A description of the proposed resolution.	ASCII	–	–	–
	Timeframe	The timeframe in which the proposed resolution needs to be addressed in order to eliminate, or mitigate, the associated issues(s) which will facilitate wide-scale deployments of impacted solutions, information triples and service packages.	Ordered List (Urgent, Near-Term, Medium-Term, Future)	–	–	–
	Applicability	The HARTS region or regions in which the proposed resolution is relevant.	Multiple from the following list (AU, EU, JP, US)	–	–	–
3	**Source**	The HARTS *physical object* that is the source of the information in the flow. The combination of the source, destination and the information flow constitute the "information triple".	ASCII	4	Alphabetic	↓

Report Level	Field Information			Sort Criteria		
	Title	**Description**	**Value Range**	**Order**	**Measure**	**Direction**
	Destination	The HARTS physical object that is the destination of the information in the flow. The combination of the source, destination and the information flow constitute the "information triple".	ASCII	5	Alphabetic	↓
	FlowName	Name for the information that is exchanged between two physical objects in the *physical view* of HARTS. Information flows and their communication requirements define the interfaces which formed the basis for the standards analysis conducted by HTG7. The combination of the source, destination and the information flow constitute the "information triple".	ASCII	6	Alphabetic	↓

4. Report Content

The table of results is shown below.

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Solution Name:	(None-Data) - Guaranteed Internet (US)		Number of Issues:	2	Total Issue Severity:	35
Solution Name:	(None-Data) - Guaranteed Internet (US)		Number of Issues:	2	Total Issue Severity:	35

This solution is used within the U.S., E.U., and Australia. It combines standards associated with (None-Data) with those for I-I: Guaranteed Internet (US). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-I: Guaranteed Internet (US) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Update SIRI for other transport modes	Revise the SIRI application specification to support the exchange of ferry, airline, and inter-city rail information between centres.	Near-term	Australia, European Union

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution Destination	Flow Name
Alternate Mode Transportation Center	Transportation Information Center	alternate mode incident information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: System monitoring	Develop an internationally acceptable ITS application specification for the Service Monitor System to monitor other centers and support systems and to report issues.	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution Destination	Flow Name
Data Distribution System	Service Monitor System	support system status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - coordination among centres	Develop an internationally acceptable standard for the user permission request coordination information triples contained within the Core Authorization Service Package.	Near-term	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution Destination	Flow Name
Authorizing Center	Other Authorizing Centers	permission request coordination
Other Authorizing Centers	Authorizing Center	permission request coordination

| Solution Name: | (None-Data) - Guaranteed Internet (US) | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - base services	Develop an internationally acceptable standard for the user permission sets, permission request, permission update request, permission request received, and device identification information triples contained within the Core Authorization Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Authorizing Center	Center	permission request received
Authorizing Center	Cooperative ITS Credentials Management System	user permission sets
Center	Authorizing Center	permission request
Center	Authorizing Center	permission update request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Private location and address	Develop an internationally acceptable ITS application specification that defines the operation of a Privacy Protection Gateway.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Center	protected location and address flow
Connected Vehicle Roadside Equipment	Cooperative ITS Credentials Management System	protected location and address flow
Privacy Protection Gateway	Center	protected location and address flow
Privacy Protection Gateway	Cooperative ITS Credentials Management System	protected location and address flow

Solution Name:	(None-Data) - Guaranteed Internet (US)			Number of Issues:	2	Total Issue Severity:	35

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Security and credentials management - base services	Develop an internationally acceptable standard for the security policy and networking information, device enrolment information, security credentials, security credential revocations, and misbehaviour report information triples contained within the Security and Credentials Management Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Cooperative ITS Credentials Management System	device enrollment information
Center	Cooperative ITS Credentials Management System	misbehavior report
Connected Vehicle Roadside Equipment	Cooperative ITS Credentials Management System	device enrollment information
Connected Vehicle Roadside Equipment	Cooperative ITS Credentials Management System	misbehavior report
Cooperative ITS Credentials Management System	Center	security credential revocations
Cooperative ITS Credentials Management System	Center	security credentials
Cooperative ITS Credentials Management System	Center	security policy and networking information
Cooperative ITS Credentials Management System	Connected Vehicle Roadside Equipment	security credential revocations
Cooperative ITS Credentials Management System	Connected Vehicle Roadside Equipment	security credentials
Cooperative ITS Credentials Management System	Connected Vehicle Roadside Equipment	security policy and networking information
Cooperative ITS Credentials Management System	Data Distribution System	security credential revocations
Cooperative ITS Credentials Management System	Data Distribution System	security credentials
Cooperative ITS Credentials Management System	Data Distribution System	security policy and networking information
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credential revocations
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credentials
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security policy and networking information
Cooperative ITS Credentials Management System	Service Monitor System	security credential revocations
Cooperative ITS Credentials Management System	Service Monitor System	security credentials
Cooperative ITS Credentials Management System	Service Monitor System	security policy and networking information
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credential revocations
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credentials
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security policy and networking information
Data Distribution System	Cooperative ITS Credentials Management System	device enrollment information
Data Distribution System	Cooperative ITS Credentials Management System	misbehavior report
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	device enrollment information
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	misbehavior report
Service Monitor System	Cooperative ITS Credentials Management System	device enrollment information
Service Monitor System	Cooperative ITS Credentials Management System	misbehavior report
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	device enrollment information
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	misbehavior report

| Solution Name: | (None-Data) - Guaranteed Internet (US) | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Security and credentials management - coordination among CCMS	Develop internationally acceptable standardised solutions that facilitate Credential Management Systems coordination of enrolment credentialing, authorization credentialing, misbehavior analysis and certificate revocation processes, so that actions undertaken by one CCMS may be properly referenced and/or utilized by other CCMS, and so that relevant information for these activities may be appropriately shared between CCMS.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Cooperative ITS Credentials Management System	Other CCMS	authorization coordination
Cooperative ITS Credentials Management System	Other CCMS	enrollment coordination
Cooperative ITS Credentials Management System	Other CCMS	misbehavior analysis coordination
Cooperative ITS Credentials Management System	Other CCMS	revocation coordination
Other CCMS	Cooperative ITS Credentials Management System	authorization coordination
Other CCMS	Cooperative ITS Credentials Management System	enrollment coordination
Other CCMS	Cooperative ITS Credentials Management System	misbehavior analysis coordination
Other CCMS	Cooperative ITS Credentials Management System	revocation coordination

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Secure installation/update of software	Develop an internationally acceptable standard for the secure installation, update, and validation of software (including application, support, and OS software) on devices. The process should allow a system to determine which devices have been updated and provide a mechanism to define when such updates are allowed, recommended, and required.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE application install/upgrade
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE application install/upgrade

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Public Information Device	map updates

Solution Name:	(None-Data) - Guaranteed Internet (US)				Number of Issues:	2	Total Issue Severity:	35

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Credentials management system	Implement regional (security) credentials management systems that are interoperable.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Cooperative ITS Credentials Management System	device enrollment information
Center	Cooperative ITS Credentials Management System	misbehavior report
Connected Vehicle Roadside Equipment	Cooperative ITS Credentials Management System	device enrollment information
Connected Vehicle Roadside Equipment	Cooperative ITS Credentials Management System	misbehavior report
Cooperative ITS Credentials Management System	Center	security credential revocations
Cooperative ITS Credentials Management System	Center	security credentials
Cooperative ITS Credentials Management System	Center	security policy and networking information
Cooperative ITS Credentials Management System	Connected Vehicle Roadside Equipment	security credential revocations
Cooperative ITS Credentials Management System	Connected Vehicle Roadside Equipment	security credentials
Cooperative ITS Credentials Management System	Connected Vehicle Roadside Equipment	security policy and networking information
Cooperative ITS Credentials Management System	Data Distribution System	security credential revocations
Cooperative ITS Credentials Management System	Data Distribution System	security credentials
Cooperative ITS Credentials Management System	Data Distribution System	security policy and networking information
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credential revocations
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credentials
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security policy and networking information
Cooperative ITS Credentials Management System	Service Monitor System	security credential revocations
Cooperative ITS Credentials Management System	Service Monitor System	security credentials
Cooperative ITS Credentials Management System	Service Monitor System	security policy and networking information
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credential revocations
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credentials
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security policy and networking information
Data Distribution System	Cooperative ITS Credentials Management System	device enrollment information
Data Distribution System	Cooperative ITS Credentials Management System	misbehavior report
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	device enrollment information
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	misbehavior report
Service Monitor System	Cooperative ITS Credentials Management System	device enrollment information
Service Monitor System	Cooperative ITS Credentials Management System	misbehavior report
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	device enrollment information
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	misbehavior report

Solution Name:	(None-Data) - Guaranteed Internet (US)				Number of Issues:	2	Total Issue Severity:	35

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Alternate Mode Transportation Center	Transportation Information Center	alternate mode incident information
Alternate Mode Transportation Center	Transportation Information Center	alternate mode information
Alternate Mode Transportation Center	Transportation Information Center	alternate mode service demand info
Alternate Mode Transportation Center	Transportation Information Center	service request
Authorizing Center	Center	permission request received
Authorizing Center	Cooperative ITS Credentials Management System	user permission sets
Authorizing Center	Other Authorizing Centers	permission request coordination
Center	Authorizing Center	permission request
Center	Authorizing Center	permission update request
Center	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Center	Cooperative ITS Credentials Management System	device enrollment information
Center	Cooperative ITS Credentials Management System	misbehavior report
Connected Vehicle Roadside Equipment	Center	protected location and address flow
Connected Vehicle Roadside Equipment	Cooperative ITS Credentials Management System	device enrollment information
Connected Vehicle Roadside Equipment	Cooperative ITS Credentials Management System	misbehavior report
Connected Vehicle Roadside Equipment	Cooperative ITS Credentials Management System	protected location and address flow
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE application install/upgrade
Connected Vehicle Roadside Equipment	Payment Administration Center	access violation notification
Connected Vehicle Roadside Equipment	Payment Administration Center	road use history
Cooperative ITS Credentials Management System	Center	security credential revocations
Cooperative ITS Credentials Management System	Center	security credentials
Cooperative ITS Credentials Management System	Center	security policy and networking information
Cooperative ITS Credentials Management System	Connected Vehicle Roadside Equipment	security credential revocations
Cooperative ITS Credentials Management System	Connected Vehicle Roadside Equipment	security credentials
Cooperative ITS Credentials Management System	Connected Vehicle Roadside Equipment	security policy and networking information
Cooperative ITS Credentials Management System	Data Distribution System	security credential revocations
Cooperative ITS Credentials Management System	Data Distribution System	security credentials
Cooperative ITS Credentials Management System	Data Distribution System	security policy and networking information
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credential revocations
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credentials

Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security policy and networking information
Cooperative ITS Credentials Management System	Other CCMS	authorization coordination
Cooperative ITS Credentials Management System	Other CCMS	enrollment coordination
Cooperative ITS Credentials Management System	Other CCMS	misbehavior analysis coordination
Cooperative ITS Credentials Management System	Other CCMS	revocation coordination
Cooperative ITS Credentials Management System	Service Monitor System	security credential revocations
Cooperative ITS Credentials Management System	Service Monitor System	security credentials
Cooperative ITS Credentials Management System	Service Monitor System	security policy and networking information
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credential revocations
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credentials
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security policy and networking information
Data Distribution System	Cooperative ITS Credentials Management System	device enrollment information
Data Distribution System	Cooperative ITS Credentials Management System	misbehavior report
Data Distribution System	Service Monitor System	support system status
DMV	Payment Administration Center	registration
Emissions Management Center	Payment Administration Center	low emissions zone coordination
Emissions Management Center	Payment Administration Center	low emissions zone operations information
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Map Update System	Public Information Device	map updates
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	device enrollment information
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	misbehavior report
Other Authorizing Centers	Authorizing Center	permission request coordination
Other CCMS	Cooperative ITS Credentials Management System	authorization coordination
Other CCMS	Cooperative ITS Credentials Management System	enrollment coordination
Other CCMS	Cooperative ITS Credentials Management System	misbehavior analysis coordination
Other CCMS	Cooperative ITS Credentials Management System	revocation coordination
Payment Administration Center	Connected Vehicle Roadside Equipment	road use charges
Payment Administration Center	Connected Vehicle Roadside Equipment	vehicle payment request
Payment Administration Center	DMV	license request
Payment Administration Center	Emissions Management Center	low emissions zone coordination
Payment Administration Center	Enforcement Center	payment violation notification
Payment Administration Center	Parking Management System	vehicle payment request
Payment Administration Center	Public Information Device	traveler payment request
Payment Administration Center	Public Information Device	user account reports
Privacy Protection Gateway	Center	protected location and address flow
Privacy Protection Gateway	Cooperative ITS Credentials Management System	protected location and address flow

Solution Name:	(None-Data) - Guaranteed Internet (US)		Number of Issues:	2	Total Issue Severity:	35

Public Information Device	Payment Administration Center	user account setup
Public Information Device	Transit Management Center	transit information user request
Service Monitor System	Cooperative ITS Credentials Management System	device enrollment information
Service Monitor System	Cooperative ITS Credentials Management System	misbehavior report
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	device enrollment information
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	misbehavior report

Solution Name:	(None-Data) - Guaranteed Internet (X.509)		Number of Issues:	1	Total Issue Severity:	32

This solution is used within the U.S., E.U., and Australia. It combines standards associated with (None-Data) with those for I-I: Guaranteed Internet (X.509). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-I: Guaranteed Internet (X.509) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using mainstream Internet security standards (X.509).

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: System monitoring	Develop an internationally acceptable ITS application specification for the Service Monitor System to monitor other centers and support systems and to report issues.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Data Distribution System	Service Monitor System	support system status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - coordination among centres	Develop an internationally acceptable standard for the user permission request coordination information triples contained within the Core Authorization Service Package.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Authorizing Center	Other Authorizing Centers	permission request coordination
Other Authorizing Centers	Authorizing Center	permission request coordination

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - base services	Develop an internationally acceptable standard for the user permission sets, permission request, permission update request, permission request received, and device identification information triples contained within the Core Authorization Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Authorizing Center	Center	permission request received
Center	Authorizing Center	permission request
Center	Authorizing Center	permission update request

Solution Name:	(None-Data) - Guaranteed Internet (X.509)				Number of Issues:	1	Total Issue Severity:	32

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Equipment maintenance coordination	Develop an internationally acceptable ITS application specification for C-C exchange of equipment maintenance and status information	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Service Monitor System	Center	RSE fault data
Service Monitor System	Maint and Constr Management Center	RSE fault data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Security and credentials management - base services	Develop an internationally acceptable standard for the security policy and networking information, device enrolment information, security credentials, security credential revocations, and misbehaviour report information triples contained within the Security and Credentials Management Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credential revocations
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credentials
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security policy and networking information
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	device enrollment information
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	misbehavior report

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Private location and address	Develop an internationally acceptable ITS application specification that defines the operation of a Privacy Protection Gateway.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Center	protected location and address flow
Privacy Protection Gateway	Center	protected location and address flow

| Solution Name: | (None-Data) - Guaranteed Internet (X.509) | | | | Number of Issues: | 1 | Total Issue Severity: | 32 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Object registration and discovery	Investigate mechanisms to register and discover objects within the ITS network.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Object Registration and Discovery Service	object registration
Connected Vehicle Roadside Equipment	Object Registration and Discovery Service	object registration
Data Distribution System	Object Registration and Discovery Service	object registration
Object Registration and Discovery Service	Center	object discovery
Object Registration and Discovery Service	Connected Vehicle Roadside Equipment	object discovery
Object Registration and Discovery Service	Data Distribution System	object discovery
Object Registration and Discovery Service	Wide Area Information Disseminator	object discovery
Wide Area Information Disseminator	Object Registration and Discovery Service	object registration

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Secure installation/update of software	Develop an internationally acceptable standard for the secure installation, update, and validation of software (including application, support, and OS software) on devices. The process should allow a system to determine which devices have been updated and provide a mechanism to define when such updates are allowed, recommended, and required.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE application install/upgrade
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE application install/upgrade

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Data aggregation	Develop an internationally acceptable ITS application specification for an RSE to aggregate collected data and report the information to interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Data Distribution System	Connected Vehicle Roadside Equipment	situation data collection parameters

| Solution Name: | (None-Data) - Guaranteed Internet (X.509) | | | | Number of Issues: | 1 | Total Issue Severity: | 32 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Public Information Device	map updates

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Credentials management system	Implement regional (security) credentials management systems that are interoperable.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credential revocations
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security credentials
Cooperative ITS Credentials Management System	Object Registration and Discovery Service	security policy and networking information
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	device enrollment information
Object Registration and Discovery Service	Cooperative ITS Credentials Management System	misbehavior report

| Solution Name: | (None-Data) - Guaranteed Mobile Internet (US) | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-M: Guaranteed Mobile Internet (US). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-M: Guaranteed Mobile Internet (US) standards include lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be actively moving; based on X.509 or 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Internet connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Credentials management system	Implement regional (security) credentials management systems that are interoperable.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Cooperative ITS Credentials Management System	Personal Information Device	security credential revocations
Cooperative ITS Credentials Management System	Personal Information Device	security credentials
Cooperative ITS Credentials Management System	Personal Information Device	security policy and networking information
Cooperative ITS Credentials Management System	Vehicle OBE	security credential revocations
Cooperative ITS Credentials Management System	Vehicle OBE	security credentials
Cooperative ITS Credentials Management System	Vehicle OBE	security policy and networking information
Personal Information Device	Cooperative ITS Credentials Management System	device enrollment information
Personal Information Device	Cooperative ITS Credentials Management System	misbehavior report
Vehicle OBE	Cooperative ITS Credentials Management System	device enrollment information
Vehicle OBE	Cooperative ITS Credentials Management System	misbehavior report

Solution Name:	(None-Data) - Guaranteed Mobile Internet (US)			Number of Issues:	2	Total Issue Severity:	35

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Security and credentials management - base services	Develop an internationally acceptable standard for the security policy and networking information, device enrolment information, security credentials, security credential revocations, and misbehaviour report information triples contained within the Security and Credentials Management Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Cooperative ITS Credentials Management System	Personal Information Device	security credential revocations
Cooperative ITS Credentials Management System	Personal Information Device	security credentials
Cooperative ITS Credentials Management System	Personal Information Device	security policy and networking information
Cooperative ITS Credentials Management System	Vehicle OBE	security credential revocations
Cooperative ITS Credentials Management System	Vehicle OBE	security credentials
Cooperative ITS Credentials Management System	Vehicle OBE	security policy and networking information
Personal Information Device	Cooperative ITS Credentials Management System	device enrollment information
Personal Information Device	Cooperative ITS Credentials Management System	misbehavior report
Vehicle OBE	Cooperative ITS Credentials Management System	device enrollment information
Vehicle OBE	Cooperative ITS Credentials Management System	misbehavior report

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Cooperative ITS Credentials Management System	Personal Information Device	security credential revocations
Cooperative ITS Credentials Management System	Personal Information Device	security credentials
Cooperative ITS Credentials Management System	Personal Information Device	security policy and networking information
Cooperative ITS Credentials Management System	Vehicle OBE	security credential revocations
Cooperative ITS Credentials Management System	Vehicle OBE	security credentials
Cooperative ITS Credentials Management System	Vehicle OBE	security policy and networking information
Emergency Management Center	Emergency Vehicle OBE	occupant information
Personal Information Device	Cooperative ITS Credentials Management System	device enrollment information
Personal Information Device	Cooperative ITS Credentials Management System	misbehavior report
Vehicle OBE	Cooperative ITS Credentials Management System	device enrollment information
Vehicle OBE	Cooperative ITS Credentials Management System	misbehavior report
Vehicle OBE	Payment Administration Center	vehicle payment request

Solution Name:	(None-Data) - Guaranteed Mobile Internet (X.509)			Number of Issues:	2	Total Issue Severity:	35

This solution is used within the U.S., E.U., and Australia. It combines standards associated with (None-Data) with those for I-M: Guaranteed Mobile Internet (X.509). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-M: Guaranteed Mobile Internet (X.509) standards include lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be actively moving; based on X.509

| Solution Name: | (None-Data) - Guaranteed Mobile Internet (X.509) | | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Object registration and discovery	Investigate mechanisms to register and discover objects within the ITS network.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Object Registration and Discovery Service	Personal Information Device	object discovery
Object Registration and Discovery Service	Vehicle OBE	object discovery

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: EU signal priority/preemption	Develop an ITS application specification for a centre to exchange requests and status for signal priority/preemption along a route with a vehicle.	Medium-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	green wave information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Care Facility	Emergency Vehicle OBE	care facility status
Care Facility	Emergency Vehicle OBE	medical records
Emergency Management Center	Emergency Vehicle OBE	green wave information
Emergency Vehicle OBE	Care Facility	care facility status request
Emergency Vehicle OBE	Care Facility	medical records request
Object Registration and Discovery Service	Personal Information Device	object discovery
Object Registration and Discovery Service	Vehicle OBE	object discovery

| Solution Name: | (None-Data) - Internet (US) | | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-I: Internet (US). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-I: Internet (US) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.

| Solution Name: | (None-Data) - Internet (US) | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: System monitoring	Develop an internationally acceptable ITS application specification for the Service Monitor System to monitor other centers and support systems and to report issues.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Wide Area Information Disseminator	Service Monitor System	support system status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Equipment maintenance coordination	Develop an internationally acceptable ITS application specification for C-C exchange of equipment maintenance and status information	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Service Monitor System	Wide Area Information Disseminator	service maintenance status
Wide Area Information Disseminator	Service Monitor System	service maintenance request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	map updates

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Exception-based reporting	Develop an internationally acceptable ITS application specification for managing exception-based reports from other local field devices.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Border Inspection System	Connected Vehicle Roadside Equipment	vehicle signage local data

| Solution Name: | (None-Data) - Internet (US) | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Security and credentials management - base services	Develop an internationally acceptable standard for the security policy and networking information, device enrolment information, security credentials, security credential revocations, and misbehaviour report information triples contained within the Security and Credentials Management Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credential revocations
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credentials
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security policy and networking information
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	device enrollment information
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	misbehavior report

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Object registration and discovery	Investigate mechanisms to register and discover objects within the ITS network.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Object Registration and Discovery Service	Wide Area Information Disseminator	object discovery
Wide Area Information Disseminator	Object Registration and Discovery Service	object registration

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Develop standard for electronic distribution of traffic regulations	Develop an internationally acceptable standard to enable the provision and management of electronic traffic regulations to enable proper operation of road users as they cross jurisdictional boundaries.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	traffic-related regulations

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Credentials management system	Implement regional (security) credentials management systems that are interoperable.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credential revocations
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credentials
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security policy and networking information
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	device enrollment information
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	misbehavior report

Solution Name:	(None-Data) - Internet (US)				Number of Issues:	2	Total Issue Severity:	35

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Border Inspection System	Commercial Vehicle Check Equipment	inspection results
Border Inspection System	Connected Vehicle Roadside Equipment	border pass/pull-in
Border Inspection System	Connected Vehicle Roadside Equipment	clearance notification
Border Inspection System	Connected Vehicle Roadside Equipment	traveler border clearance status
Border Inspection System	Connected Vehicle Roadside Equipment	vehicle signage local data
Commercial Vehicle Check Equipment	Connected Vehicle Roadside Equipment	border pass/pull-in
Commercial Vehicle Check Equipment	Connected Vehicle Roadside Equipment	electronic screening request
Commercial Vehicle Check Equipment	Connected Vehicle Roadside Equipment	pass/pull-in
Commercial Vehicle Check Equipment	Connected Vehicle Roadside Equipment	screening event record
Connected Vehicle Roadside Equipment	Border Inspection System	container manifest
Connected Vehicle Roadside Equipment	Border Inspection System	container seal status
Connected Vehicle Roadside Equipment	Border Inspection System	local border wait times
Connected Vehicle Roadside Equipment	Border Inspection System	tag data
Connected Vehicle Roadside Equipment	Border Inspection System	traveler credentials
Connected Vehicle Roadside Equipment	Commercial Vehicle Check Equipment	border clearance data
Connected Vehicle Roadside Equipment	Commercial Vehicle Check Equipment	electronic lock data
Connected Vehicle Roadside Equipment	Commercial Vehicle Check Equipment	on-board safety data
Connected Vehicle Roadside Equipment	Commercial Vehicle Check Equipment	screening event record
Connected Vehicle Roadside Equipment	Commercial Vehicle Check Equipment	tag data
Connected Vehicle Roadside Equipment	Commercial Vehicle Check Equipment	unique identifiers
Connected Vehicle Roadside Equipment	Traffic Management Center	local border wait times
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credential revocations
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security credentials
Cooperative ITS Credentials Management System	Wide Area Information Disseminator	security policy and networking information
Map Update System	Center	map updates
Object Registration and Discovery Service	Wide Area Information Disseminator	object discovery
Service Monitor System	Wide Area Information Disseminator	service maintenance status
Transportation Information Center	Wide Area Information Disseminator	traffic-related regulations
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	device enrollment information
Wide Area Information Disseminator	Cooperative ITS Credentials Management System	misbehavior report

Solution Name:	(None-Data) - Internet (US)		Number of Issues:	2	Total Issue Severity:	35

Wide Area Information Disseminator	Object Registration and Discovery Service	object registration
Wide Area Information Disseminator	Service Monitor System	service maintenance request
Wide Area Information Disseminator	Service Monitor System	support system status

Solution Name:	(None-Data) - Internet (X.509)		Number of Issues:	2	Total Issue Severity:	35

This solution is used within the U.S., E.U., and Australia. It combines standards associated with (None-Data) with those for I-I: Internet (X.509). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-I: Internet (X.509) standards include lower-layer standards that support secure communications between ITS equipment using mainstream Internet security standards (X.509).

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: System monitoring	Develop an internationally acceptable ITS application specification for the Service Monitor System to monitor other centers and support systems and to report issues.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Wide Area Information Disseminator	Service Monitor System	support system status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Map Update System	map update notification
Maint and Constr Management Center	Map Update System	current infrastructure restrictions
Map Update System	Center	intersection geometry
Map Update System	Center	map updates
Map Update System	Other Map Update Systems	map update coordination
Map Update System	Parking Management System	parking facility geometry
Other Map Update Systems	Map Update System	map update coordination
Parking Management System	Map Update System	parking facility geometry
Traffic Management Center	Map Update System	map update notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Develop standard for electronic distribution of traffic regulations	Develop an internationally acceptable standard to enable the provision and management of electronic traffic regulations to enable proper operation of road users as they cross jurisdictional boundaries.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	traffic-related regulations

| Solution Name: | (None-Data) - Internet (X.509) | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Update central map database	Develop an internationally acceptable ITS application specification that defines the rules for updating a central map database, including roadway and intersection geometry, based on real-world data readings from vehicles and transmitted to a map update system.	Medium-term	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Map Update System	vehicle location data for mapping

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

| Solution Name: | (None-Data) - Local Broadcast Wireless (US) | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for V-X: Local Broadcast Wireless (US). The (None-Data) standards include an unspecified set of standards at the upper layers. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Queue warning	Develop an ITS application specification for providing queue warnings to vehicles from the roadside or other vehicles that is harmonised with DENM.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	queue warning information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry to a vehicle from a local source.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	map updates
Connected Vehicle Roadside Equipment	Vehicle OBE	parking facility geometry

Solution Name:	(None-Data) - Local Broadcast Wireless (US)				Number of Issues:	2	Total Issue Severity:	35

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	border clearance data
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	container transfer location request
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	electronic lock data
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	on-board safety data
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	screening event record
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	tag data
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	unique identifiers
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	border clearance data request
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	border clearance event
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	border pass/pull-in
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	clearance notification
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	container transfer location
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	electronic lock data request
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	electronic screening request
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	pass/pull-in
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	request tag data
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	screening event record
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	trigger area notification
Connected Vehicle Roadside Equipment	Freight Equipment	container identification request
Connected Vehicle Roadside Equipment	Freight Equipment	container seal interrogation
Connected Vehicle Roadside Equipment	Vehicle OBE	cooperative adaptive cruise control parameters
Connected Vehicle Roadside Equipment	Vehicle OBE	electric charging services inventory
Connected Vehicle Roadside Equipment	Vehicle OBE	emergency acknowledge
Connected Vehicle Roadside Equipment	Vehicle OBE	infrastructure restriction warning notification
Connected Vehicle Roadside Equipment	Vehicle OBE	low emissions zone parameters
Connected Vehicle Roadside Equipment	Vehicle OBE	map updates
Connected Vehicle Roadside Equipment	Vehicle OBE	parking facility geometry
Connected Vehicle Roadside Equipment	Vehicle OBE	queue warning information
Connected Vehicle Roadside Equipment	Vehicle OBE	restricted lane warning
Connected Vehicle Roadside Equipment	Vehicle OBE	restricted lanes parameters

Solution Name:	(None-Data) - Local Broadcast Wireless (US)		Number of Issues:	2	Total Issue Severity:	35

Connected Vehicle Roadside Equipment	Vehicle OBE	road use charges
Connected Vehicle Roadside Equipment	Vehicle OBE	traveler border clearance status
Emergency Vehicle OBE	Freight Equipment	container seal interrogation
Other Vehicle OBEs	Vehicle OBE	emergency acknowledge
Vehicle OBE	Connected Vehicle Roadside Equipment	cooperative adaptive cruise control status
Vehicle OBE	Connected Vehicle Roadside Equipment	road use history
Vehicle OBE	Other Vehicle OBEs	emergency acknowledge

Solution Name:	(None-Data) - Local Unicast Wireless (US)		Number of Issues:	2	Total Issue Severity:	35

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for V-X: Local Unicast Wireless (US). The (None-Data) standards include an unspecified set of standards at the upper layers. The V-X: Local Unicast Wireless (US) standards include lower-layer standards that support local-area unicast wireless solutions, such as DSRC technologies, LTE, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Private location and address	Develop an internationally acceptable ITS application specification that defines the operation of a Privacy Protection Gateway.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Connected Vehicle Roadside Equipment	private location and address flow
Vehicle OBE	Connected Vehicle Roadside Equipment	private location and address flow

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs/CAMs, sensors, probe data, etc.) between vehicles and remote interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle route plan

| Solution Name: | (None-Data) - Local Unicast Wireless (US) | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Intermodal Terminal	container transfer location request
Connected Vehicle Roadside Equipment	Vehicle OBE	access violation notification
Connected Vehicle Roadside Equipment	Vehicle OBE	current charging status
Freight Equipment	Connected Vehicle Roadside Equipment	container manifest
Freight Equipment	Connected Vehicle Roadside Equipment	container seal status
Freight Equipment	Connected Vehicle Roadside Equipment	tag data
Freight Equipment	Emergency Vehicle OBE	container manifest
Freight Equipment	Emergency Vehicle OBE	container seal status
Intermodal Terminal	Commercial Vehicle OBE	container transfer location
Intermodal Terminal	Freight Equipment	container identification request
Personal Information Device	Connected Vehicle Roadside Equipment	private location and address flow
Personal Information Device	Connected Vehicle Roadside Equipment	transit user information
Personal Information Device	Transit Vehicle OBE	transfer request
Personal Information Device	Transit Vehicle OBE	transit user information
Transit Vehicle OBE	Personal Information Device	transfer status
Vehicle OBE	Connected Vehicle Roadside Equipment	private location and address flow
Vehicle OBE	Connected Vehicle Roadside Equipment	service response
Vehicle OBE	Connected Vehicle Roadside Equipment	traveler credentials
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle charging profile
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle payment information
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle route plan

| Solution Name: | (None-Data) - Mobile Internet (US) | | | Number of Issues: | 3 | Total Issue Severity: | 38 |

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-M: Mobile Internet (US). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - requests	Develop an internationally acceptable standard for the permission application and permission application receipt information triples contained within the Core Authorization Service Package.	Medium-term	Australia, European Union, United States

| Solution Name: | (None-Data) - Mobile Internet (US) | | | | | Number of Issues: | 3 | Total Issue Severity: | 38 |

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Center	Personal Information Device	permission application receipt
Personal Information Device	Center	permission application

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - base services	Develop an internationally acceptable standard for the user permission sets, permission request, permission update request, permission request received, and device identification information triples contained within the Core Authorization Service Package.	Urgent	Australia, European Union, United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Personal Information Device	Center	device identification
Vehicle OBE	Center	device identification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Private location and address	Develop an internationally acceptable ITS application specification that defines the operation of a Privacy Protection Gateway.	Urgent	Australia, European Union, United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Personal Information Device	Privacy Protection Gateway	private location and address flow
Vehicle OBE	Privacy Protection Gateway	private location and address flow

Solution Name:	(None-Data) - Mobile Internet (US)				Number of Issues:	3	Total Issue Severity:	38

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Personal Information Device	permission application receipt
Commercial Vehicle Administration Center	Commercial Vehicle OBE	safety inspection record
Commercial Vehicle OBE	Commercial Vehicle Administration Center	on-board safety data
Commercial Vehicle OBE	Commercial Vehicle Administration Center	unique identifiers
Commercial Vehicle OBE	Commercial Vehicle OBE Service Provider	on-board vehicle data
Commercial Vehicle OBE	Fleet and Freight Management Center	on-board safety data
Commercial Vehicle OBE	Fleet and Freight Management Center	on-board vehicle data
Commercial Vehicle OBE	Fleet and Freight Management Center	route deviation alert
Commercial Vehicle OBE	Transportation Information Center	freight traveler information preferences
Emergency Management Center	Emergency Vehicle OBE	emergency dispatch requests
Emergency Management Center	Vehicle OBE	emergency acknowledge
Emergency Vehicle OBE	Emergency Management Center	emergency dispatch response
Enforcement Center	Commercial Vehicle OBE	commercial vehicle violation notification
Enforcement Center	Vehicle OBE	service notification record
Fleet and Freight Management Center	Commercial Vehicle OBE	route deviation alert
Fleet and Freight Management Center	Commercial Vehicle OBE	safety inspection record
Fleet and Freight Management Center	Commercial Vehicle OBE	transport assignment
Fleet and Freight Management Center	Commercial Vehicle OBE	trigger area
Fleet and Freight Management Center	Commercial Vehicle OBE	trigger area notification
Fleet and Freight Management Center	Freight Equipment	freight monitoring parameters
Maint and Constr Management Center	Maint and Constr Vehicle OBE	maint and constr dispatch information
Maint and Constr Management Center	Vehicle OBE	roadway maintenance status
Maint and Constr Vehicle OBE	Maint and Constr Management Center	infrastructure conditions data
Maint and Constr Vehicle OBE	Maint and Constr Management Center	maint and constr dispatch status
Maint and Constr Vehicle OBE	Maint and Constr Management Center	work zone status
Map Update System	Personal Information Device	map updates
Map Update System	Vehicle OBE	map updates
Map Update System	Vehicle OBE	parking facility geometry
Payment Administration Center	Personal Information Device	access violation notification
Payment Administration Center	Personal Information Device	traveler payment request

Solution Name:	(None-Data) - Mobile Internet (US)	Number of Issues:	3	Total Issue Severity:	38

Payment Administration Center	Personal Information Device	user account reports
Payment Administration Center	Vehicle OBE	access violation notification
Payment Administration Center	Vehicle OBE	road use charges
Payment Administration Center	Vehicle OBE	vehicle payment request
Personal Information Device	Center	device identification
Personal Information Device	Center	permission application
Personal Information Device	Data Distribution System	traveler sourced updates
Personal Information Device	Payment Administration Center	user account setup
Personal Information Device	Privacy Protection Gateway	private location and address flow
Personal Information Device	Service Monitor System	PID status
Personal Information Device	Transit Management Center	transfer request
Personal Information Device	Transit Management Center	transit information user request
Personal Information Device	Transit Management Center	trip confirmation
Personal Information Device	Transit Management Center	trip request
Personal Information Device	Transportation Information Center	emergency traveler information request
Personal Information Device	Transportation Information Center	evacuation assistance request
Personal Information Device	Transportation Information Center	freight traveler information preferences
Personal Information Device	Transportation Information Center	shelter request
Personal Information Device	Transportation Information Center	traveler sourced updates
Personal Information Device	Transportation Information Center	trip confirmation
Personal Information Device	Transportation Information Center	trip feedback
Personal Information Device	Transportation Information Center	trip request
Personal Information Device	Transportation Information Center	user account setup
Personal Information Device	Transportation Information Center	user profile
Traffic Management Center	Vehicle OBE	automated lane control data
Traffic Management Center	Vehicle OBE	restricted lane warning
Traffic Management Center	Vehicle OBE	restricted lanes application info
Traffic Management Center	Vehicle OBE	restricted lanes parameters
Transit Management Center	Personal Information Device	transfer status
Transit Management Center	Personal Information Device	trip plan
Transit Management Center	Transit Vehicle OBE	transfer status
Transit Management Center	Transit Vehicle OBE	transit stop locations
Transit Vehicle OBE	Transit Management Center	transfer request
Transit Vehicle OBE	Transit Management Center	transit traveler request
Transit Vehicle OBE	Transit Management Center	transit user information
Transportation Information Center	Commercial Vehicle OBE	freight-specific traveler information

| Solution Name: | (None-Data) - Mobile Internet (US) | Number of Issues: | 3 | Total Issue Severity: | 38 |

Transportation Information Center	Personal Information Device	emergency traveler information
Transportation Information Center	Personal Information Device	evacuation assistance information
Transportation Information Center	Personal Information Device	freight-specific traveler information
Transportation Information Center	Personal Information Device	shelter recommendations
Transportation Information Center	Personal Information Device	traffic-related regulations
Transportation Information Center	Personal Information Device	trip plan
Transportation Information Center	Personal Information Device	user profile
Transportation Information Center	Vehicle OBE	electric charging services inventory
Transportation Information Center	Vehicle OBE	evacuation assistance information
Transportation Information Center	Vehicle OBE	shelter recommendations
Transportation Information Center	Vehicle OBE	traffic-related regulations
Transportation Information Center	Vehicle OBE	trip plan
Vehicle OBE	Center	device identification
Vehicle OBE	Data Distribution System	traveler sourced updates
Vehicle OBE	Payment Administration Center	road use history
Vehicle OBE	Payment Administration Center	vehicle payment request
Vehicle OBE	Privacy Protection Gateway	private location and address flow
Vehicle OBE	Service Monitor System	OBE status
Vehicle OBE	Transportation Information Center	emergency traveler information request
Vehicle OBE	Transportation Information Center	evacuation assistance request
Vehicle OBE	Transportation Information Center	shelter request
Vehicle OBE	Transportation Information Center	traveler sourced updates
Vehicle OBE	Transportation Information Center	trip confirmation
Vehicle OBE	Transportation Information Center	trip feedback
Vehicle OBE	Transportation Information Center	trip request
Vehicle OBE	Transportation Information Center	user profile

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Fleet management	Develop an ITS application specification for managing fleet vehicles, including managing the location of fleet vehicles such as emergency vehicles and transit vehicles	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Service Monitor System	PID status
Vehicle OBE	Service Monitor System	OBE status

| Solution Name: | (None-Data) - Mobile Internet (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 38 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry and associated regulations and restrictions over mobile Internet from a centre to user devices (e.g., a vehicle or personal information device).	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Personal Information Device	map updates
Map Update System	Vehicle OBE	map updates
Map Update System	Vehicle OBE	parking facility geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Automated lane control data	Develop an internationally acceptable ITS application specification for providing control commands and operating parameters for automated vehicle systems, including platooning operations.	Medium-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	automated lane control data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Work zone status	Develop an ITS application specification for a maintenance and construction vehicle to report and update the status of a work zone to a centre.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Vehicle OBE	Maint and Constr Management Center	work zone status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Develop standard for electronic distribution of traffic regulations	Develop an internationally acceptable standard to enable the provision and management of electronic traffic regulations to enable proper operation of road users as they cross jurisdictional boundaries.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	traffic-related regulations
Transportation Information Center	Vehicle OBE	traffic-related regulations

Solution Name:	(None-Data) - Mobile Internet (US)				Number of Issues:	3	Total Issue Severity:	38

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Identifier registry does not exist	The standard defines a field which requires a globally unique identifier, but no registration authority exists to assign these values.	Medium	Identifier registry	Implement a centralised identifier registry network that ensures the assignment of globally unique C-ITS identifiers.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Center	device identification
Vehicle OBE	Center	device identification

Solution Name:	(None-Data) - Mobile Internet (X.509)				Number of Issues:	4	Total Issue Severity:	46

This solution is used within the U.S., E.U., and Australia. It combines standards associated with (None-Data) with those for I-M: Mobile Internet (X.509). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-M: Mobile Internet (X.509) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - base services	Develop an internationally acceptable standard for the user permission sets, permission request, permission update request, permission request received, and device identification information triples contained within the Core Authorization Service Package.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Center	device identification
Vehicle OBE	Center	device identification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - requests	Develop an internationally acceptable standard for the permission application and permission application receipt information triples contained within the Core Authorization Service Package.		Medium-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Personal Information Device	permission application receipt
Personal Information Device	Center	permission application

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-X: DENM, IVI, TPEG2, TMC and Contextual Speed Information	Standardise on a single solution for providing traveler information, lane closure information and speed information; currently this information can be sent via DENM, IVI, TPEG2, TMC, or Contextual Speed Information (speed information only). Use cases need to consider the various environments (e.g., Centre-Vehicle, Roadside-Vehicle, Special Vehicle-Vehicle, etc).		Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	road weather advisories

Solution Name:	(None-Data) - Mobile Internet (X.509)		Number of Issues:	4	Total Issue Severity:	46

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Private location and address	Develop an internationally acceptable ITS application specification that defines the operation of a Privacy Protection Gateway.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Privacy Protection Gateway	private location and address flow
Vehicle OBE	Privacy Protection Gateway	private location and address flow

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Fleet management	Develop an ITS application specification for managing fleet vehicles, including managing the location of fleet vehicles such as emergency vehicles and transit vehicles	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Emergency Management Center	emergency vehicle tracking data
Personal Information Device	Service Monitor System	PID status
Vehicle OBE	Service Monitor System	OBE status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: EU signal priority/preemption	Develop an ITS application specification for a centre to exchange requests and status for signal priority/preemption along a route with a vehicle.	Medium-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	green wave information
Emergency Vehicle OBE	Emergency Management Center	green wave request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Signal operations	Develop an ITS application specification for providing intersection status information to vehicles from a centre for environmental benefits.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	intersection status

| Solution Name: | (None-Data) - Mobile Internet (X.509) | | | | Number of Issues: | 4 | Total Issue Severity: | 46 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry and associated regulations and restrictions over mobile Internet from a centre to user devices (e.g., a vehicle or personal information device).	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Personal Information Device	map updates
Map Update System	Vehicle OBE	map updates
Map Update System	Vehicle OBE	parking facility geometry
Map Update System	Vehicle OBE	roadway geometry
Traffic Management Center	Vehicle OBE	vehicle road information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Automated lane control data	Develop an internationally acceptable ITS application specification for providing control commands and operating parameters for automated vehicle systems, including platooning operations.	Medium-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	automated lane control data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Develop standard for electronic distribution of traffic regulations	Develop an internationally acceptable standard to enable the provision and management of electronic traffic regulations to enable proper operation of road users as they cross jurisdictional boundaries.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	traffic-related regulations
Transportation Information Center	Vehicle OBE	traffic-related regulations

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Work zone status	Develop an ITS application specification for a maintenance and construction vehicle to report and update the status of a work zone to a centre.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Vehicle OBE	Maint and Constr Management Center	work zone status

| Solution Name: | (None-Data) - Mobile Internet (X.509) | | | | Number of Issues: | 4 | Total Issue Severity: | 46 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Update central map database	Develop an internationally acceptable ITS application specification that defines the rules for updating a central map database, including roadway and intersection geometry, based on real-world data readings from vehicles and transmitted to a map update system.	Medium-term	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Vehicle OBE	Map Update System	vehicle location and motion for mapping

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Transit vehicle schedule management	Develop an ITS application specification for managing transit vehicle schedule performance data from transit vehicles to a centre.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transit Management Center	Transit Vehicle OBE	transit schedule information
Transit Vehicle OBE	Transit Management Center	transit vehicle schedule performance

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs/CAMs, sensors, probe data, etc.) between vehicles and remote interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Vehicle OBE	Data Distribution System	vehicle situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined (high)	Required data elements are not defined.	High	C-V: Fleet management	Develop an ITS application specification for managing fleet vehicles, including managing the location of fleet vehicles such as emergency vehicles and transit vehicles	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Emergency Management Center	emergency vehicle tracking data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Fleet management	Develop an ITS application specification for managing fleet vehicles, including managing the location of fleet vehicles such as emergency vehicles and transit vehicles	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Emergency Management Center	emergency vehicle tracking data

| Solution Name: | (None-Data) - Mobile Internet (X.509) | | | | Number of Issues: | 4 | Total Issue Severity: | 46 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Signal operations	Develop an ITS application specification for providing intersection status information to vehicles from a centre for environmental benefits.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	intersection status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Update central map database	Develop an internationally acceptable ITS application specification that defines the rules for updating a central map database, including roadway and intersection geometry, based on real-world data readings from vehicles and transmitted to a map update system.	Medium-term	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Vehicle OBE	Map Update System	vehicle location and motion for mapping

