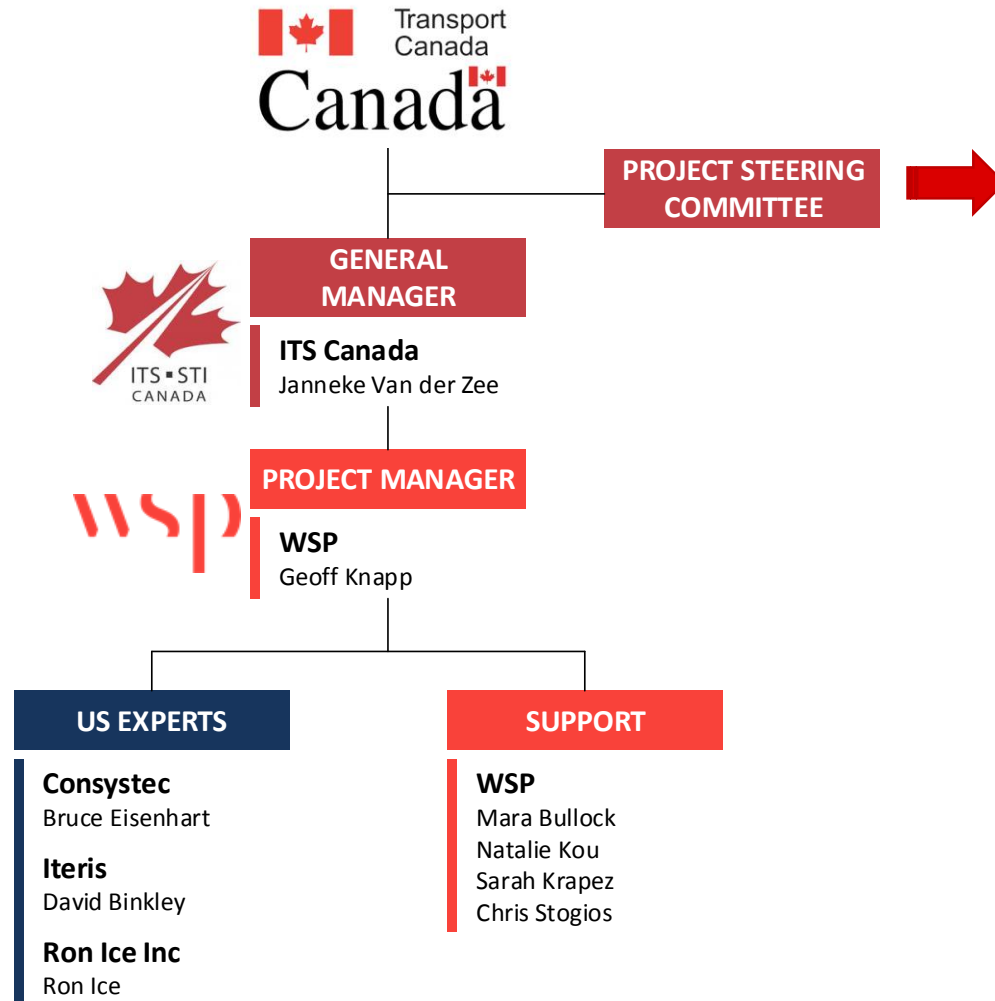*Updating the ITS Architecture for Canada Phase II – English Update and Scoping for French Update*

Webinar Part 1: Review of Current Differences and Assessment of Unique Canadian Aspects

July 30, 2019
1:30 pm – 3:30 pm EDT

Project Team for Update

Transport Canada
Canadä

PROJECT STEERING COMMITTEE →

GENERAL MANAGER

ITS Canada
Janneke Van der Zee

PROJECT MANAGER

WSP
Geoff Knapp

US EXPERTS

Consystec
Bruce Eisenhart

Iteris
David Binkley

Ron Ice Inc
Ron Ice

SUPPORT

WSP
Mara Bullock
Natalie Kou
Sarah Krapez
Chris Stogios

— Amanda Price, Yukon Government

— Barry Pekilis, NRC

— Brigid Canil, BC MoTI

— Jonathan Foord, City of Winnipeg

— Keenan Kitasaka, Associated Engineering

— Ken Moshi, Transport Canada

— Oliver Audet, Ville de Montréal

— Pierre Bolduc, Infrastructure Canada

— Pierre Rasolider, Transport Canada

— Peter Allaby, Crandell Engineering

— Rajeev Roy, The Regional Municipality of York

— Richard Beauregard-Long, NB Department of Transportation and Infrastructure

— Richard Chylinski, Parsons

— Tony Qiu, U of A / ActvieAurora

— Trevor Hanson, University of New Brunswick

Transport Canada **Transports Canada**

MENTI

Use computer or mobile to access:

Go to **www.menti.com** and use the code **86 11 32**

Please enter your name (can skip, or be 'anonymous')

Mentimeter

Palkins

Fred Wollin

Peter Giese

Heba Taher, City of Toronto

Chris Philp

⊘ Slide is not active   Activate

👤 36

3

Welcome to the new plugin

Add Mentimeter slides directly to your PowerPoint presentation!
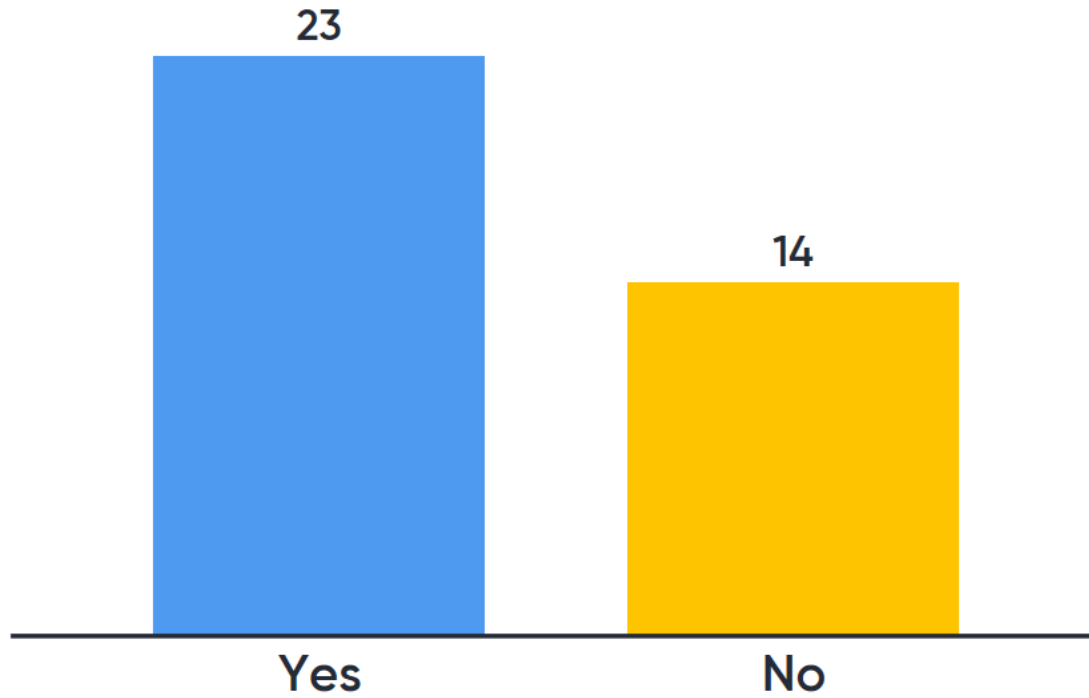
Paste the link to the slide you want to display here:

Slide link   **How does it work?**

https://www.mentimeter.com/s/asdfakn3290&

Select

Log out

wsp

Agenda

1.0 Background
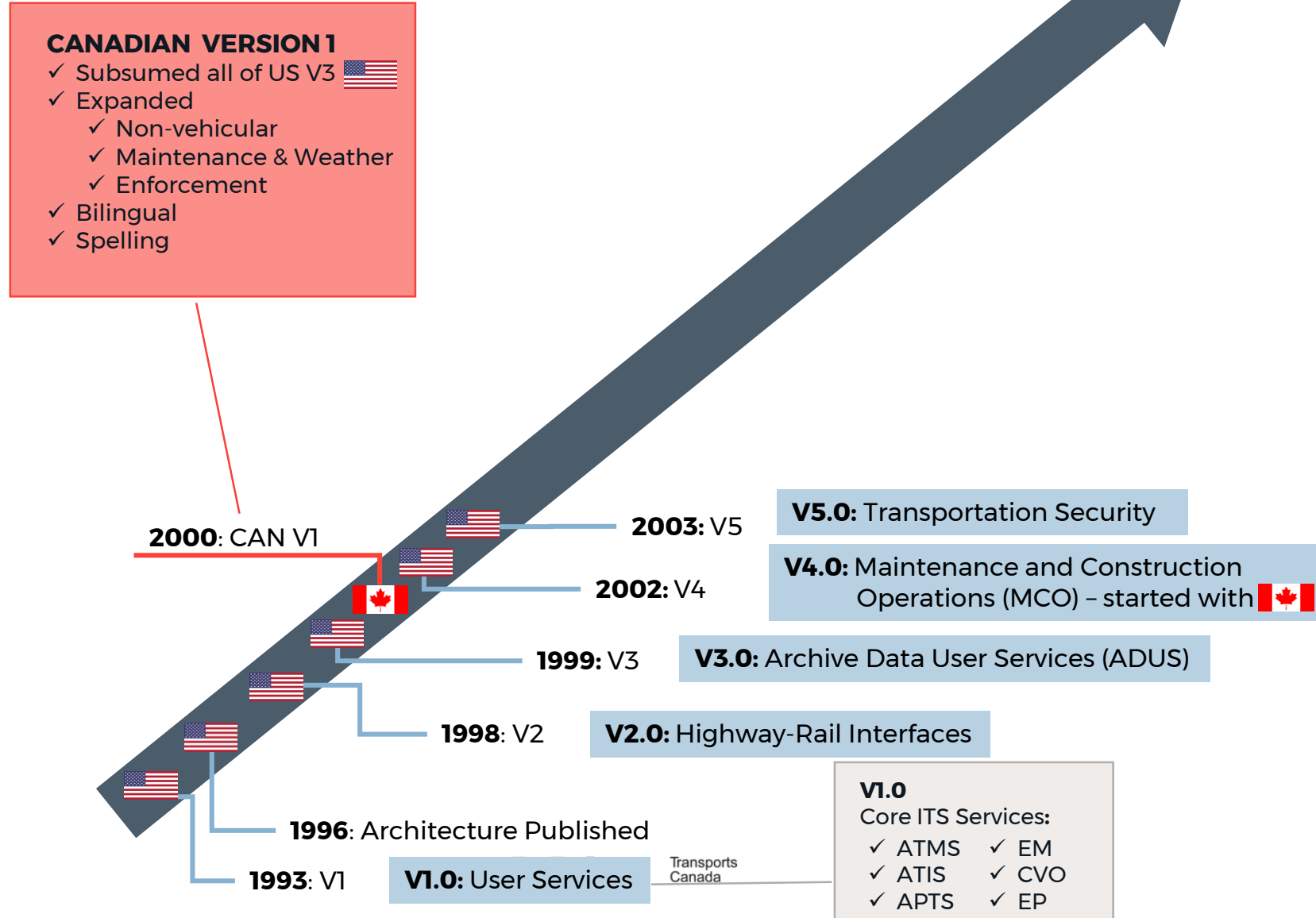
2.0 Quick ITS Architecture Primer

3.0 Introduction to the Project

4.0 Assessment of Differences
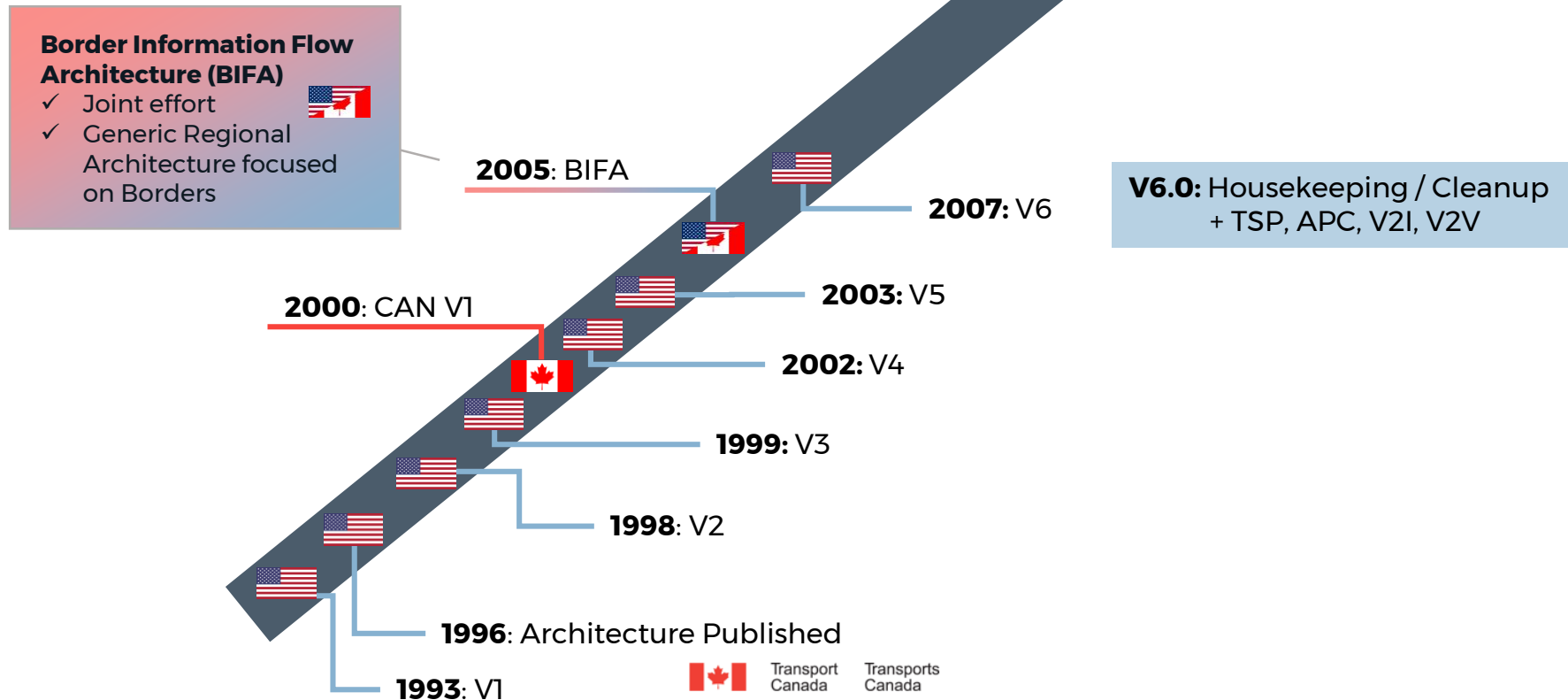
5.0 What to Expect Tomorrow

1.0 Background

Relationship Between U.S. and Canadian Architectures

CANADIAN VERSION 1
- ✓ Subsumed all of US V3
- ✓ Expanded
  - ✓ Non-vehicular
  - ✓ Maintenance & Weather
  - ✓ Enforcement
- ✓ Bilingual
- ✓ Spelling

2000: CAN V1

2003: V5 — **V5.0:** Transportation Security

2002: V4 — **V4.0:** Maintenance and Construction Operations (MCO) – started with 🍁

1999: V3 — **V3.0:** Archive Data User Services (ADUS)

1998: V2 — **V2.0:** Highway-Rail Interfaces

1996: Architecture Published

1993: V1 — **V1.0:** User Services

Transports Canada

V1.0
Core ITS Services:
- ✓ ATMS   ✓ EM
- ✓ ATIS   ✓ CVO
- ✓ APTS   ✓ EP

8

wsp

ITS•STI CANADA

Relationship Between U.S. and Canadian Architectures

Border Information Flow Architecture (BIFA)
- ✓ Joint effort
- ✓ Generic Regional Architecture focused on Borders

2005: BIFA

2000: CAN V1

V6.0: Housekeeping / Cleanup + TSP, APC, V2I, V2V

2007: V6

2003: V5

2002: V4

1999: V3

1998: V2

1996: Architecture Published

1993: V1

Transport Canada / Transports Canada

Relationship Between U.S. and Canadian Architectures

Connected Vehicle Reference Implementation Architecture (CVRIA)
✓ Developed as the basis for identifying the key interfaces across the connected vehicle environment which will support further analysis to identify and prioritize standards development activities

CVRIA

WE ARE HERE

2017/18: ARC-IT 8

ARC-IT 8: Integrated CRVIA
+ Fully Restructuring
+ RAD-IT & SET-IT tools

CANADIAN VERSION 2
✓ Full re-alignment with US V6.1
  ✓ Adopted MCO
✓ Incorporated BIFA
✓ Continued support of 'Canadian' Services
✓ Bilingual, Spelling
✓ Canadian Turbo Architecture

2010: CAN V2

2012: V7

V7.0: Aligned with CVISN 4.0
+ Multimodal Connection Protection
+ Mixed Use Warning Systems

2005: BIFA

2007: V6

2003: V5

2000: CAN V1

2002: V4

1999: V3

1998: V2

1996: Architecture Published

1993: V1

Transport Canada / Transports Canada

U.S. ARC-IT_V8

Connected Vehicle Reference Information Architecture (CVRIA)

Canada Version 2

wsp

ITS • STI CANADA

2.0 Quick ITS Architecture Primer

What is a National ITS Architecture?

A National ITS Architecture provides a common framework for planning, defining, and integrating intelligent transportation systems.

As a **Reference Architecture,** it provides common basis for planners and engineers with differing concerns to conceive, design and implement systems using a common language as a basis for delivering ITS, but does not mandate any particular implementation.
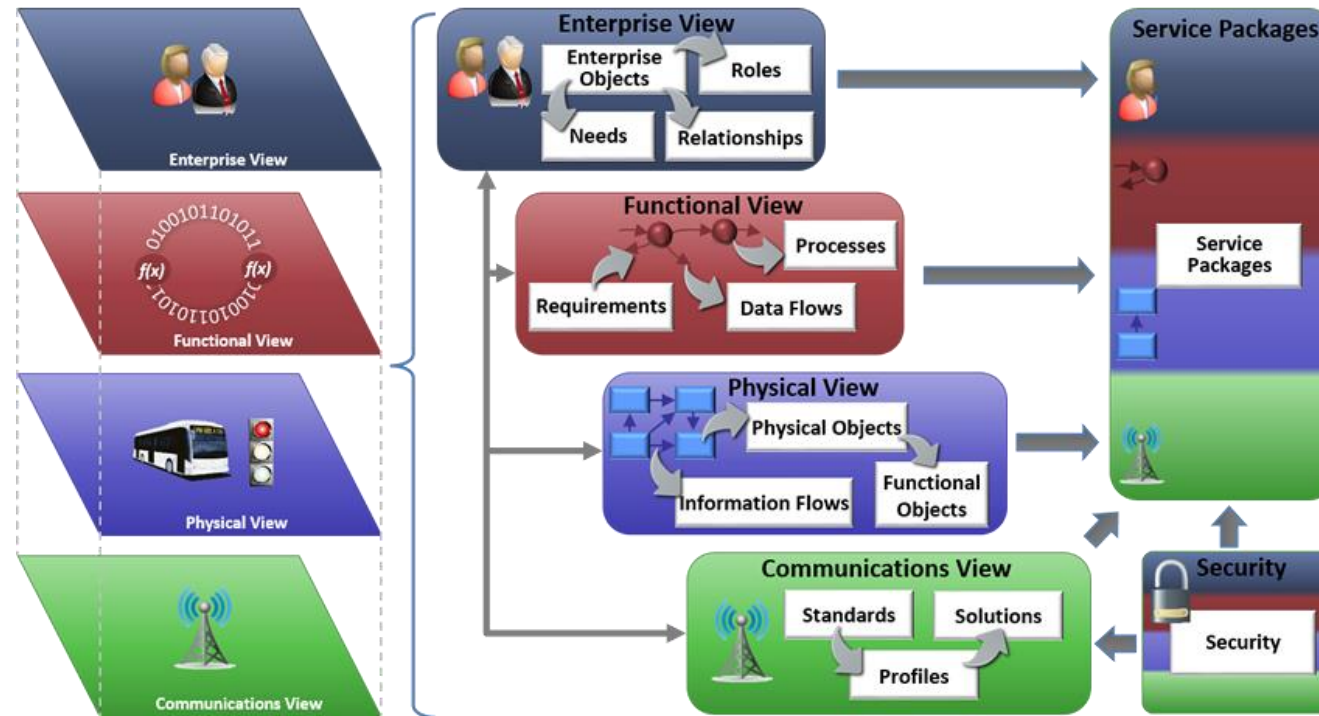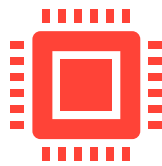
Service Packages – example: Transit Signal Priority
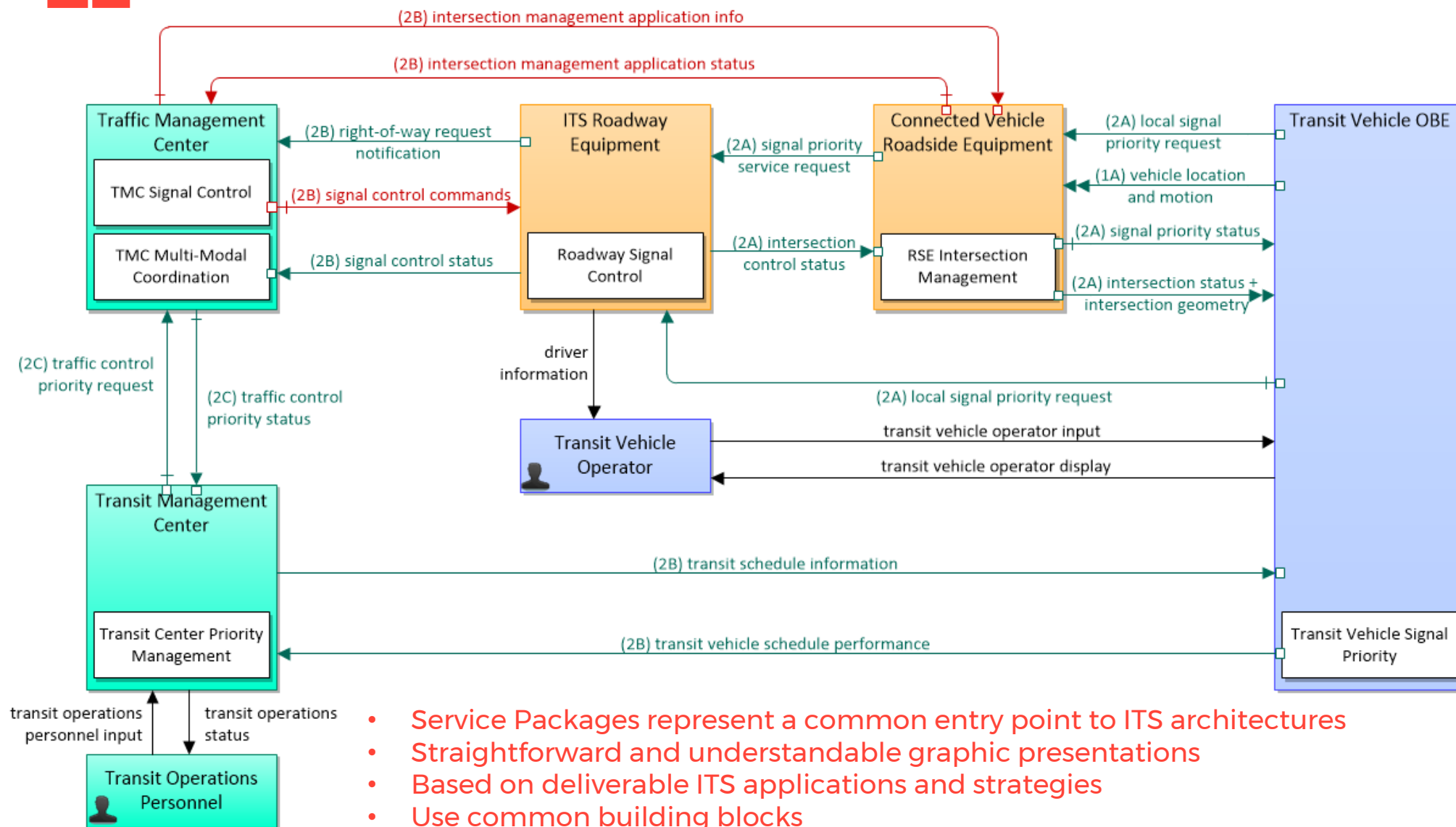
- Service Packages represent a common entry point to ITS architectures
- Straightforward and understandable graphic presentations
- Based on deliverable ITS applications and strategies
- Use common building blocks