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Identifier registry does not exist	The standard defines a field which requires a globally unique identifier, but no registration authority exists to assign these values.	Medium	Identifier registry	Implement a centralised identifier registry network that ensures the assignment of globally unique C-ITS identifiers.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Center	device identification
Vehicle OBE	Center	device identification

| Solution Name: | (None-Data) - Mobile SNMPv3 | | | | Number of Issues: | 3 | Total Issue Severity: | 36 |

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-M: Mobile SNMPv3. The (None-Data) standards include an unspecified set of standards at the upper layers. The I-M: Mobile SNMPv3 standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Highway advisory radio	Develop an internationally acceptable ITS application specification for managing highway advisory radios for secure communications with proper access control.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	roadway advisory radio status
Maint and Constr Vehicle OBE	ITS Roadway Equipment	roadway advisory radio data

| Solution Name: | (None-Data) - Mobile SNMPv3 | | | | Number of Issues: | 3 | Total Issue Severity: | 36 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Fleet management	Develop an ITS application specification for managing fleet vehicles, including managing the location of fleet vehicles such as emergency vehicles and transit vehicles	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Service Monitor System	PID status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	roadway advisory radio status
Maint and Constr Vehicle OBE	ITS Roadway Equipment	roadway advisory radio data
Personal Information Device	Service Monitor System	PID status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	roadway advisory radio status
Maint and Constr Vehicle OBE	ITS Roadway Equipment	roadway advisory radio data
Personal Information Device	Service Monitor System	PID status

| Solution Name: | (None-Data) - NTCIP Messaging | | | | Number of Issues: | 5 | Total Issue Severity: | 49 |

This solution is used within the U.S. and Australia. It combines standards associated with (None-Data) with those for C-C: NTCIP Messaging. The (None-Data) standards include an unspecified set of standards at the upper layers. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Solution Name:	(None-Data) - NTCIP Messaging	Number of Issues:	5	Total Issue Severity:	49

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Archived Data Center	Archived Data User Systems	archive analysis results
Archived Data Center	Archived Data User Systems	archive request confirmation
Archived Data Center	Archived Data User Systems	archived data products
Archived Data Center	Center	archive requests
Archived Data Center	Center	archive status
Archived Data Center	Government Reporting Systems	government reporting system data
Archived Data User Systems	Archived Data Center	archive analysis requests
Archived Data User Systems	Archived Data Center	archived data product requests
Authorizing Center	Center	permission request received
Authorizing Center	Other Authorizing Centers	permission request coordination
Border Inspection Administration Center	Border Inspection System	consolidated agency response
Border Inspection Administration Center	Border Inspection System	manifest data
Border Inspection Administration Center	Border Inspection System	traveler personal information
Border Inspection Administration Center	Fleet and Freight Management Center	clearance notification
Border Inspection Administration Center	Freight Distribution and Logistics Center	clearance notification
Border Inspection Administration Center	Intermodal Customer System	clearance notification
Border Inspection System	Border Inspection Administration Center	border security input
Border Inspection System	Border Inspection Administration Center	inspection results
Border Inspection System	Commercial Vehicle Administration Center	arrival notification
Cellular Communications Provider	Transportation Information Center	comm-derived travel time data
Center	Authorizing Center	permission request
Center	Authorizing Center	permission update request
Center	Data Distribution System	operational data
Center	Data Distribution System	traveler information distribution data
Center	Maint and Constr Management Center	equipment maintenance request
Center	Map Update System	map update notification
Center	Service Monitor System	service maintenance request
Center	Service Monitor System	system monitoring
Commercial Vehicle Administration Center	Border Inspection Administration Center	border clearance status
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	border agency clearance results
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	carrier participation report
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	commercial vehicle permit information
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	credentials information
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	credentials status information
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	cv driver record

Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	safety status information
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	targeted list
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	transportation border clearance assessment
Commercial Vehicle Administration Center	Commercial Vehicle OBE Service Provider	commercial vehicle permit information
Commercial Vehicle Administration Center	CVO Information Requestor Center	carrier participation report
Commercial Vehicle Administration Center	CVO Information Requestor Center	credentials information
Commercial Vehicle Administration Center	CVO Information Requestor Center	credentials status information
Commercial Vehicle Administration Center	CVO Information Requestor Center	cv driver record
Commercial Vehicle Administration Center	CVO Information Requestor Center	safety status information
Commercial Vehicle Administration Center	Fleet and Freight Management Center	border clearance status
Commercial Vehicle Administration Center	Fleet and Freight Management Center	citation
Commercial Vehicle Administration Center	Fleet and Freight Management Center	compliance review report
Commercial Vehicle Administration Center	Fleet and Freight Management Center	credentials information
Commercial Vehicle Administration Center	Fleet and Freight Management Center	credentials status information
Commercial Vehicle Administration Center	Fleet and Freight Management Center	cv driver record
Commercial Vehicle Administration Center	Fleet and Freight Management Center	safety status information
Commercial Vehicle Administration Center	Fleet and Freight Management Center	trigger area
Commercial Vehicle Administration Center	Fleet and Freight Management Center	trigger area notification
Commercial Vehicle Administration Center	Intermodal Customer System	border clearance status
Commercial Vehicle Administration Center	Other CV Administration Centers	accident report
Commercial Vehicle Administration Center	Other CV Administration Centers	citation
Commercial Vehicle Administration Center	Other CV Administration Centers	commercial vehicle permit information
Commercial Vehicle Administration Center	Other CV Administration Centers	credential fee coordination
Commercial Vehicle Administration Center	Other CV Administration Centers	credentials information
Commercial Vehicle Administration Center	Other CV Administration Centers	credentials status information
Commercial Vehicle Administration Center	Other CV Administration Centers	cv driver record
Commercial Vehicle Administration Center	Other CV Administration Centers	safety status information
Commercial Vehicle Administration Center	Transportation Information Center	commercial vehicle permit information
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	border clearance event
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	citation
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	daily site activity data
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	on-board safety data
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	violation notification
Commercial Vehicle Check Equipment	Commercial Vehicle OBE Service Provider	security credentials
Commercial Vehicle Check Equipment	Emergency Management Center	commercial vehicle incident notification
Commercial Vehicle Check Equipment	Enforcement Center	violation notification

Commercial Vehicle OBE Service Provider	Commercial Vehicle Administration Center	commercial vehicle permit information
Connected Vehicle Roadside Equipment	Intermodal Terminal	container identification
Connected Vehicle Roadside Equipment	Intermodal Terminal	container location
Connected Vehicle Roadside Equipment	Intermodal Terminal	container transfer location request
CVO Information Requestor Center	Commercial Vehicle Administration Center	request for data review
Data Distribution System	Center	operational data
Data Distribution System	Center	regional situation data
Data Distribution System	Other Data Distribution Systems	field situation data sharing
Data Distribution System	Other Data Distribution Systems	traveler situation data sharing
Data Distribution System	Other Data Distribution Systems	vehicle situation data sharing
Data Distribution System	Service Monitor System	service maintenance request
Data Distribution System	Service Monitor System	support system status
Emergency Management Center	Other Emergency Management Centers	evacuation coordination
Emergency Management Center	Public Health System	public health request
Emergency Management Center	Traffic Management Center	emergency traffic control request
Emergency Management Center	Traffic Management Center	special vehicle restricted use information
Emergency Management Center	Transportation Information Center	incident information
Emergency Management Center	Transportation Information Center	transportation system status
Emissions Management Center	Traffic Management Center	low emissions zone coordination
Emissions Management Center	Traffic Management Center	low emissions zone operations information
Emissions Management Center	Traffic Management Center	mobile source emissions data
Emissions Management Center	Traffic Management Center	widearea statistical pollution information
Emissions Management Center	Transit Management Center	low emissions zone coordination
Emissions Management Center	Transit Management Center	low emissions zone operations information
Emissions Management Center	Transportation Information Center	air quality information
Emissions Management Center	Transportation Information Center	low emissions zone operations information
Enforcement Center	Commercial Vehicle Check Equipment	information on violators
Event Promoters	Parking Management System	event plans
Fleet and Freight Management Center	Border Inspection Administration Center	manifest data
Fleet and Freight Management Center	Commercial Vehicle Administration Center	audit data
Fleet and Freight Management Center	Commercial Vehicle Administration Center	credential application
Fleet and Freight Management Center	Commercial Vehicle Administration Center	on-board safety data
Fleet and Freight Management Center	Commercial Vehicle Administration Center	request for permit
Fleet and Freight Management Center	Commercial Vehicle Administration Center	tax filing
Fleet and Freight Management Center	Commercial Vehicle Administration Center	unique identifiers
Fleet and Freight Management Center	Emergency Management Center	commercial vehicle incident notification

Fleet and Freight Management Center	Freight Distribution and Logistics Center	available truck capacity
Fleet and Freight Management Center	Freight Distribution and Logistics Center	load appointment status
Fleet and Freight Management Center	Intermodal Customer System	available truck capacity
Fleet and Freight Management Center	Intermodal Customer System	booking status
Fleet and Freight Management Center	Intermodal Terminal	container delivery request
Fleet and Freight Management Center	Intermodal Terminal	container pickup confirmation
Fleet and Freight Management Center	Intermodal Terminal	freight transportation status
Fleet and Freight Management Center	Intermodal Terminal	terminal reservation request
Fleet and Freight Management Center	Transportation Information Center	commercial vehicle trip information
Fleet and Freight Management Center	Transportation Information Center	freight traveler information preferences
Fleet and Freight Management Center	Transportation Information Center	route request
Freight Consolidation Station	Fleet and Freight Management Center	container pickup request
Freight Distribution and Logistics Center	Border Inspection Administration Center	manifest data
Freight Distribution and Logistics Center	Fleet and Freight Management Center	available loads
Freight Distribution and Logistics Center	Fleet and Freight Management Center	load matching info
Freight Distribution and Logistics Center	Intermodal Customer System	booking status
Freight Distribution and Logistics Center	Intermodal Terminal	container availability request
Freight Distribution and Logistics Center	Other Freight Distribution and Logistics Centers	load matching systems coordination
Freight Distribution and Logistics Center	Transportation Information Center	freight traveler information preferences
Government Reporting Systems	Archived Data Center	government reporting data receipt
Intermodal Customer System	Border Inspection Administration Center	manifest data
Intermodal Customer System	Fleet and Freight Management Center	available loads
Intermodal Customer System	Freight Distribution and Logistics Center	available loads
Intermodal Customer System	Transportation Information Center	freight traveler information preferences
Intermodal Terminal	Connected Vehicle Roadside Equipment	container transfer location
Intermodal Terminal	Fleet and Freight Management Center	container pickup request
Intermodal Terminal	Fleet and Freight Management Center	freight transportation status
Intermodal Terminal	Fleet and Freight Management Center	intermodal terminal status
Intermodal Terminal	Fleet and Freight Management Center	terminal reservation
Intermodal Terminal	Freight Distribution and Logistics Center	container availability status
Intermodal Terminal	Freight Distribution and Logistics Center	intermodal terminal status
Intermodal Terminal	Traffic Management Center	intermodal freight event information
Intermodal Terminal	Transportation Information Center	intermodal terminal status
Maint and Constr Management Center	Center	equipment maintenance status
Maint and Constr Management Center	Emergency Management Center	road network status assessment
Maint and Constr Management Center	Emergency Management Center	roadway maintenance status

Maint and Constr Management Center	Maintenance and Construction Administrative Systems	maint and constr work performance
Maint and Constr Management Center	Map Update System	current infrastructure restrictions
Maint and Constr Management Center	Traffic Management Center	special vehicle restricted use information
Maint and Constr Management Center	Traffic Management Center	work zone information
Maint and Constr Management Center	Transportation Information Center	maint and constr work plans
Maint and Constr Management Center	Transportation Information Center	roadway maintenance status
Maint and Constr Management Center	Transportation Information Center	work zone information
Maintenance and Construction Administrative Systems	Maint and Constr Management Center	maint and constr administrative information
Map Update System	Center	map updates
Map Update System	Other Map Update Systems	map update coordination
Map Update System	Parking Management System	parking facility geometry
Other Authorizing Centers	Authorizing Center	permission request coordination
Other CV Administration Centers	Commercial Vehicle Administration Center	accident report
Other CV Administration Centers	Commercial Vehicle Administration Center	citation
Other CV Administration Centers	Commercial Vehicle Administration Center	commercial vehicle permit information
Other CV Administration Centers	Commercial Vehicle Administration Center	credential fee coordination
Other CV Administration Centers	Commercial Vehicle Administration Center	credentials information
Other CV Administration Centers	Commercial Vehicle Administration Center	credentials status information
Other CV Administration Centers	Commercial Vehicle Administration Center	cv driver record
Other CV Administration Centers	Commercial Vehicle Administration Center	safety status information
Other Data Distribution Systems	Data Distribution System	field situation data sharing
Other Data Distribution Systems	Data Distribution System	traveler situation data sharing
Other Data Distribution Systems	Data Distribution System	vehicle situation data sharing
Other Emergency Management Centers	Emergency Management Center	evacuation coordination
Other Freight Distribution and Logistics Centers	Freight Distribution and Logistics Center	load matching systems coordination
Other Map Update Systems	Map Update System	map update coordination
Other Parking Management Systems	Parking Management System	parking coordination
Other Traffic Management Centers	Traffic Management Center	device data
Other Traffic Management Centers	Traffic Management Center	device status
Other Traffic Management Centers	Traffic Management Center	road network conditions
Other Transportation Information Centers	Transportation Information Center	incident information
Other Transportation Information Centers	Transportation Information Center	multimodal information
Other Transportation Information Centers	Transportation Information Center	parking information
Other Transportation Information Centers	Transportation Information Center	road network conditions
Other Transportation Information Centers	Transportation Information Center	traffic image meta data
Other Transportation Information Centers	Transportation Information Center	traffic images

Other Transportation Information Centers	Transportation Information Center	transit service information
Parking Management System	Map Update System	parking facility geometry
Parking Management System	Other Parking Management Systems	parking coordination
Parking Management System	Transportation Information Center	parking reservation confirmation
Payment Administration Center	Parking Management System	vehicle payment request
Privacy Protection Gateway	Center	protected location and address flow
Security Credentials Registry	Commercial Vehicle Check Equipment	security credentials
Service Monitor System	Center	RSE fault data
Service Monitor System	Center	service maintenance status
Service Monitor System	Data Distribution System	service maintenance status
Service Monitor System	Maint and Constr Management Center	RSE fault data
Service Monitor System	Wide Area Information Disseminator	service maintenance status
Storage Facility Data Acquisition System	Maint and Constr Management Center	maintenance materials storage status
Surface Transportation Weather Service	Traffic Management Center	transportation weather information
Traffic Management Center	Emergency Management Center	emergency traffic control information
Traffic Management Center	Emergency Management Center	incident information
Traffic Management Center	Emergency Management Center	road network conditions
Traffic Management Center	Emissions Management Center	low emissions zone coordination
Traffic Management Center	Enforcement Center	lane violation notification
Traffic Management Center	Intermodal Terminal	intermodal freight traffic confirmation
Traffic Management Center	Maint and Constr Management Center	incident information
Traffic Management Center	Maint and Constr Management Center	road network conditions
Traffic Management Center	Map Update System	map update notification
Traffic Management Center	Media	traffic information for media
Traffic Management Center	Other Traffic Management Centers	device data
Traffic Management Center	Other Traffic Management Centers	device status
Traffic Management Center	Other Traffic Management Centers	road network conditions
Traffic Management Center	Parking Management System	parking demand management request
Traffic Management Center	Parking Management System	parking traffic information
Traffic Management Center	Parking Management System	transportation operational strategies
Traffic Management Center	Transit Management Center	dynamic bus lane status
Traffic Management Center	Transit Management Center	traffic control priority status
Traffic Management Center	Transportation Information Center	incident information
Traffic Management Center	Transportation Information Center	road network conditions
Traffic Management Center	Transportation Information Center	traffic control information
Traffic Management Center	Transportation Information Center	traffic image meta data

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Traffic Management Center	Transportation Information Center	traffic images
Traffic Management Center	Wide Area Information Disseminator	traffic information for media
Traffic Regulatory Authority	Transportation Information Center	traffic-related regulations
Transit Management Center	Emissions Management Center	low emissions zone coordination
Transit Management Center	Traffic Management Center	dynamic bus lane request
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transportation Information Center	Emergency Management Center	road network environmental situation data
Transportation Information Center	Fleet and Freight Management Center	freight-specific traveler information
Transportation Information Center	Fleet and Freight Management Center	incident information
Transportation Information Center	Fleet and Freight Management Center	road network conditions
Transportation Information Center	Fleet and Freight Management Center	road network environmental situation data
Transportation Information Center	Fleet and Freight Management Center	route plan
Transportation Information Center	Freight Distribution and Logistics Center	freight-specific traveler information
Transportation Information Center	Intermodal Customer System	freight-specific traveler information
Transportation Information Center	Maint and Constr Management Center	road network environmental situation data
Transportation Information Center	Media	traffic information for media
Transportation Information Center	Media	traveler information for media
Transportation Information Center	Other Transportation Information Centers	incident information
Transportation Information Center	Other Transportation Information Centers	multimodal information
Transportation Information Center	Other Transportation Information Centers	parking information
Transportation Information Center	Other Transportation Information Centers	road network conditions
Transportation Information Center	Other Transportation Information Centers	traffic image meta data
Transportation Information Center	Other Transportation Information Centers	traffic images
Transportation Information Center	Other Transportation Information Centers	transit service information
Transportation Information Center	Parking Management System	parking reservation request
Transportation Information Center	Surface Transportation Weather Service	road network environmental situation data
Transportation Information Center	Traffic Management Center	road network environmental situation data
Transportation Information Center	Wide Area Information Disseminator	traffic information for media
Transportation Information Center	Wide Area Information Disseminator	traffic-related regulations
Transportation Information Center	Wide Area Information Disseminator	traveler information for media
Travel Services Provider System	Transportation Information Center	travel service reservations
Wide Area Information Disseminator	Service Monitor System	service maintenance request
Wide Area Information Disseminator	Service Monitor System	support system status

| Solution Name: | (None-Data) - NTCIP Messaging | | | | Number of Issues: | 5 | Total Issue Severity: | 49 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.	Medium-term	United States

Source	Destination	Flow Name
Traffic Management Center	Transit Management Center	traffic control priority status
Transit Management Center	Traffic Management Center	traffic control priority request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: System monitoring	Develop an internationally acceptable ITS application specification for the Service Monitor System to monitor other centers and support systems and to report issues.	Urgent	Australia, European Union, United States

Source	Destination	Flow Name
Center	Service Monitor System	system monitoring
Data Distribution System	Service Monitor System	support system status
Wide Area Information Disseminator	Service Monitor System	support system status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs, CAMs, sensors, etc.) among various centres.	Urgent	Australia, European Union, United States

Source	Destination	Flow Name
Transportation Information Center	Traffic Management Center	road network environmental situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: EU emergency traffic control	Update DATEX to support the provision of emergency traffic control information with a complete application specification.	Near-term	Australia, European Union

Source	Destination	Flow Name
Emergency Management Center	Traffic Management Center	emergency traffic control request
Traffic Management Center	Emergency Management Center	emergency traffic control information

| Solution Name: | (None-Data) - NTCIP Messaging | | | | Number of Issues: | 5 | Total Issue Severity: | 49 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - coordination among centres	Develop an internationally acceptable standard for the user permission request coordination information triples contained within the Core Authorization Service Package.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Authorizing Center	Other Authorizing Centers	permission request coordination
Other Authorizing Centers	Authorizing Center	permission request coordination

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - base services	Develop an internationally acceptable standard for the user permission sets, permission request, permission update request, permission request received, and device identification information triples contained within the Core Authorization Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Authorizing Center	Center	permission request received
Center	Authorizing Center	permission request
Center	Authorizing Center	permission update request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: AU weather information	Adopt an existing weather information centre-to-centre data profile for use within the region.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Surface Transportation Weather Service	Traffic Management Center	transportation weather information

Solution Name:	(None-Data) - NTCIP Messaging				Number of Issues:	5	Total Issue Severity:	49

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: AU traffic management data	Adopt an existing traffic management centre-to-centre data profile for use within the region.	Urgent	Australia

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Other Traffic Management Centers	Traffic Management Center	device data
Other Traffic Management Centers	Traffic Management Center	device status
Other Traffic Management Centers	Traffic Management Center	road network conditions
Other Transportation Information Centers	Transportation Information Center	road network conditions
Traffic Management Center	Emergency Management Center	road network conditions
Traffic Management Center	Maint and Constr Management Center	road network conditions
Traffic Management Center	Other Traffic Management Centers	device data
Traffic Management Center	Other Traffic Management Centers	device status
Traffic Management Center	Other Traffic Management Centers	road network conditions
Traffic Management Center	Transportation Information Center	road network conditions
Transportation Information Center	Fleet and Freight Management Center	road network conditions
Transportation Information Center	Other Transportation Information Centers	road network conditions

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: AU incident information	Adopt an existing incident management centre-to-centre data profile for use within the region.	Urgent	Australia

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Transportation Information Center	incident information
Maint and Constr Management Center	Traffic Management Center	work zone information
Maint and Constr Management Center	Transportation Information Center	work zone information
Other Transportation Information Centers	Transportation Information Center	incident information
Traffic Management Center	Emergency Management Center	incident information
Traffic Management Center	Maint and Constr Management Center	incident information
Traffic Management Center	Transportation Information Center	incident information
Transportation Information Center	Fleet and Freight Management Center	incident information
Transportation Information Center	Other Transportation Information Centers	incident information

| Solution Name: | (None-Data) - NTCIP Messaging | | | | Number of Issues: | 5 | Total Issue Severity: | 49 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Credentials management system	Implement regional (security) credentials management systems that are interoperable.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle Check Equipment	Commercial Vehicle OBE Service Provider	security credentials
Security Credentials Registry	Commercial Vehicle Check Equipment	security credentials

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Equipment maintenance coordination	Develop an internationally acceptable ITS application specification for C-C exchange of equipment maintenance and status information	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Maint and Constr Management Center	equipment maintenance request
Center	Service Monitor System	service maintenance request
Data Distribution System	Service Monitor System	service maintenance request
Maint and Constr Management Center	Center	equipment maintenance status
Service Monitor System	Center	RSE fault data
Service Monitor System	Center	service maintenance status
Service Monitor System	Data Distribution System	service maintenance status
Service Monitor System	Maint and Constr Management Center	RSE fault data
Service Monitor System	Wide Area Information Disseminator	service maintenance status
Wide Area Information Disseminator	Service Monitor System	service maintenance request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Map Update System	map update notification
Maint and Constr Management Center	Map Update System	current infrastructure restrictions
Map Update System	Center	map updates
Map Update System	Other Map Update Systems	map update coordination
Map Update System	Parking Management System	parking facility geometry
Other Map Update Systems	Map Update System	map update coordination
Parking Management System	Map Update System	parking facility geometry
Traffic Management Center	Map Update System	map update notification

| Solution Name: | (None-Data) - NTCIP Messaging | | | Number of Issues: | 5 | Total Issue Severity: | 49 | |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Private location and address	Develop an internationally acceptable ITS application specification that defines the operation of a Privacy Protection Gateway.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Privacy Protection Gateway	Center	protected location and address flow

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Security and credentials management - base services	Develop an internationally acceptable standard for the security policy and networking information, device enrolment information, security credentials, security credential revocations, and misbehaviour report information triples contained within the Security and Credentials Management Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle Check Equipment	Commercial Vehicle OBE Service Provider	security credentials
Security Credentials Registry	Commercial Vehicle Check Equipment	security credentials

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: CCTV	Develop an internationally acceptable ITS application specification for exchanging CCTV camera data with a management entity that uses the secure centre-to-field protocol.	Medium-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Other Transportation Information Centers	Transportation Information Center	traffic images
Traffic Management Center	Transportation Information Center	traffic images
Transportation Information Center	Other Transportation Information Centers	traffic images

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Develop standard for electronic distribution of traffic regulations	Develop an internationally acceptable standard to enable the provision and management of electronic traffic regulations to enable proper operation of road users as they cross jurisdictional boundaries.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Regulatory Authority	Transportation Information Center	traffic-related regulations
Transportation Information Center	Wide Area Information Disseminator	traffic-related regulations

Solution Name:	(None-Data) - NTCIP Messaging				Number of Issues:	5	Total Issue Severity:	49

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-C: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs, CAMs, sensors, etc.) among various centres.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Traffic Management Center	road network environmental situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: TCIP/IM/TMDD/ATIS for incident information	Standardise on a single solution for providing incident and incident management information; currently this information is defined within APTA TCIP, IEEE 1512 (IM), ITE TMDD, and SAE ATIS.		Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Transportation Information Center	incident information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not defined (high)	Required data elements are not defined.	High	C-C: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs, CAMs, sensors, etc.) among various centres.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Traffic Management Center	road network environmental situation data

Solution Name:	(None-Data) - OMG DDS				Number of Issues:	4	Total Issue Severity:	46

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for C-C: OMG DDS. The (None-Data) standards include an unspecified set of standards at the upper layers. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: System monitoring	Develop an internationally acceptable ITS application specification for the Service Monitor System to monitor other centers and support systems and to report issues.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Service Monitor System	system monitoring
Data Distribution System	Service Monitor System	support system status

| Solution Name: | (None-Data) - OMG DDS | | | | Number of Issues: | 4 | Total Issue Severity: | 46 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs, CAMs, sensors, etc.) among various centres.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Traffic Management Center	road network environmental situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Private location and address	Develop an internationally acceptable ITS application specification that defines the operation of a Privacy Protection Gateway.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Privacy Protection Gateway	Center	protected location and address flow

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Equipment maintenance coordination	Develop an internationally acceptable ITS application specification for C-C exchange of equipment maintenance and status information	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Service Monitor System	service maintenance request
Data Distribution System	Service Monitor System	service maintenance request
Service Monitor System	Center	service maintenance status
Service Monitor System	Data Distribution System	service maintenance status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Map Update System	map update notification
Map Update System	Center	map updates
Map Update System	Other Map Update Systems	map update coordination
Map Update System	Parking Management System	parking facility geometry
Other Map Update Systems	Map Update System	map update coordination
Parking Management System	Map Update System	parking facility geometry
Traffic Management Center	Map Update System	map update notification

| Solution Name: | (None-Data) - OMG DDS | | | | Number of Issues: | 4 | Total Issue Severity: | 46 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Security and credentials management - base services	Develop an internationally acceptable standard for the security policy and networking information, device enrolment information, security credentials, security credential revocations, and misbehaviour report information triples contained within the Security and Credentials Management Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle Check Equipment	Commercial Vehicle OBE Service Provider	security credentials
Security Credentials Registry	Commercial Vehicle Check Equipment	security credentials

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Develop standard for electronic distribution of traffic regulations	Develop an internationally acceptable standard to enable the provision and management of electronic traffic regulations to enable proper operation of road users as they cross jurisdictional boundaries.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Regulatory Authority	Transportation Information Center	traffic-related regulations

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Credentials management system	Implement regional (security) credentials management systems that are interoperable.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle Check Equipment	Commercial Vehicle OBE Service Provider	security credentials
Security Credentials Registry	Commercial Vehicle Check Equipment	security credentials

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-C: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs, CAMs, sensors, etc.) among various centres.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Traffic Management Center	road network environmental situation data

Solution Name:	(None-Data) - OMG DDS					Number of Issues:	4	Total Issue Severity:	46

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Archived Data Center	Archived Data User Systems	archive analysis results
Archived Data Center	Archived Data User Systems	archive request confirmation
Archived Data Center	Archived Data User Systems	archived data products
Archived Data Center	Center	archive requests
Archived Data Center	Center	archive status
Archived Data Center	Government Reporting Systems	government reporting system data
Archived Data User Systems	Archived Data Center	archive analysis requests
Archived Data User Systems	Archived Data Center	archived data product requests
Border Inspection Administration Center	Border Inspection System	consolidated agency response
Border Inspection Administration Center	Border Inspection System	manifest data
Border Inspection Administration Center	Border Inspection System	traveler personal information
Border Inspection Administration Center	Fleet and Freight Management Center	clearance notification
Border Inspection Administration Center	Freight Distribution and Logistics Center	clearance notification
Border Inspection Administration Center	Intermodal Customer System	clearance notification
Border Inspection System	Border Inspection Administration Center	border security input
Border Inspection System	Border Inspection Administration Center	inspection results
Border Inspection System	Commercial Vehicle Administration Center	arrival notification
Cellular Communications Provider	Transportation Information Center	comm-derived travel time data
Center	Map Update System	map update notification
Center	Service Monitor System	service maintenance request
Center	Service Monitor System	system monitoring
Commercial Vehicle Administration Center	Border Inspection Administration Center	border clearance status
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	border agency clearance results
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	carrier participation report
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	commercial vehicle permit information
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	credentials information
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	credentials status information
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	cv driver record
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	safety status information
Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	targeted list

Commercial Vehicle Administration Center	Commercial Vehicle Check Equipment	transportation border clearance assessment
Commercial Vehicle Administration Center	Commercial Vehicle OBE Service Provider	commercial vehicle permit information
Commercial Vehicle Administration Center	CVO Information Requestor Center	carrier participation report
Commercial Vehicle Administration Center	CVO Information Requestor Center	credentials information
Commercial Vehicle Administration Center	CVO Information Requestor Center	credentials status information
Commercial Vehicle Administration Center	CVO Information Requestor Center	cv driver record
Commercial Vehicle Administration Center	CVO Information Requestor Center	safety status information
Commercial Vehicle Administration Center	Fleet and Freight Management Center	border clearance status
Commercial Vehicle Administration Center	Fleet and Freight Management Center	citation
Commercial Vehicle Administration Center	Fleet and Freight Management Center	compliance review report
Commercial Vehicle Administration Center	Fleet and Freight Management Center	credentials information
Commercial Vehicle Administration Center	Fleet and Freight Management Center	credentials status information
Commercial Vehicle Administration Center	Fleet and Freight Management Center	cv driver record
Commercial Vehicle Administration Center	Fleet and Freight Management Center	safety status information
Commercial Vehicle Administration Center	Fleet and Freight Management Center	trigger area
Commercial Vehicle Administration Center	Fleet and Freight Management Center	trigger area notification
Commercial Vehicle Administration Center	Intermodal Customer System	border clearance status
Commercial Vehicle Administration Center	Other CV Administration Centers	accident report
Commercial Vehicle Administration Center	Other CV Administration Centers	citation
Commercial Vehicle Administration Center	Other CV Administration Centers	commercial vehicle permit information
Commercial Vehicle Administration Center	Other CV Administration Centers	credential fee coordination
Commercial Vehicle Administration Center	Other CV Administration Centers	credentials information
Commercial Vehicle Administration Center	Other CV Administration Centers	credentials status information
Commercial Vehicle Administration Center	Other CV Administration Centers	cv driver record
Commercial Vehicle Administration Center	Other CV Administration Centers	safety status information
Commercial Vehicle Administration Center	Transportation Information Center	commercial vehicle permit information
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	border clearance event
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	citation
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	daily site activity data
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	on-board safety data
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	violation notification
Commercial Vehicle Check Equipment	Commercial Vehicle OBE Service Provider	security credentials
Commercial Vehicle Check Equipment	Emergency Management Center	commercial vehicle incident notification
Commercial Vehicle Check Equipment	Enforcement Center	violation notification
Commercial Vehicle OBE Service Provider	Commercial Vehicle Administration Center	commercial vehicle permit information
Connected Vehicle Roadside Equipment	Parking Management System	connected vehicle parking data

Solution Name:	(None-Data) - OMG DDS		Number of Issues:	4	Total Issue Severity:	46

CVO Information Requestor Center	Commercial Vehicle Administration Center	request for data review
Data Distribution System	Other Data Distribution Systems	field situation data sharing
Data Distribution System	Other Data Distribution Systems	traveler situation data sharing
Data Distribution System	Other Data Distribution Systems	vehicle situation data sharing
Data Distribution System	Service Monitor System	service maintenance request
Data Distribution System	Service Monitor System	support system status
Emergency Management Center	Other Emergency Management Centers	evacuation coordination
Emergency Management Center	Public Health System	public health request
Emergency Management Center	Traffic Management Center	special vehicle restricted use information
Emergency Management Center	Transportation Information Center	transportation system status
Emissions Management Center	Traffic Management Center	low emissions zone coordination
Emissions Management Center	Traffic Management Center	low emissions zone operations information
Emissions Management Center	Traffic Management Center	mobile source emissions data
Emissions Management Center	Traffic Management Center	widearea statistical pollution information
Emissions Management Center	Transit Management Center	low emissions zone coordination
Emissions Management Center	Transit Management Center	low emissions zone operations information
Emissions Management Center	Transportation Information Center	low emissions zone operations information
Enforcement Center	Commercial Vehicle Check Equipment	information on violators
Event Promoters	Parking Management System	event plans
Fleet and Freight Management Center	Border Inspection Administration Center	manifest data
Fleet and Freight Management Center	Commercial Vehicle Administration Center	audit data
Fleet and Freight Management Center	Commercial Vehicle Administration Center	credential application
Fleet and Freight Management Center	Commercial Vehicle Administration Center	on-board safety data
Fleet and Freight Management Center	Commercial Vehicle Administration Center	request for permit
Fleet and Freight Management Center	Commercial Vehicle Administration Center	tax filing
Fleet and Freight Management Center	Commercial Vehicle Administration Center	unique identifiers
Fleet and Freight Management Center	Emergency Management Center	commercial vehicle incident notification
Fleet and Freight Management Center	Freight Distribution and Logistics Center	available truck capacity
Fleet and Freight Management Center	Freight Distribution and Logistics Center	load appointment status
Fleet and Freight Management Center	Intermodal Customer System	available truck capacity
Fleet and Freight Management Center	Intermodal Customer System	booking status
Fleet and Freight Management Center	Intermodal Terminal	container delivery request
Fleet and Freight Management Center	Intermodal Terminal	container pickup confirmation
Fleet and Freight Management Center	Intermodal Terminal	terminal reservation request
Fleet and Freight Management Center	Transportation Information Center	commercial vehicle trip information
Fleet and Freight Management Center	Transportation Information Center	freight traveler information preferences

Freight Distribution and Logistics Center	Border Inspection Administration Center	manifest data
Freight Distribution and Logistics Center	Fleet and Freight Management Center	available loads
Freight Distribution and Logistics Center	Fleet and Freight Management Center	load matching info
Freight Distribution and Logistics Center	Intermodal Customer System	booking status
Freight Distribution and Logistics Center	Intermodal Terminal	container availability request
Freight Distribution and Logistics Center	Other Freight Distribution and Logistics Centers	load matching systems coordination
Freight Distribution and Logistics Center	Transportation Information Center	freight traveler information preferences
Government Reporting Systems	Archived Data Center	government reporting data receipt
Intermodal Customer System	Border Inspection Administration Center	manifest data
Intermodal Customer System	Fleet and Freight Management Center	available loads
Intermodal Customer System	Freight Distribution and Logistics Center	available loads
Intermodal Customer System	Transportation Information Center	freight traveler information preferences
Intermodal Terminal	Fleet and Freight Management Center	container pickup request
Intermodal Terminal	Fleet and Freight Management Center	intermodal terminal status
Intermodal Terminal	Fleet and Freight Management Center	terminal reservation
Intermodal Terminal	Freight Distribution and Logistics Center	container availability status
Intermodal Terminal	Freight Distribution and Logistics Center	intermodal terminal status
Intermodal Terminal	Traffic Management Center	intermodal freight event information
Intermodal Terminal	Transportation Information Center	intermodal terminal status
Maint and Constr Management Center	Emergency Management Center	road network status assessment
Maint and Constr Management Center	Emergency Management Center	roadway maintenance status
Maint and Constr Management Center	Maintenance and Construction Administrative Systems	maint and constr work performance
Maint and Constr Management Center	Traffic Management Center	special vehicle restricted use information
Maint and Constr Management Center	Transportation Information Center	roadway maintenance status
Maintenance and Construction Administrative Systems	Maint and Constr Management Center	maint and constr administrative information
Map Update System	Center	map updates
Map Update System	Other Map Update Systems	map update coordination
Map Update System	Parking Management System	parking facility geometry
Other CV Administration Centers	Commercial Vehicle Administration Center	accident report
Other CV Administration Centers	Commercial Vehicle Administration Center	citation
Other CV Administration Centers	Commercial Vehicle Administration Center	commercial vehicle permit information
Other CV Administration Centers	Commercial Vehicle Administration Center	credential fee coordination
Other CV Administration Centers	Commercial Vehicle Administration Center	credentials information
Other CV Administration Centers	Commercial Vehicle Administration Center	credentials status information
Other CV Administration Centers	Commercial Vehicle Administration Center	cv driver record
Other CV Administration Centers	Commercial Vehicle Administration Center	safety status information

Other Data Distribution Systems	Data Distribution System	field situation data sharing
Other Data Distribution Systems	Data Distribution System	traveler situation data sharing
Other Data Distribution Systems	Data Distribution System	vehicle situation data sharing
Other Emergency Management Centers	Emergency Management Center	evacuation coordination
Other Freight Distribution and Logistics Centers	Freight Distribution and Logistics Center	load matching systems coordination
Other Map Update Systems	Map Update System	map update coordination
Parking Management System	Map Update System	parking facility geometry
Parking Management System	Transportation Information Center	parking reservation confirmation
Payment Administration Center	Parking Management System	vehicle payment request
Privacy Protection Gateway	Center	protected location and address flow
Security Credentials Registry	Commercial Vehicle Check Equipment	security credentials
Service Monitor System	Center	service maintenance status
Service Monitor System	Data Distribution System	service maintenance status
Storage Facility Data Acquisition System	Maint and Constr Management Center	maintenance materials storage status
Traffic Management Center	Emissions Management Center	low emissions zone coordination
Traffic Management Center	Intermodal Terminal	intermodal freight traffic confirmation
Traffic Management Center	Map Update System	map update notification
Traffic Management Center	Parking Management System	parking demand management request
Traffic Management Center	Parking Management System	parking traffic information
Traffic Management Center	Parking Management System	transportation operational strategies
Traffic Management Center	Transit Management Center	dynamic bus lane status
Traffic Regulatory Authority	Transportation Information Center	traffic-related regulations
Transit Management Center	Emissions Management Center	low emissions zone coordination
Transit Management Center	Traffic Management Center	dynamic bus lane request
Transportation Information Center	Emergency Management Center	road network environmental situation data
Transportation Information Center	Fleet and Freight Management Center	freight-specific traveler information
Transportation Information Center	Fleet and Freight Management Center	road network environmental situation data
Transportation Information Center	Freight Distribution and Logistics Center	freight-specific traveler information
Transportation Information Center	Intermodal Customer System	freight-specific traveler information
Transportation Information Center	Maint and Constr Management Center	road network environmental situation data
Transportation Information Center	Parking Management System	parking reservation request
Transportation Information Center	Surface Transportation Weather Service	road network environmental situation data
Transportation Information Center	Traffic Management Center	road network environmental situation data
Travel Services Provider System	Transportation Information Center	travel service reservations

Solution Name:	(None-Data) - OMG DDS					Number of Issues:	4	Total Issue Severity:	46

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined (high)	Required data elements are not defined.	High	C-C: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs, CAMs, sensors, etc.) among various centres.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Transportation Information Center	Traffic Management Center	road network environmental situation data

Solution Name:	(None-Data) - OMG DDS RPC					Number of Issues:	4	Total Issue Severity:	41

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-F: OMG DDS RPC. The (None-Data) standards include an unspecified set of standards at the upper layers. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - base services	Develop an internationally acceptable standard for the user permission sets, permission request, permission update request, permission request received, and device identification information triples contained within the Core Authorization Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Connected Vehicle Roadside Equipment	Center	device identification
ITS Roadway Equipment	Center	device identification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Wrong way vehicle detected	Develop an internationally acceptable ITS application specification for providing distributing wrong way vehicle alerts in real-time.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Connected Vehicle Roadside Equipment	Other Connected Vehicle Roadside Equipment	wrong way vehicle detected
Other Connected Vehicle Roadside Equipment	Connected Vehicle Roadside Equipment	wrong way vehicle detected

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Private location and address	Develop an internationally acceptable ITS application specification that defines the operation of a Privacy Protection Gateway.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Connected Vehicle Roadside Equipment	Center	protected location and address flow

Solution Name:	(None-Data) - OMG DDS RPC			Number of Issues:	4	Total Issue Severity:	41	

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Speed warning	Develop an internationally acceptable ITS application specification for providing roadway configuration data, current speed limits , warning parameters and thresholds to a speed warning application.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	reduced speed warning status
Connected Vehicle Roadside Equipment	Traffic Management Center	reduced speed warning status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	reduced speed warning info
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	reduced speed warning info
Traffic Management Center	Connected Vehicle Roadside Equipment	reduced speed warning info

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Exception-based reporting	Develop an internationally acceptable ITS application specification for managing exception-based reports from other local field devices.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	vehicle signage local data
Parking Management System	Connected Vehicle Roadside Equipment	vehicle signage local data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Highway advisory radio	Develop an internationally acceptable ITS application specification for managing highway advisory radios for secure communications with proper access control.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	roadway advisory radio status
Maint and Constr Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	roadway advisory radio data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Intersection infringement	Develop an internationally acceptable ITS application specification that defines the rules for providing intersection infringment information within a local environment.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection infringement info

| Solution Name: | | (None-Data) - OMG DDS RPC | | | | Number of Issues: | 4 | Total Issue Severity: | 41 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Weather information	Develop an internationally acceptable ITS application specification for directing an RSE to provide weather information to vehicles.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Transportation Information Center	road weather advisory status
Transportation Information Center	Connected Vehicle Roadside Equipment	road weather advisory info

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Secure installation/update of software	Develop an internationally acceptable standard for the secure installation, update, and validation of software (including application, support, and OS software) on devices. The process should allow a system to determine which devices have been updated and provide a mechanism to define when such updates are allowed, recommended, and required.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE application install/upgrade
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE application install/upgrade

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Data aggregation	Develop an internationally acceptable ITS application specification for an RSE to aggregate collected data and report the information to interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	environmental situation data
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	environmental situation data
Data Distribution System	Connected Vehicle Roadside Equipment	situation data collection parameters
Traffic Management Center	Connected Vehicle Roadside Equipment	situation data collection parameters

| Solution Name: | (None-Data) - OMG DDS RPC | | | | Number of Issues: | 4 | Total Issue Severity: | 41 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Application management	Develop an internationally acceptable ITS application specification for generically managing applications (e.g., enabling, monitoring, etc.) within an RSE.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Connected Vehicle Roadside Equipment	RSE application information
Center	Connected Vehicle Roadside Equipment	RSE control commands
Connected Vehicle Roadside Equipment	Center	RSE application status
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE configuration settings
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE control commands
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	vehicle signage application status
Connected Vehicle Roadside Equipment	Traffic Management Center	intersection management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	intersection safety application status
Connected Vehicle Roadside Equipment	Traffic Management Center	queue warning application status
Connected Vehicle Roadside Equipment	Traffic Management Center	speed management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic monitoring application status
Connected Vehicle Roadside Equipment	Traffic Management Center	vehicle signage application status
Connected Vehicle Roadside Equipment	Traffic Management Center	work zone application status
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE configuration settings
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE control commands
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	vehicle signage application info
Traffic Management Center	Connected Vehicle Roadside Equipment	intersection management application info
Traffic Management Center	Connected Vehicle Roadside Equipment	intersection safety application info
Traffic Management Center	Connected Vehicle Roadside Equipment	queue warning application information
Traffic Management Center	Connected Vehicle Roadside Equipment	speed management application information
Traffic Management Center	Connected Vehicle Roadside Equipment	traffic monitoring application info
Traffic Management Center	Connected Vehicle Roadside Equipment	vehicle signage application info
Traffic Management Center	Connected Vehicle Roadside Equipment	work zone application info
Tunnel Management System	Connected Vehicle Roadside Equipment	vehicle signage application info

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	map updates
Map Update System	Connected Vehicle Roadside Equipment	parking facility geometry

Solution Name:	(None-Data) - OMG DDS RPC				Number of Issues:	4	Total Issue Severity:	41

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Update central map database	Develop an internationally acceptable ITS application specification that defines the rules for updating a central map database, including roadway and intersection geometry, based on real-world data readings from vehicles and transmitted to a map update system.	Medium-term	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Map Update System	vehicle location data for mapping

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	I-F: Data aggregation	Develop an internationally acceptable ITS application specification for an RSE to aggregate collected data and report the information to interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	environmental situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	environmental situation data

Solution Name:	(None-Data) - OMG DDS RPC				Number of Issues:	4	Total Issue Severity:	41

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Center	Connected Vehicle Roadside Equipment	RSE application information
Center	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Center	Connected Vehicle Roadside Equipment	RSE control commands
Commercial Vehicle Administration Center	Connected Vehicle Roadside Equipment	trigger area notification
Commercial Vehicle Administration Center	Connected Vehicle Roadside Equipment	trigger control
Connected Vehicle Roadside Equipment	Archived Data Center	local situation data
Connected Vehicle Roadside Equipment	Center	device identification
Connected Vehicle Roadside Equipment	Center	protected location and address flow
Connected Vehicle Roadside Equipment	Center	RSE application status
Connected Vehicle Roadside Equipment	Commercial Vehicle Administration Center	on-board safety data
Connected Vehicle Roadside Equipment	Commercial Vehicle Administration Center	roadside data message
Connected Vehicle Roadside Equipment	Data Distribution System	local situation data
Connected Vehicle Roadside Equipment	Electric Charging Station	vehicle charging profile
Connected Vehicle Roadside Equipment	Emergency Management Center	work zone safety application status
Connected Vehicle Roadside Equipment	Emissions Management Center	low emissions zone application status
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE application install/upgrade
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE configuration settings
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE control commands
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	environmental situation data
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection infringement info
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	restricted lanes application status
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	vehicle entries and exits
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	vehicle occupancy
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	work zone warning notification
Connected Vehicle Roadside Equipment	ITS Roadway Payment Equipment	vehicle entries and exits
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	reduced speed warning status
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	vehicle signage application status
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	work zone safety application status
Connected Vehicle Roadside Equipment	Map Update System	vehicle location data for mapping

Connected Vehicle Roadside Equipment	Other Connected Vehicle Roadside Equipment	wrong way vehicle detected
Connected Vehicle Roadside Equipment	Parking Management System	connected vehicle parking data
Connected Vehicle Roadside Equipment	Payment Administration Center	access violation notification
Connected Vehicle Roadside Equipment	Payment Administration Center	road use history
Connected Vehicle Roadside Equipment	Payment Administration Center	toll collection application status
Connected Vehicle Roadside Equipment	Payment Administration Center	vehicle payment information
Connected Vehicle Roadside Equipment	Traffic Management Center	automated lane status
Connected Vehicle Roadside Equipment	Traffic Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	infrastructure restriction warning status
Connected Vehicle Roadside Equipment	Traffic Management Center	intersection management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	intersection safety application status
Connected Vehicle Roadside Equipment	Traffic Management Center	lighting management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	local border wait times
Connected Vehicle Roadside Equipment	Traffic Management Center	queue warning application status
Connected Vehicle Roadside Equipment	Traffic Management Center	rail crossing application status
Connected Vehicle Roadside Equipment	Traffic Management Center	reduced speed warning status
Connected Vehicle Roadside Equipment	Traffic Management Center	restricted lanes application status
Connected Vehicle Roadside Equipment	Traffic Management Center	speed management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	stop sign gap assist RSE status
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic metering application status
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic monitoring application status
Connected Vehicle Roadside Equipment	Traffic Management Center	vehicle signage application status
Connected Vehicle Roadside Equipment	Traffic Management Center	work zone application status
Connected Vehicle Roadside Equipment	Transit Management Center	transit user guidance application status
Connected Vehicle Roadside Equipment	Transportation Information Center	electric charging station information
Connected Vehicle Roadside Equipment	Transportation Information Center	environmental situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	local situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	road weather advisory status
Connected Vehicle Roadside Equipment	Transportation Information Center	traveler information application status
Data Distribution System	Connected Vehicle Roadside Equipment	local traveler information distribution data
Data Distribution System	Connected Vehicle Roadside Equipment	situation data collection parameters
DMV	ITS Roadway Equipment	registration
Electric Charging Station	Connected Vehicle Roadside Equipment	current charging status
Emergency Management Center	Connected Vehicle Roadside Equipment	emergency acknowledge
Emergency Management Center	Connected Vehicle Roadside Equipment	work zone safety application info
Emissions Management Center	Connected Vehicle Roadside Equipment	low emissions zone application info

Solution Name:	(None-Data) - OMG DDS RPC		Number of Issues:	4	Total Issue Severity:	41

Emissions Management Center	Connected Vehicle Roadside Equipment	vehicle emissions monitoring parameters
Emissions Management Center	ITS Roadway Equipment	emissions sensor control
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE configuration settings
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE control commands
Field Support Equipment	ITS Roadway Equipment	field equipment software install/upgrade
ITS Roadway Equipment	Center	device identification
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	infrastructure restriction warning
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	reduced speed warning info
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	traffic gap information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	vehicle entries and exits
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	vehicle signage local data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	work zone warning notification
ITS Roadway Equipment	Emissions Management Center	vehicle emissions data
ITS Roadway Equipment	Maint and Constr Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	infrastructure restriction warning status
ITS Roadway Equipment	Traffic Management Center	lane management information
ITS Roadway Equipment	Traffic Management Center	lane violation notification
ITS Roadway Equipment	Traffic Management Center	rail crossing blockage notification
ITS Roadway Equipment	Traffic Management Center	rail crossing status
ITS Roadway Equipment	Traffic Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	stop sign gap assist status
ITS Roadway Payment Equipment	Connected Vehicle Roadside Equipment	payment instructions
ITS Roadway Payment Equipment	Connected Vehicle Roadside Equipment	vehicle entries and exits
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	reduced speed warning info
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	vehicle signage application info
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	work zone safety application info
Maint and Constr Management Center	ITS Roadway Equipment	roadway advisory radio data
Map Update System	Connected Vehicle Roadside Equipment	map updates
Map Update System	Connected Vehicle Roadside Equipment	parking facility geometry
Other Connected Vehicle Roadside Equipment	Connected Vehicle Roadside Equipment	wrong way vehicle detected
Other Parking Management Systems	Parking Management System	parking coordination
Parking Management System	Connected Vehicle Roadside Equipment	parking management application info
Parking Management System	Connected Vehicle Roadside Equipment	vehicle signage local data
Parking Management System	Other Parking Management Systems	parking coordination
Payment Administration Center	Connected Vehicle Roadside Equipment	road use charges

Solution Name:	(None-Data) - OMG DDS RPC		Number of Issues:	4	Total Issue Severity:	41

Payment Administration Center	Connected Vehicle Roadside Equipment	toll collection application info
Payment Administration Center	Connected Vehicle Roadside Equipment	vehicle payment request
Payment Administration Center	ITS Roadway Payment Equipment	payment instructions
Traffic Management Center	Connected Vehicle Roadside Equipment	automated lane control data
Traffic Management Center	Connected Vehicle Roadside Equipment	infrastructure restriction warning info
Traffic Management Center	Connected Vehicle Roadside Equipment	intersection management application info
Traffic Management Center	Connected Vehicle Roadside Equipment	intersection safety application info
Traffic Management Center	Connected Vehicle Roadside Equipment	lighting management application info
Traffic Management Center	Connected Vehicle Roadside Equipment	queue warning application information
Traffic Management Center	Connected Vehicle Roadside Equipment	rail crossing application info
Traffic Management Center	Connected Vehicle Roadside Equipment	reduced speed warning info
Traffic Management Center	Connected Vehicle Roadside Equipment	restricted lanes application info
Traffic Management Center	Connected Vehicle Roadside Equipment	situation data collection parameters
Traffic Management Center	Connected Vehicle Roadside Equipment	speed management application information
Traffic Management Center	Connected Vehicle Roadside Equipment	stop sign gap assist info
Traffic Management Center	Connected Vehicle Roadside Equipment	traffic metering application info
Traffic Management Center	Connected Vehicle Roadside Equipment	traffic monitoring application info
Traffic Management Center	Connected Vehicle Roadside Equipment	vehicle signage application info
Traffic Management Center	Connected Vehicle Roadside Equipment	work zone application info
Traffic Management Center	ITS Roadway Equipment	infrastructure restriction warning control
Traffic Management Center	ITS Roadway Equipment	rail crossing control data
Traffic Management Center	ITS Roadway Equipment	rail crossing request
Traffic Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	stop sign gap assist control
Transit Management Center	Connected Vehicle Roadside Equipment	transit user guidance application info
Transportation Information Center	Connected Vehicle Roadside Equipment	electric charging services inventory
Transportation Information Center	Connected Vehicle Roadside Equipment	road weather advisory info
Transportation Information Center	Connected Vehicle Roadside Equipment	traveler information application info
Tunnel Management System	Connected Vehicle Roadside Equipment	vehicle signage application info

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Identifier registry does not exist	The standard defines a field which requires a globally unique identifier, but no registration authority exists to assign these values.	Medium	Identifier registry	Implement a centralised identifier registry network that ensures the assignment of globally unique C-ITS identifiers.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Center	device identification
ITS Roadway Equipment	Center	device identification

Solution Name:	(None-Data) - SNMPv1					Number of Issues:	3	Total Issue Severity:	43

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-F: SNMPv1. The (None-Data) standards include an unspecified set of standards at the upper layers. The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
DMV	ITS Roadway Equipment	registration
Emissions Management Center	ITS Roadway Equipment	emissions sensor control
ITS Roadway Equipment	Center	device identification
ITS Roadway Equipment	Emissions Management Center	vehicle emissions data
ITS Roadway Equipment	Maint and Constr Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	infrastructure restriction warning status
ITS Roadway Equipment	Traffic Management Center	lane management information
ITS Roadway Equipment	Traffic Management Center	lane violation notification
ITS Roadway Equipment	Traffic Management Center	rail crossing blockage notification
ITS Roadway Equipment	Traffic Management Center	rail crossing status
ITS Roadway Equipment	Traffic Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	stop sign gap assist status
Maint and Constr Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	infrastructure restriction warning control
Traffic Management Center	ITS Roadway Equipment	rail crossing control data
Traffic Management Center	ITS Roadway Equipment	rail crossing request
Traffic Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	stop sign gap assist control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - base services	Develop an internationally acceptable standard for the user permission sets, permission request, permission update request, permission request received, and device identification information triples contained within the Core Authorization Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Center	device identification

Solution Name:	(None-Data) - SNMPv1					Number of Issues:	3	Total Issue Severity:	43

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Highway advisory radio	Develop an internationally acceptable ITS application specification for managing highway advisory radios for secure communications with proper access control.		Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	roadway advisory radio status
Maint and Constr Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	roadway advisory radio data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Identifier registry does not exist	The standard defines a field which requires a globally unique identifier, but no registration authority exists to assign these values.	Medium	Identifier registry	Implement a centralised identifier registry network that ensures the assignment of globally unique C-ITS identifiers.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Center	device identification

Solution Name:	(None-Data) - SNMPv1/TLS					Number of Issues:	4	Total Issue Severity:	41

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-F: SNMPv1/TLS. The (None-Data) standards include an unspecified set of standards at the upper layers. The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
DMV	ITS Roadway Equipment	registration
Emissions Management Center	ITS Roadway Equipment	emissions sensor control
ITS Roadway Equipment	Center	device identification
ITS Roadway Equipment	Emissions Management Center	vehicle emissions data
ITS Roadway Equipment	Maint and Constr Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	infrastructure restriction warning status
ITS Roadway Equipment	Traffic Management Center	lane management information
ITS Roadway Equipment	Traffic Management Center	lane violation notification
ITS Roadway Equipment	Traffic Management Center	rail crossing blockage notification
ITS Roadway Equipment	Traffic Management Center	rail crossing status
ITS Roadway Equipment	Traffic Management Center	roadway advisory radio status

Solution Name:	(None-Data) - SNMPv1/TLS		Number of Issues:	4	Total Issue Severity:	41

ITS Roadway Equipment	Traffic Management Center	stop sign gap assist status
Maint and Constr Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	infrastructure restriction warning control
Traffic Management Center	ITS Roadway Equipment	rail crossing control data
Traffic Management Center	ITS Roadway Equipment	rail crossing request
Traffic Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	stop sign gap assist control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - base services	Develop an internationally acceptable standard for the user permission sets, permission request, permission update request, permission request received, and device identification information triples contained within the Core Authorization Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Center	device identification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Highway advisory radio	Develop an internationally acceptable ITS application specification for managing highway advisory radios for secure communications with proper access control.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	roadway advisory radio status
Maint and Constr Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	roadway advisory radio data

Solution Name:	(None-Data) - SNMPv1/TLS				Number of Issues:	4	Total Issue Severity:	41

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
DMV	ITS Roadway Equipment	registration
Emissions Management Center	ITS Roadway Equipment	emissions sensor control
ITS Roadway Equipment	Center	device identification
ITS Roadway Equipment	Emissions Management Center	vehicle emissions data
ITS Roadway Equipment	Maint and Constr Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	infrastructure restriction warning status
ITS Roadway Equipment	Traffic Management Center	lane management information
ITS Roadway Equipment	Traffic Management Center	lane violation notification
ITS Roadway Equipment	Traffic Management Center	rail crossing blockage notification
ITS Roadway Equipment	Traffic Management Center	rail crossing status
ITS Roadway Equipment	Traffic Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	stop sign gap assist status
Maint and Constr Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	infrastructure restriction warning control
Traffic Management Center	ITS Roadway Equipment	rail crossing control data
Traffic Management Center	ITS Roadway Equipment	rail crossing request
Traffic Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	stop sign gap assist control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Identifier registry does not exist	The standard defines a field which requires a globally unique identifier, but no registration authority exists to assign these values.	Medium	Identifier registry	Implement a centralised identifier registry network that ensures the assignment of globally unique C-ITS identifiers.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Center	device identification

Solution Name:	(None-Data) - SNMPv3				Number of Issues:	4	Total Issue Severity:	39

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-F: SNMPv3. The (None-Data) standards include an unspecified set of standards at the upper layers. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Solution Name:		(None-Data) - SNMPv3			Number of Issues:	4	Total Issue Severity:	39

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: System monitoring	Develop an internationally acceptable ITS application specification for the Service Monitor System to monitor other centers and support systems and to report issues.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Service Monitor System	system monitoring

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Core authorization - base services	Develop an internationally acceptable standard for the user permission sets, permission request, permission update request, permission request received, and device identification information triples contained within the Core Authorization Service Package.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Center	device identification
ITS Roadway Equipment	Center	device identification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Wrong way vehicle detected	Develop an internationally acceptable ITS application specification for providing distributing wrong way vehicle alerts in real-time.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Other Connected Vehicle Roadside Equipment	wrong way vehicle detected
Other Connected Vehicle Roadside Equipment	Connected Vehicle Roadside Equipment	wrong way vehicle detected

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Speed warning	Develop an internationally acceptable ITS application specification for providing roadway configuration data, current speed limits , warning parameters and thresholds to a speed warning application.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	reduced speed warning status
Connected Vehicle Roadside Equipment	Traffic Management Center	reduced speed warning status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	reduced speed warning info
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	reduced speed warning info
Traffic Management Center	Connected Vehicle Roadside Equipment	reduced speed warning info

| Solution Name: | (None-Data) - SNMPv3 | | | | Number of Issues: | 4 | Total Issue Severity: | 39 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Highway advisory radio	Develop an internationally acceptable ITS application specification for managing highway advisory radios for secure communications with proper access control.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	roadway advisory radio status
Maint and Constr Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	roadway advisory radio data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Exception-based reporting	Develop an internationally acceptable ITS application specification for managing exception-based reports from other local field devices.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	vehicle signage local data
Parking Management System	Connected Vehicle Roadside Equipment	vehicle signage local data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Private location and address	Develop an internationally acceptable ITS application specification that defines the operation of a Privacy Protection Gateway.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Center	protected location and address flow

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Intersection infringement	Develop an internationally acceptable ITS application specification that defines the rules for providing intersection infringment information within a local environment.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection infringement info

| Solution Name: | (None-Data) - SNMPv3 | | | | Number of Issues: | 4 | Total Issue Severity: | 39 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Weather information	Develop an internationally acceptable ITS application specification for directing an RSE to provide weather information to vehicles.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Transportation Information Center	road weather advisory status
Transportation Information Center	Connected Vehicle Roadside Equipment	road weather advisory info

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Secure installation/update of software	Develop an internationally acceptable standard for the secure installation, update, and validation of software (including application, support, and OS software) on devices. The process should allow a system to determine which devices have been updated and provide a mechanism to define when such updates are allowed, recommended, and required.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE application install/upgrade
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE application install/upgrade

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Data aggregation	Develop an internationally acceptable ITS application specification for an RSE to aggregate collected data and report the information to interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	environmental situation data
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	environmental situation data
Data Distribution System	Connected Vehicle Roadside Equipment	situation data collection parameters
Traffic Management Center	Connected Vehicle Roadside Equipment	situation data collection parameters

Solution Name:	(None-Data) - SNMPv3				Number of Issues:	4	Total Issue Severity:	39

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Application management	Develop an internationally acceptable ITS application specification for generically managing applications (e.g., enabling, monitoring, etc.) within an RSE.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Connected Vehicle Roadside Equipment	RSE application information
Center	Connected Vehicle Roadside Equipment	RSE control commands
Connected Vehicle Roadside Equipment	Center	RSE application status
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE configuration settings
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE control commands
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	vehicle signage application status
Connected Vehicle Roadside Equipment	Traffic Management Center	intersection management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	intersection safety application status
Connected Vehicle Roadside Equipment	Traffic Management Center	queue warning application status
Connected Vehicle Roadside Equipment	Traffic Management Center	speed management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic monitoring application status
Connected Vehicle Roadside Equipment	Traffic Management Center	vehicle signage application status
Connected Vehicle Roadside Equipment	Traffic Management Center	work zone application status
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE configuration settings
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE control commands
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	vehicle signage application info
Traffic Management Center	Connected Vehicle Roadside Equipment	intersection management application info
Traffic Management Center	Connected Vehicle Roadside Equipment	intersection safety application info
Traffic Management Center	Connected Vehicle Roadside Equipment	queue warning application information
Traffic Management Center	Connected Vehicle Roadside Equipment	speed management application information
Traffic Management Center	Connected Vehicle Roadside Equipment	traffic monitoring application info
Traffic Management Center	Connected Vehicle Roadside Equipment	vehicle signage application info
Traffic Management Center	Connected Vehicle Roadside Equipment	work zone application info
Tunnel Management System	Connected Vehicle Roadside Equipment	vehicle signage application info

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	map updates
Map Update System	Connected Vehicle Roadside Equipment	parking facility geometry

Solution Name:	(None-Data) - SNMPv3			Number of Issues:	4	Total Issue Severity:	39

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Update central map database	Develop an internationally acceptable ITS application specification that defines the rules for updating a central map database, including roadway and intersection geometry, based on real-world data readings from vehicles and transmitted to a map update system.	Medium-term	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Map Update System	vehicle location data for mapping

Solution Name:	(None-Data) - SNMPv3			Number of Issues:	4	Total Issue Severity:	39

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Connected Vehicle Roadside Equipment	RSE application information
Center	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Center	Connected Vehicle Roadside Equipment	RSE control commands
Center	Service Monitor System	system monitoring
Commercial Vehicle Administration Center	Connected Vehicle Roadside Equipment	trigger area notification
Commercial Vehicle Administration Center	Connected Vehicle Roadside Equipment	trigger control
Connected Vehicle Roadside Equipment	Archived Data Center	local situation data
Connected Vehicle Roadside Equipment	Center	device identification
Connected Vehicle Roadside Equipment	Center	protected location and address flow
Connected Vehicle Roadside Equipment	Center	RSE application status
Connected Vehicle Roadside Equipment	Commercial Vehicle Administration Center	on-board safety data
Connected Vehicle Roadside Equipment	Commercial Vehicle Administration Center	roadside data message
Connected Vehicle Roadside Equipment	Data Distribution System	local situation data
Connected Vehicle Roadside Equipment	Electric Charging Station	vehicle charging profile
Connected Vehicle Roadside Equipment	Emergency Management Center	work zone safety application status
Connected Vehicle Roadside Equipment	Emissions Management Center	low emissions zone application status
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE application install/upgrade
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE configuration settings
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE control commands
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	environmental situation data
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection infringement info
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	restricted lanes application status
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	vehicle entries and exits
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	vehicle occupancy
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	work zone warning notification
Connected Vehicle Roadside Equipment	ITS Roadway Payment Equipment	vehicle entries and exits
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	reduced speed warning status
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	vehicle signage application status
Connected Vehicle Roadside Equipment	Maint and Constr Management Center	work zone safety application status

Connected Vehicle Roadside Equipment	Map Update System	vehicle location data for mapping
Connected Vehicle Roadside Equipment	Other Connected Vehicle Roadside Equipment	wrong way vehicle detected
Connected Vehicle Roadside Equipment	Parking Management System	connected vehicle parking data
Connected Vehicle Roadside Equipment	Payment Administration Center	access violation notification
Connected Vehicle Roadside Equipment	Payment Administration Center	road use history
Connected Vehicle Roadside Equipment	Payment Administration Center	toll collection application status
Connected Vehicle Roadside Equipment	Payment Administration Center	vehicle payment information
Connected Vehicle Roadside Equipment	Traffic Management Center	automated lane status
Connected Vehicle Roadside Equipment	Traffic Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	infrastructure restriction warning status
Connected Vehicle Roadside Equipment	Traffic Management Center	intersection management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	intersection safety application status
Connected Vehicle Roadside Equipment	Traffic Management Center	lighting management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	local border wait times
Connected Vehicle Roadside Equipment	Traffic Management Center	queue warning application status
Connected Vehicle Roadside Equipment	Traffic Management Center	rail crossing application status
Connected Vehicle Roadside Equipment	Traffic Management Center	reduced speed warning status
Connected Vehicle Roadside Equipment	Traffic Management Center	restricted lanes application status
Connected Vehicle Roadside Equipment	Traffic Management Center	speed management application status
Connected Vehicle Roadside Equipment	Traffic Management Center	stop sign gap assist RSE status
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic metering application status
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic monitoring application status
Connected Vehicle Roadside Equipment	Traffic Management Center	vehicle signage application status
Connected Vehicle Roadside Equipment	Traffic Management Center	work zone application status
Connected Vehicle Roadside Equipment	Transit Management Center	transit user guidance application status
Connected Vehicle Roadside Equipment	Transportation Information Center	electric charging station information
Connected Vehicle Roadside Equipment	Transportation Information Center	environmental situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	local situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	road weather advisory status
Connected Vehicle Roadside Equipment	Transportation Information Center	traveler information application status
Data Distribution System	Connected Vehicle Roadside Equipment	local traveler information distribution data
Data Distribution System	Connected Vehicle Roadside Equipment	situation data collection parameters
DMV	ITS Roadway Equipment	registration
Electric Charging Station	Connected Vehicle Roadside Equipment	current charging status
Emergency Management Center	Connected Vehicle Roadside Equipment	emergency acknowledge
Emergency Management Center	Connected Vehicle Roadside Equipment	work zone safety application info

Solution Name:	(None-Data) - SNMPv3		Number of Issues:	4	Total Issue Severity:	39

Emissions Management Center	Connected Vehicle Roadside Equipment	low emissions zone application info
Emissions Management Center	Connected Vehicle Roadside Equipment	vehicle emissions monitoring parameters
Emissions Management Center	ITS Roadway Equipment	emissions sensor control
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE application install/upgrade
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE configuration settings
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE control commands
Field Support Equipment	ITS Roadway Equipment	field equipment software install/upgrade
ITS Roadway Equipment	Center	device identification
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	infrastructure restriction warning
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	reduced speed warning info
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	traffic gap information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	vehicle entries and exits
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	vehicle signage local data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	work zone warning notification
ITS Roadway Equipment	Emissions Management Center	vehicle emissions data
ITS Roadway Equipment	Maint and Constr Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	infrastructure restriction warning status
ITS Roadway Equipment	Traffic Management Center	lane management information
ITS Roadway Equipment	Traffic Management Center	lane violation notification
ITS Roadway Equipment	Traffic Management Center	rail crossing blockage notification
ITS Roadway Equipment	Traffic Management Center	rail crossing status
ITS Roadway Equipment	Traffic Management Center	roadway advisory radio status
ITS Roadway Equipment	Traffic Management Center	stop sign gap assist status
ITS Roadway Payment Equipment	Connected Vehicle Roadside Equipment	payment instructions
ITS Roadway Payment Equipment	Connected Vehicle Roadside Equipment	vehicle entries and exits
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	reduced speed warning info
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	vehicle signage application info
Maint and Constr Management Center	Connected Vehicle Roadside Equipment	work zone safety application info
Maint and Constr Management Center	ITS Roadway Equipment	roadway advisory radio data
Map Update System	Connected Vehicle Roadside Equipment	map updates
Map Update System	Connected Vehicle Roadside Equipment	parking facility geometry
Other Connected Vehicle Roadside Equipment	Connected Vehicle Roadside Equipment	wrong way vehicle detected
Other Parking Management Systems	Parking Management System	parking coordination
Parking Management System	Connected Vehicle Roadside Equipment	parking management application info
Parking Management System	Connected Vehicle Roadside Equipment	vehicle signage local data
Parking Management System	Other Parking Management Systems	parking coordination

Solution Name:	(None-Data) - SNMPv3	Number of Issues:	4	Total Issue Severity:	39

Payment Administration Center	Connected Vehicle Roadside Equipment	road use charges
Payment Administration Center	Connected Vehicle Roadside Equipment	toll collection application info
Payment Administration Center	Connected Vehicle Roadside Equipment	vehicle payment request
Payment Administration Center	ITS Roadway Payment Equipment	payment instructions
Traffic Management Center	Connected Vehicle Roadside Equipment	automated lane control data
Traffic Management Center	Connected Vehicle Roadside Equipment	infrastructure restriction warning info
Traffic Management Center	Connected Vehicle Roadside Equipment	intersection management application info
Traffic Management Center	Connected Vehicle Roadside Equipment	intersection safety application info
Traffic Management Center	Connected Vehicle Roadside Equipment	lighting management application info
Traffic Management Center	Connected Vehicle Roadside Equipment	queue warning application information
Traffic Management Center	Connected Vehicle Roadside Equipment	rail crossing application info
Traffic Management Center	Connected Vehicle Roadside Equipment	reduced speed warning info
Traffic Management Center	Connected Vehicle Roadside Equipment	restricted lanes application info
Traffic Management Center	Connected Vehicle Roadside Equipment	situation data collection parameters
Traffic Management Center	Connected Vehicle Roadside Equipment	speed management application information
Traffic Management Center	Connected Vehicle Roadside Equipment	stop sign gap assist info
Traffic Management Center	Connected Vehicle Roadside Equipment	traffic metering application info
Traffic Management Center	Connected Vehicle Roadside Equipment	traffic monitoring application info
Traffic Management Center	Connected Vehicle Roadside Equipment	vehicle signage application info
Traffic Management Center	Connected Vehicle Roadside Equipment	work zone application info
Traffic Management Center	ITS Roadway Equipment	infrastructure restriction warning control
Traffic Management Center	ITS Roadway Equipment	rail crossing control data
Traffic Management Center	ITS Roadway Equipment	rail crossing request
Traffic Management Center	ITS Roadway Equipment	roadway advisory radio data
Traffic Management Center	ITS Roadway Equipment	stop sign gap assist control
Transit Management Center	Connected Vehicle Roadside Equipment	transit user guidance application info
Transportation Information Center	Connected Vehicle Roadside Equipment	electric charging services inventory
Transportation Information Center	Connected Vehicle Roadside Equipment	road weather advisory info
Transportation Information Center	Connected Vehicle Roadside Equipment	traveler information application info
Tunnel Management System	Connected Vehicle Roadside Equipment	vehicle signage application info

Solution Name:	(None-Data) - SNMPv3				Number of Issues:	4	Total Issue Severity:	39

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	I-F: Data aggregation	Develop an internationally acceptable ITS application specification for an RSE to aggregate collected data and report the information to interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	environmental situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	environmental situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	environmental situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Identifier registry does not exist	The standard defines a field which requires a globally unique identifier, but no registration authority exists to assign these values.	Medium	Identifier registry	Implement a centralised identifier registry network that ensures the assignment of globally unique C-ITS identifiers.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Center	device identification
ITS Roadway Equipment	Center	device identification

Solution Name:	(None-Data) - WAVE WSMP				Number of Issues:	2	Total Issue Severity:	35

This solution is used within the U.S.. It combines standards associated with (None-Data) with those for V-X: WAVE WSMP. The (None-Data) standards include an unspecified set of standards at the upper layers. The V-X: WAVE WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications within ~300m using the WAVE Short Messaging Protocol (WSMP) over the 5.9GHz spectrum. The broadcast mode is interoperable with M5 FNTP.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Wrong way vehicle detected	Develop an internationally acceptable ITS application specification for providing distributing wrong way vehicle alerts in real-time.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	wrong way vehicle detected
Vehicle OBE	Connected Vehicle Roadside Equipment	wrong way vehicle detected

| Solution Name: | (None-Data) - WAVE WSMP | | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	traffic gap information
Connected Vehicle Roadside Equipment	Vehicle OBE	wrong way vehicle detected
Other Vehicle OBEs	Vehicle OBE	vehicle platoon coordination
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle platoon coordination
Vehicle OBE	Connected Vehicle Roadside Equipment	wrong way vehicle detected
Vehicle OBE	Other Vehicle OBEs	vehicle platoon coordination

| Solution Name: | (None-Data) - Wide Area Broadcast (Upper) | | | | | Number of Issues: | 2 | Total Issue Severity: | 33 |

This solution is used within the U.S., E.U., and Australia. It combines standards associated with (None-Data) with those for C-X: Wide Area Broadcast (Upper). The (None-Data) standards include an unspecified set of standards at the upper layers. The C-X: Wide Area Broadcast (Upper) standards include lower-layer standards that support one entity broadcasting information to all wireless devices over an area that covers at least a metropolitan area without any expectation of acknowledgement or response; security is provided by the upper-layers.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Ubiquitous broadcast technology	With the continual enhancement of broadcast technologies and a mixture of free and subscriber-based systems, it is difficult to identify any single technology that can be used to reliably reach the bulk of drivers in a timely manner.	Low	C-V: Wide-area broadcast subnet and hybrid communications	Standardise one or more mechanisms by which wide-area broadcast messages can be received by a defined minimum percentage of transportation users that are currently operating within a specified geographic area. The required minimum percentage is dependent on the type of information being transmitted and will need to be determined by the expert community. Some alerts (e.g., tornado warnings) will require near 100% reception, while other messages (e.g., road works ahead) may require significantly lower minimum percentages. The minimum percentage may be made up with a variety of technologies using hybrid communications and the ITS station architecture.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	emergency traveler information
Transportation Information Center	Vehicle OBE	emergency traveler information
Wide Area Information Disseminator	Personal Information Device	traffic-related regulations
Wide Area Information Disseminator	Vehicle OBE	traffic-related regulations

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	Develop standard for electronic distribution of traffic regulations	Develop an internationally acceptable standard to enable the provision and management of electronic traffic regulations to enable proper operation of road users as they cross jurisdictional boundaries.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Wide Area Information Disseminator	Personal Information Device	traffic-related regulations
Wide Area Information Disseminator	Vehicle OBE	traffic-related regulations

| Solution Name: | [Null] - Local Broadcast Wireless (US) | | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

| Solution Name: | [Null] - Local Broadcast Wireless (US) | | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with [Null] with those for V-X: Local Broadcast Wireless (US). The [Null] standards include no standards in the upper layers (i.e., this occurs where the information flow is handled by the lower layers and the communication profile contains all of the standards required to handle the flow). The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	service advertisement

| Solution Name: | DDS: ATIS - OMG DDS | | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

This solution is used within the U.S. It combines standards associated with US: ATIS with those for C-C: OMG DDS. The US: ATIS standards include upper-layer standards required to implement traveler information communications. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Fleet and Freight Management Center	Transportation Information Center	route request
Other Transportation Information Centers	Transportation Information Center	multimodal information
Other Transportation Information Centers	Transportation Information Center	parking information
Parking Management System	Traffic Management Center	parking information
Parking Management System	Transit Management Center	parking information
Parking Management System	Transportation Information Center	parking information
Traffic Management Center	Media	traffic information for media
Transportation Information Center	Fleet and Freight Management Center	route plan
Transportation Information Center	Media	traffic information for media
Transportation Information Center	Media	traveler information for media
Transportation Information Center	Other Transportation Information Centers	multimodal information
Transportation Information Center	Other Transportation Information Centers	parking information
Travel Services Provider System	Transportation Information Center	travel service information

| Solution Name: | DDS: ATIS - OMG DDS | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Fleet and Freight Management Center	Transportation Information Center	route request
Other Transportation Information Centers	Transportation Information Center	multimodal information
Other Transportation Information Centers	Transportation Information Center	parking information
Parking Management System	Traffic Management Center	parking information
Parking Management System	Transit Management Center	parking information
Parking Management System	Transportation Information Center	parking information
Traffic Management Center	Media	traffic information for media
Transportation Information Center	Fleet and Freight Management Center	route plan
Transportation Information Center	Media	traffic information for media
Transportation Information Center	Media	traveler information for media
Transportation Information Center	Other Transportation Information Centers	multimodal information
Transportation Information Center	Other Transportation Information Centers	parking information
Travel Services Provider System	Transportation Information Center	travel service information

| Solution Name: | DDS: Incident Management - OMG DDS | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

This solution is used within the U.S. It combines standards associated with US: Incident Management with those for C-C: OMG DDS. The US: Incident Management standards include upper-layer standards required to implement centre-to-centre communications for incident management data. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Telecommunications System	incident information for public
Emergency Management Center	Maint and Constr Management Center	emergency plan coordination
Emergency Management Center	Maint and Constr Management Center	evacuation information
Emergency Management Center	Other Emergency Management Centers	emergency plan coordination
Emergency Management Center	Other Emergency Management Centers	incident report
Emergency Management Center	Rail Operations Center	emergency plan coordination
Emergency Management Center	Rail Operations Center	evacuation information

Emergency Management Center	Traffic Management Center	emergency plan coordination
Emergency Management Center	Traffic Management Center	emergency route request
Emergency Management Center	Traffic Management Center	evacuation information
Emergency Management Center	Transit Management Center	emergency plan coordination
Emergency Management Center	Transit Management Center	evacuation information
Emergency Management Center	Transportation Information Center	evacuation information
Fleet and Freight Management Center	Emergency Management Center	hazmat information
Maint and Constr Management Center	Emergency Management Center	emergency plan coordination
Other Emergency Management Centers	Emergency Management Center	emergency plan coordination
Other Emergency Management Centers	Emergency Management Center	incident report
Rail Operations Center	Emergency Management Center	emergency plan coordination
Shelter Provider Center	Emergency Management Center	shelter information
Shelter Provider Center	Transportation Information Center	shelter information
Traffic Management Center	Emergency Management Center	emergency plan coordination
Traffic Management Center	Emergency Management Center	emergency routes
Transit Management Center	Emergency Management Center	emergency plan coordination

Solution Name:	DDS: Incident Management - OMG DDS				Number of Issues:	2	Total Issue Severity:	11

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Emergency Management Center	Emergency Telecommunications System	incident information for public
Emergency Management Center	Maint and Constr Management Center	emergency plan coordination
Emergency Management Center	Maint and Constr Management Center	evacuation information
Emergency Management Center	Other Emergency Management Centers	emergency plan coordination
Emergency Management Center	Other Emergency Management Centers	incident report
Emergency Management Center	Rail Operations Center	emergency plan coordination
Emergency Management Center	Rail Operations Center	evacuation information
Emergency Management Center	Traffic Management Center	emergency plan coordination
Emergency Management Center	Traffic Management Center	emergency route request
Emergency Management Center	Traffic Management Center	evacuation information
Emergency Management Center	Transit Management Center	emergency plan coordination
Emergency Management Center	Transit Management Center	evacuation information
Emergency Management Center	Transportation Information Center	evacuation information
Fleet and Freight Management Center	Emergency Management Center	hazmat information
Maint and Constr Management Center	Emergency Management Center	emergency plan coordination
Other Emergency Management Centers	Emergency Management Center	emergency plan coordination
Other Emergency Management Centers	Emergency Management Center	incident report
Rail Operations Center	Emergency Management Center	emergency plan coordination
Shelter Provider Center	Emergency Management Center	shelter information
Shelter Provider Center	Transportation Information Center	shelter information
Traffic Management Center	Emergency Management Center	emergency plan coordination
Traffic Management Center	Emergency Management Center	emergency routes
Transit Management Center	Emergency Management Center	emergency plan coordination

Solution Name:	DDS: NTCIP CCTV - OMG DDS RPC				Number of Issues:	2	Total Issue Severity:	11

This solution is used within the U.S. It combines standards associated with US: NTCIP CCTV with those for I-F: OMG DDS RPC. The US: NTCIP CCTV standards include upper-layer standards required to implement centre-to-field CCTV communications (data only). The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

| Solution Name: | DDS: NTCIP CCTV - OMG DDS RPC | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	traffic images
ITS Roadway Equipment	Traffic Management Center	traffic images
Maint and Constr Management Center	ITS Roadway Equipment	video surveillance control
Traffic Management Center	ITS Roadway Equipment	video surveillance control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	traffic images
ITS Roadway Equipment	Traffic Management Center	traffic images
Maint and Constr Management Center	ITS Roadway Equipment	video surveillance control
Traffic Management Center	ITS Roadway Equipment	video surveillance control

| Solution Name: | DDS: NTCIP Environmental Sensors - OMG DDS RPC | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

This solution is used within the U.S. It combines standards associated with US: NTCIP Environmental Sensors with those for I-F: OMG DDS RPC. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Emissions Management Center	emissions situation data
Emissions Management Center	ITS Roadway Equipment	air quality sensor control
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	environmental sensor data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data

| Solution Name: | DDS: NTCIP Environmental Sensors - OMG DDS RPC | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

Maint and Constr Management Center	ITS Roadway Equipment	environmental sensors control
Traffic Management Center	ITS Roadway Equipment	environmental sensors control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Emissions Management Center	emissions situation data
Emissions Management Center	ITS Roadway Equipment	air quality sensor control
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	environmental sensor data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data
Maint and Constr Management Center	ITS Roadway Equipment	environmental sensors control
Traffic Management Center	ITS Roadway Equipment	environmental sensors control

| Solution Name: | DDS: NTCIP Lighting - OMG DDS RPC | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

This solution is used within the U.S. It combines standards associated with US: NTCIP Lighting with those for I-F: OMG DDS RPC. The US: NTCIP Lighting standards include upper-layer standards required to implement centre-to-field communications with highway lighting systems. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	lighting system status
Traffic Management Center	ITS Roadway Equipment	lighting system control data

| Solution Name: | **DDS: NTCIP Lighting - OMG DDS RPC** | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	lighting system status
Traffic Management Center	ITS Roadway Equipment	lighting system control data

| Solution Name: | **DDS: NTCIP Message Sign - OMG DDS RPC** | | | | Number of Issues: | 3 | Total Issue Severity: | 43 |

This solution is used within the U.S. It combines standards associated with US: NTCIP Message Sign with those for I-F: OMG DDS RPC. The US: NTCIP Message Sign standards include upper-layer standards required to implement centre-to-field message sign communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Message signs	Develop an internationally acceptable ITS application specification for managing message signs for secure communications with proper access control.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
Traffic Management Center	ITS Roadway Equipment	roadway warning system control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Speed warning	Develop an internationally acceptable ITS application specification for providing roadway configuration data, current speed limits , warning parameters and thresholds to a speed warning application.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Solution Name:	DDS: NTCIP Message Sign - OMG DDS RPC				Number of Issues:	3	Total Issue Severity:	43

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	roadway dynamic signage data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	roadway dynamic signage status
ITS Roadway Equipment	Maint and Constr Management Center	roadway dynamic signage status
ITS Roadway Equipment	Other ITS Roadway Equipment	dynamic sign coordination
ITS Roadway Equipment	Traffic Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Maint and Constr Management Center	ITS Roadway Equipment	roadway dynamic signage data
Other ITS Roadway Equipment	ITS Roadway Equipment	dynamic sign coordination
Traffic Management Center	ITS Roadway Equipment	lane management control
Traffic Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	roadway warning system control
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Solution Name:	DDS: NTCIP Message Sign - OMG DDS RPC				Number of Issues:	3	Total Issue Severity:	43

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	roadway dynamic signage data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	roadway dynamic signage status
ITS Roadway Equipment	Maint and Constr Management Center	roadway dynamic signage status
ITS Roadway Equipment	Other ITS Roadway Equipment	dynamic sign coordination
ITS Roadway Equipment	Traffic Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Maint and Constr Management Center	ITS Roadway Equipment	roadway dynamic signage data
Other ITS Roadway Equipment	ITS Roadway Equipment	dynamic sign coordination
Traffic Management Center	ITS Roadway Equipment	lane management control
Traffic Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	roadway warning system control
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Solution Name:	DDS: NTCIP Ramp Meters - OMG DDS RPC				Number of Issues:	2	Total Issue Severity:	11

This solution is used within the U.S. It combines standards associated with US: NTCIP Ramp Meters with those for I-F: OMG DDS RPC. The US: NTCIP Ramp Meters standards include upper-layer standards required to implement centre-to-field ramp meter communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	traffic metering status
Traffic Management Center	ITS Roadway Equipment	traffic metering control

| Solution Name: | DDS: NTCIP Ramp Meters - OMG DDS RPC | | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	traffic metering status
Traffic Management Center	ITS Roadway Equipment	traffic metering control

| Solution Name: | DDS: NTCIP Signal Priority - OMG DDS | | | | | Number of Issues: | 3 | Total Issue Severity: | 43 |

This solution is used within the U.S. It combines standards associated with US: NTCIP Signal Priority with those for C-C: OMG DDS. The US: NTCIP Signal Priority standards include upper-layer standards required to implement centre-to-field traffic signal control priority communications (e.g., for busses and emergency vehicles). The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Transit Management Center	traffic control priority status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Transit Management Center	traffic control priority status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Transit Management Center	traffic control priority status

Solution Name:	DDS: NTCIP Signal Priority - OMG DDS RPC				Number of Issues:	3	Total Issue Severity:	43
Solution Name:	DDS: NTCIP Signal Priority - OMG DDS RPC				Number of Issues:	3	Total Issue Severity:	43

This solution is used within the U.S. It combines standards associated with US: NTCIP Signal Priority with those for I-F: OMG DDS RPC. The US: NTCIP Signal Priority standards include upper-layer standards required to implement centre-to-field traffic signal control priority communications (e.g., for busses and emergency vehicles). The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Signal control	Develop an internationally acceptable ITS application specification for the interface between a traffic signal controller and a roadside station to exchange raw data related to the SPaT, SRM, and SSM using the secure centre-to-field protocol.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal preemption request
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal priority service request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal preemption request
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal priority service request
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal preemption request
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal priority service request
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Solution Name:	DDS: NTCIP Signal System Masters - OMG DDS RPC		Number of Issues:	3	Total Issue Severity:	43
Solution Name:	DDS: NTCIP Signal System Masters - OMG DDS RPC		Number of Issues:	3	Total Issue Severity:	43

This solution is used within the U.S. It combines standards associated with US: NTCIP Signal System Masters with those for I-F: OMG DDS RPC. The US: NTCIP Signal System Masters standards include upper-layer standards required to implement centre-to-field signal-system master communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Solution Name:	DDS: NTCIP Traffic Signal - OMG DDS RPC		Number of Issues:	4	Total Issue Severity:	46

This solution is used within the U.S. It combines standards associated with US: NTCIP Traffic Signal with those for I-F: OMG DDS RPC. The US: NTCIP Traffic Signal standards include upper-layer standards required to implement centre-to-field traffic signal communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

| Solution Name: | DDS: NTCIP Traffic Signal - OMG DDS RPC | | | | Number of Issues: | 4 | Total Issue Severity: | 46 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	signal control plans

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	pedestrian location information
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal service request
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	conflict monitor status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	pedestrian crossing status
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control coordination
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control coordination
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

| Solution Name: | DDS: NTCIP Traffic Signal - OMG DDS RPC | | | | | Number of Issues: | 4 | Total Issue Severity: | 46 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	pedestrian location information
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal service request
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	conflict monitor status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	pedestrian crossing status
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control coordination
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control coordination
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

| Solution Name: | DDS: NTCIP Transportation Sensors - OMG DDS RPC | | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

This solution is used within the U.S. It combines standards associated with US: NTCIP Transportation Sensors with those for I-F: OMG DDS RPC. The US: NTCIP Transportation Sensors standards include upper-layer standards required to implement centre-to-field transportation sensors (e.g., vehicle detectors) communications (e.g., real-time). The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	traffic situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	traffic situation data
ITS Roadway Equipment	Maint and Constr Management Center	speed monitoring information
ITS Roadway Equipment	Maint and Constr Management Center	traffic detector data
ITS Roadway Equipment	Other ITS Roadway Equipment	roadway detector coordination

Solution Name:	DDS: NTCIP Transportation Sensors - OMG DDS RPC		Number of Issues:	2	Total Issue Severity:	11