Physical Objects
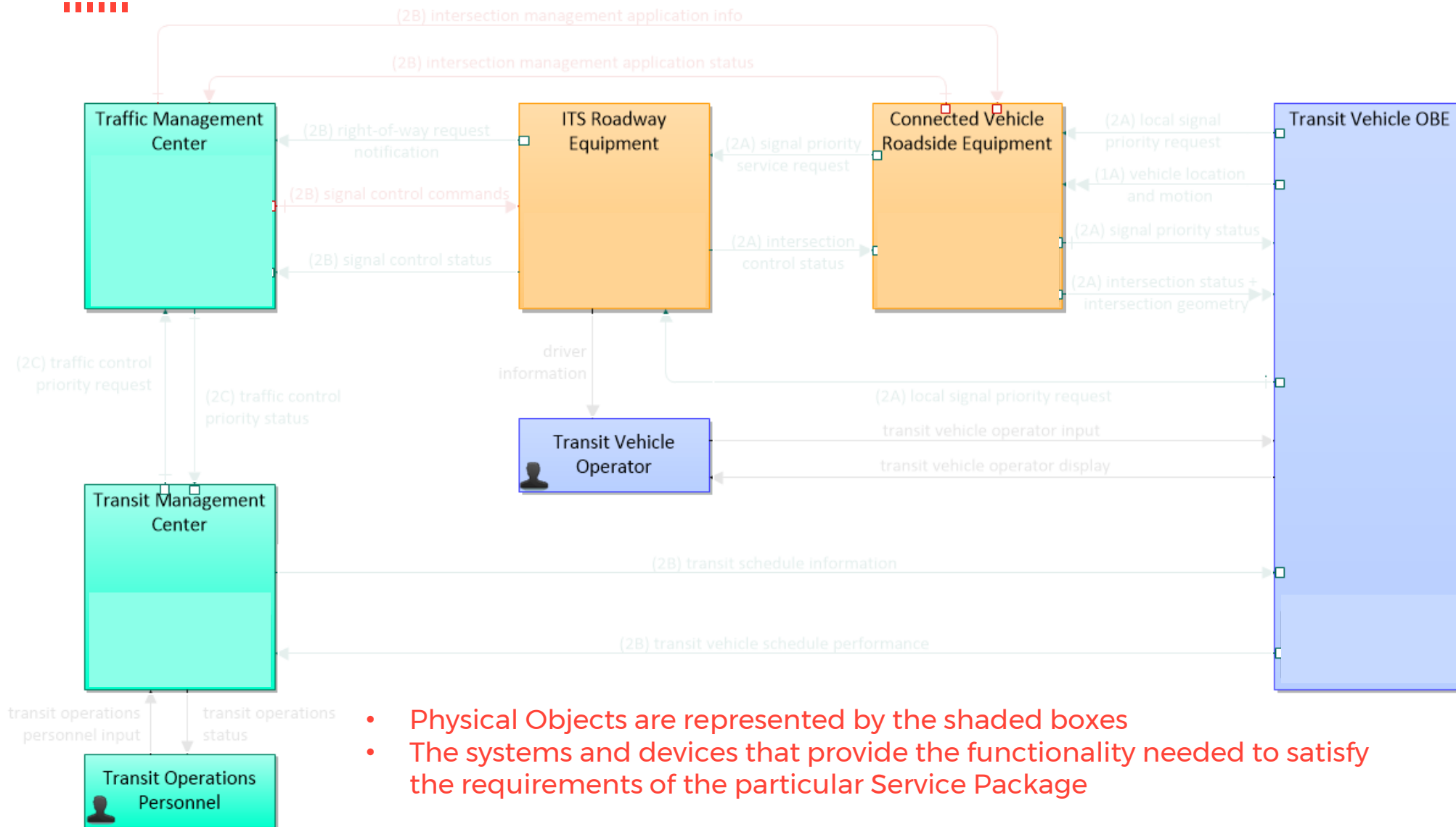
- Physical Objects are represented by the shaded boxes
- The systems and devices that provide the functionality needed to satisfy the requirements of the particular Service Package
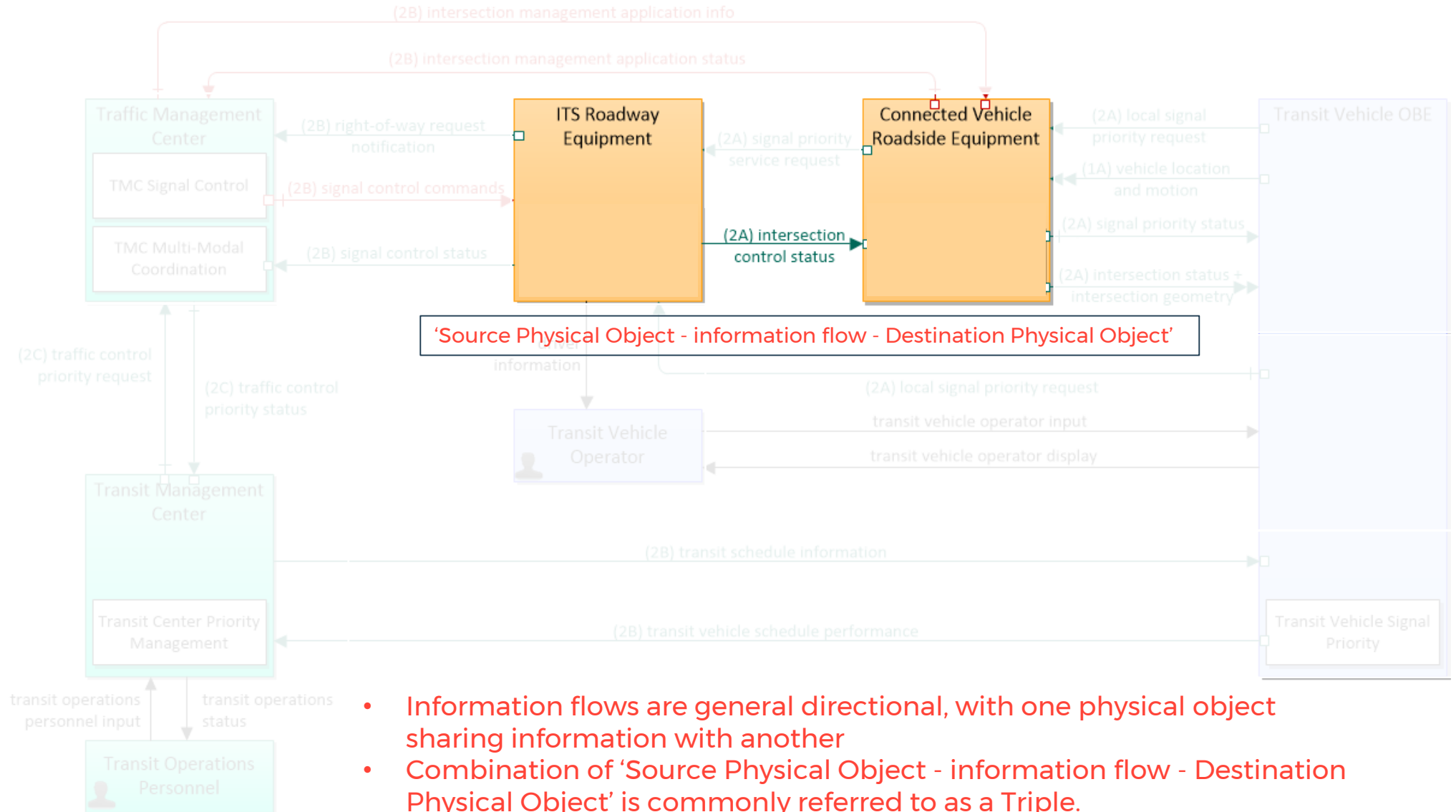
Information Flows