ITS Roadway Equipment	Traffic Management Center	speed monitoring information
ITS Roadway Equipment	Traffic Management Center	traffic detector data
Maint and Constr Management Center	ITS Roadway Equipment	speed monitoring control
Maint and Constr Management Center	ITS Roadway Equipment	traffic detector control
Other ITS Roadway Equipment	ITS Roadway Equipment	roadway detector coordination
Traffic Management Center	ITS Roadway Equipment	speed monitoring control
Traffic Management Center	ITS Roadway Equipment	traffic detector control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	traffic situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	traffic situation data
ITS Roadway Equipment	Maint and Constr Management Center	speed monitoring information
ITS Roadway Equipment	Maint and Constr Management Center	traffic detector data
ITS Roadway Equipment	Other ITS Roadway Equipment	roadway detector coordination
ITS Roadway Equipment	Traffic Management Center	speed monitoring information
ITS Roadway Equipment	Traffic Management Center	traffic detector data
Maint and Constr Management Center	ITS Roadway Equipment	speed monitoring control
Maint and Constr Management Center	ITS Roadway Equipment	traffic detector control
Other ITS Roadway Equipment	ITS Roadway Equipment	roadway detector coordination
Traffic Management Center	ITS Roadway Equipment	speed monitoring control
Traffic Management Center	ITS Roadway Equipment	traffic detector control

Solution Name:	DDS: NTCIP Warning Device - OMG DDS RPC		Number of Issues:	2	Total Issue Severity:	11

This solution is used within the U.S. It combines standards associated with US: NTCIP Warning Device with those for I-F: OMG DDS RPC. The US: NTCIP Warning Device standards include a composite of upper-layer standards that support monitoring for unsafe traffic activities and displaying warning to drivers. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

| Solution Name: | DDS: NTCIP Warning Device - OMG DDS RPC | | | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution
Source	Destination	Flow Name
Emergency Management Center	ITS Roadway Equipment	work zone warning device control
ITS Roadway Equipment	Emergency Management Center	work zone warning status
ITS Roadway Equipment	Maint and Constr Management Center	work zone warning status
Maint and Constr Management Center	ITS Roadway Equipment	work zone warning device control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution
Source	Destination	Flow Name
Emergency Management Center	ITS Roadway Equipment	work zone warning device control
ITS Roadway Equipment	Emergency Management Center	work zone warning status
ITS Roadway Equipment	Maint and Constr Management Center	work zone warning status
Maint and Constr Management Center	ITS Roadway Equipment	work zone warning device control

| Solution Name: | DDS: SAE J3067 (J2735 SE) - OMG DDS | | | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

This solution is used within the U.S. It combines standards associated with US: SAE J3067 (J2735 SE) with those for C-C: OMG DDS. The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution
Source	Destination	Flow Name
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	driver log
Commercial Vehicle OBE Service Provider	Commercial Vehicle Check Equipment	driver log
Commercial Vehicle OBE Service Provider	Fleet and Freight Management Center	driver log
Commercial Vehicle OBE Service Provider	Other CVOBE Service Provider	driver log
Connected Vehicle Roadside Equipment	Commercial Vehicle Administration Center	driver log
Fleet and Freight Management Center	Commercial Vehicle Administration Center	driver log
Other CVOBE Service Provider	Commercial Vehicle OBE Service Provider	driver log

| Solution Name: | DDS: SAE J3067 (J2735 SE) - OMG DDS | | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	driver log
Commercial Vehicle OBE Service Provider	Commercial Vehicle Check Equipment	driver log
Commercial Vehicle OBE Service Provider	Fleet and Freight Management Center	driver log
Commercial Vehicle OBE Service Provider	Other CVOBE Service Provider	driver log
Connected Vehicle Roadside Equipment	Commercial Vehicle Administration Center	driver log
Fleet and Freight Management Center	Commercial Vehicle Administration Center	driver log
Other CVOBE Service Provider	Commercial Vehicle OBE Service Provider	driver log

| Solution Name: | DDS: SAE J3067 (J2735 SE) - OMG DDS RPC | | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

This solution is used within the U.S. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-F: OMG DDS RPC. The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Parking Management System	commercial vehicle identification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Parking Management System	commercial vehicle identification

| Solution Name: | DDS: SAE Other J2735 - OMG DDS | | | | | Number of Issues: | 4 | Total Issue Severity: | 15 |

This solution is used within the U.S. It combines standards associated with US: SAE Other J2735 with those for I-F: OMG DDS. The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do

| Solution Name: | DDS: SAE Other J2735 - OMG DDS | | | | Number of Issues: | 4 | Total Issue Severity: | 15 |

not yet have fully specified functionality and performance charcateristics. The I-F: OMG DDS standards include lower-layer standards that support secure data distribution services between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry

| Solution Name: | DDS: SAE Signal Control Messages - OMG DDS RPC | | | | Number of Issues: | 3 | Total Issue Severity: | 43 |

This solution is used within the U.S. It combines standards associated with US: SAE Signal Control Messages with those for I-F: OMG DDS RPC. The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Solution Name:	DDS: SAE Signal Control Messages - OMG DDS RPC					Number of Issues:	3	Total Issue Severity:	43

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Develop ITS-wide reference data model	Develop an internationally representative ITS-wide reference data model that will enable better data sharing across disparate enterprise systems with data defined by different entities, working groups, and standards development organisations.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.		Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Solution Name:	DDS: TCIP - OMG DDS					Number of Issues:	4	Total Issue Severity:	44

This solution is used within the U.S. It combines standards associated with US: TCIP with those for C-C: OMG DDS. The US: TCIP standards include upper-layer standards required to implement transit-related communications. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.		Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transit Management Center	Traffic Management Center	traffic control priority request

Solution Name:	DDS: TCIP - OMG DDS					Number of Issues:	4	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Alternate Mode Transportation Center	Transit Management Center	multimodal service data
Alternate Mode Transportation Center	Transit Management Center	service information response
Alternate Mode Transportation Center	Transportation Information Center	multimodal service data
Emergency Management Center	Transit Management Center	emergency transit service request
Other Transit Management Centers	Transit Management Center	transit service coordination
Other Transportation Information Centers	Transportation Information Center	transit service information
Traffic Management Center	Transit Management Center	transit service change request
Traffic Management Center	Transportation Information Center	transit service change request
Transit Management Center	Alternate Mode Transportation Center	service information request
Transit Management Center	Alternate Mode Transportation Center	transit multimodal information
Transit Management Center	Emergency Management Center	emergency transit service response
Transit Management Center	Emissions Management Center	transit and fare schedules
Transit Management Center	Other Transit Management Centers	transit service coordination
Transit Management Center	Parking Management System	transit schedule adherence information
Transit Management Center	Parking Management System	transit schedule information
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Traffic Management Center	transit system data
Transit Management Center	Transportation Information Center	demand responsive transit plan
Transit Management Center	Transportation Information Center	emergency transit schedule information
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit incident information
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transit Management Center	Transportation Information Center	transit trip plan
Transportation Information Center	Alternate Mode Transportation Center	service information request
Transportation Information Center	Other Transportation Information Centers	transit service information
Transportation Information Center	Transit Management Center	demand responsive transit request
Transportation Information Center	Transit Management Center	transit service change request

Solution Name:	DDS: TCIP - OMG DDS				Number of Issues:	4	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Alternate Mode Transportation Center	Transit Management Center	multimodal service data
Alternate Mode Transportation Center	Transit Management Center	service information response
Alternate Mode Transportation Center	Transportation Information Center	multimodal service data
Emergency Management Center	Transit Management Center	emergency transit service request
Other Transit Management Centers	Transit Management Center	transit service coordination
Other Transportation Information Centers	Transportation Information Center	transit service information
Traffic Management Center	Transit Management Center	transit service change request
Traffic Management Center	Transportation Information Center	transit service change request
Transit Management Center	Alternate Mode Transportation Center	service information request
Transit Management Center	Alternate Mode Transportation Center	transit multimodal information
Transit Management Center	Emergency Management Center	emergency transit service response
Transit Management Center	Emissions Management Center	transit and fare schedules
Transit Management Center	Other Transit Management Centers	transit service coordination
Transit Management Center	Parking Management System	transit schedule adherence information
Transit Management Center	Parking Management System	transit schedule information
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Traffic Management Center	transit system data
Transit Management Center	Transportation Information Center	demand responsive transit plan
Transit Management Center	Transportation Information Center	emergency transit schedule information
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit incident information
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transit Management Center	Transportation Information Center	transit trip plan
Transportation Information Center	Alternate Mode Transportation Center	service information request
Transportation Information Center	Other Transportation Information Centers	transit service information
Transportation Information Center	Transit Management Center	demand responsive transit request
Transportation Information Center	Transit Management Center	transit service change request

Solution Name:	DDS: TCIP - OMG DDS				Number of Issues:	4	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Alternate Mode Transportation Center	Transit Management Center	multimodal service data
Alternate Mode Transportation Center	Transit Management Center	service information response
Alternate Mode Transportation Center	Transportation Information Center	multimodal service data
Emergency Management Center	Transit Management Center	emergency transit service request
Other Transit Management Centers	Transit Management Center	transit service coordination
Other Transportation Information Centers	Transportation Information Center	transit service information
Traffic Management Center	Transit Management Center	transit service change request
Traffic Management Center	Transportation Information Center	transit service change request
Transit Management Center	Alternate Mode Transportation Center	service information request
Transit Management Center	Alternate Mode Transportation Center	transit multimodal information
Transit Management Center	Emergency Management Center	emergency transit service response
Transit Management Center	Emissions Management Center	transit and fare schedules
Transit Management Center	Other Transit Management Centers	transit service coordination
Transit Management Center	Parking Management System	transit schedule adherence information
Transit Management Center	Parking Management System	transit schedule information
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Traffic Management Center	transit system data
Transit Management Center	Transportation Information Center	demand responsive transit plan
Transit Management Center	Transportation Information Center	emergency transit schedule information
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit incident information
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transit Management Center	Transportation Information Center	transit trip plan
Transportation Information Center	Alternate Mode Transportation Center	service information request
Transportation Information Center	Other Transportation Information Centers	transit service information
Transportation Information Center	Transit Management Center	demand responsive transit request
Transportation Information Center	Transit Management Center	transit service change request

Solution Name:	DDS: TMDD - OMG DDS				Number of Issues:	3	Total Issue Severity:	43

This solution is used within the U.S. It combines standards associated with US: TMDD with those for C-C: OMG DDS. The US: TMDD standards include upper-layer standards required to implement centre-to-centre communications with traffic management systems. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

| Solution Name: | DDS: TMDD - OMG DDS | | | | | Number of Issues: | 3 | Total Issue Severity: | 43 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: EU emergency traffic control	Update DATEX to support the provision of emergency traffic control information with a complete application specification.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Traffic Management Center	emergency traffic control request
Traffic Management Center	Emergency Management Center	emergency traffic control information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Equipment maintenance coordination	Develop an internationally acceptable ITS application specification for C-C exchange of equipment maintenance and status information	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Maint and Constr Management Center	equipment maintenance request
Maint and Constr Management Center	Center	equipment maintenance status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: AU weather information	Adopt an existing weather information centre-to-centre data profile for use within the region.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Surface Transportation Weather Service	Traffic Management Center	transportation weather information

Solution Name:	DDS: TMDD - OMG DDS				Number of Issues:	3	Total Issue Severity:	43

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Border Inspection System	Traffic Management Center	border wait times data
Border Inspection System	Transportation Information Center	border crossing status information
Center	Archived Data Center	center archive data
Center	Data Distribution System	operational data
Center	Data Distribution System	traveler information distribution data
Center	Maint and Constr Management Center	equipment maintenance request
Commercial Vehicle Administration Center	Fleet and Freight Management Center	route restrictions
Commercial Vehicle Administration Center	Other CV Administration Centers	route restrictions
Commercial Vehicle Administration Center	Transportation Information Center	route restrictions
Data Distribution System	Center	operational data
Data Distribution System	Center	regional situation data
Emergency Management Center	Traffic Management Center	emergency traffic control request
Emergency Management Center	Traffic Management Center	incident information
Emergency Management Center	Transportation Information Center	incident information
Emissions Management Center	Transportation Information Center	air quality information
Fleet and Freight Management Center	Commercial Vehicle Administration Center	route restrictions
Maint and Constr Management Center	Center	equipment maintenance status
Maint and Constr Management Center	Commercial Vehicle Administration Center	current infrastructure restrictions
Maint and Constr Management Center	Emergency Management Center	road weather information
Maint and Constr Management Center	Map Update System	current infrastructure restrictions
Maint and Constr Management Center	Surface Transportation Weather Service	road weather information
Maint and Constr Management Center	Traffic Management Center	current infrastructure restrictions
Maint and Constr Management Center	Traffic Management Center	environmental conditions data
Maint and Constr Management Center	Traffic Management Center	equipment maintenance status
Maint and Constr Management Center	Traffic Management Center	work zone information
Maint and Constr Management Center	Transit Management Center	current infrastructure restrictions
Maint and Constr Management Center	Transportation Information Center	current infrastructure restrictions
Maint and Constr Management Center	Transportation Information Center	environmental conditions data
Maint and Constr Management Center	Transportation Information Center	maint and constr work plans
Maint and Constr Management Center	Transportation Information Center	road weather information

Maint and Constr Management Center	Transportation Information Center	work zone information
Other CV Administration Centers	Commercial Vehicle Administration Center	route restrictions
Other Traffic Management Centers	Traffic Management Center	device control request
Other Traffic Management Centers	Traffic Management Center	device data
Other Traffic Management Centers	Traffic Management Center	device status
Other Traffic Management Centers	Traffic Management Center	incident information
Other Traffic Management Centers	Traffic Management Center	road network conditions
Other Traffic Management Centers	Traffic Management Center	traffic image meta data
Other Traffic Management Centers	Traffic Management Center	traffic images
Other Transportation Information Centers	Transportation Information Center	emergency traveler information
Other Transportation Information Centers	Transportation Information Center	incident information
Other Transportation Information Centers	Transportation Information Center	road network conditions
Other Transportation Information Centers	Transportation Information Center	traffic image meta data
Other Transportation Information Centers	Transportation Information Center	traffic images
Service Monitor System	Center	RSE fault data
Service Monitor System	Maint and Constr Management Center	RSE fault data
Surface Transportation Weather Service	Emergency Management Center	transportation weather information
Surface Transportation Weather Service	Maint and Constr Management Center	transportation weather information
Surface Transportation Weather Service	Traffic Management Center	transportation weather information
Surface Transportation Weather Service	Transportation Information Center	transportation weather information
Traffic Management Center	Emergency Management Center	emergency traffic control information
Traffic Management Center	Emergency Management Center	incident information
Traffic Management Center	Emergency Management Center	road network conditions
Traffic Management Center	Emissions Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	route restrictions
Traffic Management Center	Maint and Constr Management Center	equipment maintenance request
Traffic Management Center	Maint and Constr Management Center	field equipment status
Traffic Management Center	Maint and Constr Management Center	incident information
Traffic Management Center	Maint and Constr Management Center	road network conditions
Traffic Management Center	Other Traffic Management Centers	device control request
Traffic Management Center	Other Traffic Management Centers	device data
Traffic Management Center	Other Traffic Management Centers	device status
Traffic Management Center	Other Traffic Management Centers	incident information
Traffic Management Center	Other Traffic Management Centers	road network conditions
Traffic Management Center	Other Traffic Management Centers	traffic image meta data

Traffic Management Center	Other Traffic Management Centers	traffic images
Traffic Management Center	Transit Management Center	incident information
Traffic Management Center	Transit Management Center	road network conditions
Traffic Management Center	Transportation Information Center	incident information
Traffic Management Center	Transportation Information Center	regional situation data
Traffic Management Center	Transportation Information Center	road network conditions
Traffic Management Center	Transportation Information Center	traffic control information
Traffic Management Center	Transportation Information Center	traffic image meta data
Traffic Management Center	Transportation Information Center	traffic images
Transportation Information Center	Archived Data Center	regional situation data
Transportation Information Center	Emergency Management Center	corridor operational strategies
Transportation Information Center	Emergency Management Center	road network conditions
Transportation Information Center	Emergency Management Center	road weather advisories
Transportation Information Center	Emissions Management Center	corridor operational strategies
Transportation Information Center	Fleet and Freight Management Center	incident information
Transportation Information Center	Fleet and Freight Management Center	road network conditions
Transportation Information Center	Fleet and Freight Management Center	road weather advisories
Transportation Information Center	Maint and Constr Management Center	corridor operational strategies
Transportation Information Center	Other Transportation Information Centers	emergency traveler information
Transportation Information Center	Other Transportation Information Centers	incident information
Transportation Information Center	Other Transportation Information Centers	road network conditions
Transportation Information Center	Other Transportation Information Centers	traffic image meta data
Transportation Information Center	Other Transportation Information Centers	traffic images
Transportation Information Center	Traffic Management Center	corridor operational strategies
Transportation Information Center	Traffic Management Center	regional situation data
Transportation Information Center	Transit Management Center	corridor operational strategies
Tunnel Management System	Maint and Constr Management Center	field equipment status

Solution Name:	DDS: TMDD - OMG DDS				Number of Issues:	3	Total Issue Severity:	43

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Border Inspection System	Traffic Management Center	border wait times data
Border Inspection System	Transportation Information Center	border crossing status information
Center	Archived Data Center	center archive data
Center	Data Distribution System	operational data
Center	Data Distribution System	traveler information distribution data
Center	Maint and Constr Management Center	equipment maintenance request
Commercial Vehicle Administration Center	Fleet and Freight Management Center	route restrictions
Commercial Vehicle Administration Center	Other CV Administration Centers	route restrictions
Commercial Vehicle Administration Center	Transportation Information Center	route restrictions
Data Distribution System	Center	operational data
Data Distribution System	Center	regional situation data
Emergency Management Center	Traffic Management Center	emergency traffic control request
Emergency Management Center	Traffic Management Center	incident information
Emergency Management Center	Transportation Information Center	incident information
Emissions Management Center	Transportation Information Center	air quality information
Fleet and Freight Management Center	Commercial Vehicle Administration Center	route restrictions
Maint and Constr Management Center	Center	equipment maintenance status
Maint and Constr Management Center	Commercial Vehicle Administration Center	current infrastructure restrictions
Maint and Constr Management Center	Emergency Management Center	road weather information
Maint and Constr Management Center	Map Update System	current infrastructure restrictions
Maint and Constr Management Center	Surface Transportation Weather Service	road weather information
Maint and Constr Management Center	Traffic Management Center	current infrastructure restrictions
Maint and Constr Management Center	Traffic Management Center	environmental conditions data
Maint and Constr Management Center	Traffic Management Center	equipment maintenance status
Maint and Constr Management Center	Traffic Management Center	work zone information
Maint and Constr Management Center	Transit Management Center	current infrastructure restrictions
Maint and Constr Management Center	Transportation Information Center	current infrastructure restrictions
Maint and Constr Management Center	Transportation Information Center	environmental conditions data
Maint and Constr Management Center	Transportation Information Center	maint and constr work plans
Maint and Constr Management Center	Transportation Information Center	road weather information

Maint and Constr Management Center	Transportation Information Center	work zone information
Other CV Administration Centers	Commercial Vehicle Administration Center	route restrictions
Other Traffic Management Centers	Traffic Management Center	device control request
Other Traffic Management Centers	Traffic Management Center	device data
Other Traffic Management Centers	Traffic Management Center	device status
Other Traffic Management Centers	Traffic Management Center	incident information
Other Traffic Management Centers	Traffic Management Center	road network conditions
Other Traffic Management Centers	Traffic Management Center	traffic image meta data
Other Traffic Management Centers	Traffic Management Center	traffic images
Other Transportation Information Centers	Transportation Information Center	emergency traveler information
Other Transportation Information Centers	Transportation Information Center	incident information
Other Transportation Information Centers	Transportation Information Center	road network conditions
Other Transportation Information Centers	Transportation Information Center	traffic image meta data
Other Transportation Information Centers	Transportation Information Center	traffic images
Service Monitor System	Center	RSE fault data
Service Monitor System	Maint and Constr Management Center	RSE fault data
Surface Transportation Weather Service	Emergency Management Center	transportation weather information
Surface Transportation Weather Service	Maint and Constr Management Center	transportation weather information
Surface Transportation Weather Service	Traffic Management Center	transportation weather information
Surface Transportation Weather Service	Transportation Information Center	transportation weather information
Traffic Management Center	Emergency Management Center	emergency traffic control information
Traffic Management Center	Emergency Management Center	incident information
Traffic Management Center	Emergency Management Center	road network conditions
Traffic Management Center	Emissions Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	route restrictions
Traffic Management Center	Maint and Constr Management Center	equipment maintenance request
Traffic Management Center	Maint and Constr Management Center	field equipment status
Traffic Management Center	Maint and Constr Management Center	incident information
Traffic Management Center	Maint and Constr Management Center	road network conditions
Traffic Management Center	Other Traffic Management Centers	device control request
Traffic Management Center	Other Traffic Management Centers	device data
Traffic Management Center	Other Traffic Management Centers	device status
Traffic Management Center	Other Traffic Management Centers	incident information
Traffic Management Center	Other Traffic Management Centers	road network conditions
Traffic Management Center	Other Traffic Management Centers	traffic image meta data

Solution Name:	DDS: TMDD - OMG DDS		Number of Issues:	3	Total Issue Severity:	43

Traffic Management Center	Other Traffic Management Centers	traffic images
Traffic Management Center	Transit Management Center	incident information
Traffic Management Center	Transit Management Center	road network conditions
Traffic Management Center	Transportation Information Center	incident information
Traffic Management Center	Transportation Information Center	regional situation data
Traffic Management Center	Transportation Information Center	road network conditions
Traffic Management Center	Transportation Information Center	traffic control information
Traffic Management Center	Transportation Information Center	traffic image meta data
Traffic Management Center	Transportation Information Center	traffic images
Transportation Information Center	Archived Data Center	regional situation data
Transportation Information Center	Emergency Management Center	corridor operational strategies
Transportation Information Center	Emergency Management Center	road network conditions
Transportation Information Center	Emergency Management Center	road weather advisories
Transportation Information Center	Emissions Management Center	corridor operational strategies
Transportation Information Center	Fleet and Freight Management Center	incident information
Transportation Information Center	Fleet and Freight Management Center	road network conditions
Transportation Information Center	Fleet and Freight Management Center	road weather advisories
Transportation Information Center	Maint and Constr Management Center	corridor operational strategies
Transportation Information Center	Other Transportation Information Centers	emergency traveler information
Transportation Information Center	Other Transportation Information Centers	incident information
Transportation Information Center	Other Transportation Information Centers	road network conditions
Transportation Information Center	Other Transportation Information Centers	traffic image meta data
Transportation Information Center	Other Transportation Information Centers	traffic images
Transportation Information Center	Traffic Management Center	corridor operational strategies
Transportation Information Center	Traffic Management Center	regional situation data
Transportation Information Center	Transit Management Center	corridor operational strategies
Tunnel Management System	Maint and Constr Management Center	field equipment status

Solution Name:	DDS: UBL - OMG DDS		Number of Issues:	2	Total Issue Severity:	11

This solution is used within the U.S. It combines standards associated with US: UBL with those for C-C: OMG DDS. The US: UBL standards include upper-layer standards required to implement shipment related information flows. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (non-critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: J3067; ATIS; Incident management; UBL; some J2735; some NTCIP. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)	Medium-term	United States

Solution Name:	DDS: UBL - OMG DDS				Number of Issues:	2	Total Issue Severity:	11

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution Destination	Flow Name
Fleet and Freight Management Center	Freight Distribution and Logistics Center	freight transportation status
Freight Distribution and Logistics Center	Intermodal Customer System	freight transportation status
Freight Distribution and Logistics Center	Intermodal Terminal	freight transportation status
Intermodal Customer System	Freight Distribution and Logistics Center	freight transport booking

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution Destination	Flow Name
Fleet and Freight Management Center	Freight Distribution and Logistics Center	freight transportation status
Freight Distribution and Logistics Center	Intermodal Customer System	freight transportation status
Freight Distribution and Logistics Center	Intermodal Terminal	freight transportation status
Intermodal Customer System	Freight Distribution and Logistics Center	freight transport booking

Solution Name:	EU: Probe Data - Mobile Internet (X.509)				Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S., E.U., and Australia. It combines standards associated with EU: Probe Data with those for I-M: Mobile Internet (X.509). The EU: Probe Data standards include upper-layer standards required to provide detailed probe data information from a vehicle. The I-M: Mobile Internet (X.509) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs/CAMs, sensors, probe data, etc.) between vehicles and remote interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution Destination	Flow Name
Vehicle OBE	Transportation Information Center	vehicle situation data

Solution Name:	EU: TPEG2 - Internet (X.509)				Number of Issues:	1	Total Issue Severity:	3

This solution is used within the E.U., and Australia. It combines standards associated with EU: TPEG2 with those for I-I: Internet (X.509). The EU: TPEG2 standards include upper-layer standards required to support multi-modal information services.. The I-I: Internet (X.509) standards include lower-layer standards that support secure communications between two entities, based on X.509 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Solution Name:	EU: TPEG2 - Internet (X.509)		Number of Issues:	1	Total Issue Severity:	3

Source	Destination	Flow Name
Traffic Management Center	Media	traffic information for media
Transportation Information Center	Media	traffic information for media
Transportation Information Center	Media	traveler information for media
Transportation Information Center	Wide Area Information Disseminator	traveler information for media

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Solution Name:	F-F: Highway-Rail Field Interface - Internet (US)		Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S. It combines upper layer standards that for the interface between the rail subsystem and the highway subsystem at a highway rail intersection with lower-layer standards that support standard Internet-based links.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Wayside Equipment	rail crossing blockage notification
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	arriving train information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	track status
ITS Roadway Equipment	Wayside Equipment	rail crossing blockage notification
Multi-Modal Crossing	Connected Vehicle Roadside Equipment	multimodal crossing status
Multi-Modal Crossing	ITS Roadway Equipment	multimodal crossing status
Wayside Equipment	Connected Vehicle Roadside Equipment	arriving train information
Wayside Equipment	Connected Vehicle Roadside Equipment	track status
Wayside Equipment	ITS Roadway Equipment	arriving train information
Wayside Equipment	ITS Roadway Equipment	track status

Solution Name:	F-F: Highway-Rail Field Interface - OMG DDS RPC		Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with F-F: Highway-Rail Field Interface with those for I-F: OMG DDS RPC. The F-F: Highway-Rail Field Interface standards include upper layer standards that for the interface between the rail subsystem and the highway subsystem at a highway rail intersection. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Wayside Equipment	rail crossing blockage notification
Connected Vehicle Roadside Equipment	Wayside Equipment	rail crossing operational status

Solution Name:	F-F: Highway-Rail Field Interface - OMG DDS RPC		Number of Issues:	1	Total Issue Severity:	3

ITS Roadway Equipment	Connected Vehicle Roadside Equipment	track status
ITS Roadway Equipment	Wayside Equipment	rail crossing blockage notification
ITS Roadway Equipment	Wayside Equipment	rail crossing operational status
Multi-Modal Crossing	Connected Vehicle Roadside Equipment	multimodal crossing status
Multi-Modal Crossing	ITS Roadway Equipment	multimodal crossing status
Wayside Equipment	Connected Vehicle Roadside Equipment	track status
Wayside Equipment	ITS Roadway Equipment	track status

Solution Name:	F-F: Highway-Rail Field Interface - SNMPv3		Number of Issues:	1	Total Issue Severity:	1

This solution is used within the U.S.. It combines standards associated with F-F: Highway-Rail Field Interface with those for I-F: SNMPv3. The F-F: Highway-Rail Field Interface standards include upper layer standards that for the interface between the rail subsystem and the highway subsystem at a highway rail intersection. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Wayside Equipment	rail crossing blockage notification
Connected Vehicle Roadside Equipment	Wayside Equipment	rail crossing operational status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	track status
ITS Roadway Equipment	Wayside Equipment	rail crossing blockage notification
ITS Roadway Equipment	Wayside Equipment	rail crossing operational status
Multi-Modal Crossing	Connected Vehicle Roadside Equipment	multimodal crossing status
Multi-Modal Crossing	ITS Roadway Equipment	multimodal crossing status
Wayside Equipment	Connected Vehicle Roadside Equipment	track status
Wayside Equipment	ITS Roadway Equipment	track status

Solution Name:	Flow-Specific Data - Mobile Internet (US)		Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S.. It combines standards associated with Flow-Specific Data with those for I-M: Mobile Internet (US). The Flow-Specific Data standards include a placeholder for upper-layer standards necessary to complete a solution for a generic support information flow. Prior to implementation, specific upper-layer standards need to be identified to tailor the flow to meet the specific data exchange needs.. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Solution Name:	Flow-Specific Data - Mobile Internet (US)		Number of Issues:	2	Total Issue Severity:	6

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Data Distribution System	Personal Information Device	data publication
Data Distribution System	Personal Information Device	data query publication
Data Distribution System	Vehicle OBE	data publication
Data Distribution System	Vehicle OBE	data query publication
Personal Information Device	Data Distribution System	data provision
Personal Information Device	Data Distribution System	data query
Personal Information Device	Data Distribution System	data subscription
Vehicle OBE	Data Distribution System	data provision
Vehicle OBE	Data Distribution System	data query
Vehicle OBE	Data Distribution System	data subscription

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	Develop ITS-wide reference data model	Develop an internationally representative ITS-wide reference data model that will enable better data sharing across disparate enterprise systems with data defined by different entities, working groups, and standards development organisations.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Data Distribution System	Personal Information Device	data publication
Data Distribution System	Personal Information Device	data query publication
Data Distribution System	Vehicle OBE	data publication
Data Distribution System	Vehicle OBE	data query publication
Personal Information Device	Data Distribution System	data provision
Personal Information Device	Data Distribution System	data query
Personal Information Device	Data Distribution System	data subscription
Vehicle OBE	Data Distribution System	data provision
Vehicle OBE	Data Distribution System	data query
Vehicle OBE	Data Distribution System	data subscription

Solution Name:	Flow-Specific Data - NTCIP Messaging		Number of Issues:	3	Total Issue Severity:	9

This solution is used within the U.S. and Australia. It combines standards associated with Flow-Specific Data with those for C-C: NTCIP Messaging. The Flow-Specific Data standards include a placeholder for upper-layer standards necessary to complete a solution for a generic support information flow. Prior to implementation, specific upper-layer standards need to be identified to tailor the flow to meet the specific data exchange needs.. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Solution Name:	Flow-Specific Data - NTCIP Messaging		Number of Issues:	3	Total Issue Severity:	9

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Data Distribution System	data provision
Center	Data Distribution System	data query
Center	Data Distribution System	data subscription
Data Distribution System	Center	data publication
Data Distribution System	Center	data query publication
Data Distribution System	Other Data Distribution Systems	data provision
Data Distribution System	Other Data Distribution Systems	data publication
Data Distribution System	Other Data Distribution Systems	data query
Data Distribution System	Other Data Distribution Systems	data query publication
Data Distribution System	Other Data Distribution Systems	data subscription
Other Data Distribution Systems	Data Distribution System	data provision
Other Data Distribution Systems	Data Distribution System	data publication
Other Data Distribution Systems	Data Distribution System	data query
Other Data Distribution Systems	Data Distribution System	data query publication
Other Data Distribution Systems	Data Distribution System	data subscription

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	Develop ITS-wide reference data model	Develop an internationally representative ITS-wide reference data model that will enable better data sharing across disparate enterprise systems with data defined by different entities, working groups, and standards development organisations.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Data Distribution System	data provision
Center	Data Distribution System	data query
Center	Data Distribution System	data subscription
Data Distribution System	Center	data publication
Data Distribution System	Center	data query publication
Data Distribution System	Other Data Distribution Systems	data provision
Data Distribution System	Other Data Distribution Systems	data publication
Data Distribution System	Other Data Distribution Systems	data query
Data Distribution System	Other Data Distribution Systems	data query publication
Data Distribution System	Other Data Distribution Systems	data subscription
Other Data Distribution Systems	Data Distribution System	data provision
Other Data Distribution Systems	Data Distribution System	data publication
Other Data Distribution Systems	Data Distribution System	data query
Other Data Distribution Systems	Data Distribution System	data query publication
Other Data Distribution Systems	Data Distribution System	data subscription

| Solution Name: | Flow-Specific Data - NTCIP Messaging | | | | | Number of Issues: | 3 | Total Issue Severity: | 9 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Dialogs are not fully defined (medium)	The specific dialogs for exchanging this data have not been fully defined.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Data Distribution System	data provision
Center	Data Distribution System	data query
Center	Data Distribution System	data subscription
Data Distribution System	Center	data publication
Data Distribution System	Center	data query publication
Data Distribution System	Other Data Distribution Systems	data provision
Data Distribution System	Other Data Distribution Systems	data publication
Data Distribution System	Other Data Distribution Systems	data query
Data Distribution System	Other Data Distribution Systems	data query publication
Data Distribution System	Other Data Distribution Systems	data subscription
Other Data Distribution Systems	Data Distribution System	data provision
Other Data Distribution Systems	Data Distribution System	data publication
Other Data Distribution Systems	Data Distribution System	data query
Other Data Distribution Systems	Data Distribution System	data query publication
Other Data Distribution Systems	Data Distribution System	data subscription

| Solution Name: | Flow-Specific Data - OMG DDS | | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

This solution is used within the U.S.. It combines standards associated with Flow-Specific Data with those for C-C: OMG DDS. The Flow-Specific Data standards include a placeholder for upper-layer standards necessary to complete a solution for a generic support information flow. Prior to implementation, specific upper-layer standards need to be identified to tailor the flow to meet the specific data exchange needs.. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	Develop ITS-wide reference data model	Develop an internationally representative ITS-wide reference data model that will enable better data sharing across disparate enterprise systems with data defined by different entities, working groups, and standards development organisations.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Data Distribution System	data provision
Center	Data Distribution System	data query
Center	Data Distribution System	data subscription
Data Distribution System	Center	data publication
Data Distribution System	Center	data query publication
Data Distribution System	Other Data Distribution Systems	data provision

Solution Name:	Flow-Specific Data - OMG DDS	Number of Issues:	2	Total Issue Severity:	6
Data Distribution System	Other Data Distribution Systems	data publication			
Data Distribution System	Other Data Distribution Systems	data query			
Data Distribution System	Other Data Distribution Systems	data query publication			
Data Distribution System	Other Data Distribution Systems	data subscription			
Data Distribution System	Personal Information Device	data publication			
Data Distribution System	Personal Information Device	data query publication			
Data Distribution System	Vehicle OBE	data publication			
Data Distribution System	Vehicle OBE	data query publication			
Other Data Distribution Systems	Data Distribution System	data provision			
Other Data Distribution Systems	Data Distribution System	data publication			
Other Data Distribution Systems	Data Distribution System	data query			
Other Data Distribution Systems	Data Distribution System	data query publication			
Other Data Distribution Systems	Data Distribution System	data subscription			
Personal Information Device	Data Distribution System	data provision			
Personal Information Device	Data Distribution System	data query			
Personal Information Device	Data Distribution System	data subscription			
Vehicle OBE	Data Distribution System	data provision			
Vehicle OBE	Data Distribution System	data query			
Vehicle OBE	Data Distribution System	data subscription			

Solution Name:	Flow-Specific Data - OMG DDS					Number of Issues:	2	Total Issue Severity:	6

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Data Distribution System	data provision
Center	Data Distribution System	data query
Center	Data Distribution System	data subscription
Data Distribution System	Center	data publication
Data Distribution System	Center	data query publication
Data Distribution System	Other Data Distribution Systems	data provision
Data Distribution System	Other Data Distribution Systems	data publication
Data Distribution System	Other Data Distribution Systems	data query
Data Distribution System	Other Data Distribution Systems	data query publication
Data Distribution System	Other Data Distribution Systems	data subscription
Data Distribution System	Personal Information Device	data publication
Data Distribution System	Personal Information Device	data query publication
Data Distribution System	Vehicle OBE	data publication
Data Distribution System	Vehicle OBE	data query publication
Other Data Distribution Systems	Data Distribution System	data provision
Other Data Distribution Systems	Data Distribution System	data publication
Other Data Distribution Systems	Data Distribution System	data query
Other Data Distribution Systems	Data Distribution System	data query publication
Other Data Distribution Systems	Data Distribution System	data subscription
Personal Information Device	Data Distribution System	data provision
Personal Information Device	Data Distribution System	data query
Personal Information Device	Data Distribution System	data subscription
Vehicle OBE	Data Distribution System	data provision
Vehicle OBE	Data Distribution System	data query
Vehicle OBE	Data Distribution System	data subscription

Solution Name:	Flow-Specific Data - OMG DDS RPC					Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S.. It combines standards associated with Flow-Specific Data with those for I-F: OMG DDS RPC. The Flow-Specific Data standards include a placeholder for upper-layer standards necessary to complete a solution for a generic support information flow. Prior to implementation, specific upper-layer standards need to be identified to tailor the flow to meet the specific data exchange needs.. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

| Solution Name: | Flow-Specific Data - OMG DDS RPC | | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	Develop ITS-wide reference data model	Develop an internationally representative ITS-wide reference data model that will enable better data sharing across disparate enterprise systems with data defined by different entities, working groups, and standards development organisations.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Data Distribution System	data provision
Connected Vehicle Roadside Equipment	Data Distribution System	data query
Connected Vehicle Roadside Equipment	Data Distribution System	data subscription
Data Distribution System	Connected Vehicle Roadside Equipment	data publication
Data Distribution System	Connected Vehicle Roadside Equipment	data query publication

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Data Distribution System	data provision
Connected Vehicle Roadside Equipment	Data Distribution System	data query
Connected Vehicle Roadside Equipment	Data Distribution System	data subscription
Data Distribution System	Connected Vehicle Roadside Equipment	data publication
Data Distribution System	Connected Vehicle Roadside Equipment	data query publication

| Solution Name: | Flow-Specific Data - SNMPv3 | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S.. It combines standards associated with Flow-Specific Data with those for I-F: SNMPv3. The Flow-Specific Data standards include a placeholder for upper-layer standards necessary to complete a solution for a generic support information flow. Prior to implementation, specific upper-layer standards need to be identified to tailor the flow to meet the specific data exchange needs.. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Data Distribution System	data provision
Connected Vehicle Roadside Equipment	Data Distribution System	data query
Connected Vehicle Roadside Equipment	Data Distribution System	data subscription
Data Distribution System	Connected Vehicle Roadside Equipment	data publication
Data Distribution System	Connected Vehicle Roadside Equipment	data query publication

Solution Name:	Flow-Specific Data - SNMPv3				Number of Issues:	2	Total Issue Severity:	4

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	Develop ITS-wide reference data model	Develop an internationally representative ITS-wide reference data model that will enable better data sharing across disparate enterprise systems with data defined by different entities, working groups, and standards development organisations.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Data Distribution System	data provision
Connected Vehicle Roadside Equipment	Data Distribution System	data query
Connected Vehicle Roadside Equipment	Data Distribution System	data subscription
Data Distribution System	Connected Vehicle Roadside Equipment	data publication
Data Distribution System	Connected Vehicle Roadside Equipment	data query publication

Solution Name:	Flow-Specific Data - Apache Kafka				Number of Issues:	3	Total Issue Severity:	7

This solution is used within the U.S.. It combines standards associated with Flow-Specific Data with those for Apache Kafka. The Flow-Specific Data standards include a placeholder for upper-layer standards necessary to complete a solution for a generic support information flow. Prior to implementation, specific upper-layer standards need to be identified to tailor the flow to meet the specific data exchange needs.. The Apache Kafka standards include lower-layer open source code that supports data distribution of specific types of data.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Open source software	This is open-source software rather than a documented interface specification standardized through a formal and open process.	Low	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Data Distribution System	data provision
Center	Data Distribution System	data query
Center	Data Distribution System	data subscription
Connected Vehicle Roadside Equipment	Data Distribution System	data provision
Connected Vehicle Roadside Equipment	Data Distribution System	data query
Connected Vehicle Roadside Equipment	Data Distribution System	data subscription
Data Distribution System	Center	data publication
Data Distribution System	Center	data query publication
Data Distribution System	Connected Vehicle Roadside Equipment	data publication
Data Distribution System	Connected Vehicle Roadside Equipment	data query publication
Data Distribution System	Other Data Distribution Systems	data provision
Data Distribution System	Other Data Distribution Systems	data publication
Data Distribution System	Other Data Distribution Systems	data query
Data Distribution System	Other Data Distribution Systems	data query publication
Data Distribution System	Other Data Distribution Systems	data subscription
Data Distribution System	Personal Information Device	data publication

Solution Name:	Flow-Specific Data - Apache Kafka	Number of Issues:	3	Total Issue Severity:	7

Data Distribution System	Personal Information Device	data query publication
Data Distribution System	Vehicle OBE	data publication
Data Distribution System	Vehicle OBE	data query publication
Other Data Distribution Systems	Data Distribution System	data provision
Other Data Distribution Systems	Data Distribution System	data publication
Other Data Distribution Systems	Data Distribution System	data query
Other Data Distribution Systems	Data Distribution System	data query publication
Other Data Distribution Systems	Data Distribution System	data subscription
Personal Information Device	Data Distribution System	data provision
Personal Information Device	Data Distribution System	data query
Personal Information Device	Data Distribution System	data subscription
Vehicle OBE	Data Distribution System	data provision
Vehicle OBE	Data Distribution System	data query
Vehicle OBE	Data Distribution System	data subscription

Solution Name:	Flow-Specific Data - Apache Kafka					Number of Issues:	3	Total Issue Severity:	7

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	Develop ITS-wide reference data model	Develop an internationally representative ITS-wide reference data model that will enable better data sharing across disparate enterprise systems with data defined by different entities, working groups, and standards development organisations.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Data Distribution System	data provision
Center	Data Distribution System	data query
Center	Data Distribution System	data subscription
Connected Vehicle Roadside Equipment	Data Distribution System	data provision
Connected Vehicle Roadside Equipment	Data Distribution System	data query
Connected Vehicle Roadside Equipment	Data Distribution System	data subscription
Data Distribution System	Center	data publication
Data Distribution System	Center	data query publication
Data Distribution System	Connected Vehicle Roadside Equipment	data publication
Data Distribution System	Connected Vehicle Roadside Equipment	data query publication
Data Distribution System	Other Data Distribution Systems	data provision
Data Distribution System	Other Data Distribution Systems	data publication
Data Distribution System	Other Data Distribution Systems	data query
Data Distribution System	Other Data Distribution Systems	data query publication
Data Distribution System	Other Data Distribution Systems	data subscription
Data Distribution System	Personal Information Device	data publication
Data Distribution System	Personal Information Device	data query publication
Data Distribution System	Vehicle OBE	data publication
Data Distribution System	Vehicle OBE	data query publication
Other Data Distribution Systems	Data Distribution System	data provision
Other Data Distribution Systems	Data Distribution System	data publication
Other Data Distribution Systems	Data Distribution System	data query
Other Data Distribution Systems	Data Distribution System	data query publication
Other Data Distribution Systems	Data Distribution System	data subscription
Personal Information Device	Data Distribution System	data provision
Personal Information Device	Data Distribution System	data query
Personal Information Device	Data Distribution System	data subscription
Vehicle OBE	Data Distribution System	data provision
Vehicle OBE	Data Distribution System	data query
Vehicle OBE	Data Distribution System	data subscription

Solution Name:		Flow-Specific Data - Apache Kafka				Number of Issues:	3	Total Issue Severity:	7

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Data Distribution System	data provision
Center	Data Distribution System	data query
Center	Data Distribution System	data subscription
Connected Vehicle Roadside Equipment	Data Distribution System	data provision
Connected Vehicle Roadside Equipment	Data Distribution System	data query
Connected Vehicle Roadside Equipment	Data Distribution System	data subscription
Data Distribution System	Center	data publication
Data Distribution System	Center	data query publication
Data Distribution System	Connected Vehicle Roadside Equipment	data publication
Data Distribution System	Connected Vehicle Roadside Equipment	data query publication
Data Distribution System	Other Data Distribution Systems	data provision
Data Distribution System	Other Data Distribution Systems	data publication
Data Distribution System	Other Data Distribution Systems	data query
Data Distribution System	Other Data Distribution Systems	data query publication
Data Distribution System	Other Data Distribution Systems	data subscription
Data Distribution System	Personal Information Device	data publication
Data Distribution System	Personal Information Device	data query publication
Data Distribution System	Vehicle OBE	data publication
Data Distribution System	Vehicle OBE	data query publication
Other Data Distribution Systems	Data Distribution System	data provision
Other Data Distribution Systems	Data Distribution System	data publication
Other Data Distribution Systems	Data Distribution System	data query
Other Data Distribution Systems	Data Distribution System	data query publication
Other Data Distribution Systems	Data Distribution System	data subscription
Personal Information Device	Data Distribution System	data provision
Personal Information Device	Data Distribution System	data query
Personal Information Device	Data Distribution System	data subscription
Vehicle OBE	Data Distribution System	data provision
Vehicle OBE	Data Distribution System	data query
Vehicle OBE	Data Distribution System	data subscription

Solution Name:	Flow-Specific Data - Apache Kafka						Number of Issues:	3	Total Issue Severity:	7

Solution Name:	ISO: Equipment Identification - Local Unicast Wireless (US)						Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with ISO: Equipment Identification with those for V-X: Local Unicast Wireless (US). The ISO: Equipment Identification standards include upper-layer standards required to implement equipment identification flows. The V-X: Local Unicast Wireless (US) standards include lower-layer standards that support local-area unicast wireless solutions, such as DSRC technologies, LTE, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Freight Equipment	Connected Vehicle Roadside Equipment	container identification
Freight Equipment	Intermodal Terminal	container identification

Solution Name:	ISO: Equipment Identification - NTCIP Messaging						Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S. It combines standards associated with ISO: Equipment Identification with those for C-C: NTCIP Messaging. The ISO: Equipment Identification standards include upper-layer standards required to implement equipment identification flows. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Intermodal Terminal	container identification

Solution Name:	Location/Time reference - Positioning						Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S., E.U., and Australia. It combines standards associated with Location/Time reference with those for Positioning. The Location/Time reference standards include upper-layer standards required to obtain location and time information from a satellite-positioning-system-based geolocation receiver. The Positioning standards include lower-layer standards that support communications between connected ITS equipment and geolocation equipment such as a GPS receiver.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	Secure and accurate location and time standards	Develop/adopt an internationally acceptable standard/solution for synchronising and continuously maintaining location and time information throughout the ITS environment in a secure and reliable manner with sufficient accuracy (including leap seconds) and confidence.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Field Location and Time Data Source	Connected Vehicle Roadside Equipment	location and time
Personal Location and Time Data Source	Personal Information Device	location and time
Vehicle Location and Time Data Source	Vehicle OBE	location and time

Solution Name:	NTP - UDP/IP				Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with NTP with those for I-I: UDP/IP. The NTP standards include standards required to reliably set time information in a subsystem. The I-I: UDP/IP standards include lower-layer standards that support the Network Time Protocol that allows NTP servers to provide time synchronization services to other NTP servers and clients.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	Secure and accurate location and time standards	Develop/adopt an internationally acceptable standard/solution for synchronising and continuously maintaining location and time information throughout the ITS environment in a secure and reliable manner with sufficient accuracy (including leap seconds) and confidence.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Network Time Source	Center	time
Network Time Source	Data Distribution System	time
Network Time Source	Service Monitor System	time
Service Monitor System	Center	time local form
Service Monitor System	Data Distribution System	time local form

Solution Name:	TMC - Internet (US)				Number of Issues:	3	Total Issue Severity:	9

This solution is used within the U.S.. It combines standards associated with TMC with those for I-I: Internet (US). The TMC standards include upper-layer standards required to support multi-modal information services to the vehicle.. The I-I: Internet (US) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

| Solution Name: | TMC - Internet (US) | | | | | Number of Issues: | 3 | Total Issue Severity: | 9 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-C: WAID	Develop an internationally acceptable ITS application specification for providing information from a centre to a WAID for wide-area dissemination.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

| Solution Name: | TMC - Wide Area Broadcast (Upper) | | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

This solution is used within the U.S., E.U., and Australia. It combines standards associated with TMC with those for C-X: Wide Area Broadcast (Upper). The TMC standards include upper-layer standards required to support multi-modal information services to the vehicle.. The C-X: Wide Area Broadcast (Upper) standards include lower-layer standards that support one entity broadcasting information to all wireless devices over an area that covers at least a metropolitan area without any expectation of acknowledgement or response; security is provided by the upper-layers.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	broadcast traveler information
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Personal Information Device	wide area broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	wide area broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Ubiquitous broadcast technology	With the continual enhancement of broadcast technologies and a mixture of free and subscriber-based systems, it is difficult to identify any single technology that can be used to reliably reach the bulk of drivers in a timely manner.	Low	C-V: Wide-area broadcast subnet and hybrid communications	Standardise one or more mechanisms by which wide-area broadcast messages can be received by a defined minimum percentage of transportation users that are currently operating within a specified geographic area. The required minimum percentage is dependent on the type of information being transmitted and will need to be determined by the expert community. Some alerts (e.g., tornado warnings) will require near 100% reception, while other messages (e.g., road works ahead) may require significantly lower minimum percentages. The minimum percentage may be made up with a variety of technologies using hybrid communications and the ITS station architecture.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	broadcast traveler information
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Personal Information Device	wide area broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	wide area broadcast traveler information

Solution Name:	TMC - Wide Area Broadcast (Upper)					Number of Issues:	3	Total Issue Severity:	7

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description			Timeframe	Applicability	
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.			Urgent	Australia, European Union	

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information

Solution Name:	TPEG2 - Guaranteed Internet (X.509)					Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S., E.U., and Australia. It combines standards associated with TPEG2 with those for I-I: Guaranteed Internet (X.509). The TPEG2 standards include upper-layer standards required to support multi-modal information services. The I-I: Guaranteed Internet (X.509) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using mainstream Internet security standards (X.509).

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description			Timeframe	Applicability	
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).			Urgent	Australia, European Union, United States	

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Wide Area Information Disseminator	traffic information for media
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information
Transportation Information Center	Wide Area Information Disseminator	traffic information for media

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description			Timeframe	Applicability	
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-C: WAID	Develop an internationally acceptable ITS application specification for providing information from a centre to a WAID for wide-area dissemination.			Urgent	Australia, European Union, United States	

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

Solution Name:	TPEG2 - Local Broadcast Wireless (US)					Number of Issues:	4	Total Issue Severity:	12

This solution is used within the U.S.. It combines standards associated with TPEG2 with those for V-X: Local Broadcast Wireless (US). The TPEG2 standards include upper-layer standards required to support multi-modal information services.. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description			Timeframe	Applicability	
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).			Urgent	Australia, European Union, United States	

Solution Name:	TPEG2 - Local Broadcast Wireless (US)		Number of Issues:	4	Total Issue Severity:	12

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	lane closure information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	lane closure information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	V-X: DENM, IVI, TPEG2, TMC and Contextual Speed Information	Standardise on a single solution for providing traveler information, lane closure information and speed information; currently this information can be sent via DENM, IVI, TPEG2, TMC, or Contextual Speed Information (speed information only). Use cases need to consider the various environments (e.g., Centre-Vehicle, Roadside-Vehicle, Special Vehicle-Vehicle, etc).	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	lane closure information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	V-L: US traveler information	Develop an ITS application specification for providing in-vehicle signage and other traveler information to the vehicle from the roadside. This will also need to address issues such as when and how to locally generate traveler information messages and how to sign these messages.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	lane closure information

Solution Name:	TPEG2 - Mobile Internet (US)		Number of Issues:	6	Total Issue Severity:	47

This solution is used within the U.S.. It combines standards associated with TPEG2 with those for I-M: Mobile Internet (US). The TPEG2 standards include upper-layer standards required to support multi-modal information services.. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

| Solution Name: | TPEG2 - Mobile Internet (US) | | | Number of Issues: | 6 | Total Issue Severity: | 47 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	suggested route
Fleet and Freight Management Center	Commercial Vehicle OBE	road weather advisories
Maint and Constr Management Center	Personal Information Device	road weather advisories
Maint and Constr Management Center	Vehicle OBE	road weather advisories
Maint and Constr Management Center	Vehicle OBE	work zone information
Traffic Management Center	Vehicle OBE	lane closure information
Traffic Management Center	Vehicle OBE	speed management information
Traffic Management Center	Vehicle OBE	vehicle signage data
Transportation Information Center	Vehicle OBE	road weather advisories

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-X: DENM, IVI, TPEG2, TMC and Contextual Speed Information	Standardise on a single solution for providing traveler information, lane closure information and speed information; currently this information can be sent via DENM, IVI, TPEG2, TMC, or Contextual Speed Information (speed information only). Use cases need to consider the various environments (e.g., Centre-Vehicle, Roadside-Vehicle, Special Vehicle-Vehicle, etc).	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	road weather advisories

| Solution Name: | TPEG2 - Mobile Internet (US) | | | | Number of Issues: | 6 | Total Issue Severity: | 47 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	suggested route
Fleet and Freight Management Center	Commercial Vehicle OBE	road weather advisories
Maint and Constr Management Center	Personal Information Device	road weather advisories
Maint and Constr Management Center	Vehicle OBE	road weather advisories
Maint and Constr Management Center	Vehicle OBE	work zone information
Traffic Management Center	Vehicle OBE	lane closure information
Traffic Management Center	Vehicle OBE	speed management information
Traffic Management Center	Vehicle OBE	vehicle signage data
Transportation Information Center	Vehicle OBE	road weather advisories

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	V-X: DENM, IVI, TPEG2, TMC and Contextual Speed Information	Standardise on a single solution for providing traveler information, lane closure information and speed information; currently this information can be sent via DENM, IVI, TPEG2, TMC, or Contextual Speed Information (speed information only). Use cases need to consider the various environments (e.g., Centre-Vehicle, Roadside-Vehicle, Special Vehicle-Vehicle, etc).	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	lane closure information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	vehicle signage data

| Solution Name: | TPEG2 - Mobile Internet (US) | | | Number of Issues: | 6 | Total Issue Severity: | 47 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	lane closure information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use case not considered in design (medium)	While the indicated standards nominally address the information flow, the design may not meet practical constraints because this particular use case was not the focus of the design effort.	Medium	C-V: Weather information	Update the international ITS application specification to address road weather advisories.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	road weather advisories

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use case not considered in design (medium)	While the indicated standards nominally address the information flow, the design may not meet practical constraints because this particular use case was not the focus of the design effort.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	vehicle signage data

| Solution Name: | TPEG2 - Mobile Internet (X.509) | | | Number of Issues: | 5 | Total Issue Severity: | 44 |

This solution is used within the U.S., E.U., and Australia. It combines standards associated with TPEG2 with those for I-M: Mobile Internet (X.509). The TPEG2 standards include upper-layer standards required to support multi-modal information services.. The I-M: Mobile Internet (X.509) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Data Distribution System	Personal Information Device	traveler information
Data Distribution System	Vehicle OBE	traveler information

| Solution Name: | TPEG2 - Mobile Internet (X.509) | | | Number of Issues: | 5 | Total Issue Severity: | 44 |

Emergency Management Center	Emergency Vehicle OBE	suggested route
Maint and Constr Management Center	Vehicle OBE	work zone information
Traffic Management Center	Personal Information Device	traffic demand management information
Traffic Management Center	Vehicle OBE	lane closure information
Traffic Management Center	Vehicle OBE	traffic demand management information
Traffic Management Center	Vehicle OBE	vehicle signage data
Transportation Information Center	Vehicle OBE	road weather advisories

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-X: DENM, IVI, TPEG2, TMC and Contextual Speed Information	Standardise on a single solution for providing traveler information, lane closure information and speed information; currently this information can be sent via DENM, IVI, TPEG2, TMC, or Contextual Speed Information (speed information only). Use cases need to consider the various environments (e.g., Centre-Vehicle, Roadside-Vehicle, Special Vehicle-Vehicle, etc).	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	road weather advisories

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	vehicle signage data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	V-X: DENM, IVI, TPEG2, TMC and Contextual Speed Information	Standardise on a single solution for providing traveler information, lane closure information and speed information; currently this information can be sent via DENM, IVI, TPEG2, TMC, or Contextual Speed Information (speed information only). Use cases need to consider the various environments (e.g., Centre-Vehicle, Roadside-Vehicle, Special Vehicle-Vehicle, etc).	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	lane closure information

Solution Name:	TPEG2 - Mobile Internet (X.509)				Number of Issues:	5	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.		Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	lane closure information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Use case not considered in design (medium)	While the indicated standards nominally address the information flow, the design may not meet practical constraints because this particular use case was not the focus of the design effort.	Medium	C-V: Weather information	Update the international ITS application specification to address road weather advisories.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	road weather advisories

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Use case not considered in design (medium)	While the indicated standards nominally address the information flow, the design may not meet practical constraints because this particular use case was not the focus of the design effort.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.		Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	vehicle signage data

Solution Name:	TPEG2 - NTCIP Messaging				Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S. and Australia. It combines standards associated with TPEG2 with those for C-C: NTCIP Messaging. The TPEG2 standards include upper-layer standards required to support multi-modal information services.. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).		Urgent	Australia, European Union, United States

| Solution Name: | TPEG2 - NTCIP Messaging | | Number of Issues: | 2 | Total Issue Severity: | 6 |

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-C: WAID	Develop an internationally acceptable ITS application specification for providing information from a centre to a WAID for wide-area dissemination.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

| Solution Name: | TPEG2 - Wide Area Broadcast (Upper) | | Number of Issues: | 3 | Total Issue Severity: | 7 |

This solution is used within the U.S., E.U., and Australia. It combines standards associated with TPEG2 with those for C-X: Wide Area Broadcast (Upper). The TPEG2 standards include upper-layer standards required to support multi-modal information services.. The C-X: Wide Area Broadcast (Upper) standards include lower-layer standards that support one entity broadcasting information to all wireless devices over an area that covers at least a metropolitan area without any expectation of acknowledgement or response; security is provided by the upper-layers.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	broadcast traveler information
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Personal Information Device	wide area broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	wide area broadcast traveler information

| Solution Name: | TPEG2 - Wide Area Broadcast (Upper) | | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Ubiquitous broadcast technology	With the continual enhancement of broadcast technologies and a mixture of free and subscriber-based systems, it is difficult to identify any single technology that can be used to reliably reach the bulk of drivers in a timely manner.	Low	C-V: Wide-area broadcast subnet and hybrid communications	Standardise one or more mechanisms by which wide-area broadcast messages can be received by a defined minimum percentage of transportation users that are currently operating within a specified geographic area. The required minimum percentage is dependent on the type of information being transmitted and will need to be determined by the expert community. Some alerts (e.g., tornado warnings) will require near 100% reception, while other messages (e.g., road works ahead) may require significantly lower minimum percentages. The minimum percentage may be made up with a variety of technologies using hybrid communications and the ITS station architecture.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	broadcast traveler information
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Personal Information Device	wide area broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	wide area broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information

| Solution Name: | US: ATIS - Internet (US) | | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

This solution is used within the U.S.. It combines standards associated with US: ATIS with those for I-I: Internet (US). The US: ATIS standards include upper-layer standards required to implement traveler information communications. The I-I: Internet (US) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Wide Area Information Disseminator	traffic information for media
Transportation Information Center	Wide Area Information Disseminator	traffic information for media
Transportation Information Center	Wide Area Information Disseminator	traveler information for media

| Solution Name: | US: ATIS - Internet (US) | | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: TCIP/IM/TMDD/ATIS for incident information	Standardise on a single solution for providing incident and incident management information; currently this information is defined within APTA TCIP, IEEE 1512 (IM), ITE TMDD, and SAE ATIS.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Wide Area Information Disseminator	traffic information for media

| Solution Name: | US: ATIS - Mobile Internet (US) | | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: ATIS with those for I-M: Mobile Internet (US). The US: ATIS standards include upper-layer standards required to implement traveler information communications. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Data Distribution System	Personal Information Device	traveler information
Data Distribution System	Vehicle OBE	traveler information
Personal Information Device	Data Distribution System	traveler request
Personal Information Device	Transportation Information Center	traveler request
Transportation Information Center	Personal Information Device	interactive traveler information
Transportation Information Center	Vehicle OBE	interactive traveler information
Vehicle OBE	Data Distribution System	traveler request
Vehicle OBE	Transportation Information Center	traveler request

| Solution Name: | US: ATIS - NTCIP Messaging | | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

This solution is used within the U.S.. It combines standards associated with US: ATIS with those for C-C: NTCIP Messaging. The US: ATIS standards include upper-layer standards required to implement traveler information communications. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.

Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s). | Urgent | Australia, European Union, United States |

Solution Name:	US: ATIS - NTCIP Messaging		Number of Issues:	2	Total Issue Severity:	6

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Fleet and Freight Management Center	Transportation Information Center	route request
Other Transportation Information Centers	Transportation Information Center	multimodal information
Other Transportation Information Centers	Transportation Information Center	parking information
Parking Management System	Traffic Management Center	parking information
Parking Management System	Transit Management Center	parking information
Parking Management System	Transportation Information Center	parking information
Traffic Management Center	Media	traffic information for media
Transportation Information Center	Fleet and Freight Management Center	route plan
Transportation Information Center	Media	traffic information for media
Transportation Information Center	Media	traveler information for media
Transportation Information Center	Other Transportation Information Centers	multimodal information
Transportation Information Center	Other Transportation Information Centers	parking information
Travel Services Provider System	Transportation Information Center	travel service information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: TCIP/IM/TMDD/ATIS for incident information	Standardise on a single solution for providing incident and incident management information; currently this information is defined within APTA TCIP, IEEE 1512 (IM), ITE TMDD, and SAE ATIS.	Urgent	United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Traffic Management Center	Media	traffic information for media
Transportation Information Center	Other Transportation Information Centers	multimodal information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: ATIS/TMDD/TCIP for parking information	Standardise on a single solution for providing parking information; currently this information is defined within ATIS, TMDD, and TCIP (using alternative approaches).	Urgent	United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Other Transportation Information Centers	Transportation Information Center	parking information
Parking Management System	Traffic Management Center	parking information
Parking Management System	Transit Management Center	parking information
Parking Management System	Transportation Information Center	parking information
Transportation Information Center	Other Transportation Information Centers	parking information

Solution Name:	US: ATIS - OMG DDS		Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S.. It combines standards associated with US: ATIS with those for C-C: OMG DDS. The US: ATIS standards include upper-layer standards required to implement traveler information communications. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

| Solution Name: | US: ATIS - OMG DDS | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: TCIP/IM/TMDD/ATIS for incident information	Standardise on a single solution for providing incident and incident management information; currently this information is defined within APTA TCIP, IEEE 1512 (IM), ITE TMDD, and SAE ATIS.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Media	traffic information for media
Transportation Information Center	Other Transportation Information Centers	multimodal information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: ATIS/TMDD/TCIP for parking information	Standardise on a single solution for providing parking information; currently this information is defined within ATIS, TMDD, and TCIP (using alternative approaches).	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Other Transportation Information Centers	Transportation Information Center	parking information
Parking Management System	Traffic Management Center	parking information
Parking Management System	Transit Management Center	parking information
Parking Management System	Transportation Information Center	parking information
Transportation Information Center	Other Transportation Information Centers	parking information

| Solution Name: | US: ATIS - OMG DDS | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Fleet and Freight Management Center	Transportation Information Center	route request
Other Transportation Information Centers	Transportation Information Center	multimodal information
Other Transportation Information Centers	Transportation Information Center	parking information
Parking Management System	Traffic Management Center	parking information
Parking Management System	Transit Management Center	parking information
Parking Management System	Transportation Information Center	parking information
Traffic Management Center	Media	traffic information for media
Transportation Information Center	Fleet and Freight Management Center	route plan
Transportation Information Center	Media	traffic information for media
Transportation Information Center	Media	traveler information for media
Transportation Information Center	Other Transportation Information Centers	multimodal information
Transportation Information Center	Other Transportation Information Centers	parking information
Travel Services Provider System	Transportation Information Center	travel service information

| Solution Name: | US: Incident Management - Guaranteed Mobile Internet (US), with WAVE alternative | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: Incident Management with those for V-X: Guaranteed Mobile Internet (US), with WAVE alternative. The US: Incident Management standards include upper-layer standards required to implement centre-to-centre communications for incident management data. The V-X: Guaranteed Mobile Internet (US), with WAVE alternative standards include lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be actively moving; based on X.509 or 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method. This set of standards includes WAVE as one alternative, which may be used in remote areas without cell coverage.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Other EV OBEs	decision support information
Other EV OBEs	Emergency Vehicle OBE	decision support information

| Solution Name: | US: Incident Management - Guaranteed Mobile Internet (X.509) | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: Incident Management with those for I-M: Guaranteed Mobile Internet (X.509). The US: Incident Management standards include upper-layer standards required to implement centre-to-centre communications for incident management data. The I-M: Guaranteed Mobile Internet (X.509) standards include lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be actively moving; based on X.509 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

| Solution Name: | US: Incident Management - Guaranteed Mobile Internet (X.509) | | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Care Facility	patient status

| Solution Name: | US: Incident Management - Mobile Internet (US) | | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: Incident Management with those for I-M: Mobile Internet (US). The US: Incident Management standards include upper-layer standards required to implement centre-to-centre communications for incident management data. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	decision support information
Emergency Vehicle OBE	Emergency Management Center	incident status
Fleet and Freight Management Center	Commercial Vehicle OBE	hazmat information

| Solution Name: | US: Incident Management - NTCIP Messaging | | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

This solution is used within the U.S.. It combines standards associated with US: Incident Management with those for C-C: NTCIP Messaging. The US: Incident Management standards include upper-layer standards required to implement centre-to-centre communications for incident management data. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.

Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s). | Urgent | Australia, European Union, United States |

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Telecommunications System	incident information for public
Emergency Management Center	Maint and Constr Management Center	emergency plan coordination
Emergency Management Center	Maint and Constr Management Center	evacuation information
Emergency Management Center	Other Emergency Management Centers	emergency plan coordination
Emergency Management Center	Other Emergency Management Centers	incident report

Solution Name:	US: Incident Management - NTCIP Messaging		Number of Issues:	2	Total Issue Severity:	6

Emergency Management Center	Rail Operations Center	emergency plan coordination
Emergency Management Center	Rail Operations Center	evacuation information
Emergency Management Center	Shelter Provider Center	evacuation information
Emergency Management Center	Traffic Management Center	emergency plan coordination
Emergency Management Center	Traffic Management Center	emergency route request
Emergency Management Center	Traffic Management Center	evacuation information
Emergency Management Center	Transit Management Center	emergency plan coordination
Emergency Management Center	Transit Management Center	evacuation information
Emergency Management Center	Transportation Information Center	evacuation information
Fleet and Freight Management Center	Emergency Management Center	hazmat information
Maint and Constr Management Center	Emergency Management Center	emergency plan coordination
Other Emergency Management Centers	Emergency Management Center	emergency plan coordination
Other Emergency Management Centers	Emergency Management Center	incident report
Rail Operations Center	Emergency Management Center	emergency plan coordination
Shelter Provider Center	Emergency Management Center	shelter information
Shelter Provider Center	Transportation Information Center	shelter information
Traffic Management Center	Emergency Management Center	emergency plan coordination
Traffic Management Center	Emergency Management Center	emergency routes
Transit Management Center	Emergency Management Center	emergency plan coordination

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: TCIP/IM/TMDD/ATIS for incident information	Standardise on a single solution for providing incident and incident management information; currently this information is defined within APTA TCIP, IEEE 1512 (IM), ITE TMDD, and SAE ATIS.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Other Emergency Management Centers	incident report
Other Emergency Management Centers	Emergency Management Center	incident report

Solution Name:	US: Incident Management - OMG DDS		Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S.. It combines standards associated with US: Incident Management with those for C-C: OMG DDS. The US: Incident Management standards include upper-layer standards required to implement centre-to-centre communications for incident management data. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: TCIP/IM/TMDD/ATIS for incident information	Standardise on a single solution for providing incident and incident management information; currently this information is defined within APTA TCIP, IEEE 1512 (IM), ITE TMDD, and SAE ATIS.	Urgent	United States

Solution Name:	US: Incident Management - OMG DDS		Number of Issues:	2	Total Issue Severity:	6

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Other Emergency Management Centers	incident report
Other Emergency Management Centers	Emergency Management Center	incident report

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Telecommunications System	incident information for public
Emergency Management Center	Maint and Constr Management Center	emergency plan coordination
Emergency Management Center	Maint and Constr Management Center	evacuation information
Emergency Management Center	Other Emergency Management Centers	emergency plan coordination
Emergency Management Center	Other Emergency Management Centers	incident report
Emergency Management Center	Rail Operations Center	emergency plan coordination
Emergency Management Center	Rail Operations Center	evacuation information
Emergency Management Center	Traffic Management Center	emergency plan coordination
Emergency Management Center	Traffic Management Center	emergency route request
Emergency Management Center	Traffic Management Center	evacuation information
Emergency Management Center	Transit Management Center	emergency plan coordination
Emergency Management Center	Transit Management Center	evacuation information
Emergency Management Center	Transportation Information Center	evacuation information
Fleet and Freight Management Center	Emergency Management Center	hazmat information
Maint and Constr Management Center	Emergency Management Center	emergency plan coordination
Other Emergency Management Centers	Emergency Management Center	emergency plan coordination
Other Emergency Management Centers	Emergency Management Center	incident report
Rail Operations Center	Emergency Management Center	emergency plan coordination
Shelter Provider Center	Emergency Management Center	shelter information
Shelter Provider Center	Transportation Information Center	shelter information
Traffic Management Center	Emergency Management Center	emergency plan coordination
Traffic Management Center	Emergency Management Center	emergency routes
Transit Management Center	Emergency Management Center	emergency plan coordination

Solution Name:	US: Incident Management - OMG DDS RPC		Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with US: Incident Management with those for I-F: OMG DDS RPC. The US: Incident Management standards include upper-layer standards required to implement centre-to-centre communications for incident management data. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

| Solution Name: | US: Incident Management - OMG DDS RPC | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
ITS Roadway Payment Equipment	Traffic Management Center	incident report

| Solution Name: | US: Incident Management - SNMPv3 | | | | Number of Issues: | 1 | Total Issue Severity: | 1 |

This solution is used within the U.S.. It combines standards associated with US: Incident Management with those for I-F: SNMPv3. The US: Incident Management standards include upper-layer standards required to implement centre-to-centre communications for incident management data. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
ITS Roadway Payment Equipment	Traffic Management Center	incident report

| Solution Name: | US: NTCIP CCTV - Mobile SNMPv3 | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP CCTV with those for I-M: Mobile SNMPv3. The US: NTCIP CCTV standards include upper-layer standards required to implement centre-to-field CCTV communications (data only). The I-M: Mobile SNMPv3 standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	traffic images
Maint and Constr Vehicle OBE	ITS Roadway Equipment	video surveillance control

Solution Name:	US: NTCIP CCTV - Mobile SNMPv3				Number of Issues:	2	Total Issue Severity:	4

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	traffic images
Maint and Constr Vehicle OBE	ITS Roadway Equipment	video surveillance control

Solution Name:	US: NTCIP CCTV - OMG DDS RPC				Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with US: NTCIP CCTV with those for I-F: OMG DDS RPC. The US: NTCIP CCTV standards include upper-layer standards required to implement centre-to-field CCTV communications (data only). The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	traffic images
ITS Roadway Equipment	Traffic Management Center	traffic images
Maint and Constr Management Center	ITS Roadway Equipment	video surveillance control
Traffic Management Center	ITS Roadway Equipment	video surveillance control

Solution Name:	US: NTCIP CCTV - SNMPv1				Number of Issues:	1	Total Issue Severity:	8

This solution is used within the U.S.. It combines standards associated with US: NTCIP CCTV with those for I-F: SNMPv1. The US: NTCIP CCTV standards include upper-layer standards required to implement centre-to-field CCTV communications (data only). The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	traffic images
ITS Roadway Equipment	Traffic Management Center	traffic images
Maint and Constr Management Center	ITS Roadway Equipment	video surveillance control
Traffic Management Center	ITS Roadway Equipment	video surveillance control

Solution Name:	US: NTCIP CCTV - SNMPv1/TLS				Number of Issues:	2	Total Issue Severity:	6

Solution Name:	US: NTCIP CCTV - SNMPv1/TLS					Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S.. It combines standards associated with US: NTCIP CCTV with those for I-F: SNMPv1/TLS. The US: NTCIP CCTV standards include upper-layer standards required to implement centre-to-field CCTV communications (data only). The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	traffic images
ITS Roadway Equipment	Traffic Management Center	traffic images
Maint and Constr Management Center	ITS Roadway Equipment	video surveillance control
Traffic Management Center	ITS Roadway Equipment	video surveillance control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	traffic images
ITS Roadway Equipment	Traffic Management Center	traffic images
Maint and Constr Management Center	ITS Roadway Equipment	video surveillance control
Traffic Management Center	ITS Roadway Equipment	video surveillance control

Solution Name:	US: NTCIP CCTV - SNMPv3					Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: NTCIP CCTV with those for I-F: SNMPv3. The US: NTCIP CCTV standards include upper-layer standards required to implement centre-to-field CCTV communications (data only). The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Update data to SNMPv3	Data has been defined for SNMPv1, but needs to be updated to SNMPv3 format.	Medium	I-F: CCTV	Develop an internationally acceptable ITS application specification for exchanging CCTV camera data with a management entity that uses the secure centre-to-field protocol.	Medium-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	traffic images
ITS Roadway Equipment	Traffic Management Center	traffic images
Maint and Constr Management Center	ITS Roadway Equipment	video surveillance control
Traffic Management Center	ITS Roadway Equipment	video surveillance control

Solution Name:	US: NTCIP CCTV - SNMPv3				Number of Issues:	2	Total Issue Severity:	4

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	traffic images
ITS Roadway Equipment	Traffic Management Center	traffic images
Maint and Constr Management Center	ITS Roadway Equipment	video surveillance control
Traffic Management Center	ITS Roadway Equipment	video surveillance control

Solution Name:	US: NTCIP Environmental Sensors - Local Broadcast Wireless (US)				Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for V-X: Local Broadcast Wireless (US). The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
	Destination	Flow Name
Connected Vehicle Roadside Equipment	Maint and Constr Vehicle OBE	environmental sensor data
Maint and Constr Vehicle OBE	Connected Vehicle Roadside Equipment	environmental sensor data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	I-F: Update ESS (non-critical)	Update NTCIP 1204 to enable the representation of accuracy of sensor data so that external systems are able to determine if the data is accurate enough.	Medium-term	United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
	Destination	Flow Name
Connected Vehicle Roadside Equipment	Maint and Constr Vehicle OBE	environmental sensor data
Maint and Constr Vehicle OBE	Connected Vehicle Roadside Equipment	environmental sensor data

Solution Name:	US: NTCIP Environmental Sensors - Mobile Internet (US)				Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for I-M: Mobile Internet (US). The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

| Solution Name: | US: NTCIP Environmental Sensors - Mobile Internet (US) | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Management Center	Maint and Constr Vehicle OBE	environmental sensors control
Maint and Constr Management Center	Maint and Constr Vehicle OBE	maint and constr vehicle system control
Maint and Constr Vehicle OBE	Maint and Constr Management Center	environmental sensor data
Maint and Constr Vehicle OBE	Maint and Constr Management Center	maint and constr vehicle operational data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	I-F: Update ESS (non-critical)	Update NTCIP 1204 to enable the representation of accuracy of sensor data so that external systems are able to determine if the data is accurate enough.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Vehicle OBE	Maint and Constr Management Center	environmental sensor data

| Solution Name: | US: NTCIP Environmental Sensors - Mobile SNMPv1/TLS | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for I-M: Mobile SNMPv1/TLS. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The I-M: Mobile SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security to SNMPv1 implementations (mainly in the US) for mobile use.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Management Center	Maint and Constr Vehicle OBE	environmental sensors control
Maint and Constr Vehicle OBE	Maint and Constr Management Center	environmental sensor data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	I-F: Update ESS (non-critical)	Update NTCIP 1204 to enable the representation of accuracy of sensor data so that external systems are able to determine if the data is accurate enough.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Vehicle OBE	Maint and Constr Management Center	environmental sensor data

Solution Name:	US: NTCIP Environmental Sensors - Mobile SNMPv3				Number of Issues:	3	Total Issue Severity:	5
Solution Name:	US: NTCIP Environmental Sensors - Mobile SNMPv3				Number of Issues:	3	Total Issue Severity:	5

This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for I-M: Mobile SNMPv3. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The I-M: Mobile SNMPv3 standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Management Center	Maint and Constr Vehicle OBE	environmental sensors control
Maint and Constr Management Center	Maint and Constr Vehicle OBE	maint and constr vehicle system control
Maint and Constr Vehicle OBE	Maint and Constr Management Center	environmental sensor data
Maint and Constr Vehicle OBE	Maint and Constr Management Center	maint and constr vehicle operational data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	I-F: Update ESS (non-critical)	Update NTCIP 1204 to enable the representation of accuracy of sensor data so that external systems are able to determine if the data is accurate enough.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Vehicle OBE	Maint and Constr Management Center	environmental sensor data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Management Center	Maint and Constr Vehicle OBE	environmental sensors control
Maint and Constr Management Center	Maint and Constr Vehicle OBE	maint and constr vehicle system control
Maint and Constr Vehicle OBE	Maint and Constr Management Center	environmental sensor data
Maint and Constr Vehicle OBE	Maint and Constr Management Center	maint and constr vehicle operational data

Solution Name:	US: NTCIP Environmental Sensors - OMG DDS RPC				Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for I-F: OMG DDS RPC. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

| Solution Name: | US: NTCIP Environmental Sensors - OMG DDS RPC | | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	I-F: Update ESS (non-critical)	Update NTCIP 1204 to enable the representation of accuracy of sensor data so that external systems are able to determine if the data is accurate enough.		Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	environmental sensor data
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Emissions Management Center	emissions situation data
Emissions Management Center	ITS Roadway Equipment	air quality sensor control
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	environmental sensor data
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data
Maint and Constr Management Center	ITS Roadway Equipment	environmental sensors control
Traffic Management Center	ITS Roadway Equipment	environmental sensors control

| Solution Name: | US: NTCIP Environmental Sensors - SNMPv1 | | | | | | Number of Issues: | 2 | Total Issue Severity: | 9 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for I-F: SNMPv1. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emissions Management Center	ITS Roadway Equipment	air quality sensor control
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data

Solution Name:	US: NTCIP Environmental Sensors - SNMPv1			Number of Issues:	2	Total Issue Severity:	9

ITS Roadway Equipment	Traffic Management Center	environmental sensor data
Maint and Constr Management Center	ITS Roadway Equipment	environmental sensors control
Traffic Management Center	ITS Roadway Equipment	environmental sensors control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	I-F: Update ESS (non-critical)	Update NTCIP 1204 to enable the representation of accuracy of sensor data so that external systems are able to determine if the data is accurate enough.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data

Solution Name:	US: NTCIP Environmental Sensors - SNMPv1/TLS			Number of Issues:	3	Total Issue Severity:	7

This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for I-F: SNMPv1/TLS. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emissions Management Center	ITS Roadway Equipment	air quality sensor control
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data
Maint and Constr Management Center	ITS Roadway Equipment	environmental sensors control
Traffic Management Center	ITS Roadway Equipment	environmental sensors control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	I-F: Update ESS (non-critical)	Update NTCIP 1204 to enable the representation of accuracy of sensor data so that external systems are able to determine if the data is accurate enough.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data

Solution Name:	US: NTCIP Environmental Sensors - SNMPv1/TLS					Number of Issues:	3	Total Issue Severity:	7

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emissions Management Center	ITS Roadway Equipment	air quality sensor control
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data
Maint and Constr Management Center	ITS Roadway Equipment	environmental sensors control
Traffic Management Center	ITS Roadway Equipment	environmental sensors control

Solution Name:	US: NTCIP Environmental Sensors - SNMPv3					Number of Issues:	3	Total Issue Severity:	5

This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for I-F: SNMPv3. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Update data to SNMPv3	Data has been defined for SNMPv1, but needs to be updated to SNMPv3 format.	Medium	I-F: Environmental sensor stations	Develop an internationally acceptable ITS application specification for managing environmental sensor stations for secure communications with proper access control.		Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Emissions Management Center	emissions situation data
Emissions Management Center	ITS Roadway Equipment	air quality sensor control
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	environmental sensor data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data
Maint and Constr Management Center	ITS Roadway Equipment	environmental sensors control
Traffic Management Center	ITS Roadway Equipment	environmental sensors control

| Solution Name: | US: NTCIP Environmental Sensors - SNMPv3 | | | | Number of Issues: | 3 | Total Issue Severity: | 5 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Emissions Management Center	emissions situation data
Emissions Management Center	ITS Roadway Equipment	air quality sensor control
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	environmental sensor data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data
Maint and Constr Management Center	ITS Roadway Equipment	environmental sensors control
Traffic Management Center	ITS Roadway Equipment	environmental sensors control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	I-F: Update ESS (non-critical)	Update NTCIP 1204 to enable the representation of accuracy of sensor data so that external systems are able to determine if the data is accurate enough.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	environmental sensor data
ITS Roadway Equipment	Emissions Management Center	air quality sensor data
ITS Roadway Equipment	Maint and Constr Management Center	environmental sensor data
ITS Roadway Equipment	Traffic Management Center	environmental sensor data

| Solution Name: | US: NTCIP Environmental Sensors - WAVE SNMPv3 | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for V-X: WAVE SNMPv3. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement centre-to-field weather and environmental sensor communications. The V-X: WAVE SNMPv3 standards include lower-layer standards that support connectionless, ultra-low latency vehicle-to-any communications within ~300m using the SNMPv3 over UDP/IP over the 5.9GHz spectrum.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Maint and Constr Vehicle OBE	environmental sensor data
Maint and Constr Vehicle OBE	Connected Vehicle Roadside Equipment	environmental sensor data

Solution Name:	US: NTCIP Environmental Sensors - WAVE SNMPv3				Number of Issues:	2	Total Issue Severity:	4

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	I-F: Update ESS (non-critical)	Update NTCIP 1204 to enable the representation of accuracy of sensor data so that external systems are able to determine if the data is accurate enough.		Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Maint and Constr Vehicle OBE	environmental sensor data
Maint and Constr Vehicle OBE	Connected Vehicle Roadside Equipment	environmental sensor data

Solution Name:	US: NTCIP Generic Objects - OMG DDS RPC				Number of Issues:	2	Total Issue Severity:	11

This solution is used within the U.S.. It combines standards associated with US: NTCIP Generic Objects with those for I-F: OMG DDS RPC. The US: NTCIP Generic Objects standards include upper-layer standards required to implement centre-to-field communications for generic-device functionality. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	Updates for data distribution (critical flows)	Update data dictionary standards to conform to the chosen Data Distribution Technology for those interfaces where this technology might be appropriate. This may include updates to standards such as: TMDD, TCIP, J2735, NTICP, etc. (i.e., this would potentially convert ASN.1 data into the format that is native to the chosen DDT.)		Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE status
Connected Vehicle Roadside Equipment	Service Monitor System	RSE status
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE status
Field Support Equipment	ITS Roadway Equipment	field equipment commands
Field Support Equipment	ITS Roadway Equipment	field equipment configuration settings
ITS Roadway Equipment	Field Support Equipment	field equipment status
ITS Roadway Equipment	Maint and Constr Management Center	field device status
ITS Roadway Equipment	Maint and Constr Management Center	field equipment status

| Solution Name: | US: NTCIP Generic Objects - OMG DDS RPC | | | | Number of Issues: | 2 | Total Issue Severity: | 11 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE status
Connected Vehicle Roadside Equipment	Service Monitor System	RSE status
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE status
Field Support Equipment	ITS Roadway Equipment	field equipment commands
Field Support Equipment	ITS Roadway Equipment	field equipment configuration settings
ITS Roadway Equipment	Field Support Equipment	field equipment status
ITS Roadway Equipment	Maint and Constr Management Center	field device status
ITS Roadway Equipment	Maint and Constr Management Center	field equipment status

| Solution Name: | US: NTCIP Generic Objects - SNMPv1 | | | | Number of Issues: | 1 | Total Issue Severity: | 8 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Generic Objects with those for I-F: SNMPv1. The US: NTCIP Generic Objects standards include upper-layer standards required to implement centre-to-field communications for generic-device functionality. The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	field device status
ITS Roadway Equipment	Maint and Constr Management Center	field equipment status

| Solution Name: | US: NTCIP Generic Objects - SNMPv1/TLS | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Generic Objects with those for I-F: SNMPv1/TLS. The US: NTCIP Generic Objects standards include upper-layer standards required to implement centre-to-field communications for generic-device functionality. The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

| Solution Name: | US: NTCIP Generic Objects - SNMPv1/TLS | | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	field device status
ITS Roadway Equipment	Maint and Constr Management Center	field equipment status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	field device status
ITS Roadway Equipment	Maint and Constr Management Center	field equipment status

| Solution Name: | US: NTCIP Generic Objects - SNMPv3 | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Generic Objects with those for I-F: SNMPv3. The US: NTCIP Generic Objects standards include upper-layer standards required to implement centre-to-field communications for generic-device functionality. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Update data to SNMPv3	Data has been defined for SNMPv1, but needs to be updated to SNMPv3 format.	Medium	Develop ITS-wide reference data model	Develop an internationally representative ITS-wide reference data model that will enable better data sharing across disparate enterprise systems with data defined by different entities, working groups, and standards development organisations.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE status
Connected Vehicle Roadside Equipment	Service Monitor System	RSE status
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE status
Field Support Equipment	ITS Roadway Equipment	field equipment commands
Field Support Equipment	ITS Roadway Equipment	field equipment configuration settings
ITS Roadway Equipment	Field Support Equipment	field equipment status
ITS Roadway Equipment	Maint and Constr Management Center	field device status
ITS Roadway Equipment	Maint and Constr Management Center	field equipment status

| Solution Name: | | US: NTCIP Generic Objects - SNMPv3 | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Field Support Equipment	RSE status
Connected Vehicle Roadside Equipment	Service Monitor System	RSE status
Field Support Equipment	Connected Vehicle Roadside Equipment	RSE status
Field Support Equipment	ITS Roadway Equipment	field equipment commands
Field Support Equipment	ITS Roadway Equipment	field equipment configuration settings
ITS Roadway Equipment	Field Support Equipment	field equipment status
ITS Roadway Equipment	Maint and Constr Management Center	field device status
ITS Roadway Equipment	Maint and Constr Management Center	field equipment status

| Solution Name: | | US: NTCIP Lighting - OMG DDS RPC | | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Lighting with those for I-F: OMG DDS RPC. The US: NTCIP Lighting standards include upper-layer standards required to implement centre-to-field communications with highway lighting systems. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	lighting system status
Traffic Management Center	ITS Roadway Equipment	lighting system control data

| Solution Name: | | US: NTCIP Lighting - SNMPv1 | | | | | Number of Issues: | 1 | Total Issue Severity: | 8 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Lighting with those for I-F: SNMPv1. The US: NTCIP Lighting standards include upper-layer standards required to implement centre-to-field communications with highway lighting systems. The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	lighting system status
Traffic Management Center	ITS Roadway Equipment	lighting system control data

Solution Name:	US: NTCIP Lighting - SNMPv1		Number of Issues:	1	Total Issue Severity:	8

Solution Name:	US: NTCIP Lighting - SNMPv1/TLS		Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S.. It combines standards associated with US: NTCIP Lighting with those for I-F: SNMPv1/TLS. The US: NTCIP Lighting standards include upper-layer standards required to implement centre-to-field communications with highway lighting systems. The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	lighting system status
Traffic Management Center	ITS Roadway Equipment	lighting system control data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	lighting system status
Traffic Management Center	ITS Roadway Equipment	lighting system control data

Solution Name:	US: NTCIP Lighting - SNMPv3		Number of Issues:	1	Total Issue Severity:	1

This solution is used within the U.S.. It combines standards associated with US: NTCIP Lighting with those for I-F: SNMPv3. The US: NTCIP Lighting standards include upper-layer standards required to implement centre-to-field communications with highway lighting systems. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	lighting system status
Traffic Management Center	ITS Roadway Equipment	lighting system control data

Solution Name:	US: NTCIP Message Sign - Mobile SNMPv3		Number of Issues:	3	Total Issue Severity:	7

This solution is used within the U.S.. It combines standards associated with US: NTCIP Message Sign with those for I-M: Mobile SNMPv3. The US: NTCIP Message Sign standards include upper-layer standards required to implement centre-to-field message sign communications. The I-M: Mobile SNMPv3 standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).

| Solution Name: | US: NTCIP Message Sign - Mobile SNMPv3 | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Update data to SNMPv3	Data has been defined for SNMPv1, but needs to be updated to SNMPv3 format.	Medium	I-F: Message signs	Develop an internationally acceptable ITS application specification for managing message signs for secure communications with proper access control.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	roadway dynamic signage status
Maint and Constr Vehicle OBE	ITS Roadway Equipment	roadway dynamic signage data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	roadway dynamic signage status
Maint and Constr Vehicle OBE	ITS Roadway Equipment	roadway dynamic signage data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	roadway dynamic signage status
Maint and Constr Vehicle OBE	ITS Roadway Equipment	roadway dynamic signage data

| Solution Name: | US: NTCIP Message Sign - OMG DDS RPC | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Message Sign with those for I-F: OMG DDS RPC. The US: NTCIP Message Sign standards include upper-layer standards required to implement centre-to-field message sign communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Message signs	Develop an internationally acceptable ITS application specification for managing message signs for secure communications with proper access control.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
Traffic Management Center	ITS Roadway Equipment	roadway warning system control

Solution Name:	US: NTCIP Message Sign - OMG DDS RPC				Number of Issues:	2	Total Issue Severity:	35

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Speed warning	Develop an internationally acceptable ITS application specification for providing roadway configuration data, current speed limits , warning parameters and thresholds to a speed warning application.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	roadway dynamic signage data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	roadway dynamic signage status
ITS Roadway Equipment	Maint and Constr Management Center	roadway dynamic signage status
ITS Roadway Equipment	Other ITS Roadway Equipment	dynamic sign coordination
ITS Roadway Equipment	Traffic Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Maint and Constr Management Center	ITS Roadway Equipment	roadway dynamic signage data
Other ITS Roadway Equipment	ITS Roadway Equipment	dynamic sign coordination
Traffic Management Center	ITS Roadway Equipment	lane management control
Traffic Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	roadway warning system control
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Solution Name:	US: NTCIP Message Sign - SNMPv1				Number of Issues:	2	Total Issue Severity:	40