Triples

(2B) intersection management application info

(2B) intersection management application status

Traffic Management Center
- TMC Signal Control
- TMC Multi-Modal Coordination

ITS Roadway Equipment

Connected Vehicle Roadside Equipment

Transit Vehicle OBE

(2B) right-of-way request notification

(2A) signal priority service request

(2A) local signal priority request

(1A) vehicle location and motion

(2B) signal control commands

(2A) intersection control status

(2A) signal priority status

(2B) signal control status

(2A) intersection status + intersection geometry

> 'Source Physical Object - information flow - Destination Physical Object'

(2C) traffic control priority request

(2C) traffic control priority status

(2A) local signal priority request

transit vehicle operator input

Transit Vehicle Operator

transit vehicle operator display

Transit Management Center
- Transit Center Priority Management

(2B) transit schedule information

(2B) transit vehicle schedule performance

Transit Vehicle Signal Priority

transit operations personnel input
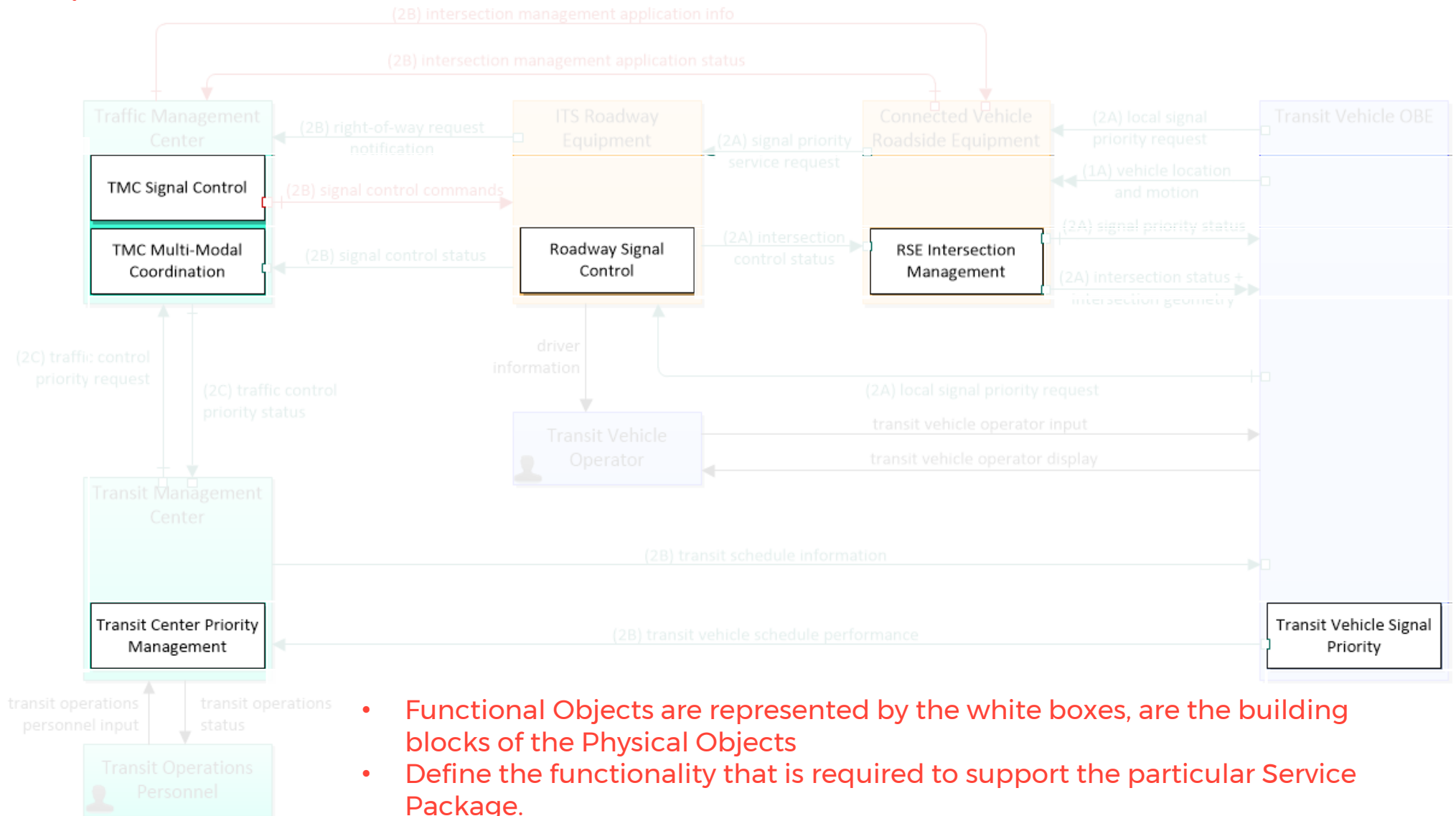
transit operations status