This solution is used within the U.S.. It combines standards associated with US: NTCIP Message Sign with those for I-F: SNMPv1. The US: NTCIP Message Sign standards include upper-layer standards required to implement centre-to-field message sign communications. The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Solution Name:	US: NTCIP Message Sign - SNMPv1				Number of Issues:	2	Total Issue Severity:	40

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	**Destination**	**Flow Name**
ITS Roadway Equipment	Maint and Constr Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Maint and Constr Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	lane management control
Traffic Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	roadway warning system control
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Speed warning	Develop an internationally acceptable ITS application specification for providing roadway configuration data, current speed limits , warning parameters and thresholds to a speed warning application.	Urgent	Australia, European Union, United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	**Destination**	**Flow Name**
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Message signs	Develop an internationally acceptable ITS application specification for managing message signs for secure communications with proper access control.	Urgent	Australia, European Union, United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	**Destination**	**Flow Name**
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
Traffic Management Center	ITS Roadway Equipment	roadway warning system control

Solution Name:	US: NTCIP Message Sign - SNMPv1/TLS				Number of Issues:	3	Total Issue Severity:	38

This solution is used within the U.S.. It combines standards associated with US: NTCIP Message Sign with those for I-F: SNMPv1/TLS. The US: NTCIP Message Sign standards include upper-layer standards required to implement centre-to-field message sign communications. The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	**Destination**	**Flow Name**
ITS Roadway Equipment	Maint and Constr Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway dynamic signage status

Solution Name:	US: NTCIP Message Sign - SNMPv1/TLS			Number of Issues:	3	Total Issue Severity:	38

ITS Roadway Equipment	Traffic Management Center	roadway warning system status
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Maint and Constr Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	lane management control
Traffic Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	roadway warning system control
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Message signs	Develop an internationally acceptable ITS application specification for managing message signs for secure communications with proper access control.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
Traffic Management Center	ITS Roadway Equipment	roadway warning system control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Speed warning	Develop an internationally acceptable ITS application specification for providing roadway configuration data, current speed limits , warning parameters and thresholds to a speed warning application.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Solution Name:	US: NTCIP Message Sign - SNMPv1/TLS				Number of Issues:	3	Total Issue Severity:	38

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Maint and Constr Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	lane management control
Traffic Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	roadway warning system control
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Solution Name:	US: NTCIP Message Sign - SNMPv3				Number of Issues:	3	Total Issue Severity:	36

This solution is used within the U.S.. It combines standards associated with US: NTCIP Message Sign with those for I-F: SNMPv3. The US: NTCIP Message Sign standards include upper-layer standards required to implement centre-to-field message sign communications. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Speed warning	Develop an internationally acceptable ITS application specification for providing roadway configuration data, current speed limits , warning parameters and thresholds to a speed warning application.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Message signs	Develop an internationally acceptable ITS application specification for managing message signs for secure communications with proper access control.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
Traffic Management Center	ITS Roadway Equipment	roadway warning system control

| Solution Name: | US: NTCIP Message Sign - SNMPv3 | | | | Number of Issues: | 3 | Total Issue Severity: | 36 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Update data to SNMPv3	Data has been defined for SNMPv1, but needs to be updated to SNMPv3 format.	Medium	I-F: Message signs	Develop an internationally acceptable ITS application specification for managing message signs for secure communications with proper access control.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	roadway dynamic signage data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	roadway dynamic signage status
ITS Roadway Equipment	Maint and Constr Management Center	roadway dynamic signage status
ITS Roadway Equipment	Other ITS Roadway Equipment	dynamic sign coordination
ITS Roadway Equipment	Traffic Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Maint and Constr Management Center	ITS Roadway Equipment	roadway dynamic signage data
Other ITS Roadway Equipment	ITS Roadway Equipment	dynamic sign coordination
Traffic Management Center	ITS Roadway Equipment	lane management control
Traffic Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	roadway warning system control
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Solution Name:	US: NTCIP Message Sign - SNMPv3					Number of Issues:	3	Total Issue Severity:	36

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description			Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.			Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	roadway dynamic signage data
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	roadway dynamic signage status
ITS Roadway Equipment	Maint and Constr Management Center	roadway dynamic signage status
ITS Roadway Equipment	Other ITS Roadway Equipment	dynamic sign coordination
ITS Roadway Equipment	Traffic Management Center	roadway dynamic signage status
ITS Roadway Equipment	Traffic Management Center	roadway warning system status
ITS Roadway Equipment	Traffic Management Center	variable speed limit status
Maint and Constr Management Center	ITS Roadway Equipment	roadway dynamic signage data
Other ITS Roadway Equipment	ITS Roadway Equipment	dynamic sign coordination
Traffic Management Center	ITS Roadway Equipment	lane management control
Traffic Management Center	ITS Roadway Equipment	roadway dynamic signage data
Traffic Management Center	ITS Roadway Equipment	roadway warning system control
Traffic Management Center	ITS Roadway Equipment	variable speed limit control

Solution Name:	US: NTCIP Ramp Meters - OMG DDS RPC					Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with US: NTCIP Ramp Meters with those for I-F: OMG DDS RPC. The US: NTCIP Ramp Meters standards include upper-layer standards required to implement centre-to-field ramp meter communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description			Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.			Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	traffic metering status
Traffic Management Center	ITS Roadway Equipment	traffic metering control

Solution Name:	US: NTCIP Ramp Meters - SNMPv1					Number of Issues:	1	Total Issue Severity:	8

This solution is used within the U.S.. It combines standards associated with US: NTCIP Ramp Meters with those for I-F: SNMPv1. The US: NTCIP Ramp Meters standards include upper-layer standards required to implement centre-to-field ramp meter communications. The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

| Solution Name: | US: NTCIP Ramp Meters - SNMPv1 | | | | Number of Issues: | 1 | Total Issue Severity: | 8 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	traffic metering status
Traffic Management Center	ITS Roadway Equipment	traffic metering control

| Solution Name: | US: NTCIP Ramp Meters - SNMPv1/TLS | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Ramp Meters with those for I-F: SNMPv1/TLS. The US: NTCIP Ramp Meters standards include upper-layer standards required to implement centre-to-field ramp meter communications. The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	traffic metering status
Traffic Management Center	ITS Roadway Equipment	traffic metering control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	traffic metering status
Traffic Management Center	ITS Roadway Equipment	traffic metering control

| Solution Name: | US: NTCIP Ramp Meters - SNMPv3 | | | | Number of Issues: | 1 | Total Issue Severity: | 1 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Ramp Meters with those for I-F: SNMPv3. The US: NTCIP Ramp Meters standards include upper-layer standards required to implement centre-to-field ramp meter communications. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

| Solution Name: | US: NTCIP Ramp Meters - SNMPv3 | | | | Number of Issues: | 1 | Total Issue Severity: | 1 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	traffic metering status
Traffic Management Center	ITS Roadway Equipment	traffic metering control

| Solution Name: | US: NTCIP Signal Priority - NTCIP Messaging | | | | Number of Issues: | 3 | Total Issue Severity: | 43 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal Priority with those for C-C: NTCIP Messaging. The US: NTCIP Signal Priority standards include upper-layer standards required to implement centre-to-field traffic signal control priority communications (e.g., for busses and emergency vehicles). The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Transit Management Center	traffic control priority status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Transit Management Center	traffic control priority status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Transit Management Center	traffic control priority status

Solution Name:	US: NTCIP Signal Priority - OMG DDS				Number of Issues:	2	Total Issue Severity:	35

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal Priority with those for C-C: OMG DDS. The US: NTCIP Signal Priority standards include upper-layer standards required to implement centre-to-field traffic signal control priority communications (e.g., for busses and emergency vehicles). The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Transit Management Center	traffic control priority status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Transit Management Center	traffic control priority status

Solution Name:	US: NTCIP Signal Priority - OMG DDS RPC				Number of Issues:	2	Total Issue Severity:	35

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal Priority with those for I-F: OMG DDS RPC. The US: NTCIP Signal Priority standards include upper-layer standards required to implement centre-to-field traffic signal control priority communications (e.g., for busses and emergency vehicles). The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Signal control	Develop an internationally acceptable ITS application specification for the interface between a traffic signal controller and a roadside station to exchange raw data related to the SPaT, SRM, and SSM using the secure centre-to-field protocol.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal preemption request
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal priority service request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Solution Name:	US: NTCIP Signal Priority - OMG DDS RPC				Number of Issues:	2	Total Issue Severity:	35

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal preemption request
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal priority service request
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Solution Name:	US: NTCIP Signal Priority - SNMPv1				Number of Issues:	2	Total Issue Severity:	40

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal Priority with those for I-F: SNMPv1. The US: NTCIP Signal Priority standards include upper-layer standards required to implement centre-to-field traffic signal control priority communications (e.g., for busses and emergency vehicles). The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.		Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Solution Name:	US: NTCIP Signal Priority - SNMPv1/TLS				Number of Issues:	3	Total Issue Severity:	38

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal Priority with those for I-F: SNMPv1/TLS. The US: NTCIP Signal Priority standards include upper-layer standards required to implement centre-to-field traffic signal control priority communications (e.g., for busses and emergency vehicles). The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

| Solution Name: | US: NTCIP Signal Priority - SNMPv1/TLS | | | Number of Issues: | 3 | Total Issue Severity: | 38 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

| Solution Name: | US: NTCIP Signal Priority - SNMPv3 | | | Number of Issues: | 3 | Total Issue Severity: | 36 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal Priority with those for I-F: SNMPv3. The US: NTCIP Signal Priority standards include upper-layer standards required to implement centre-to-field traffic signal control priority communications (e.g., for busses and emergency vehicles). The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Signal control	Develop an internationally acceptable ITS application specification for the interface between a traffic signal controller and a roadside station to exchange raw data related to the SPaT, SRM, and SSM using the secure centre-to-field protocol.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal preemption request
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal priority service request

| Solution Name: | US: NTCIP Signal Priority - SNMPv3 | | | | Number of Issues: | 3 | Total Issue Severity: | 36 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Update data to SNMPv3	Data has been defined for SNMPv1, but needs to be updated to SNMPv3 format.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal preemption request
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal priority service request
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal preemption request
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal priority service request
ITS Roadway Equipment	Traffic Management Center	right-of-way request notification

| Solution Name: | US: NTCIP Signal System Masters - OMG DDS RPC | | | | Number of Issues: | 2 | Total Issue Severity: | 35 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal System Masters with those for I-F: OMG DDS RPC. The US: NTCIP Signal System Masters standards include upper-layer standards required to implement centre-to-field signal-system master communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Solution Name:	US: NTCIP Signal System Masters - OMG DDS RPC				Number of Issues:	2	Total Issue Severity:	35

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Solution Name:	US: NTCIP Signal System Masters - SNMPv1				Number of Issues:	2	Total Issue Severity:	40

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal System Masters with those for I-F: SNMPv1. The US: NTCIP Signal System Masters standards include upper-layer standards required to implement centre-to-field signal-system master communications. The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.		Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Solution Name:	US: NTCIP Signal System Masters - SNMPv1/TLS				Number of Issues:	3	Total Issue Severity:	38

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal System Masters with those for I-F: SNMPv1/TLS. The US: NTCIP Signal System Masters standards include upper-layer standards required to implement centre-to-field signal-system master communications. The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

| Solution Name: | US: NTCIP Signal System Masters - SNMPv1/TLS | | | | Number of Issues: | 3 | Total Issue Severity: | 38 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

| Solution Name: | US: NTCIP Signal System Masters - SNMPv3 | | | | Number of Issues: | 3 | Total Issue Severity: | 36 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal System Masters with those for I-F: SNMPv3. The US: NTCIP Signal System Masters standards include upper-layer standards required to implement centre-to-field signal-system master communications. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

| Solution Name: | US: NTCIP Signal System Masters - SNMPv3 | | | | Number of Issues: | 3 | Total Issue Severity: | 36 |

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Update data to SNMPv3	Data has been defined for SNMPv1, but needs to be updated to SNMPv3 format.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	ITS Roadway Equipment	signal control commands
Traffic Management Center	ITS Roadway Equipment	signal control device configuration
Traffic Management Center	ITS Roadway Equipment	signal system configuration

| Solution Name: | US: NTCIP Traffic Signal - OMG DDS RPC | | | | Number of Issues: | 5 | Total Issue Severity: | 49 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Traffic Signal with those for I-F: OMG DDS RPC. The US: NTCIP Traffic Signal standards include upper-layer standards required to implement centre-to-field traffic signal communications. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	signal control plans

Solution Name:	US: NTCIP Traffic Signal - OMG DDS RPC				Number of Issues:	5	Total Issue Severity:	49

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	I-F: Signal control	Develop an internationally acceptable ITS application specification for the interface between a traffic signal controller and a roadside station to exchange raw data related to the SPaT, SRM, and SSM using the secure centre-to-field protocol.		Urgent	Australia, European Union, United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.		Urgent	United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Dialogs are not fully defined (medium)	The specific dialogs for exchanging this data have not been fully defined.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.		Urgent	United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	pedestrian location information
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal service request
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	conflict monitor status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	pedestrian crossing status
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control coordination
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control coordination
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

Solution Name:	US: NTCIP Traffic Signal - OMG DDS RPC			Number of Issues:	5	Total Issue Severity:	49

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	pedestrian location information
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal service request
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	conflict monitor status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	pedestrian crossing status
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control coordination
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control coordination
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

Solution Name:	US: NTCIP Traffic Signal - SNMPv1			Number of Issues:	4	Total Issue Severity:	46

This solution is used within the U.S.. It combines standards associated with US: NTCIP Traffic Signal with those for I-F: SNMPv1. The US: NTCIP Traffic Signal standards include upper-layer standards required to implement centre-to-field traffic signal communications. The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

| Solution Name: | US: NTCIP Traffic Signal - SNMPv1 | | | Number of Issues: | 4 | Total Issue Severity: | 46 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	signal control status
Traffic Management Center	ITS Roadway Equipment	signal control plans

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Dialogs are not fully defined (medium)	The specific dialogs for exchanging this data have not been fully defined.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

| Solution Name: | US: NTCIP Traffic Signal - SNMPv1/TLS | | | Number of Issues: | 5 | Total Issue Severity: | 44 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Traffic Signal with those for I-F: SNMPv1/TLS. The US: NTCIP Traffic Signal standards include upper-layer standards required to implement centre-to-field traffic signal communications. The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

Solution Name:	US: NTCIP Traffic Signal - SNMPv1/TLS					Number of Issues:	5	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.		Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	signal control status
Traffic Management Center	ITS Roadway Equipment	signal control plans

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Dialogs are not fully defined (medium)	The specific dialogs for exchanging this data have not been fully defined.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.		Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

Solution Name:	US: NTCIP Traffic Signal - SNMPv3					Number of Issues:	6	Total Issue Severity:	50

This solution is used within the U.S.. It combines standards associated with US: NTCIP Traffic Signal with those for I-F: SNMPv3. The US: NTCIP Traffic Signal standards include upper-layer standards required to implement centre-to-field traffic signal communications. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: EU signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.		Urgent	Australia, European Union

| Solution Name: | US: NTCIP Traffic Signal - SNMPv3 | | | | Number of Issues: | 6 | Total Issue Severity: | 50 |

Source	Destination	Flow Name
	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	signal control plans

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Update data to SNMPv3	Data has been defined for SNMPv1, but needs to be updated to SNMPv3 format.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	United States

Source	Destination	Flow Name
	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	pedestrian location information
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal service request
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	conflict monitor status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	pedestrian crossing status
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control coordination
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control coordination
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

| Solution Name: | US: NTCIP Traffic Signal - SNMPv3 | | | | Number of Issues: | 6 | Total Issue Severity: | 50 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	pedestrian location information
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal service request
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	conflict monitor status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	pedestrian crossing status
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control coordination
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control coordination
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	I-F: Signal control	Develop an internationally acceptable ITS application specification for the interface between a traffic signal controller and a roadside station to exchange raw data related to the SPaT, SRM, and SSM using the secure centre-to-field protocol.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status

| Solution Name: | US: NTCIP Traffic Signal - SNMPv3 | | | | | Number of Issues: | 6 | Total Issue Severity: | 50 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Dialogs are not fully defined (medium)	The specific dialogs for exchanging this data have not been fully defined.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	pedestrian location information
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	signal service request
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	conflict monitor status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	intersection control status
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	ITS roadway equipment information
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	pedestrian crossing status
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control coordination
ITS Roadway Equipment	Other ITS Roadway Equipment	signal control data
ITS Roadway Equipment	Traffic Management Center	pedestrian safety warning status
ITS Roadway Equipment	Traffic Management Center	signal control status
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control coordination
Other ITS Roadway Equipment	ITS Roadway Equipment	signal control data
Traffic Management Center	ITS Roadway Equipment	pedestrian safety warning control
Traffic Management Center	ITS Roadway Equipment	signal control plans

| Solution Name: | US: NTCIP Transportation Sensors - Mobile SNMPv3 | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Transportation Sensors with those for I-M: Mobile SNMPv3. The US: NTCIP Transportation Sensors standards include upper-layer standards required to implement centre-to-field transportation sensors (e.g., vehicle detectors) communications (e.g., real-time). The I-M: Mobile SNMPv3 standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	traffic detector data
Maint and Constr Vehicle OBE	ITS Roadway Equipment	traffic detector control

| Solution Name: | **US: NTCIP Transportation Sensors - Mobile SNMPv3** | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	traffic detector data
Maint and Constr Vehicle OBE	ITS Roadway Equipment	traffic detector control

| Solution Name: | **US: NTCIP Transportation Sensors - OMG DDS RPC** | | | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Transportation Sensors with those for I-F: OMG DDS RPC. The US: NTCIP Transportation Sensors standards include upper-layer standards required to implement centre-to-field transportation sensors (e.g., vehicle detectors) communications (e.g., real-time). The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	I-F: Data aggregation	Develop an internationally acceptable ITS application specification for an RSE to aggregate collected data and report the information to interested parties (e.g., centres).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	traffic situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-V: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs/CAMs, sensors, probe data, etc.) between vehicles and remote interested parties (e.g., centres).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic situation data

Solution Name:	US: NTCIP Transportation Sensors - OMG DDS RPC					Number of Issues:	2	Total Issue Severity:	6

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	traffic situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	traffic situation data
ITS Roadway Equipment	Maint and Constr Management Center	speed monitoring information
ITS Roadway Equipment	Maint and Constr Management Center	traffic detector data
ITS Roadway Equipment	Other ITS Roadway Equipment	roadway detector coordination
ITS Roadway Equipment	Traffic Management Center	speed monitoring information
ITS Roadway Equipment	Traffic Management Center	traffic detector data
Maint and Constr Management Center	ITS Roadway Equipment	speed monitoring control
Maint and Constr Management Center	ITS Roadway Equipment	traffic detector control
Other ITS Roadway Equipment	ITS Roadway Equipment	roadway detector coordination
Traffic Management Center	ITS Roadway Equipment	speed monitoring control
Traffic Management Center	ITS Roadway Equipment	traffic detector control

Solution Name:	US: NTCIP Transportation Sensors - SNMPv1					Number of Issues:	1	Total Issue Severity:	8

This solution is used within the U.S.. It combines standards associated with US: NTCIP Transportation Sensors with those for I-F: SNMPv1. The US: NTCIP Transportation Sensors standards include upper-layer standards required to implement centre-to-field transportation sensors (e.g., vehicle detectors) communications (e.g., real-time). The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	speed monitoring information
ITS Roadway Equipment	Maint and Constr Management Center	traffic detector data
ITS Roadway Equipment	Traffic Management Center	speed monitoring information
ITS Roadway Equipment	Traffic Management Center	traffic detector data
Maint and Constr Management Center	ITS Roadway Equipment	speed monitoring control
Maint and Constr Management Center	ITS Roadway Equipment	traffic detector control
Traffic Management Center	ITS Roadway Equipment	speed monitoring control

| Solution Name: | US: NTCIP Transportation Sensors - SNMPv1 | | | Number of Issues: | 1 | Total Issue Severity: | 8 |

| Traffic Management Center | ITS Roadway Equipment | traffic detector control |

| Solution Name: | US: NTCIP Transportation Sensors - SNMPv1/TLS | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Transportation Sensors with those for I-F: SNMPv1/TLS. The US: NTCIP Transportation Sensors standards include upper-layer standards required to implement centre-to-field transportation sensors (e.g., vehicle detectors) communications (e.g., real-time). The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	speed monitoring information
ITS Roadway Equipment	Maint and Constr Management Center	traffic detector data
ITS Roadway Equipment	Traffic Management Center	speed monitoring information
ITS Roadway Equipment	Traffic Management Center	traffic detector data
Maint and Constr Management Center	ITS Roadway Equipment	speed monitoring control
Maint and Constr Management Center	ITS Roadway Equipment	traffic detector control
Traffic Management Center	ITS Roadway Equipment	speed monitoring control
Traffic Management Center	ITS Roadway Equipment	traffic detector control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Management Center	speed monitoring information
ITS Roadway Equipment	Maint and Constr Management Center	traffic detector data
ITS Roadway Equipment	Traffic Management Center	speed monitoring information
ITS Roadway Equipment	Traffic Management Center	traffic detector data
Maint and Constr Management Center	ITS Roadway Equipment	speed monitoring control
Maint and Constr Management Center	ITS Roadway Equipment	traffic detector control
Traffic Management Center	ITS Roadway Equipment	speed monitoring control
Traffic Management Center	ITS Roadway Equipment	traffic detector control

| Solution Name: | US: NTCIP Transportation Sensors - SNMPv3 | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Transportation Sensors with those for I-F: SNMPv3. The US: NTCIP Transportation Sensors standards include upper-layer standards required to implement centre-to-field transportation sensors (e.g., vehicle detectors) communications (e.g., real-time). The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Solution Name:	US: NTCIP Transportation Sensors - SNMPv3				Number of Issues:	3	Total Issue Severity:	7

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Update data to SNMPv3	Data has been defined for SNMPv1, but needs to be updated to SNMPv3 format.	Medium	I-F: Transportation sensor systems	Develop an internationally acceptable ITS application specification for exchanging transportation sensor station data with a management entity that uses the secure centre-to-field protocol.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	traffic situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	traffic situation data
ITS Roadway Equipment	Maint and Constr Management Center	speed monitoring information
ITS Roadway Equipment	Maint and Constr Management Center	traffic detector data
ITS Roadway Equipment	Other ITS Roadway Equipment	roadway detector coordination
ITS Roadway Equipment	Traffic Management Center	speed monitoring information
ITS Roadway Equipment	Traffic Management Center	traffic detector data
Maint and Constr Management Center	ITS Roadway Equipment	speed monitoring control
Maint and Constr Management Center	ITS Roadway Equipment	traffic detector control
Other ITS Roadway Equipment	ITS Roadway Equipment	roadway detector coordination
Traffic Management Center	ITS Roadway Equipment	speed monitoring control
Traffic Management Center	ITS Roadway Equipment	traffic detector control

| Solution Name: | US: NTCIP Transportation Sensors - SNMPv3 | | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	traffic situation data
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic situation data
Connected Vehicle Roadside Equipment	Transportation Information Center	traffic situation data
ITS Roadway Equipment	Maint and Constr Management Center	speed monitoring information
ITS Roadway Equipment	Maint and Constr Management Center	traffic detector data
ITS Roadway Equipment	Other ITS Roadway Equipment	roadway detector coordination
ITS Roadway Equipment	Traffic Management Center	speed monitoring information
ITS Roadway Equipment	Traffic Management Center	traffic detector data
Maint and Constr Management Center	ITS Roadway Equipment	speed monitoring control
Maint and Constr Management Center	ITS Roadway Equipment	traffic detector control
Other ITS Roadway Equipment	ITS Roadway Equipment	roadway detector coordination
Traffic Management Center	ITS Roadway Equipment	speed monitoring control
Traffic Management Center	ITS Roadway Equipment	traffic detector control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	I-F: Data aggregation	Develop an internationally acceptable ITS application specification for an RSE to aggregate collected data and report the information to interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	traffic situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-V: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs/CAMs, sensors, probe data, etc.) between vehicles and remote interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Traffic Management Center	traffic situation data

| Solution Name: | US: NTCIP Warning Device - Mobile Internet (US) | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Warning Device with those for I-M: Mobile Internet (US). The US: NTCIP Warning Device standards include a composite of upper-layer standards that support monitoring for unsafe traffic activities and displaying warning to drivers. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

| Solution Name: | US: NTCIP Warning Device - Mobile Internet (US) | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	work zone warning device control
Emergency Vehicle OBE	Emergency Management Center	work zone warning status
Maint and Constr Management Center	Maint and Constr Vehicle OBE	work zone warning device control
Maint and Constr Vehicle OBE	Maint and Constr Management Center	work zone warning status

| Solution Name: | US: NTCIP Warning Device - Mobile SNMPv3 | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Warning Device with those for I-M: Mobile SNMPv3. The US: NTCIP Warning Device standards include a composite of upper-layer standards that support monitoring for unsafe traffic activities and displaying warning to drivers. The I-M: Mobile SNMPv3 standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	work zone warning device control
Emergency Vehicle OBE	Emergency Management Center	work zone warning status
Maint and Constr Management Center	Maint and Constr Vehicle OBE	work zone warning device control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	work zone warning device control
Emergency Vehicle OBE	Emergency Management Center	work zone warning status
Maint and Constr Management Center	Maint and Constr Vehicle OBE	work zone warning device control

| Solution Name: | US: NTCIP Warning Device - OMG DDS RPC | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: NTCIP Warning Device with those for I-F: OMG DDS RPC. The US: NTCIP Warning Device standards include a composite of upper-layer standards that support monitoring for unsafe traffic activities and displaying warning to drivers. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Solution Name:	US: NTCIP Warning Device - OMG DDS RPC					Number of Issues:	1	Total Issue Severity:	3

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	ITS Roadway Equipment	work zone warning device control
ITS Roadway Equipment	Emergency Management Center	work zone warning status
ITS Roadway Equipment	Maint and Constr Management Center	work zone warning status
Maint and Constr Management Center	ITS Roadway Equipment	work zone warning device control

Solution Name:	US: NTCIP Warning Device - SNMPv1					Number of Issues:	1	Total Issue Severity:	8

This solution is used within the U.S.. It combines standards associated with US: NTCIP Warning Device with those for I-F: SNMPv1. The US: NTCIP Warning Device standards include a composite of upper-layer standards that support monitoring for unsafe traffic activities and displaying warning to drivers. The I-F: SNMPv1 standards include lower-layer standards that define how SNMPv1, which does not provide any security, is used within some deployments within the ITS industry. This solution is no longer recommended due to known security vulnerabilities.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Security not provided	The solution does not provide any significant security and a communications link using this solution is easily hacked.	High	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	ITS Roadway Equipment	work zone warning device control
ITS Roadway Equipment	Emergency Management Center	work zone warning status
ITS Roadway Equipment	Maint and Constr Management Center	work zone warning status
Maint and Constr Management Center	ITS Roadway Equipment	work zone warning device control

Solution Name:	US: NTCIP Warning Device - SNMPv1/TLS					Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S.. It combines standards associated with US: NTCIP Warning Device with those for I-F: SNMPv1/TLS. The US: NTCIP Warning Device standards include a composite of upper-layer standards that support monitoring for unsafe traffic activities and displaying warning to drivers. The I-F: SNMPv1/TLS standards include lower-layer standards that define one way to retrofit basic security into SNMPv1 implementations (mainly in the US); however, this only secures the communications link and does not provide end-application security and is not recommended for new deployments.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	ITS Roadway Equipment	work zone warning device control
ITS Roadway Equipment	Emergency Management Center	work zone warning status
ITS Roadway Equipment	Maint and Constr Management Center	work zone warning status

Solution Name:	US: NTCIP Warning Device - SNMPv1/TLS				Number of Issues:	2	Total Issue Severity:	6

Maint and Constr Management Center	ITS Roadway Equipment	work zone warning device control

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	ITS Roadway Equipment	work zone warning device control
ITS Roadway Equipment	Emergency Management Center	work zone warning status
ITS Roadway Equipment	Maint and Constr Management Center	work zone warning status
Maint and Constr Management Center	ITS Roadway Equipment	work zone warning device control

Solution Name:	US: NTCIP Warning Device - SNMPv3				Number of Issues:	1	Total Issue Severity:	1

This solution is used within the U.S.. It combines standards associated with US: NTCIP Warning Device with those for I-F: SNMPv3. The US: NTCIP Warning Device standards include a composite of upper-layer standards that support monitoring for unsafe traffic activities and displaying warning to drivers. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	ITS Roadway Equipment	work zone warning device control
ITS Roadway Equipment	Emergency Management Center	work zone warning status
ITS Roadway Equipment	Maint and Constr Management Center	work zone warning status
Maint and Constr Management Center	ITS Roadway Equipment	work zone warning device control
Maint and Constr Vehicle OBE	Maint and Constr Management Center	work zone warning status

Solution Name:	US: SAE Basic Safety Messages - Local Broadcast Wireless (US)				Number of Issues:	3	Total Issue Severity:	7

This solution is used within the U.S.. It combines standards associated with US: SAE Basic Safety Messages with those for V-X: Local Broadcast Wireless (US). The US: SAE Basic Safety Messages standards include upper-layer standards required to implement V2V safety information flows. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle path prediction
Transit Vehicle OBE	Personal Information Device	vehicle path prediction

Solution Name:	US: SAE Basic Safety Messages - Local Broadcast Wireless (US)			Number of Issues:	3	Total Issue Severity:	7

Transit Vehicle OBE	Vehicle OBE	vehicle path prediction
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion for surveillance

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	V-L: Trailer information for vehicle location and motion	Standardise the mechanism for the BSM, CAM, and DENM to accurately convey geometric properties related to articulated vehicles.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion for surveillance

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle path prediction
Transit Vehicle OBE	Personal Information Device	vehicle path prediction
Transit Vehicle OBE	Vehicle OBE	vehicle path prediction
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion for surveillance

Solution Name:	US: SAE Basic Safety Messages - WAVE WSMP			Number of Issues:	3	Total Issue Severity:	7

This solution is used within the U.S.. It combines standards associated with US: SAE Basic Safety Messages with those for V-X: WAVE WSMP. The US: SAE Basic Safety Messages standards include upper-layer standards required to implement V2V safety information flows. The V-X: WAVE WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications within ~300m using the WAVE Short Messaging Protocol (WSMP) over the 5.9GHz spectrum. The broadcast mode is interoperable with M5 FNTP.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Other Vehicle OBEs	Connected Vehicle Roadside Equipment	vehicle location and motion
Other Vehicle OBEs	Transit Vehicle OBE	vehicle location and motion
Other Vehicle OBEs	Vehicle OBE	vehicle control event
Other Vehicle OBEs	Vehicle OBE	vehicle location and motion
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Transit Vehicle OBE	Other Vehicle OBEs	vehicle location and motion
Transit Vehicle OBE	Personal Information Device	vehicle location and motion

| Solution Name: | US: SAE Basic Safety Messages - WAVE WSMP | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Transit Vehicle OBE	Vehicle OBE	vehicle location and motion
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle control event
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion for surveillance
Vehicle OBE	Emergency Vehicle OBE	vehicle location and motion
Vehicle OBE	Maint and Constr Vehicle OBE	vehicle location and motion
Vehicle OBE	Other Vehicle OBEs	vehicle control event
Vehicle OBE	Other Vehicle OBEs	vehicle location and motion
Vehicle OBE	Personal Information Device	vehicle location and motion
Vehicle OBE	Transit Vehicle OBE	vehicle location and motion

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	V-L: Trailer information for vehicle location and motion	Standardise the mechanism for the BSM, CAM, and DENM to accurately convey geometric properties related to articulated vehicles.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Other Vehicle OBEs	Vehicle OBE	vehicle location and motion
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion for surveillance
Vehicle OBE	Other Vehicle OBEs	vehicle location and motion

| Solution Name: | US: SAE Basic Safety Messages - WAVE WSMP | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Other Vehicle OBEs	Connected Vehicle Roadside Equipment	vehicle location and motion
Other Vehicle OBEs	Transit Vehicle OBE	vehicle location and motion
Other Vehicle OBEs	Vehicle OBE	vehicle control event
Other Vehicle OBEs	Vehicle OBE	vehicle location and motion
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Transit Vehicle OBE	Other Vehicle OBEs	vehicle location and motion
Transit Vehicle OBE	Personal Information Device	vehicle location and motion
Transit Vehicle OBE	Vehicle OBE	vehicle location and motion
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle control event
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle location and motion for surveillance
Vehicle OBE	Emergency Vehicle OBE	vehicle location and motion
Vehicle OBE	Maint and Constr Vehicle OBE	vehicle location and motion
Vehicle OBE	Other Vehicle OBEs	vehicle control event
Vehicle OBE	Other Vehicle OBEs	vehicle location and motion
Vehicle OBE	Personal Information Device	vehicle location and motion
Vehicle OBE	Transit Vehicle OBE	vehicle location and motion

| Solution Name: | US: SAE J3067 (J2735 SE) - Guaranteed Internet (US) | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-I: Guaranteed Internet (US). The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The I-I: Guaranteed Internet (US) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Emergency Management Center	emergency notification
Connected Vehicle Roadside Equipment	Emergency Management Center	emergency notification relay

Solution Name:	US: SAE J3067 (J2735 SE) - Guaranteed Mobile Internet (US)				Number of Issues:	2	Total Issue Severity:	4
Solution Name:	US: SAE J3067 (J2735 SE) - Guaranteed Mobile Internet (US)				Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-M: Guaranteed Mobile Internet (US). The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The I-M: Guaranteed Mobile Internet (US) standards include lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be actively moving; based on X.509 or 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Internet connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Emergency Management Center	hazmat spill notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data may not be fully defined (low)	The information flow is unclear as to what precisely is needed; the standard may not fully support the needs of the information flow, depending on how it is interpreted.	Low	V-L: Update J2735 for hazmat sensors	Update SAE J2735 to include data concepts for on-board hazmat sensors.	Future	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Emergency Management Center	hazmat spill notification

Solution Name:	US: SAE J3067 (J2735 SE) - Internet (US)				Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-I: Internet (US). The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The I-I: Internet (US) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Commercial Vehicle Check Equipment	driver log
Connected Vehicle Roadside Equipment	Commercial Vehicle Check Equipment	freight equipment information

Solution Name:	US: SAE J3067 (J2735 SE) - Local Broadcast Wireless (US)				Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for V-X: Local Broadcast Wireless (US). The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Solution Name:	US: SAE J3067 (J2735 SE) - Local Broadcast Wireless (US)				Number of Issues:	1	Total Issue Severity:	3

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	freight equipment information
Commercial Vehicle OBE	Emergency Vehicle OBE	hazmat spill notification
Connected Vehicle Roadside Equipment	Vehicle OBE	parking availability
Other Vehicle OBEs	Vehicle OBE	emergency notification relay
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle profile
Vehicle OBE	Connected Vehicle Roadside Equipment	emergency notification relay
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle profile
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle reported emissions
Vehicle OBE	Emergency Vehicle OBE	emergency notification relay
Vehicle OBE	Other Vehicle OBEs	emergency notification relay

Solution Name:	US: SAE J3067 (J2735 SE) - Local Unicast Wireless (US)				Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for V-X: Local Unicast Wireless (US). The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The V-X: Local Unicast Wireless (US) standards include lower-layer standards that support local-area unicast wireless solutions, such as DSRC technologies, LTE, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	commercial vehicle identification
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	driver log
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle profile
Commercial Vehicle OBE	Intermodal Terminal	commercial vehicle identification
Commercial Vehicle OBE	Parking Management System	commercial vehicle identification
Connected Vehicle Roadside Equipment	Vehicle OBE	work zone information
Freight Equipment	Connected Vehicle Roadside Equipment	container location
Freight Equipment	Connected Vehicle Roadside Equipment	freight equipment information
Freight Equipment	Intermodal Terminal	container location
Maint and Constr Vehicle OBE	Vehicle OBE	work zone information

Solution Name:	US: SAE J3067 (J2735 SE) - Local Unicast Wireless (US)					Number of Issues:	2	Total Issue Severity:	6

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Not a standard	The document may be publicly available but it is not currently available as a formal standard and details may change prior to adoption as a standard.	Medium	V-L: US work zone information	Develop an ITS application specification for providing work zone information to vehicles within a local area. This should be based on the currently defined mechanisms in J3067, TPEG2, IVI, and DENM and assist in the development of an ITS-Wide Data Model.		Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	work zone information
Maint and Constr Vehicle OBE	Vehicle OBE	work zone information

Solution Name:	US: SAE J3067 (J2735 SE) - Mobile Internet (US)					Number of Issues:	2	Total Issue Severity:	6

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-M: Mobile Internet (US). The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Commercial Vehicle Administration Center	driver log
Commercial Vehicle OBE	Commercial Vehicle OBE Service Provider	driver log
Commercial Vehicle OBE	Fleet and Freight Management Center	driver log
Commercial Vehicle OBE	Fleet and Freight Management Center	driver to fleet request
Commercial Vehicle OBE	Fleet and Freight Management Center	emergency notification
Commercial Vehicle OBE	Fleet and Freight Management Center	freight equipment information
Commercial Vehicle OBE	Fleet and Freight Management Center	trip log
Emergency Management Center	Emergency Vehicle OBE	suggested route
Emergency Vehicle OBE	Emergency Management Center	emergency notification relay
Fleet and Freight Management Center	Commercial Vehicle OBE	driver log
Fleet and Freight Management Center	Commercial Vehicle OBE	fleet to driver update
Freight Equipment	Fleet and Freight Management Center	freight equipment information
Maint and Constr Management Center	Vehicle OBE	current infrastructure restrictions
Transit Vehicle OBE	Transit Management Center	transit vehicle emissions
Transportation Information Center	Personal Information Device	current infrastructure restrictions
Transportation Information Center	Vehicle OBE	current infrastructure restrictions
Vehicle OBE	Emergency Management Center	emergency notification
Vehicle OBE	Emergency Management Center	emergency notification relay

| Solution Name: | US: SAE J3067 (J2735 SE) - Mobile Internet (US) | | | Number of Issues: | 2 | Total Issue Severity: | 6 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Not a standard	The document may be publicly available but it is not currently available as a formal standard and details may change prior to adoption as a standard.	Medium	C-V: Routing of emergency vehicles	Develop an acceptable ITS application specification for a center to provide suggested routes to emergency vehicles during emergency response, specifically considering TPEG2, which already claims support for this feature.	Medium-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	suggested route

| Solution Name: | US: SAE J3067 (J2735 SE) - NTCIP Messaging | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for C-C: NTCIP Messaging. The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	driver log
Commercial Vehicle OBE Service Provider	Commercial Vehicle Check Equipment	driver log
Commercial Vehicle OBE Service Provider	Fleet and Freight Management Center	driver log
Commercial Vehicle OBE Service Provider	Other CVOBE Service Provider	driver log
Connected Vehicle Roadside Equipment	Commercial Vehicle Administration Center	driver log
Connected Vehicle Roadside Equipment	Intermodal Terminal	commercial vehicle identification
Connected Vehicle Roadside Equipment	Intermodal Terminal	container location
Fleet and Freight Management Center	Commercial Vehicle Administration Center	driver log
Other CVOBE Service Provider	Commercial Vehicle OBE Service Provider	driver log

| Solution Name: | US: SAE J3067 (J2735 SE) - OMG DDS | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for C-C: OMG DDS. The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

| Solution Name: | US: SAE J3067 (J2735 SE) - OMG DDS | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle Check Equipment	Commercial Vehicle Administration Center	driver log
Commercial Vehicle OBE Service Provider	Commercial Vehicle Check Equipment	driver log
Commercial Vehicle OBE Service Provider	Fleet and Freight Management Center	driver log
Commercial Vehicle OBE Service Provider	Other CVOBE Service Provider	driver log
Fleet and Freight Management Center	Commercial Vehicle Administration Center	driver log
Other CVOBE Service Provider	Commercial Vehicle OBE Service Provider	driver log

| Solution Name: | US: SAE J3067 (J2735 SE) - OMG DDS RPC | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-F: OMG DDS RPC. The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Commercial Vehicle Administration Center	driver log
Connected Vehicle Roadside Equipment	Emergency Management Center	emergency notification
Connected Vehicle Roadside Equipment	Emergency Management Center	emergency notification relay
Connected Vehicle Roadside Equipment	Parking Management System	commercial vehicle identification

| Solution Name: | US: SAE J3067 (J2735 SE) - SNMPv3 | | | | Number of Issues: | 1 | Total Issue Severity: | 1 |

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-F: SNMPv3. The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Solution Name:	US: SAE J3067 (J2735 SE) - SNMPv3		Number of Issues:	1	Total Issue Severity:	1

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Commercial Vehicle Administration Center	driver log
Connected Vehicle Roadside Equipment	Emergency Management Center	emergency notification
Connected Vehicle Roadside Equipment	Emergency Management Center	emergency notification relay
Connected Vehicle Roadside Equipment	Parking Management System	commercial vehicle identification

Solution Name:	US: SAE J3067 (J2735 SE) - WAVE WSMP		Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for V-X: WAVE WSMP. The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance charcateristics. The V-X: WAVE WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications within ~300m using the WAVE Short Messaging Protocol (WSMP) over the 5.9GHz spectrum. The broadcast mode is interoperable with M5 FNTP.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Other Vehicle OBEs	Vehicle OBE	emergency notification
Vehicle OBE	Connected Vehicle Roadside Equipment	emergency notification
Vehicle OBE	Emergency Vehicle OBE	emergency notification
Vehicle OBE	Other Vehicle OBEs	emergency notification

Solution Name:	US: SAE Other J2735 - Guaranteed Internet (US)		Number of Issues:	4	Total Issue Severity:	39

This solution is used within the U.S. It combines upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics with lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be actively moving; based on X.509 or 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method. This set of standards includes WAVE as one alternative, which may be used in remote areas without cell coverage.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Map Update System	Center	intersection geometry

| Solution Name: | US: SAE Other J2735 - Guaranteed Internet (US) | | | | | Number of Issues: | 4 | Total Issue Severity: | 39 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

| Solution Name: | US: SAE Other J2735 - Guaranteed Mobile Internet (US) | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S. It combines standards associated with US: SAE Other J2735 with those for I-M: Guaranteed Mobile Internet (US). The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The I-M: Guaranteed Mobile Internet (US) standards include lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be actively moving; based on X.509 or 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Fleet and Freight Management Center	Commercial Vehicle OBE	road weather advisories
Maint and Constr Management Center	Personal Information Device	road weather advisories
Maint and Constr Management Center	Vehicle OBE	road weather advisories

| Solution Name: | US: SAE Other J2735 - Guaranteed Mobile Internet (US) | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Fleet and Freight Management Center	Commercial Vehicle OBE	road weather advisories
Maint and Constr Management Center	Personal Information Device	road weather advisories
Maint and Constr Management Center	Vehicle OBE	road weather advisories

| Solution Name: | US: SAE Other J2735 - Guaranteed Mobile Internet (US), with WAVE alternative | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for V-X: Guaranteed Mobile Internet (US), with WAVE alternative. The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The V-X: Guaranteed Mobile Internet (US), with WAVE alternative standards include lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be actively moving; based on X.509 or 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method. This set of standards includes WAVE as one alternative, which may be used in remote areas without cell coverage.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Other EV OBEs	work zone warning notification
Other EV OBEs	Emergency Vehicle OBE	work zone warning notification

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Other EV OBEs	work zone warning notification
Other EV OBEs	Emergency Vehicle OBE	work zone warning notification

| Solution Name: | US: SAE Other J2735 - Internet (US) | | | | | Number of Issues: | 4 | Total Issue Severity: | 10 |

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for I-I: Internet (US). The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The I-I: Internet (US) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.