Transit Operations Personnel

- Information flows are general directional, with one physical object sharing information with another
- Combination of 'Source Physical Object - information flow - Destination Physical Object' is commonly referred to as a Triple.
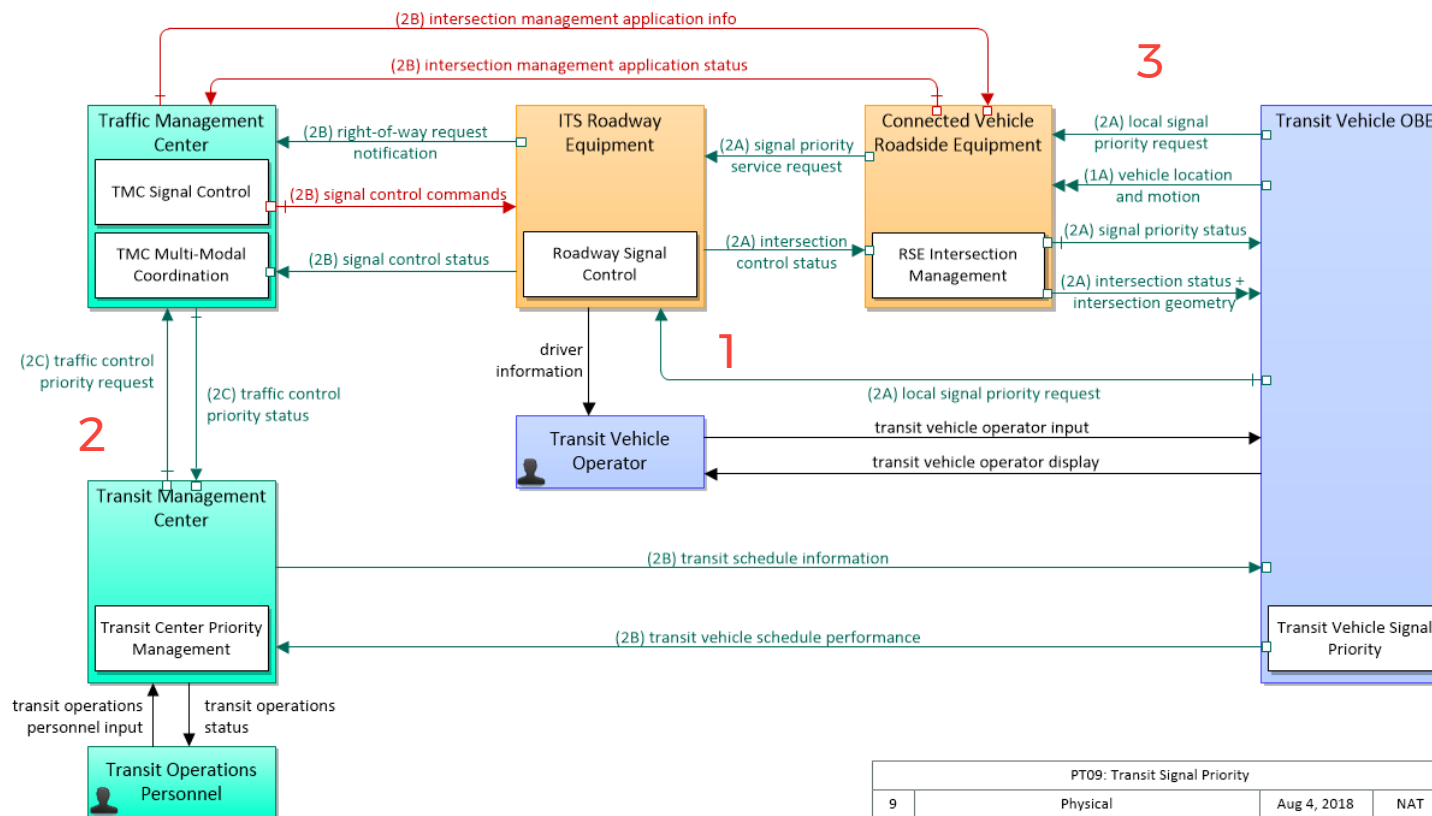
Functional Objects

- Functional Objects are represented by the white boxes, are the building blocks of the Physical Objects
- Define the functionality that is required to support the particular Service Package.

Service Packages

1. Local actuation based on a request from the transit vehicle in the field

2. Central actuation based on request from Transit Management Center

3. Local or central actuation based on Vehicle-to-Infrastructure (V2I) communication.

— Non-specific - identifying physical systems by generic terms

— Functionally oriented and not technology specific

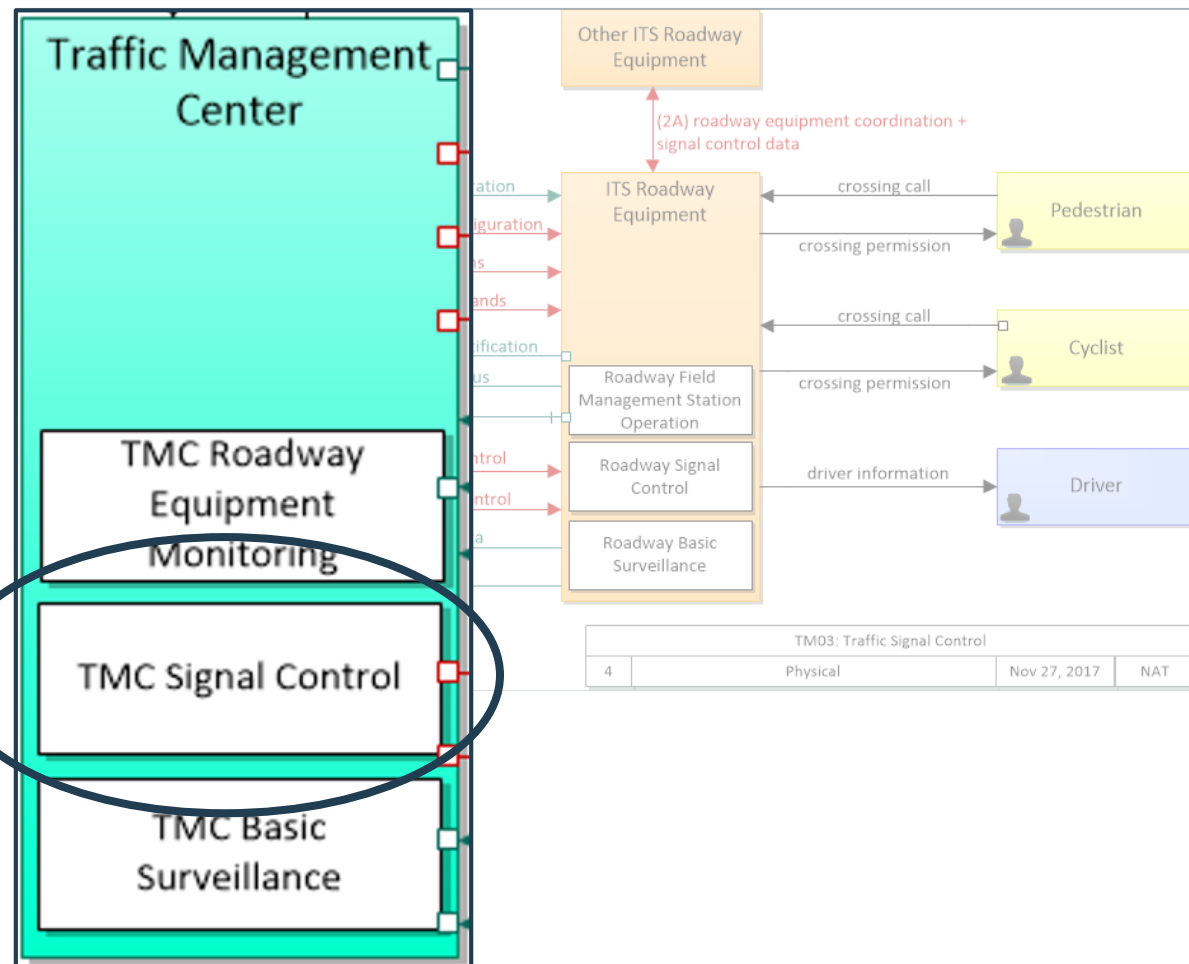— Not design prescriptive, identifying adaptable physical frameworks and in many cases multiple options for deployment
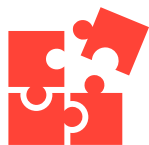
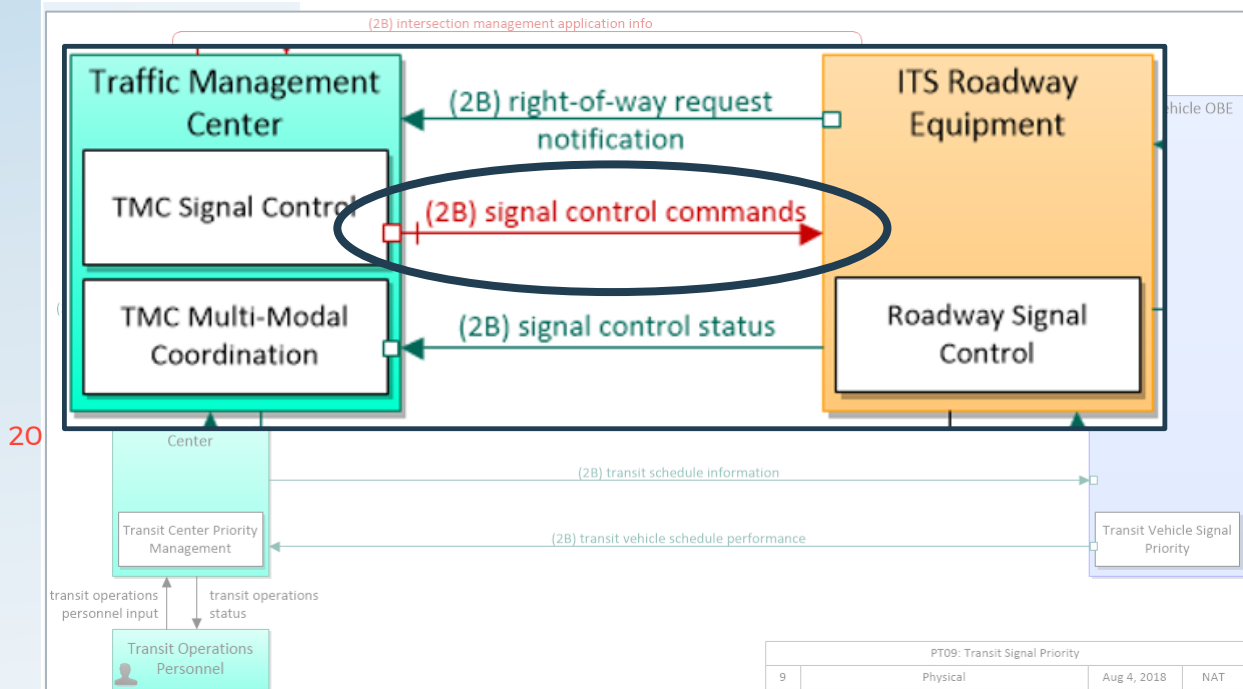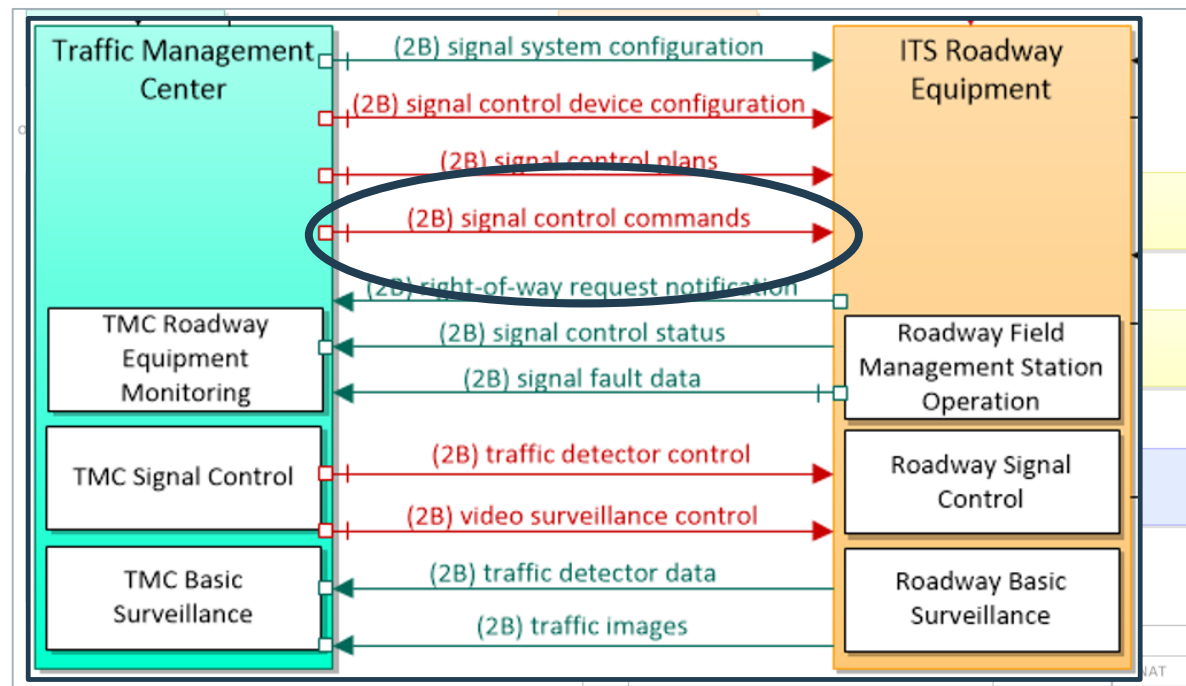# 'Building Blocks'

Transit Signal Priority
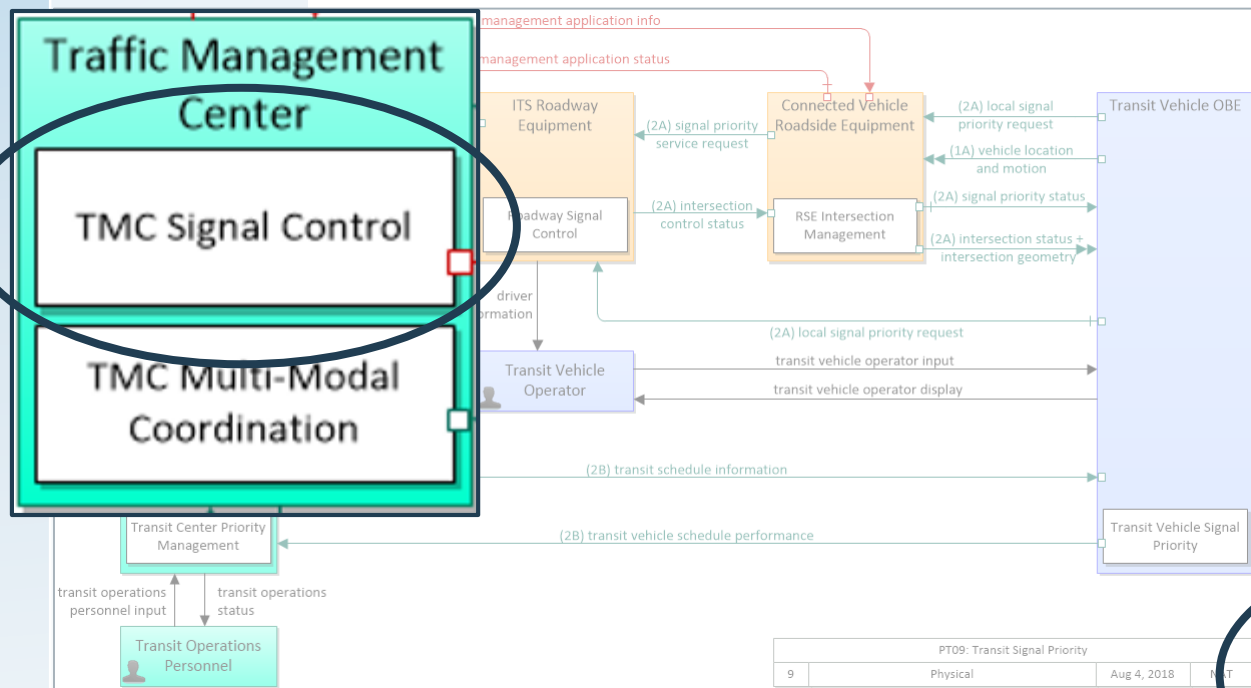
Traffic Signal Control

'Building Blocks'