| Solution Name: | US: SAE Other J2735 - Internet (US) | | | | Number of Issues: | 4 | Total Issue Severity: | 10 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-C: WAID	Develop an internationally acceptable ITS application specification for providing information from a centre to a WAID for wide-area dissemination.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-C: WAID	Develop an internationally acceptable ITS application specification for providing information from a centre to a WAID for wide-area dissemination.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Wide Area Information Disseminator	broadcast traveler information

| Solution Name: | US: SAE Other J2735 - Local Broadcast Wireless (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for V-X: Local Broadcast Wireless (US). The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

| Solution Name: | US: SAE Other J2735 - Local Broadcast Wireless (US) | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Emergency Vehicle OBE	vehicle collision information
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	work zone warning notification
Connected Vehicle Roadside Equipment	Maint and Constr Vehicle OBE	work zone warning notification
Connected Vehicle Roadside Equipment	Personal Information Device	location correction
Connected Vehicle Roadside Equipment	Personal Information Device	personal safety warning
Connected Vehicle Roadside Equipment	Personal Information Device	signal service status
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	restricted lanes application info
Connected Vehicle Roadside Equipment	Vehicle OBE	arriving train information
Connected Vehicle Roadside Equipment	Vehicle OBE	lane closure information
Connected Vehicle Roadside Equipment	Vehicle OBE	location correction
Connected Vehicle Roadside Equipment	Vehicle OBE	rail crossing warning
Connected Vehicle Roadside Equipment	Vehicle OBE	restricted lanes application info
Connected Vehicle Roadside Equipment	Vehicle OBE	road closure information
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle situation data parameters
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	work zone warning notification
Emergency Vehicle OBE	Personal Information Device	personal safety warning
Maint and Constr Vehicle OBE	Connected Vehicle Roadside Equipment	work zone warning notification
Maint and Constr Vehicle OBE	Other MCV OBEs	work zone warning notification
Other MCV OBEs	Maint and Constr Vehicle OBE	work zone warning notification
Other Vehicle OBEs	Vehicle OBE	vehicle environmental data
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle environmental data
Vehicle OBE	Emergency Vehicle OBE	vehicle collision information
Vehicle OBE	Other Vehicle OBEs	vehicle environmental data

| Solution Name: | US: SAE Other J2735 - Local Broadcast Wireless (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Emergency Vehicle OBE	vehicle collision information
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	work zone warning notification
Connected Vehicle Roadside Equipment	Maint and Constr Vehicle OBE	work zone warning notification
Connected Vehicle Roadside Equipment	Personal Information Device	location correction
Connected Vehicle Roadside Equipment	Personal Information Device	personal safety warning
Connected Vehicle Roadside Equipment	Personal Information Device	signal service status
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	restricted lanes application info
Connected Vehicle Roadside Equipment	Vehicle OBE	arriving train information
Connected Vehicle Roadside Equipment	Vehicle OBE	lane closure information
Connected Vehicle Roadside Equipment	Vehicle OBE	location correction
Connected Vehicle Roadside Equipment	Vehicle OBE	rail crossing warning
Connected Vehicle Roadside Equipment	Vehicle OBE	restricted lanes application info
Connected Vehicle Roadside Equipment	Vehicle OBE	road closure information
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle situation data parameters
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	work zone warning notification
Emergency Vehicle OBE	Personal Information Device	personal safety warning
Maint and Constr Vehicle OBE	Connected Vehicle Roadside Equipment	work zone warning notification
Maint and Constr Vehicle OBE	Other MCV OBEs	work zone warning notification
Other MCV OBEs	Maint and Constr Vehicle OBE	work zone warning notification
Other Vehicle OBEs	Vehicle OBE	vehicle environmental data
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle environmental data
Vehicle OBE	Emergency Vehicle OBE	vehicle collision information
Vehicle OBE	Other Vehicle OBEs	vehicle environmental data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	V-L: Environmental data sharing	Develop an internationally acceptable ITS application specification for sharing environmental data from vehicles to other local entities. The effort should consider efforts to date under both J2735 and DENM.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Other Vehicle OBEs	Vehicle OBE	vehicle environmental data
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle environmental data
Vehicle OBE	Other Vehicle OBEs	vehicle environmental data

| Solution Name: | US: SAE Other J2735 - Local Broadcast Wireless (US) | | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	Secure and accurate location and time standards	Develop/adopt an internationally acceptable standard/solution for synchronising and continuously maintaining location and time information throughout the ITS environment in a secure and reliable manner with sufficient accuracy (including leap seconds) and confidence.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	location correction
Connected Vehicle Roadside Equipment	Vehicle OBE	location correction

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	V-L: US traveler information	Develop an ITS application specification for providing in-vehicle signage and other traveler information to the vehicle from the roadside. This will also need to address issues such as when and how to locally generate traveler information messages and how to sign these messages.		Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	lane closure information
Connected Vehicle Roadside Equipment	Vehicle OBE	road closure information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs/CAMs, sensors, probe data, etc.) between vehicles and remote interested parties (e.g., centres).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle situation data parameters

| Solution Name: | US: SAE Other J2735 - Local Unicast Wireless (US) | | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for V-X: Local Unicast Wireless (US). The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The V-X: Local Unicast Wireless (US) standards include lower-layer standards that support local-area unicast wireless solutions, such as DSRC technologies, LTE, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Connected Vehicle Roadside Equipment	personal signal service request
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle situation data

| Solution Name: | US: SAE Other J2735 - Local Unicast Wireless (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Connected Vehicle Roadside Equipment	personal signal service request
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs/CAMs, sensors, probe data, etc.) between vehicles and remote interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Vehicle OBE	Connected Vehicle Roadside Equipment	vehicle situation data

| Solution Name: | US: SAE Other J2735 - Mobile Internet (US) | | | | Number of Issues: | 6 | Total Issue Severity: | 50 |

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for I-M: Mobile Internet (US). The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-V: Secure communications	Develop one or more internationally acceptable, secure, centre-vehicle communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Fleet and Freight Management Center	vehicle environmental data
Data Distribution System	Vehicle OBE	vehicle situation data parameters
Emergency Vehicle OBE	Emergency Management Center	emergency vehicle tracking data
Surface Transportation Weather Service	Vehicle OBE	transportation weather information
Traffic Management Center	Vehicle OBE	intersection status
Traffic Management Center	Vehicle OBE	lane closure information
Transportation Information Center	Vehicle OBE	vehicle situation data parameters
Vehicle OBE	Data Distribution System	vehicle situation data
Vehicle OBE	Map Update System	vehicle location and motion for mapping
Vehicle OBE	Transportation Information Center	vehicle environmental data
Vehicle OBE	Transportation Information Center	vehicle situation data

| Solution Name: | US: SAE Other J2735 - Mobile Internet (US) | | | | Number of Issues: | 6 | Total Issue Severity: | 50 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Fleet and Freight Management Center	vehicle environmental data
Data Distribution System	Vehicle OBE	vehicle situation data parameters
Emergency Vehicle OBE	Emergency Management Center	emergency vehicle tracking data
Surface Transportation Weather Service	Vehicle OBE	transportation weather information
Traffic Management Center	Vehicle OBE	intersection status
Traffic Management Center	Vehicle OBE	lane closure information
Transportation Information Center	Vehicle OBE	vehicle situation data parameters
Vehicle OBE	Data Distribution System	vehicle situation data
Vehicle OBE	Map Update System	vehicle location and motion for mapping
Vehicle OBE	Transportation Information Center	vehicle environmental data
Vehicle OBE	Transportation Information Center	vehicle situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-V: Update central map database	Develop an internationally acceptable ITS application specification that defines the rules for updating a central map database, including roadway and intersection geometry, based on real-world data readings from vehicles and transmitted to a map update system.	Medium-term	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Vehicle OBE	Map Update System	vehicle location and motion for mapping

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Fleet management	Develop an ITS application specification for managing fleet vehicles, including managing the location of fleet vehicles such as emergency vehicles and transit vehicles	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Emergency Management Center	emergency vehicle tracking data

| Solution Name: | US: SAE Other J2735 - Mobile Internet (US) | | | | | Number of Issues: | 6 | Total Issue Severity: | 50 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Signal operations	Develop an ITS application specification for providing intersection status information to vehicles from a centre for environmental benefits.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	intersection status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-V: Fleet management	Develop an ITS application specification for managing fleet vehicles, including managing the location of fleet vehicles such as emergency vehicles and transit vehicles	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Emergency Management Center	emergency vehicle tracking data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	lane closure information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-V: Signal operations	Develop an ITS application specification for providing intersection status information to vehicles from a centre for environmental benefits.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	intersection status

Solution Name:	US: SAE Other J2735 - Mobile Internet (US)				Number of Issues:	6	Total Issue Severity:	50

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-V: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs/CAMs, sensors, probe data, etc.) between vehicles and remote interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	vehicle situation data parameters
Vehicle OBE	Transportation Information Center	vehicle environmental data
Vehicle OBE	Transportation Information Center	vehicle situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Fleet and Freight Management Center	vehicle environmental data
Data Distribution System	Vehicle OBE	vehicle situation data parameters
Emergency Vehicle OBE	Emergency Management Center	emergency vehicle tracking data
Surface Transportation Weather Service	Vehicle OBE	transportation weather information
Traffic Management Center	Vehicle OBE	intersection status
Traffic Management Center	Vehicle OBE	lane closure information
Transportation Information Center	Vehicle OBE	vehicle situation data parameters
Vehicle OBE	Data Distribution System	vehicle situation data
Vehicle OBE	Map Update System	vehicle location and motion for mapping
Vehicle OBE	Transportation Information Center	vehicle environmental data
Vehicle OBE	Transportation Information Center	vehicle situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Fleet management	Develop an ITS application specification for managing fleet vehicles, including managing the location of fleet vehicles such as emergency vehicles and transit vehicles	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Emergency Management Center	emergency vehicle tracking data

Solution Name:	US: SAE Other J2735 - Mobile Internet (US)				Number of Issues:	6	Total Issue Severity:	50

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Situation data	Develop an internationally acceptable ITS application specification for the use case of distributing collected situation data (e.g., BSMs/CAMs, sensors, probe data, etc.) between vehicles and remote interested parties (e.g., centres).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	vehicle situation data parameters
Vehicle OBE	Transportation Information Center	vehicle environmental data
Vehicle OBE	Transportation Information Center	vehicle situation data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Signal operations	Develop an ITS application specification for providing intersection status information to vehicles from a centre for environmental benefits.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	intersection status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	lane closure information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Update central map database	Develop an internationally acceptable ITS application specification that defines the rules for updating a central map database, including roadway and intersection geometry, based on real-world data readings from vehicles and transmitted to a map update system.	Medium-term	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Vehicle OBE	Map Update System	vehicle location and motion for mapping

Solution Name:	US: SAE Other J2735 - OMG DDS RPC				Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for I-F: OMG DDS RPC. The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

| Solution Name: | US: SAE Other J2735 - OMG DDS RPC | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	arriving train information
Wayside Equipment	Connected Vehicle Roadside Equipment	arriving train information
Wayside Equipment	ITS Roadway Equipment	arriving train information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	arriving train information
Wayside Equipment	Connected Vehicle Roadside Equipment	arriving train information
Wayside Equipment	ITS Roadway Equipment	arriving train information

| Solution Name: | US: SAE Other J2735 - SNMPv3 | | | | | Number of Issues: | 4 | Total Issue Severity: | 13 |

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for I-F: SNMPv3. The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry

| Solution Name: | US: SAE Other J2735 - SNMPv3 | | | | | Number of Issues: | 4 | Total Issue Severity: | 13 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	arriving train information
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry
Wayside Equipment	Connected Vehicle Roadside Equipment	arriving train information
Wayside Equipment	ITS Roadway Equipment	arriving train information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
ITS Roadway Equipment	Connected Vehicle Roadside Equipment	arriving train information
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry
Wayside Equipment	Connected Vehicle Roadside Equipment	arriving train information
Wayside Equipment	ITS Roadway Equipment	arriving train information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry

| Solution Name: | US: SAE Other J2735 - WAVE UDP | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for V-X: WAVE UDP. The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The V-X: WAVE UDP standards include lower-layer standards that support connectionless vehicle-to-any communications within ~300m using the User Datagram Protocol (UDP) over Internet Protocol version 6 (IPv6) over the 5.9GHz spectrum.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Solution Name:	US: SAE Other J2735 - WAVE UDP				Number of Issues:	2	Total Issue Severity:	4

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	intersection safety warning

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	intersection safety warning

Solution Name:	US: SAE Other J2735 - WAVE WSMP				Number of Issues:	3	Total Issue Severity:	7

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for V-X: WAVE WSMP. The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The V-X: WAVE WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications within ~300m using the WAVE Short Messaging Protocol (WSMP) over the 5.9GHz spectrum. The broadcast mode is interoperable with M5 FNTP.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Vehicle OBE	special vehicle type alert
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection safety warning
Maint and Constr Vehicle OBE	Personal Information Device	personal safety warning
Maint and Constr Vehicle OBE	Vehicle OBE	special vehicle type alert
Other Vehicle OBEs	Vehicle OBE	intersection infringement info
Transit Vehicle OBE	Vehicle OBE	special vehicle type alert
Vehicle OBE	Connected Vehicle Roadside Equipment	intersection infringement info
Vehicle OBE	Other Vehicle OBEs	intersection infringement info

| Solution Name: | US: SAE Other J2735 - WAVE WSMP | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Vehicle OBE	special vehicle type alert
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection safety warning
Maint and Constr Vehicle OBE	Personal Information Device	personal safety warning
Maint and Constr Vehicle OBE	Vehicle OBE	special vehicle type alert
Other Vehicle OBEs	Vehicle OBE	intersection infringement info
Transit Vehicle OBE	Vehicle OBE	special vehicle type alert
Vehicle OBE	Connected Vehicle Roadside Equipment	intersection infringement info
Vehicle OBE	Other Vehicle OBEs	intersection infringement info

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	V-L: Intersection infringement	Develop an internationally acceptable ITS application specification that defines the rules for providing intersection infringment information within a local environment.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection safety warning
Other Vehicle OBEs	Vehicle OBE	intersection infringement info
Vehicle OBE	Connected Vehicle Roadside Equipment	intersection infringement info
Vehicle OBE	Other Vehicle OBEs	intersection infringement info

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	V-L: Special vehicle alert	Develop an internationally acceptable ITS application specification for sending special vehicle alerts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Vehicle OBE	special vehicle type alert
Maint and Constr Vehicle OBE	Vehicle OBE	special vehicle type alert
Transit Vehicle OBE	Vehicle OBE	special vehicle type alert

| Solution Name: | US: SAE Other J2735 - Wide Area Broadcast (Upper) | | Number of Issues: | 4 | Total Issue Severity: | 13 |

This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for C-X: Wide Area Broadcast (Upper). The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance charcateristics. The C-X: Wide Area Broadcast (Upper) standards include lower-layer standards that support one entity broadcasting information to all wireless devices over an area that covers at least a metropolitan area without any expectation of acknowledgement or response; security is provided by the upper-layers.

| Solution Name: | US: SAE Other J2735 - Wide Area Broadcast (Upper) | | | | Number of Issues: | 4 | Total Issue Severity: | 13 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Ubiquitous broadcast technology	With the continual enhancement of broadcast technologies and a mixture of free and subscriber-based systems, it is difficult to identify any single technology that can be used to reliably reach the bulk of drivers in a timely manner.	Low	C-V: Wide-area broadcast subnet and hybrid communications	Standardise one or more mechanisms by which wide-area broadcast messages can be received by a defined minimum percentage of transportation users that are currently operating within a specified geographic area. The required minimum percentage is dependent on the type of information being transmitted and will need to be determined by the expert community. Some alerts (e.g., tornado warnings) will require near 100% reception, while other messages (e.g., road works ahead) may require significantly lower minimum percentages. The minimum percentage may be made up with a variety of technologies using hybrid communications and the ITS station architecture.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	broadcast traveler information
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Personal Information Device	wide area broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	wide area broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-V: Tailoring of TPEG2	Tailor TPEG2 for use within the US for centre-vehicle communications.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	broadcast traveler information
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Personal Information Device	wide area broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	wide area broadcast traveler information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Personal Information Device	broadcast traveler information
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Personal Information Device	wide area broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	wide area broadcast traveler information

| Solution Name: | US: SAE Other J2735 - Wide Area Broadcast (Upper) | | | | Number of Issues: | 4 | Total Issue Severity: | 13 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.		Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	broadcast traveler information
Wide Area Information Disseminator	Vehicle OBE	broadcast traveler information

| Solution Name: | US: SAE Safety Awareness Messages - Local Broadcast Wireless (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 7 |

This solution is used within the U.S.. It combines standards associated with US: SAE Safety Awareness Messages with those for V-X: Local Broadcast Wireless (US). The US: SAE Safety Awareness Messages standards include upper-layer standards required to implement V2V safety situation awareness information flows. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Personal Information Device	personal safety warning
Emergency Vehicle OBE	Vehicle OBE	emergency vehicle alert

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	V-L: Safety awareness	Develop an ITS application specification for vehicle-to-vehicle safety awareness.		Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Personal Information Device	personal safety warning
Emergency Vehicle OBE	Vehicle OBE	emergency vehicle alert

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts		Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Personal Information Device	personal safety warning
Emergency Vehicle OBE	Vehicle OBE	emergency vehicle alert

| Solution Name: | US: SAE Safety Awareness Messages - WAVE WSMP | | | | Number of Issues: | 4 | Total Issue Severity: | 10 |

This solution is used within the U.S.. It combines standards associated with US: SAE Safety Awareness Messages with those for V-X: WAVE WSMP. The US: SAE Safety Awareness Messages standards include upper-layer standards required to implement V2V safety situation awareness information flows. The V-X: WAVE WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications within ~300m using the WAVE Short Messaging Protocol (WSMP) over the 5.9GHz spectrum. The broadcast mode is interoperable with M5 FNTP.

Solution Name:	US: SAE Safety Awareness Messages - WAVE WSMP			Number of Issues:	4	Total Issue Severity:	10

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Vehicle OBE	special vehicle type alert
Other Vehicle OBEs	Vehicle OBE	vehicle hazard event
Vehicle OBE	Other Vehicle OBEs	vehicle hazard event

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	V-L: Safety awareness	Develop an ITS application specification for vehicle-to-vehicle safety awareness.		Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Vehicle OBE	special vehicle type alert
Other Vehicle OBEs	Vehicle OBE	vehicle hazard event
Vehicle OBE	Other Vehicle OBEs	vehicle hazard event

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts		Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Vehicle OBE	special vehicle type alert
Other Vehicle OBEs	Vehicle OBE	vehicle hazard event
Vehicle OBE	Other Vehicle OBEs	vehicle hazard event

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	V-L: Stationary vehicle	Develop an ITS application specification harmonised with DENM for a vehicle to self-report when it is stationary and a potential hazard.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Other Vehicle OBEs	Vehicle OBE	vehicle hazard event
Vehicle OBE	Other Vehicle OBEs	vehicle hazard event

Solution Name:	US: SAE Signal Control Messages - Internet (US)			Number of Issues:	4	Total Issue Severity:	10

This solution is used within the U.S. It combines standards associated with US: SAE Signal Control Messages with those for I-I: Internet (US). The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The I-I: Internet (US) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.

| Solution Name: | US: SAE Signal Control Messages - Internet (US) | | | | | Number of Issues: | 4 | Total Issue Severity: | 10 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	I-F: Signal conflict prevention	Develop an internationally acceptable ITS application specification for monitoring intersection status information to prevent conflicts between physical displays and broadcast information.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

| Solution Name: | US: SAE Signal Control Messages - Local Broadcast Wireless (US) | | | | | Number of Issues: | 5 | Total Issue Severity: | 42 |

This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for V-X: Local Broadcast Wireless (US). The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Solution Name:	US: SAE Signal Control Messages - Local Broadcast Wireless (US)					Number of Issues:	5	Total Issue Severity:	42

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-L: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry to a vehicle from a local source.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	intersection geometry
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection geometry
Connected Vehicle Roadside Equipment	Vehicle OBE	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	V-L: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry to a vehicle from a local source.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	intersection geometry
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection geometry
Connected Vehicle Roadside Equipment	Vehicle OBE	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	intersection geometry
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection geometry
Connected Vehicle Roadside Equipment	Vehicle OBE	roadway geometry

| Solution Name: | US: SAE Signal Control Messages - Local Broadcast Wireless (US) | | | | Number of Issues: | 5 | Total Issue Severity: | 42 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	V-L: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry to a vehicle from a local source.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	intersection geometry
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection geometry

| Solution Name: | US: SAE Signal Control Messages - Mobile Internet (US) | | | | Number of Issues: | 6 | Total Issue Severity: | 50 |

This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for I-M: Mobile Internet (US). The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry and associated regulations and restrictions over mobile Internet from a centre to user devices (e.g., a vehicle or personal information device).	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Vehicle OBE	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Personal Information Device	intersection geometry
Map Update System	Vehicle OBE	intersection geometry
Map Update System	Vehicle OBE	roadway geometry
Traffic Management Center	Commercial Vehicle OBE	intersection status
Traffic Management Center	Emergency Vehicle OBE	intersection status

| Solution Name: | US: SAE Signal Control Messages - Mobile Internet (US) | | | | Number of Issues: | 6 | Total Issue Severity: | 50 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-V: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry and associated regulations and restrictions over mobile Internet from a centre to user devices (e.g., a vehicle or personal information device).	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Personal Information Device	intersection geometry
Map Update System	Vehicle OBE	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-V: Signal operations	Develop an ITS application specification for providing intersection status information to vehicles from a centre for environmental benefits.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Commercial Vehicle OBE	intersection status
Traffic Management Center	Emergency Vehicle OBE	intersection status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	C-V: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry and associated regulations and restrictions over mobile Internet from a centre to user devices (e.g., a vehicle or personal information device).	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Personal Information Device	intersection geometry
Map Update System	Vehicle OBE	intersection geometry
Map Update System	Vehicle OBE	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	C-V: Signal operations	Develop an ITS application specification for providing intersection status information to vehicles from a centre for environmental benefits.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Emergency Vehicle OBE	intersection status

| Solution Name: | US: SAE Signal Control Messages - Mobile Internet (US) | | | | Number of Issues: | 6 | Total Issue Severity: | 50 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Personal Information Device	intersection geometry
Map Update System	Vehicle OBE	intersection geometry
Map Update System	Vehicle OBE	roadway geometry
Traffic Management Center	Commercial Vehicle OBE	intersection status
Traffic Management Center	Emergency Vehicle OBE	intersection status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: EU signal priority/preemption	Develop an ITS application specification for a centre to exchange requests and status for signal priority/preemption along a route with a vehicle.	Medium-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Emergency Vehicle OBE	intersection status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry and associated regulations and restrictions over mobile Internet from a centre to user devices (e.g., a vehicle or personal information device).	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Personal Information Device	intersection geometry
Map Update System	Vehicle OBE	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-V: Signal operations	Develop an ITS application specification for providing intersection status information to vehicles from a centre for environmental benefits.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Commercial Vehicle OBE	intersection status

| Solution Name: | US: SAE Signal Control Messages - NTCIP Messaging | | | | Number of Issues: | 5 | Total Issue Severity: | 42 |

This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for C-C: NTCIP Messaging. The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

| Solution Name: | US: SAE Signal Control Messages - NTCIP Messaging | | | | Number of Issues: | 5 | Total Issue Severity: | 42 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

| Solution Name: | US: SAE Signal Control Messages - NTCIP Messaging | | | | Number of Issues: | 5 | Total Issue Severity: | 42 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

| Solution Name: | US: SAE Signal Control Messages - OMG DDS | | | | Number of Issues: | 5 | Total Issue Severity: | 42 |

This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for C-C: OMG DDS. The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

| Solution Name: | US: SAE Signal Control Messages - OMG DDS | | | | Number of Issues: | 5 | Total Issue Severity: | 42 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	C-C: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for updating maps, roadway geometry, and intersection geometry among centres (e.g., between a Map Update System and a centre).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Center	intersection geometry

| Solution Name: | US: SAE Signal Control Messages - OMG DDS RPC | | | | Number of Issues: | 5 | Total Issue Severity: | 42 |

This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for I-F: OMG DDS RPC. The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The I-F: OMG DDS RPC standards include lower-layer standards that support secure remote procedure calls between a field device and another field device or a centre over a field communication link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Solution Name:	US: SAE Signal Control Messages - OMG DDS RPC					Number of Issues:	5	Total Issue Severity:	42

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts		Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.		Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry

Solution Name:	US: SAE Signal Control Messages - SNMPv3					Number of Issues:	6	Total Issue Severity:	48

This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for I-F: SNMPv3. The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The I-F: SNMPv3 standards include lower-layer standards that support secure centre-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adeqaute security.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.		Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Solution Name:	US: SAE Signal Control Messages - SNMPv3				Number of Issues:	6	Total Issue Severity:	48

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.		Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.		Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.		Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description		Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts		Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry
Map Update System	Connected Vehicle Roadside Equipment	roadway geometry

Solution Name:	US: SAE Signal Control Messages - SNMPv3				Number of Issues:	6	Total Issue Severity:	48

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	I-F: Distribute maps	Develop an internationally acceptable ITS application specification that defines the rules for distributing maps, roadway geometry, and intersection geometry between a centres (e.g., a Map Update System) and field equipment.	Urgent	Australia, European Union, United States, Japan

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Map Update System	Connected Vehicle Roadside Equipment	intersection geometry

Solution Name:	US: SAE Signal Control Messages - WAVE UDP				Number of Issues:	4	Total Issue Severity:	10

This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for V-X: WAVE UDP. The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The V-X: WAVE UDP standards include lower-layer standards that support connectionless vehicle-to-any communications within ~300m using the User Datagram Protocol (UDP) over Internet Protocol version 6 (IPv6) over the 5.9GHz spectrum.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

Solution Name:	US: SAE Signal Control Messages - WAVE UDP				Number of Issues:	4	Total Issue Severity:	10

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	I-F: Signal conflict prevention	Develop an internationally acceptable ITS application specification for monitoring intersection status information to prevent conflicts between physical displays and broadcast information.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

Solution Name:	US: SAE Signal Control Messages - WAVE WSMP				Number of Issues:	4	Total Issue Severity:	10

This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for V-X: WAVE WSMP. The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The V-X: WAVE WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications within ~300m using the WAVE Short Messaging Protocol (WSMP) over the 5.9GHz spectrum. The broadcast mode is interoperable with M5 FNTP.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring
Connected Vehicle Roadside Equipment	Personal Information Device	intersection status
Connected Vehicle Roadside Equipment	Personal Information Device	pedestrian safety information
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	V-L: US signal operations	Develop an ITS application specification for the performance requirements related to sending signal control information to vehicles from the roadside.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection status

| Solution Name: | US: SAE Signal Control Messages - WAVE WSMP | | | | Number of Issues: | 4 | Total Issue Severity: | 10 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Still under development	A draft of the standard has been developed by the working group, but it was still under development at the time the HARTS analysis was performed.	Medium	I-F: US signal operations	Develop an ITS application specification for exchanging configuration, plans, status, and commands for signal control and signal systems using the secure centre-to-field protocol.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring
Connected Vehicle Roadside Equipment	Personal Information Device	intersection status
Connected Vehicle Roadside Equipment	Personal Information Device	pedestrian safety information
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	V-L: EU signal operations	Develop an ITS application specification for providing intersection status information to vehicles from the roadside.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	intersection status
Connected Vehicle Roadside Equipment	Vehicle OBE	intersection status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	I-F: Signal conflict prevention	Develop an internationally acceptable ITS application specification for monitoring intersection status information to prevent conflicts between physical displays and broadcast information.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	ITS Roadway Equipment	intersection status monitoring

Solution Name:	US: SAE Signal Preemption - Local Unicast Wireless (US)		Number of Issues:	6	Total Issue Severity:	19
Solution Name:	US: SAE Signal Preemption - Local Unicast Wireless (US)		Number of Issues:	6	Total Issue Severity:	19

This solution is used within the U.S.. It combines standards associated with US: SAE Signal Preemption with those for V-X: Local Unicast Wireless (US). The US: SAE Signal Preemption standards include upper-layer standards required to implement signal preemption and priority information flows. The V-X: Local Unicast Wireless (US) standards include lower-layer standards that support local-area unicast wireless solutions, such as DSRC technologies, LTE, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Guidance document under development	This recommended practice on how to use the related standards is still under development but is not seen as strictly necessary to begin deployment of equipment.	Low	V-L: US signal priority	Develop an ITS application specification for the performance requirements related to pre-emption and priority for authorised vehicles at a signal.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	signal priority status
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	local signal preemption request
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not defined (high)	The performance rules are not defined for this information flow.	High	V-L: US signal priority	Develop an ITS application specification for the performance requirements related to pre-emption and priority for authorised vehicles at a signal.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	signal priority status
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	local signal preemption request
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request

Solution Name:	US: SAE Signal Preemption - Local Unicast Wireless (US)				Number of Issues:	6	Total Issue Severity:	19

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	signal priority status
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	local signal preemption request
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	signal priority status
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	local signal preemption request
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Performance not fully defined (medium)	The performance rules are not fully defined for this information flow.	Medium	V-L: EU signal priority	Develop an ITS application specification for a traffic signal to provide pre-emption or priority to authorised vehicles.	Urgent	Australia, European Union

Source	Destination	Flow Name
Commercial Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request
Connected Vehicle Roadside Equipment	Commercial Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Emergency Vehicle OBE	signal priority status
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	signal priority status
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	local signal preemption request
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	local signal priority request

| Solution Name: | US: SAE Signal Preemption - Local Unicast Wireless (US) | | | | | Number of Issues: | 6 | Total Issue Severity: | 19 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use case not considered in design (medium)	While the indicated standards nominally address the information flow, the design may not meet practical constraints because this particular use case was not the focus of the design effort.	Medium	V-L: EU signal priority	Develop an ITS application specification for a traffic signal to provide pre-emption or priority to authorised vehicles.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Vehicle OBE	Connected Vehicle Roadside Equipment	local signal preemption request

| Solution Name: | US: SAE Traveler Info - Local Broadcast Wireless (US) | | | | | Number of Issues: | 3 | Total Issue Severity: | 12 |

This solution is used within the U.S.. It combines standards associated with US: SAE Traveler Info with those for V-X: Local Broadcast Wireless (US). The US: SAE Traveler Info standards include upper-layer standards required to implement V2X traveler information flows. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	local traveler information
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	vehicle signage data
Connected Vehicle Roadside Equipment	Vehicle OBE	local traveler information
Connected Vehicle Roadside Equipment	Vehicle OBE	reduced speed notification
Connected Vehicle Roadside Equipment	Vehicle OBE	speed management information
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle signage data
Emergency Vehicle OBE	Vehicle OBE	vehicle signage data
Maint and Constr Vehicle OBE	Vehicle OBE	vehicle signage data

| Solution Name: | US: SAE Traveler Info - Local Broadcast Wireless (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 12 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Draft not available (Critical)	The standards development organization has established a work item for the subject standard but a draft is not available for this critical feature to enable the interface. The draft may be missing due to the work item being new or simply a lack of activity on the work item.	High	V-L: TPEG2	Develop an ITS application specification for transmission of TPEG2 to a vehicle from a local broadcast source.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	vehicle signage data
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle signage data
Emergency Vehicle OBE	Vehicle OBE	vehicle signage data
Maint and Constr Vehicle OBE	Vehicle OBE	vehicle signage data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Draft not available (Critical)	The standards development organization has established a work item for the subject standard but a draft is not available for this critical feature to enable the interface. The draft may be missing due to the work item being new or simply a lack of activity on the work item.	High	V-L: US traveler information	Develop an ITS application specification for providing in-vehicle signage and other traveler information to the vehicle from the roadside. This will also need to address issues such as when and how to locally generate traveler information messages and how to sign these messages.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	local traveler information
Connected Vehicle Roadside Equipment	Vehicle OBE	local traveler information
Connected Vehicle Roadside Equipment	Vehicle OBE	reduced speed notification
Connected Vehicle Roadside Equipment	Vehicle OBE	speed management information

| Solution Name: | US: SAE Traveler Info - Local Broadcast Wireless (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 12 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	local traveler information
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	vehicle signage data
Connected Vehicle Roadside Equipment	Vehicle OBE	local traveler information
Connected Vehicle Roadside Equipment	Vehicle OBE	reduced speed notification
Connected Vehicle Roadside Equipment	Vehicle OBE	speed management information
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle signage data
Emergency Vehicle OBE	Vehicle OBE	vehicle signage data
Maint and Constr Vehicle OBE	Vehicle OBE	vehicle signage data

| Solution Name: | US: SAE Traveler Info - Mobile Internet (US) | | | | Number of Issues: | 4 | Total Issue Severity: | 20 |

This solution is used within the U.S.. It combines standards associated with US: SAE Traveler Info with those for I-M: Mobile Internet (US). The US: SAE Traveler Info standards include upper-layer standards required to implement V2X traveler information flows. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	speed management information
Traffic Management Center	Vehicle OBE	vehicle signage data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	V-L: TPEG2	Develop an ITS application specification for transmission of TPEG2 to a vehicle from a local broadcast source.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	vehicle signage data

| Solution Name: | US: SAE Traveler Info - Mobile Internet (US) | | | | | Number of Issues: | 4 | Total Issue Severity: | 20 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	V-L: US traveler information	Develop an ITS application specification for providing in-vehicle signage and other traveler information to the vehicle from the roadside. This will also need to address issues such as when and how to locally generate traveler information messages and how to sign these messages.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	speed management information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Draft not available (Critical)	The standards development organization has established a work item for the subject standard but a draft is not available for this critical feature to enable the interface. The draft may be missing due to the work item being new or simply a lack of activity on the work item.	High	C-V: In-vehicle signage	Develop an ITS application specification for in-vehicle signage to the vehicle from a centre.	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	speed management information
Traffic Management Center	Vehicle OBE	vehicle signage data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Draft not available (Critical)	The standards development organization has established a work item for the subject standard but a draft is not available for this critical feature to enable the interface. The draft may be missing due to the work item being new or simply a lack of activity on the work item.	High	V-L: TPEG2	Develop an ITS application specification for transmission of TPEG2 to a vehicle from a local broadcast source.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	vehicle signage data

Solution Name:	US: SAE Traveler Info - Mobile Internet (US)				Number of Issues:	4	Total Issue Severity:	20

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Draft not available (Critical)	The standards development organization has established a work item for the subject standard but a draft is not available for this critical feature to enable the interface. The draft may be missing due to the work item being new or simply a lack of activity on the work item.	High	V-L: US traveler information	Develop an ITS application specification for providing in-vehicle signage and other traveler information to the vehicle from the roadside. This will also need to address issues such as when and how to locally generate traveler information messages and how to sign these messages.	Urgent	United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	speed management information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Traffic Management Center	Vehicle OBE	speed management information
Traffic Management Center	Vehicle OBE	vehicle signage data

Solution Name:	US: SAE VRU Messages - WAVE WSMP				Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: SAE VRU Messages with those for V-X: WAVE WSMP. The US: SAE VRU Messages standards include upper-layer standards required to implement vulnerable road user information flows. The V-X: WAVE WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications within ~300m using the WAVE Short Messaging Protocol (WSMP) over the 5.9GHz spectrum. The broadcast mode is interoperable with M5 FNTP.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
Source	Destination	Flow Name
Personal Information Device	Connected Vehicle Roadside Equipment	personal location
Personal Information Device	Emergency Vehicle OBE	personal location
Personal Information Device	Maint and Constr Vehicle OBE	personal location
Personal Information Device	Transit Vehicle OBE	personal location
Personal Information Device	Vehicle OBE	personal location

| Solution Name: | US: SAE VRU Messages - WAVE WSMP | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Personal Information Device	Connected Vehicle Roadside Equipment	personal location
Personal Information Device	Emergency Vehicle OBE	personal location
Personal Information Device	Maint and Constr Vehicle OBE	personal location
Personal Information Device	Transit Vehicle OBE	personal location
Personal Information Device	Vehicle OBE	personal location

| Solution Name: | US: SAE Weather Info - Local Broadcast Wireless (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 12 |

This solution is used within the U.S.. It combines standards associated with US: SAE Weather Info with those for V-X: Local Broadcast Wireless (US). The US: SAE Weather Info standards include upper-layer standards required to implement V2X weather information flows. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	road weather advisories

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Draft not available (Critical)	The standards development organization has established a work item for the subject standard but a draft is not available for this critical feature to enable the interface. The draft may be missing due to the work item being new or simply a lack of activity on the work item.	High	V-L: Weather information	Develop an acceptable ITS application specification for providing weather information to vehicles from the roadside or other vehicles. The specification should consider the use of DENM and/or TPEG2 as already implemented in Europe.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	road weather advisories

Solution Name:	US: SAE Weather Info - Local Broadcast Wireless (US)				Number of Issues:	3	Total Issue Severity:	12

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	road weather advisories

Solution Name:	US: SAE Weather Info - Mobile Internet (US)				Number of Issues:	4	Total Issue Severity:	44

This solution is used within the U.S.. It combines standards associated with US: SAE Weather Info with those for I-M: Mobile Internet (US). The US: SAE Weather Info standards include upper-layer standards required to implement V2X weather information flows. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	V-X: DENM, IVI, TPEG2, TMC and Contextual Speed Information	Standardise on a single solution for providing traveler information, lane closure information and speed information; currently this information can be sent via DENM, IVI, TPEG2, TMC, or Contextual Speed Information (speed information only). Use cases need to consider the various environments (e.g., Centre-Vehicle, Roadside-Vehicle, Special Vehicle-Vehicle, etc).	Urgent	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	road weather advisories

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	road weather advisories for emergency response
Fleet and Freight Management Center	Commercial Vehicle OBE	road weather advisories
Maint and Constr Management Center	Personal Information Device	road weather advisories
Maint and Constr Management Center	Vehicle OBE	road weather advisories
Transportation Information Center	Vehicle OBE	road weather advisories

| Solution Name: | US: SAE Weather Info - Mobile Internet (US) | | | | Number of Issues: | 4 | Total Issue Severity: | 44 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Draft not available (Critical)	The standards development organization has established a work item for the subject standard but a draft is not available for this critical feature to enable the interface. The draft may be missing due to the work item being new or simply a lack of activity on the work item.	High	C-V: Weather information	Update the international ITS application specification to address road weather advisories.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transportation Information Center	Vehicle OBE	road weather advisories

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	V-L: Update SAE J2735 to conform to ISO 14817	Update the format of the standard to conform to the rules of ISO 14817-1 so that data can easily be placed in the CIDCR and understood by all ITS experts	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Emergency Vehicle OBE	road weather advisories for emergency response
Fleet and Freight Management Center	Commercial Vehicle OBE	road weather advisories
Maint and Constr Management Center	Personal Information Device	road weather advisories
Maint and Constr Management Center	Vehicle OBE	road weather advisories
Transportation Information Center	Vehicle OBE	road weather advisories

| Solution Name: | US: TCIP - Guaranteed Internet (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 12 |

This solution is used within the U.S.. It combines standards associated with US: TCIP with those for I-I: Guaranteed Internet (US). The US: TCIP standards include upper-layer standards required to implement transit-related communications. The I-I: Guaranteed Internet (US) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Alternate Mode Transportation Center	Transit Management Center	multimodal service data
Alternate Mode Transportation Center	Transit Management Center	service information response
Alternate Mode Transportation Center	Transportation Information Center	multimodal service data
Connected Vehicle Roadside Equipment	Public Information Device	transit vehicle information
Emergency Management Center	Public Information Device	alarm acknowledge
Public Information Device	Connected Vehicle Roadside Equipment	transit stop request
Public Information Device	Connected Vehicle Roadside Equipment	transit traveler information
Public Information Device	Emergency Management Center	alarm notification

| Solution Name: | US: TCIP - Guaranteed Internet (US) | | Number of Issues: | 3 | Total Issue Severity: | 12 |

Public Information Device	Transit Management Center	alarm notification
Public Information Device	Transit Management Center	transit fare and passenger status
Public Information Device	Transit Management Center	transit stop request
Transit Management Center	Alternate Mode Transportation Center	service information request
Transit Management Center	Alternate Mode Transportation Center	transit multimodal information
Transit Management Center	Public Information Device	transit fare information
Transit Management Center	Public Information Device	transit traveler information
Transportation Information Center	Alternate Mode Transportation Center	service information request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Alternate Mode Transportation Center	Transit Management Center	multimodal service data
Alternate Mode Transportation Center	Transit Management Center	service information response
Alternate Mode Transportation Center	Transportation Information Center	multimodal service data
Connected Vehicle Roadside Equipment	Public Information Device	transit vehicle information
Emergency Management Center	Public Information Device	alarm acknowledge
Public Information Device	Connected Vehicle Roadside Equipment	transit stop request
Public Information Device	Connected Vehicle Roadside Equipment	transit traveler information
Public Information Device	Emergency Management Center	alarm notification
Public Information Device	Transit Management Center	alarm notification
Public Information Device	Transit Management Center	transit fare and passenger status
Public Information Device	Transit Management Center	transit stop request
Transit Management Center	Alternate Mode Transportation Center	service information request
Transit Management Center	Alternate Mode Transportation Center	transit multimodal information
Transit Management Center	Public Information Device	transit fare information
Transit Management Center	Public Information Device	transit traveler information
Transportation Information Center	Alternate Mode Transportation Center	service information request

| Solution Name: | US: TCIP - Guaranteed Internet (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 12 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Encoding rules not defined	The standards do not unambiguously define which set of encoding rules to use.	High	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Alternate Mode Transportation Center	Transit Management Center	multimodal service data
Alternate Mode Transportation Center	Transit Management Center	service information response
Alternate Mode Transportation Center	Transportation Information Center	multimodal service data
Connected Vehicle Roadside Equipment	Public Information Device	transit vehicle information
Emergency Management Center	Public Information Device	alarm acknowledge
Public Information Device	Connected Vehicle Roadside Equipment	transit stop request
Public Information Device	Connected Vehicle Roadside Equipment	transit traveler information
Public Information Device	Emergency Management Center	alarm notification
Public Information Device	Transit Management Center	alarm notification
Public Information Device	Transit Management Center	transit fare and passenger status
Public Information Device	Transit Management Center	transit stop request
Transit Management Center	Alternate Mode Transportation Center	service information request
Transit Management Center	Alternate Mode Transportation Center	transit multimodal information
Transit Management Center	Public Information Device	transit fare information
Transit Management Center	Public Information Device	transit traveler information
Transportation Information Center	Alternate Mode Transportation Center	service information request

| Solution Name: | US: TCIP - Local Broadcast Wireless (US) | | | | Number of Issues: | 3 | Total Issue Severity: | 12 |

This solution is used within the U.S.. It combines standards associated with US: TCIP with those for V-X: Local Broadcast Wireless (US). The US: TCIP standards include upper-layer standards required to implement transit-related communications. The V-X: Local Broadcast Wireless (US) standards include lower-layer standards that support local-area broadcast wireless solutions, such as DSRC technologies, LTE/5G, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	transit stop guidance
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	transit vehicle information
Transit Vehicle OBE	Personal Information Device	transit vehicle information

| Solution Name: | US: TCIP - Local Broadcast Wireless (US) | | | | | Number of Issues: | 3 | Total Issue Severity: | 12 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	transit stop guidance
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	transit vehicle information
Transit Vehicle OBE	Personal Information Device	transit vehicle information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Encoding rules not defined	The standards do not unambiguously define which set of encoding rules to use.	High	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Personal Information Device	transit stop guidance
Transit Vehicle OBE	Connected Vehicle Roadside Equipment	transit vehicle information
Transit Vehicle OBE	Personal Information Device	transit vehicle information

| Solution Name: | US: TCIP - Local Unicast Wireless (US) | | | | | Number of Issues: | 3 | Total Issue Severity: | 12 |

This solution is used within the U.S.. It combines standards associated with US: TCIP with those for V-X: Local Unicast Wireless (US). The US: TCIP standards include upper-layer standards required to implement transit-related communications. The V-X: Local Unicast Wireless (US) standards include lower-layer standards that support local-area unicast wireless solutions, such as DSRC technologies, LTE, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	transit stop request
Personal Information Device	Transit Vehicle OBE	transit stop request

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	transit stop request
Personal Information Device	Transit Vehicle OBE	transit stop request

Solution Name:	US: TCIP - Local Unicast Wireless (US)				Number of Issues:	3	Total Issue Severity:	12

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Encoding rules not defined	The standards do not unambiguously define which set of encoding rules to use.	High	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Transit Vehicle OBE	transit stop request
Personal Information Device	Transit Vehicle OBE	transit stop request

Solution Name:	US: TCIP - Mobile Internet (US)				Number of Issues:	5	Total Issue Severity:	52

This solution is used within the U.S.. It combines standards associated with US: TCIP with those for I-M: Mobile Internet (US). The US: TCIP standards include upper-layer standards required to implement transit-related communications. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Transit Vehicle OBE	alarm acknowledge
Personal Information Device	Transit Management Center	transit stop request
Transit Management Center	Personal Information Device	personal transit information
Transit Management Center	Transit Vehicle OBE	alarm acknowledge
Transit Management Center	Transit Vehicle OBE	connection protection instructions
Transit Management Center	Transit Vehicle OBE	fare management information
Transit Management Center	Transit Vehicle OBE	transit schedule information
Transit Management Center	Transit Vehicle OBE	transit stop request
Transit Management Center	Transit Vehicle OBE	transit traveler information
Transit Management Center	Transit Vehicle OBE	transit vehicle operator information
Transit Vehicle OBE	Emergency Management Center	alarm notification
Transit Vehicle OBE	Transit Management Center	alarm notification
Transit Vehicle OBE	Transit Management Center	demand response passenger and use data
Transit Vehicle OBE	Transit Management Center	fare collection data
Transit Vehicle OBE	Transit Management Center	transit vehicle conditions
Transit Vehicle OBE	Transit Management Center	transit vehicle loading data
Transit Vehicle OBE	Transit Management Center	transit vehicle location data
Transit Vehicle OBE	Transit Management Center	transit vehicle schedule performance

Solution Name:	US: TCIP - Mobile Internet (US)				Number of Issues:	5	Total Issue Severity:	52

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-V: Transit vehicle schedule management	Develop an ITS application specification for managing transit vehicle schedule performance data from transit vehicles to a centre.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transit Management Center	Transit Vehicle OBE	transit schedule information
Transit Vehicle OBE	Transit Management Center	transit vehicle schedule performance

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data/comm profile pairing	There are ambiguities as to how to (or if one should) couple the upper-layer standards defined in this solution with the indicated lower-layer standards.	High	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Transit Vehicle OBE	alarm acknowledge
Personal Information Device	Transit Management Center	transit stop request
Transit Management Center	Personal Information Device	personal transit information
Transit Management Center	Transit Vehicle OBE	alarm acknowledge
Transit Management Center	Transit Vehicle OBE	connection protection instructions
Transit Management Center	Transit Vehicle OBE	fare management information
Transit Management Center	Transit Vehicle OBE	transit schedule information
Transit Management Center	Transit Vehicle OBE	transit stop request
Transit Management Center	Transit Vehicle OBE	transit traveler information
Transit Management Center	Transit Vehicle OBE	transit vehicle operator information
Transit Vehicle OBE	Emergency Management Center	alarm notification
Transit Vehicle OBE	Transit Management Center	alarm notification
Transit Vehicle OBE	Transit Management Center	demand response passenger and use data
Transit Vehicle OBE	Transit Management Center	fare collection data
Transit Vehicle OBE	Transit Management Center	transit vehicle conditions
Transit Vehicle OBE	Transit Management Center	transit vehicle loading data
Transit Vehicle OBE	Transit Management Center	transit vehicle location data
Transit Vehicle OBE	Transit Management Center	transit vehicle schedule performance

Solution Name:	US: TCIP - Mobile Internet (US)			Number of Issues:	5	Total Issue Severity:	52

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Transit Vehicle OBE	alarm acknowledge
Personal Information Device	Transit Management Center	transit stop request
Transit Management Center	Personal Information Device	personal transit information
Transit Management Center	Transit Vehicle OBE	alarm acknowledge
Transit Management Center	Transit Vehicle OBE	connection protection instructions
Transit Management Center	Transit Vehicle OBE	fare management information
Transit Management Center	Transit Vehicle OBE	transit schedule information
Transit Management Center	Transit Vehicle OBE	transit stop request
Transit Management Center	Transit Vehicle OBE	transit traveler information
Transit Management Center	Transit Vehicle OBE	transit vehicle operator information
Transit Vehicle OBE	Emergency Management Center	alarm notification
Transit Vehicle OBE	Transit Management Center	alarm notification
Transit Vehicle OBE	Transit Management Center	demand response passenger and use data
Transit Vehicle OBE	Transit Management Center	fare collection data
Transit Vehicle OBE	Transit Management Center	transit vehicle conditions
Transit Vehicle OBE	Transit Management Center	transit vehicle loading data
Transit Vehicle OBE	Transit Management Center	transit vehicle location data
Transit Vehicle OBE	Transit Management Center	transit vehicle schedule performance

Solution Name:	US: TCIP - Mobile Internet (US)				Number of Issues:	5	Total Issue Severity:	52

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Encoding rules not defined	The standards do not unambiguously define which set of encoding rules to use.	High	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Transit Vehicle OBE	alarm acknowledge
Personal Information Device	Transit Management Center	transit stop request
Transit Management Center	Personal Information Device	personal transit information
Transit Management Center	Transit Vehicle OBE	alarm acknowledge
Transit Management Center	Transit Vehicle OBE	connection protection instructions
Transit Management Center	Transit Vehicle OBE	fare management information
Transit Management Center	Transit Vehicle OBE	transit schedule information
Transit Management Center	Transit Vehicle OBE	transit stop request
Transit Management Center	Transit Vehicle OBE	transit traveler information
Transit Management Center	Transit Vehicle OBE	transit vehicle operator information
Transit Vehicle OBE	Emergency Management Center	alarm notification
Transit Vehicle OBE	Transit Management Center	alarm notification
Transit Vehicle OBE	Transit Management Center	demand response passenger and use data
Transit Vehicle OBE	Transit Management Center	fare collection data
Transit Vehicle OBE	Transit Management Center	transit vehicle conditions
Transit Vehicle OBE	Transit Management Center	transit vehicle loading data
Transit Vehicle OBE	Transit Management Center	transit vehicle location data
Transit Vehicle OBE	Transit Management Center	transit vehicle schedule performance

Solution Name:	US: TCIP - NTCIP Messaging				Number of Issues:	4	Total Issue Severity:	44

This solution is used within the U.S.. It combines standards associated with US: TCIP with those for C-C: NTCIP Messaging. The US: TCIP standards include upper-layer standards required to implement transit-related communications. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Alternate Mode Transportation Center	Transit Management Center	multimodal service data
Alternate Mode Transportation Center	Transit Management Center	service information response

Alternate Mode Transportation Center	Transportation Information Center	multimodal service data
Connected Vehicle Roadside Equipment	Public Information Device	transit vehicle information
Emergency Management Center	Transit Management Center	emergency transit service request
Other Transit Management Centers	Transit Management Center	transit service coordination
Other Transportation Information Centers	Transportation Information Center	transit service information
Personal Information Device	Transit Management Center	transit stop request
Public Information Device	Connected Vehicle Roadside Equipment	transit stop request
Public Information Device	Connected Vehicle Roadside Equipment	transit traveler information
Public Information Device	Transit Management Center	transit stop request
Traffic Management Center	Transit Management Center	transit service change request
Traffic Management Center	Transportation Information Center	transit service change request
Transit Management Center	Alternate Mode Transportation Center	service information request
Transit Management Center	Alternate Mode Transportation Center	transit multimodal information
Transit Management Center	Emergency Management Center	emergency transit service response
Transit Management Center	Emissions Management Center	transit and fare schedules
Transit Management Center	Other Transit Management Centers	transit service coordination
Transit Management Center	Parking Management System	transit schedule adherence information
Transit Management Center	Parking Management System	transit schedule information
Transit Management Center	Public Information Device	transit traveler information
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Traffic Management Center	transit system data
Transit Management Center	Transit Vehicle OBE	connection protection instructions
Transit Management Center	Transit Vehicle OBE	transit stop request
Transit Management Center	Transportation Information Center	demand responsive transit plan
Transit Management Center	Transportation Information Center	emergency transit schedule information
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit incident information
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transit Management Center	Transportation Information Center	transit trip plan
Transportation Information Center	Alternate Mode Transportation Center	service information request
Transportation Information Center	Other Transportation Information Centers	transit service information
Transportation Information Center	Transit Management Center	demand responsive transit request
Transportation Information Center	Transit Management Center	transit service change request

Solution Name:	US: TCIP - NTCIP Messaging			Number of Issues:	4	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transit Management Center	Traffic Management Center	traffic control priority request

Solution Name:	US: TCIP - NTCIP Messaging			Number of Issues:	4	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Alternate Mode Transportation Center	Transit Management Center	multimodal service data
Alternate Mode Transportation Center	Transit Management Center	service information response
Alternate Mode Transportation Center	Transportation Information Center	multimodal service data
Connected Vehicle Roadside Equipment	Public Information Device	transit vehicle information
Emergency Management Center	Transit Management Center	emergency transit service request
Other Transit Management Centers	Transit Management Center	transit service coordination
Other Transportation Information Centers	Transportation Information Center	transit service information
Personal Information Device	Transit Management Center	transit stop request
Public Information Device	Connected Vehicle Roadside Equipment	transit stop request
Public Information Device	Connected Vehicle Roadside Equipment	transit traveler information
Public Information Device	Transit Management Center	transit stop request
Traffic Management Center	Transit Management Center	transit service change request
Traffic Management Center	Transportation Information Center	transit service change request
Transit Management Center	Alternate Mode Transportation Center	service information request
Transit Management Center	Alternate Mode Transportation Center	transit multimodal information
Transit Management Center	Emergency Management Center	emergency transit service response
Transit Management Center	Emissions Management Center	transit and fare schedules
Transit Management Center	Other Transit Management Centers	transit service coordination
Transit Management Center	Parking Management System	transit schedule adherence information
Transit Management Center	Parking Management System	transit schedule information
Transit Management Center	Public Information Device	transit traveler information
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Traffic Management Center	transit system data
Transit Management Center	Transit Vehicle OBE	connection protection instructions
Transit Management Center	Transit Vehicle OBE	transit stop request
Transit Management Center	Transportation Information Center	demand responsive transit plan
Transit Management Center	Transportation Information Center	emergency transit schedule information
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit incident information
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transit Management Center	Transportation Information Center	transit trip plan

Solution Name:	US: TCIP - NTCIP Messaging		Number of Issues:	4	Total Issue Severity:	44
Transportation Information Center		Alternate Mode Transportation Center		service information request		
Transportation Information Center		Other Transportation Information Centers		transit service information		
Transportation Information Center		Transit Management Center		demand responsive transit request		
Transportation Information Center		Transit Management Center		transit service change request		

Solution Name:	US: TCIP - NTCIP Messaging				Number of Issues:	4	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Encoding rules not defined	The standards do not unambiguously define which set of encoding rules to use.	High	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Alternate Mode Transportation Center	Transit Management Center	multimodal service data
Alternate Mode Transportation Center	Transit Management Center	service information response
Alternate Mode Transportation Center	Transportation Information Center	multimodal service data
Connected Vehicle Roadside Equipment	Public Information Device	transit vehicle information
Emergency Management Center	Transit Management Center	emergency transit service request
Other Transit Management Centers	Transit Management Center	transit service coordination
Other Transportation Information Centers	Transportation Information Center	transit service information
Personal Information Device	Transit Management Center	transit stop request
Public Information Device	Connected Vehicle Roadside Equipment	transit stop request
Public Information Device	Connected Vehicle Roadside Equipment	transit traveler information
Public Information Device	Transit Management Center	transit stop request
Traffic Management Center	Transit Management Center	transit service change request
Traffic Management Center	Transportation Information Center	transit service change request
Transit Management Center	Alternate Mode Transportation Center	service information request
Transit Management Center	Alternate Mode Transportation Center	transit multimodal information
Transit Management Center	Emergency Management Center	emergency transit service response
Transit Management Center	Emissions Management Center	transit and fare schedules
Transit Management Center	Other Transit Management Centers	transit service coordination
Transit Management Center	Parking Management System	transit schedule adherence information
Transit Management Center	Parking Management System	transit schedule information
Transit Management Center	Public Information Device	transit traveler information
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Traffic Management Center	transit system data
Transit Management Center	Transit Vehicle OBE	connection protection instructions
Transit Management Center	Transit Vehicle OBE	transit stop request
Transit Management Center	Transportation Information Center	demand responsive transit plan
Transit Management Center	Transportation Information Center	emergency transit schedule information
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit incident information
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transit Management Center	Transportation Information Center	transit trip plan

Solution Name:	US: TCIP - NTCIP Messaging		Number of Issues:	4	Total Issue Severity:	44

Transportation Information Center	Alternate Mode Transportation Center	service information request
Transportation Information Center	Other Transportation Information Centers	transit service information
Transportation Information Center	Transit Management Center	demand responsive transit request
Transportation Information Center	Transit Management Center	transit service change request

Solution Name:	US: TCIP - OMG DDS		Number of Issues:	4	Total Issue Severity:	44

This solution is used within the U.S.. It combines standards associated with US: TCIP with those for C-C: OMG DDS. The US: TCIP standards include upper-layer standards required to implement transit-related communications. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Transit Management Center	Traffic Management Center	traffic control priority request

Solution Name:	US: TCIP - OMG DDS				Number of Issues:	4	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Transit Management Center	emergency transit service request
Other Transit Management Centers	Transit Management Center	transit service coordination
Other Transportation Information Centers	Transportation Information Center	transit service information
Traffic Management Center	Transit Management Center	transit service change request
Traffic Management Center	Transportation Information Center	transit service change request
Transit Management Center	Emergency Management Center	emergency transit service response
Transit Management Center	Emissions Management Center	transit and fare schedules
Transit Management Center	Other Transit Management Centers	transit service coordination
Transit Management Center	Parking Management System	transit schedule adherence information
Transit Management Center	Parking Management System	transit schedule information
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Traffic Management Center	transit system data
Transit Management Center	Transportation Information Center	demand responsive transit plan
Transit Management Center	Transportation Information Center	emergency transit schedule information
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit incident information
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transit Management Center	Transportation Information Center	transit trip plan
Transportation Information Center	Other Transportation Information Centers	transit service information
Transportation Information Center	Transit Management Center	demand responsive transit request
Transportation Information Center	Transit Management Center	transit service change request

Solution Name:	US: TCIP - OMG DDS				Number of Issues:	4	Total Issue Severity:	44

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not defined in standard format	The definition of data concepts should conform to ISO 14817-1 to promote reuse among ITS.	Low	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Transit Management Center	emergency transit service request
Other Transit Management Centers	Transit Management Center	transit service coordination
Other Transportation Information Centers	Transportation Information Center	transit service information
Traffic Management Center	Transit Management Center	transit service change request
Traffic Management Center	Transportation Information Center	transit service change request
Transit Management Center	Emergency Management Center	emergency transit service response
Transit Management Center	Emissions Management Center	transit and fare schedules
Transit Management Center	Other Transit Management Centers	transit service coordination
Transit Management Center	Parking Management System	transit schedule adherence information
Transit Management Center	Parking Management System	transit schedule information
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Traffic Management Center	transit system data
Transit Management Center	Transportation Information Center	demand responsive transit plan
Transit Management Center	Transportation Information Center	emergency transit schedule information
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit incident information
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transit Management Center	Transportation Information Center	transit trip plan
Transportation Information Center	Other Transportation Information Centers	transit service information
Transportation Information Center	Transit Management Center	demand responsive transit request
Transportation Information Center	Transit Management Center	transit service change request

| Solution Name: | US: TCIP - OMG DDS | | | | Number of Issues: | 4 | Total Issue Severity: | 44 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Encoding rules not defined	The standards do not unambiguously define which set of encoding rules to use.	High	C-C: Update TCIP for encoding rules and details	Update the TCIP standard to conform to 14817-1 and provide encoding rules and examples. Also provide dialog and exchange rules for Transit Management Centre to Transit Vehicle flows such as downloading schedule information.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Transit Management Center	emergency transit service request
Other Transit Management Centers	Transit Management Center	transit service coordination
Other Transportation Information Centers	Transportation Information Center	transit service information
Traffic Management Center	Transit Management Center	transit service change request
Traffic Management Center	Transportation Information Center	transit service change request
Transit Management Center	Emergency Management Center	emergency transit service response
Transit Management Center	Emissions Management Center	transit and fare schedules
Transit Management Center	Other Transit Management Centers	transit service coordination
Transit Management Center	Parking Management System	transit schedule adherence information
Transit Management Center	Parking Management System	transit schedule information
Transit Management Center	Traffic Management Center	traffic control priority request
Transit Management Center	Traffic Management Center	transit system data
Transit Management Center	Transportation Information Center	demand responsive transit plan
Transit Management Center	Transportation Information Center	emergency transit schedule information
Transit Management Center	Transportation Information Center	transit and fare schedules
Transit Management Center	Transportation Information Center	transit incident information
Transit Management Center	Transportation Information Center	transit schedule adherence information
Transit Management Center	Transportation Information Center	transit trip plan
Transportation Information Center	Other Transportation Information Centers	transit service information
Transportation Information Center	Transit Management Center	demand responsive transit request
Transportation Information Center	Transit Management Center	transit service change request

| Solution Name: | US: TMDD - Mobile Internet (US) | | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: TMDD with those for I-M: Mobile Internet (US). The US: TMDD standards include upper-layer standards required to implement centre-to-centre communications with traffic management systems. The I-M: Mobile Internet (US) standards include lower-layer standards that support secure communications between two entities, either or both of which may be actively moving; based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the wide-area-wireless service provider using any Intneret connection method.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Solution Name:	US: TMDD - Mobile Internet (US)		Number of Issues:	1	Total Issue Severity:	3

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
	Destination	Flow Name
Maint and Constr Management Center	Vehicle OBE	work zone information

Solution Name:	US: TMDD - Mobile SNMPv3		Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: TMDD with those for I-M: Mobile SNMPv3. The US: TMDD standards include upper-layer standards required to implement centre-to-centre communications with traffic management systems. The I-M: Mobile SNMPv3 standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Use TLS for SNMP Option	The standard allows for multiple security mechanisms. The only defined mechanism that meets the requirements for C-ITS is the one based on TLS.	Low	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	traffic images

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	I-F: Secure communications	Develop one or more internationally acceptable, secure, centre-to-field communication standards and define rules on when to use each one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed.	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
	Destination	Flow Name
ITS Roadway Equipment	Maint and Constr Vehicle OBE	traffic images

Solution Name:	US: TMDD - NTCIP Messaging		Number of Issues:	6	Total Issue Severity:	43

This solution is used within the U.S.. It combines standards associated with US: TMDD with those for C-C: NTCIP Messaging. The US: TMDD standards include upper-layer standards required to implement centre-to-centre communications with traffic management systems. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution	
	Destination	Flow Name
Border Inspection System	Traffic Management Center	border wait times data
Border Inspection System	Transportation Information Center	border crossing status information
Center	Archived Data Center	center archive data

Center	Data Distribution System	operational data
Center	Data Distribution System	traveler information distribution data
Center	Maint and Constr Management Center	equipment maintenance request
Commercial Vehicle Administration Center	Fleet and Freight Management Center	route restrictions
Commercial Vehicle Administration Center	Other CV Administration Centers	route restrictions
Commercial Vehicle Administration Center	Transportation Information Center	route restrictions
Data Distribution System	Center	operational data
Data Distribution System	Center	regional situation data
Emergency Management Center	Traffic Management Center	emergency traffic control request
Emergency Management Center	Traffic Management Center	incident information
Emergency Management Center	Transportation Information Center	incident information
Emissions Management Center	Transportation Information Center	air quality information
Fleet and Freight Management Center	Commercial Vehicle Administration Center	route restrictions
Maint and Constr Management Center	Center	equipment maintenance status
Maint and Constr Management Center	Commercial Vehicle Administration Center	current infrastructure restrictions
Maint and Constr Management Center	Emergency Management Center	road weather information
Maint and Constr Management Center	Map Update System	current infrastructure restrictions
Maint and Constr Management Center	Surface Transportation Weather Service	road weather information
Maint and Constr Management Center	Traffic Management Center	current infrastructure restrictions
Maint and Constr Management Center	Traffic Management Center	environmental conditions data
Maint and Constr Management Center	Traffic Management Center	equipment maintenance status
Maint and Constr Management Center	Traffic Management Center	work zone information
Maint and Constr Management Center	Transit Management Center	current infrastructure restrictions
Maint and Constr Management Center	Transportation Information Center	current infrastructure restrictions
Maint and Constr Management Center	Transportation Information Center	environmental conditions data
Maint and Constr Management Center	Transportation Information Center	maint and constr work plans
Maint and Constr Management Center	Transportation Information Center	road weather information
Maint and Constr Management Center	Transportation Information Center	work zone information
Maint and Constr Management Center	Weather Service	road weather information
Other CV Administration Centers	Commercial Vehicle Administration Center	route restrictions
Other Traffic Management Centers	Traffic Management Center	device control request
Other Traffic Management Centers	Traffic Management Center	device data
Other Traffic Management Centers	Traffic Management Center	device status
Other Traffic Management Centers	Traffic Management Center	incident information
Other Traffic Management Centers	Traffic Management Center	road network conditions
Other Traffic Management Centers	Traffic Management Center	traffic image meta data

Other Traffic Management Centers	Traffic Management Center	traffic images
Other Transportation Information Centers	Transportation Information Center	emergency traveler information
Other Transportation Information Centers	Transportation Information Center	incident information
Other Transportation Information Centers	Transportation Information Center	road network conditions
Other Transportation Information Centers	Transportation Information Center	traffic image meta data
Other Transportation Information Centers	Transportation Information Center	traffic images
Service Monitor System	Center	RSE fault data
Service Monitor System	Maint and Constr Management Center	RSE fault data
Surface Transportation Weather Service	Emergency Management Center	transportation weather information
Surface Transportation Weather Service	Maint and Constr Management Center	transportation weather information
Surface Transportation Weather Service	Traffic Management Center	transportation weather information
Surface Transportation Weather Service	Transportation Information Center	transportation weather information
Traffic Management Center	Emergency Management Center	emergency traffic control information
Traffic Management Center	Emergency Management Center	incident information
Traffic Management Center	Emergency Management Center	road network conditions
Traffic Management Center	Emissions Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	route restrictions
Traffic Management Center	Maint and Constr Management Center	equipment maintenance request
Traffic Management Center	Maint and Constr Management Center	field equipment status
Traffic Management Center	Maint and Constr Management Center	incident information
Traffic Management Center	Maint and Constr Management Center	road network conditions
Traffic Management Center	Other Traffic Management Centers	device control request
Traffic Management Center	Other Traffic Management Centers	device data
Traffic Management Center	Other Traffic Management Centers	device status
Traffic Management Center	Other Traffic Management Centers	incident information
Traffic Management Center	Other Traffic Management Centers	road network conditions
Traffic Management Center	Other Traffic Management Centers	traffic image meta data
Traffic Management Center	Other Traffic Management Centers	traffic images
Traffic Management Center	Transit Management Center	incident information
Traffic Management Center	Transit Management Center	road network conditions
Traffic Management Center	Transportation Information Center	incident information
Traffic Management Center	Transportation Information Center	regional situation data
Traffic Management Center	Transportation Information Center	road network conditions
Traffic Management Center	Transportation Information Center	traffic control information
Traffic Management Center	Transportation Information Center	traffic image meta data

Traffic Management Center	Transportation Information Center	traffic images
Transportation Information Center	Archived Data Center	regional situation data
Transportation Information Center	Emergency Management Center	corridor operational strategies
Transportation Information Center	Emergency Management Center	road network conditions
Transportation Information Center	Emergency Management Center	road weather advisories
Transportation Information Center	Emissions Management Center	corridor operational strategies
Transportation Information Center	Fleet and Freight Management Center	incident information
Transportation Information Center	Fleet and Freight Management Center	road network conditions
Transportation Information Center	Fleet and Freight Management Center	road weather advisories
Transportation Information Center	Maint and Constr Management Center	corridor operational strategies
Transportation Information Center	Other Transportation Information Centers	emergency traveler information
Transportation Information Center	Other Transportation Information Centers	incident information
Transportation Information Center	Other Transportation Information Centers	road network conditions
Transportation Information Center	Other Transportation Information Centers	traffic image meta data
Transportation Information Center	Other Transportation Information Centers	traffic images
Transportation Information Center	Traffic Management Center	corridor operational strategies
Transportation Information Center	Traffic Management Center	regional situation data
Transportation Information Center	Transit Management Center	corridor operational strategies
Tunnel Management System	Maint and Constr Management Center	field equipment status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: AU weather information	Adopt an existing weather information centre-to-centre data profile for use within the region.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Surface Transportation Weather Service	Traffic Management Center	transportation weather information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Equipment maintenance coordination	Develop an internationally acceptable ITS application specification for C-C exchange of equipment maintenance and status information	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Maint and Constr Management Center	equipment maintenance request
Maint and Constr Management Center	Center	equipment maintenance status

| Solution Name: | US: TMDD - NTCIP Messaging | | | | | Number of Issues: | 6 | Total Issue Severity: | 43 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: EU emergency traffic control	Update DATEX to support the provision of emergency traffic control information with a complete application specification.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Traffic Management Center	emergency traffic control request
Traffic Management Center	Emergency Management Center	emergency traffic control information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: TCIP/IM/TMDD/ATIS for incident information	Standardise on a single solution for providing incident and incident management information; currently this information is defined within APTA TCIP, IEEE 1512 (IM), ITE TMDD, and SAE ATIS.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Traffic Management Center	incident information
Emergency Management Center	Transportation Information Center	incident information
Other Traffic Management Centers	Traffic Management Center	incident information
Other Transportation Information Centers	Transportation Information Center	incident information
Traffic Management Center	Emergency Management Center	incident information
Traffic Management Center	Maint and Constr Management Center	incident information
Traffic Management Center	Other Traffic Management Centers	incident information
Traffic Management Center	Transit Management Center	incident information
Traffic Management Center	Transportation Information Center	incident information
Transportation Information Center	Fleet and Freight Management Center	incident information
Transportation Information Center	Other Transportation Information Centers	incident information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Traffic Management Center	emergency traffic control request
Traffic Management Center	Emergency Management Center	emergency traffic control information

| Solution Name: | US: TMDD - NTCIP Messaging | | | | | Number of Issues: | 6 | Total Issue Severity: | 43 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-C: TMDD	Updates or additions to the TMDD need to occur to support several use cases including the addition of: sensor data accuracy; air quality information; roadway maintenance status; maintenance and construction work plans.	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emissions Management Center	Transportation Information Center	air quality information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-C: Update TMDD (Mid-term)	Updates or additions to the TMDD need to occur to support several use cases including the addition of: managing the exchange of equipment faults, equipment maintenance requests, and equipment maintenance status.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Maint and Constr Management Center	equipment maintenance request
Maint and Constr Management Center	Center	equipment maintenance status
Service Monitor System	Center	RSE fault data
Service Monitor System	Maint and Constr Management Center	RSE fault data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	C-C: TMDD	Updates or additions to the TMDD need to occur to support several use cases including the addition of: sensor data accuracy; air quality information; roadway maintenance status; maintenance and construction work plans.	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Other Traffic Management Centers	Traffic Management Center	device data
Other Traffic Management Centers	Traffic Management Center	road network conditions
Other Transportation Information Centers	Transportation Information Center	road network conditions
Traffic Management Center	Emergency Management Center	road network conditions
Traffic Management Center	Emissions Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	road network conditions
Traffic Management Center	Maint and Constr Management Center	road network conditions
Traffic Management Center	Other Traffic Management Centers	device data
Traffic Management Center	Other Traffic Management Centers	road network conditions
Traffic Management Center	Transit Management Center	road network conditions
Traffic Management Center	Transportation Information Center	road network conditions
Transportation Information Center	Emergency Management Center	road network conditions
Transportation Information Center	Fleet and Freight Management Center	road network conditions
Transportation Information Center	Other Transportation Information Centers	road network conditions

Solution Name:	US: TMDD - NTCIP Messaging					Number of Issues:	6	Total Issue Severity:	43

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Inadequate guidance for complex data design	The standard provides a robust design, but there may be more than one way to convey the information contained in this information flow and the standard provides little or no guidance on how to use the defined structures.	Low	C-C: TMDD	Updates or additions to the TMDD need to occur to support several use cases including the addition of: sensor data accuracy; air quality information; roadway maintenance status; maintenance and construction work plans.	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Maint and Constr Management Center	Transportation Information Center	maint and constr work plans

Solution Name:	US: TMDD - OMG DDS					Number of Issues:	6	Total Issue Severity:	43

This solution is used within the U.S.. It combines standards associated with US: TMDD with those for C-C: OMG DDS. The US: TMDD standards include upper-layer standards required to implement centre-to-centre communications with traffic management systems. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: EU emergency traffic control	Update DATEX to support the provision of emergency traffic control information with a complete application specification.	Near-term	Australia, European Union

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Emergency Management Center	Traffic Management Center	emergency traffic control request
Traffic Management Center	Emergency Management Center	emergency traffic control information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: Equipment maintenance coordination	Develop an internationally acceptable ITS application specification for C-C exchange of equipment maintenance and status information	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Center	Maint and Constr Management Center	equipment maintenance request
Maint and Constr Management Center	Center	equipment maintenance status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data profile not defined	Performance, functionality, and the upper-layers of the OSI stack have not been defined for this information flow.	Ultra	C-C: AU weather information	Adopt an existing weather information centre-to-centre data profile for use within the region.	Near-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	**Destination**	**Flow Name**
Surface Transportation Weather Service	Traffic Management Center	transportation weather information

| Solution Name: | US: TMDD - OMG DDS | | | | Number of Issues: | 6 | Total Issue Severity: | 43 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-C: Update TMDD (Mid-term)	Updates or additions to the TMDD need to occur to support several use cases including the addition of: managing the exchange of equipment faults, equipment maintenance requests, and equipment maintenance status.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Center	Maint and Constr Management Center	equipment maintenance request
Maint and Constr Management Center	Center	equipment maintenance status
Service Monitor System	Center	RSE fault data
Service Monitor System	Maint and Constr Management Center	RSE fault data

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-C: TMDD	Updates or additions to the TMDD need to occur to support several use cases including the addition of: sensor data accuracy; air quality information; roadway maintenance status; maintenance and construction work plans.	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emissions Management Center	Transportation Information Center	air quality information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data not fully defined (medium)	Some of the data elements for this information flow are not fully defined.	Medium	C-C: US signal priority/preemption	Develop an ITS application specification for centres to exchange requests and status for signal priority/preemption along a route.	Medium-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Traffic Management Center	emergency traffic control request
Traffic Management Center	Emergency Management Center	emergency traffic control information

| Solution Name: | US: TMDD - OMG DDS | | | | | Number of Issues: | 6 | Total Issue Severity: | 43 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Overlap of standards	Multiple standards have been developed to address this information and it is unclear which standard should be used to address this specific information flow.	Medium	C-C: TCIP/IM/TMDD/ATIS for incident information	Standardise on a single solution for providing incident and incident management information; currently this information is defined within APTA TCIP, IEEE 1512 (IM), ITE TMDD, and SAE ATIS.	Urgent	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Emergency Management Center	Traffic Management Center	incident information
Emergency Management Center	Transportation Information Center	incident information
Other Traffic Management Centers	Traffic Management Center	incident information
Other Transportation Information Centers	Transportation Information Center	incident information
Traffic Management Center	Emergency Management Center	incident information
Traffic Management Center	Maint and Constr Management Center	incident information
Traffic Management Center	Other Traffic Management Centers	incident information
Traffic Management Center	Transit Management Center	incident information
Traffic Management Center	Transportation Information Center	incident information
Transportation Information Center	Fleet and Freight Management Center	incident information
Transportation Information Center	Other Transportation Information Centers	incident information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Accuracy of data	The standard is missing accuracy requirements for some of its data, which may result in anomalous behaviour.	Low	C-C: TMDD	Updates or additions to the TMDD need to occur to support several use cases including the addition of: sensor data accuracy; air quality information; roadway maintenance status; maintenance and construction work plans.	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Other Traffic Management Centers	Traffic Management Center	device data
Other Traffic Management Centers	Traffic Management Center	road network conditions
Other Transportation Information Centers	Transportation Information Center	road network conditions
Traffic Management Center	Emergency Management Center	road network conditions
Traffic Management Center	Emissions Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	road network conditions
Traffic Management Center	Maint and Constr Management Center	road network conditions
Traffic Management Center	Other Traffic Management Centers	device data
Traffic Management Center	Other Traffic Management Centers	road network conditions
Traffic Management Center	Transit Management Center	road network conditions
Traffic Management Center	Transportation Information Center	road network conditions
Transportation Information Center	Emergency Management Center	road network conditions
Transportation Information Center	Fleet and Freight Management Center	road network conditions
Transportation Information Center	Other Transportation Information Centers	road network conditions

Solution Name:	US: TMDD - OMG DDS				Number of Issues:	6	Total Issue Severity:	43

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Border Inspection System	Traffic Management Center	border wait times data
Border Inspection System	Transportation Information Center	border crossing status information
Center	Archived Data Center	center archive data
Center	Maint and Constr Management Center	equipment maintenance request
Commercial Vehicle Administration Center	Fleet and Freight Management Center	route restrictions
Commercial Vehicle Administration Center	Other CV Administration Centers	route restrictions
Commercial Vehicle Administration Center	Transportation Information Center	route restrictions
Emergency Management Center	Traffic Management Center	emergency traffic control request
Emergency Management Center	Traffic Management Center	incident information
Emergency Management Center	Transportation Information Center	incident information
Emissions Management Center	Transportation Information Center	air quality information
Fleet and Freight Management Center	Commercial Vehicle Administration Center	route restrictions
Maint and Constr Management Center	Center	equipment maintenance status
Maint and Constr Management Center	Commercial Vehicle Administration Center	current infrastructure restrictions
Maint and Constr Management Center	Emergency Management Center	road weather information
Maint and Constr Management Center	Map Update System	current infrastructure restrictions
Maint and Constr Management Center	Surface Transportation Weather Service	road weather information
Maint and Constr Management Center	Traffic Management Center	current infrastructure restrictions
Maint and Constr Management Center	Traffic Management Center	environmental conditions data
Maint and Constr Management Center	Traffic Management Center	equipment maintenance status
Maint and Constr Management Center	Traffic Management Center	work zone information
Maint and Constr Management Center	Transit Management Center	current infrastructure restrictions
Maint and Constr Management Center	Transportation Information Center	current infrastructure restrictions
Maint and Constr Management Center	Transportation Information Center	environmental conditions data
Maint and Constr Management Center	Transportation Information Center	maint and constr work plans
Maint and Constr Management Center	Transportation Information Center	road weather information
Maint and Constr Management Center	Transportation Information Center	work zone information
Other CV Administration Centers	Commercial Vehicle Administration Center	route restrictions
Other Traffic Management Centers	Traffic Management Center	device control request
Other Traffic Management Centers	Traffic Management Center	device data

Other Traffic Management Centers	Traffic Management Center	device status
Other Traffic Management Centers	Traffic Management Center	incident information
Other Traffic Management Centers	Traffic Management Center	road network conditions
Other Traffic Management Centers	Traffic Management Center	traffic image meta data
Other Traffic Management Centers	Traffic Management Center	traffic images
Other Transportation Information Centers	Transportation Information Center	emergency traveler information
Other Transportation Information Centers	Transportation Information Center	incident information
Other Transportation Information Centers	Transportation Information Center	road network conditions
Other Transportation Information Centers	Transportation Information Center	traffic image meta data
Other Transportation Information Centers	Transportation Information Center	traffic images
Service Monitor System	Center	RSE fault data
Service Monitor System	Maint and Constr Management Center	RSE fault data
Surface Transportation Weather Service	Emergency Management Center	transportation weather information
Surface Transportation Weather Service	Maint and Constr Management Center	transportation weather information
Surface Transportation Weather Service	Traffic Management Center	transportation weather information
Surface Transportation Weather Service	Transportation Information Center	transportation weather information
Traffic Management Center	Emergency Management Center	emergency traffic control information
Traffic Management Center	Emergency Management Center	incident information
Traffic Management Center	Emergency Management Center	road network conditions
Traffic Management Center	Emissions Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	road network conditions
Traffic Management Center	Fleet and Freight Management Center	route restrictions
Traffic Management Center	Maint and Constr Management Center	equipment maintenance request
Traffic Management Center	Maint and Constr Management Center	field equipment status
Traffic Management Center	Maint and Constr Management Center	incident information
Traffic Management Center	Maint and Constr Management Center	road network conditions
Traffic Management Center	Other Traffic Management Centers	device control request
Traffic Management Center	Other Traffic Management Centers	device data
Traffic Management Center	Other Traffic Management Centers	device status
Traffic Management Center	Other Traffic Management Centers	incident information
Traffic Management Center	Other Traffic Management Centers	road network conditions
Traffic Management Center	Other Traffic Management Centers	traffic image meta data
Traffic Management Center	Other Traffic Management Centers	traffic images
Traffic Management Center	Transit Management Center	incident information
Traffic Management Center	Transit Management Center	road network conditions
Traffic Management Center	Transportation Information Center	incident information

| Solution Name: | US: TMDD - OMG DDS | | | Number of Issues: | 6 | Total Issue Severity: | 43 |

Traffic Management Center	Transportation Information Center	regional situation data
Traffic Management Center	Transportation Information Center	road network conditions
Traffic Management Center	Transportation Information Center	traffic control information
Traffic Management Center	Transportation Information Center	traffic image meta data
Traffic Management Center	Transportation Information Center	traffic images
Transportation Information Center	Archived Data Center	regional situation data
Transportation Information Center	Emergency Management Center	corridor operational strategies
Transportation Information Center	Emergency Management Center	road network conditions
Transportation Information Center	Emergency Management Center	road weather advisories
Transportation Information Center	Emissions Management Center	corridor operational strategies
Transportation Information Center	Fleet and Freight Management Center	incident information
Transportation Information Center	Fleet and Freight Management Center	road network conditions
Transportation Information Center	Fleet and Freight Management Center	road weather advisories
Transportation Information Center	Maint and Constr Management Center	corridor operational strategies
Transportation Information Center	Other Transportation Information Centers	emergency traveler information
Transportation Information Center	Other Transportation Information Centers	incident information
Transportation Information Center	Other Transportation Information Centers	road network conditions
Transportation Information Center	Other Transportation Information Centers	traffic image meta data
Transportation Information Center	Other Transportation Information Centers	traffic images
Transportation Information Center	Traffic Management Center	corridor operational strategies
Transportation Information Center	Traffic Management Center	regional situation data
Transportation Information Center	Transit Management Center	corridor operational strategies
Tunnel Management System	Maint and Constr Management Center	field equipment status

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Inadequate guidance for complex data design	The standard provides a robust design, but there may be more than one way to convey the information contained in this information flow and the standard provides little or no guidance on how to use the defined structures.	Low	C-C: TMDD	Updates or additions to the TMDD need to occur to support several use cases including the addition of: sensor data accuracy; air quality information; roadway maintenance status; maintenance and construction work plans.	Near-term	United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution		
Source	Destination	Flow Name
Maint and Constr Management Center	Transportation Information Center	maint and constr work plans

| Solution Name: | US: UBL - NTCIP Messaging | | | Number of Issues: | 1 | Total Issue Severity: | 3 |

This solution is used within the U.S.. It combines standards associated with US: UBL with those for C-C: NTCIP Messaging. The US: UBL standards include upper-layer standards required to implement shipment related information flows. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centres as commonly used in the US.

Solution Name:	US: UBL - NTCIP Messaging					Number of Issues:	1	Total Issue Severity:	3

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Security inadequate	The solution does not provide adequate communications security for the information triple, which potentially jeopardizes C-ITS operations.	Medium	C-C: Secure communications	Develop one or more internationally acceptable, secure, centre-to-centre communication standards and define rules on when to use which one. The standard(s) should include support for authentication, authorization, confidentiality, and non-repudiation, as needed. Once the application layer standard(s) are developed, most ITS Information Layer standards will need to be updated to document data in appropriate format(s).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Fleet and Freight Management Center	Freight Distribution and Logistics Center	freight transportation status
Fleet and Freight Management Center	Intermodal Customer System	freight transportation status
Fleet and Freight Management Center	Intermodal Terminal	freight transportation status
Freight Distribution and Logistics Center	Intermodal Customer System	freight transportation status
Freight Distribution and Logistics Center	Intermodal Terminal	freight transportation status
Intermodal Customer System	Fleet and Freight Management Center	freight transport booking
Intermodal Customer System	Fleet and Freight Management Center	freight transportation status
Intermodal Customer System	Freight Distribution and Logistics Center	freight transport booking
Intermodal Terminal	Fleet and Freight Management Center	container delivery confirmation
Intermodal Terminal	Fleet and Freight Management Center	freight transportation status

Solution Name:	US: UBL - OMG DDS					Number of Issues:	1	Total Issue Severity:	3

This solution is used within the U.S.. It combines standards associated with US: UBL with those for C-C: OMG DDS. The US: UBL standards include upper-layer standards required to implement shipment related information flows. The C-C: OMG DDS standards include lower-layer standards that support secure data sharing between publishers and subscribers over a traditional Internet link

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Unvetted by community	The proposed solution uses a suite of standards that is accepted within some communities, but has not necessarily been accepted for use within the context of this information triple.	Medium	Data distribution technologies	Investigate emerging ICT technologies that might offer mechanisms to distribute data among multiple ITS subsystems on an as-needed basis in a more efficient, secure, and scalable manner than existing approaches. Determine where the use of these technologies might be appropriate, and what impacts the adoption of such technologies would have on ITS standards efforts.	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Fleet and Freight Management Center	Freight Distribution and Logistics Center	freight transportation status
Fleet and Freight Management Center	Intermodal Customer System	freight transportation status
Fleet and Freight Management Center	Intermodal Terminal	freight transportation status
Freight Distribution and Logistics Center	Intermodal Customer System	freight transportation status
Freight Distribution and Logistics Center	Intermodal Terminal	freight transportation status
Intermodal Customer System	Fleet and Freight Management Center	freight transport booking
Intermodal Customer System	Fleet and Freight Management Center	freight transportation status
Intermodal Customer System	Freight Distribution and Logistics Center	freight transport booking
Intermodal Terminal	Fleet and Freight Management Center	container delivery confirmation

Solution Name:	US: UBL - OMG DDS				Number of Issues:	1	Total Issue Severity:	3

Intermodal Terminal	Fleet and Freight Management Center	freight transportation status

Solution Name:	US: WAVE Tolling - Local Unicast Wireless (US)				Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: WAVE Tolling with those for V-X: Local Unicast Wireless (US). The US: WAVE Tolling standards include upper-layer standards required to implement V2I tolling flows. The V-X: Local Unicast Wireless (US) standards include lower-layer standards that support local-area unicast wireless solutions, such as DSRC technologies, LTE, etc.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution Destination	Flow Name
Personal Information Device	Connected Vehicle Roadside Equipment	service payment information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data may not be fully defined (low)	The information flow is unclear as to what precisely is needed; the standard may not fully support the needs of the information flow, depending on how it is interpreted.	Low	V-L: Electrical charging	Develop an internationally acceptable ITS application specification, including payment for services, for a vehicle to interface with an RSE as a part of an electric charging application.	Medium-term	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution Destination	Flow Name
Personal Information Device	Connected Vehicle Roadside Equipment	service payment information

Solution Name:	US: WAVE Tolling - WAVE UDP				Number of Issues:	2	Total Issue Severity:	4

This solution is used within the U.S.. It combines standards associated with US: WAVE Tolling with those for V-X: WAVE UDP. The US: WAVE Tolling standards include upper-layer standards required to implement V2I tolling flows. The V-X: WAVE UDP standards include lower-layer standards that support connectionless vehicle-to-any communications within ~300m using the User Datagram Protocol (UDP) over Internet Protocol version 6 (IPv6) over the 5.9GHz spectrum.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Source	Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle payment request
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle payment update
ITS Roadway Payment Equipment	Vehicle OBE	vehicle payment request
ITS Roadway Payment Equipment	Vehicle OBE	vehicle payment update
Vehicle OBE	Connected Vehicle Roadside Equipment	service payment information
Vehicle OBE	ITS Roadway Payment Equipment	service payment information

| Solution Name: | US: WAVE Tolling - WAVE UDP | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data may not be fully defined (low)	The information flow is unclear as to what precisely is needed; the standard may not fully support the needs of the information flow, depending on how it is interpreted.	Low	V-L: Electrical charging	Develop an internationally acceptable ITS application specification, including payment for services, for a vehicle to interface with an RSE as a part of an electric charging application.	Medium-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle payment request
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle payment update
ITS Roadway Payment Equipment	Vehicle OBE	vehicle payment request
ITS Roadway Payment Equipment	Vehicle OBE	vehicle payment update
Vehicle OBE	Connected Vehicle Roadside Equipment	service payment information
Vehicle OBE	ITS Roadway Payment Equipment	service payment information

| Solution Name: | US: WAVE Tolling - WAVE WSMP | | | | | Number of Issues: | 2 | Total Issue Severity: | 4 |

This solution is used within the U.S. It combines upper-layer standards required to implement V2I tolling flows with lower-layer standards that support vehicle-to-any communications within ~300m using WSMP over the 5.9GHz spectrum.

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Uncertainty about trust revocation mechanism	The mechanisms used to prevent bad actors from sending authorized messages is unproven.	Medium	Misbehavior detection and security revocation mechanism	Conduct a field test to prove out the trust revocation mechanisms at all levels, including revoking the privileges of a certificate authority (e.g., if an authority is no longer recognized within a region) and of an ITS station (e.g., in case an ITS station starts to misbehave).	Urgent	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle payment request
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle payment update
Vehicle OBE	Connected Vehicle Roadside Equipment	service payment information
Vehicle OBE	ITS Roadway Payment Equipment	service payment information

Issue	Issue Description	Issue Severity	Proposed Resolution	Resolution Description	Timeframe	Applicability
Data may not be fully defined (low)	The information flow is unclear as to what precisely is needed; the standard may not fully support the needs of the information flow, depending on how it is interpreted.	Low	V-L: Electrical charging	Develop an internationally acceptable ITS application specification, including payment for services, for a vehicle to interface with an RSE as a part of an electric charging application.	Medium-term	Australia, European Union, United States

Information Triples using this solution and affected by this Issue that would be addressed by the Proposed Resolution

Source	Destination	Flow Name
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle payment request
Connected Vehicle Roadside Equipment	Vehicle OBE	vehicle payment update
Vehicle OBE	Connected Vehicle Roadside Equipment	service payment information
Vehicle OBE	ITS Roadway Payment Equipment	service payment information