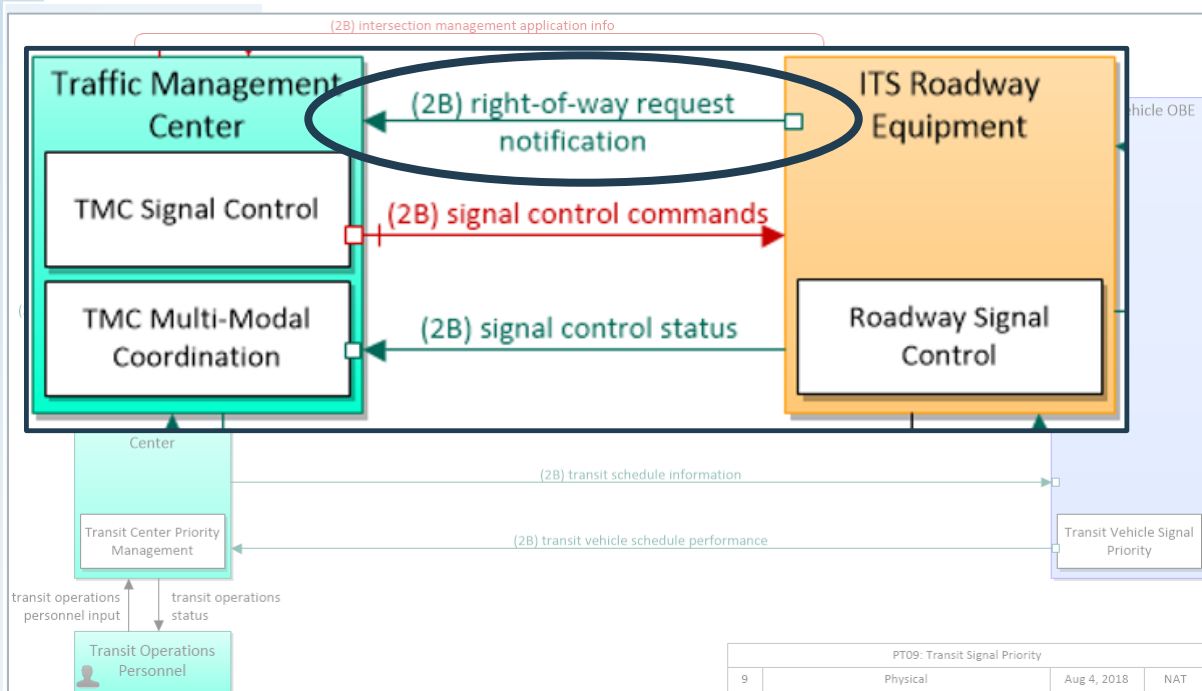Transit Signal Priority

Traffic Signal Control

'Building Blocks'

Transit Signal Priority

Traffic Signal Control

right-of-way request notification (Information Flow)

Notice that a request has occurred for signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other source for right-of-way.
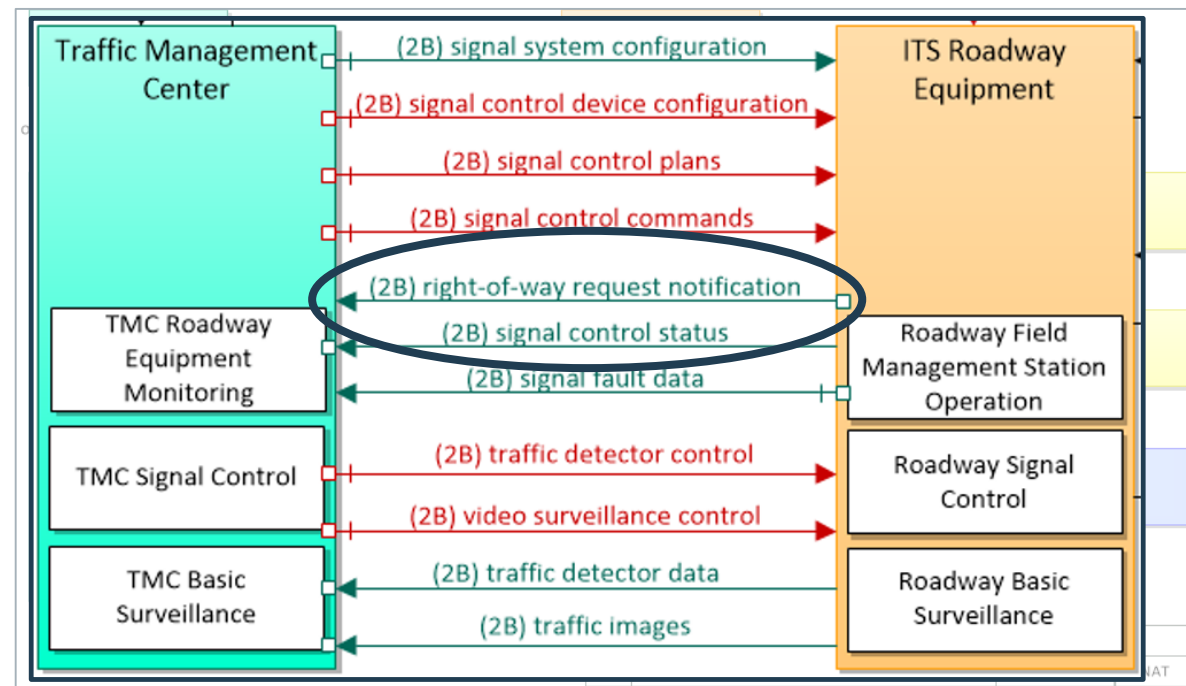
'Building Blocks'

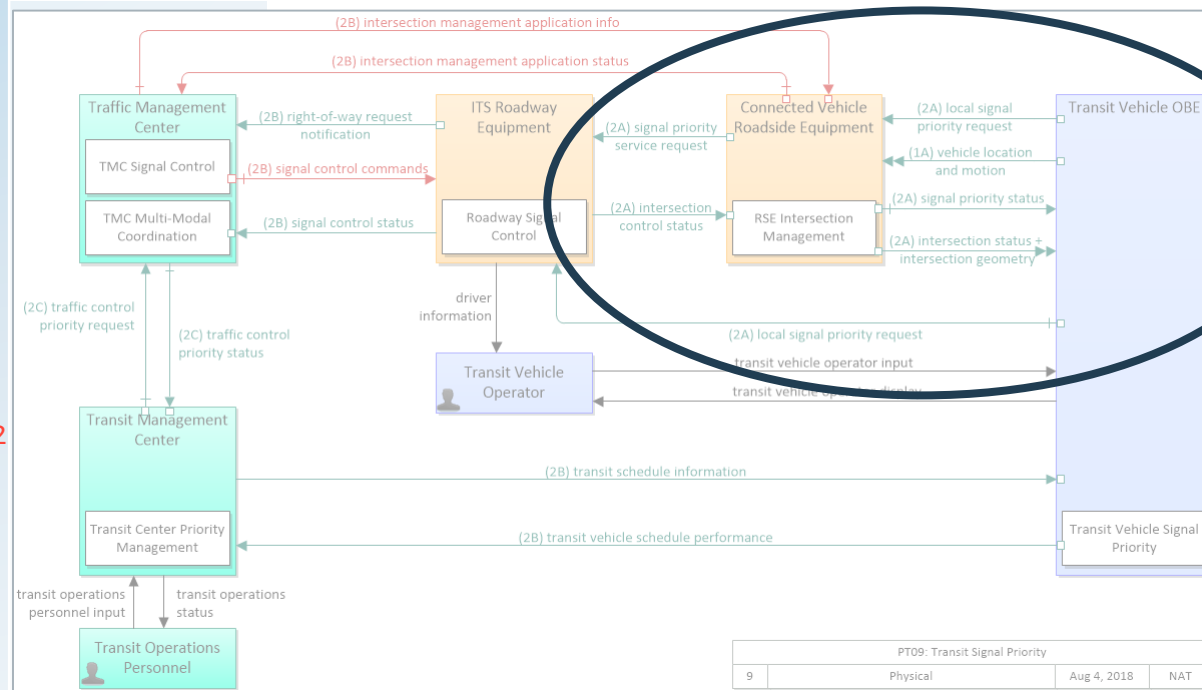## Transit Signal Priority

Traffic Signal Control

right-of-way request notification (Information Flow)

Notice that a request has occurred for signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other source for right-of-way.
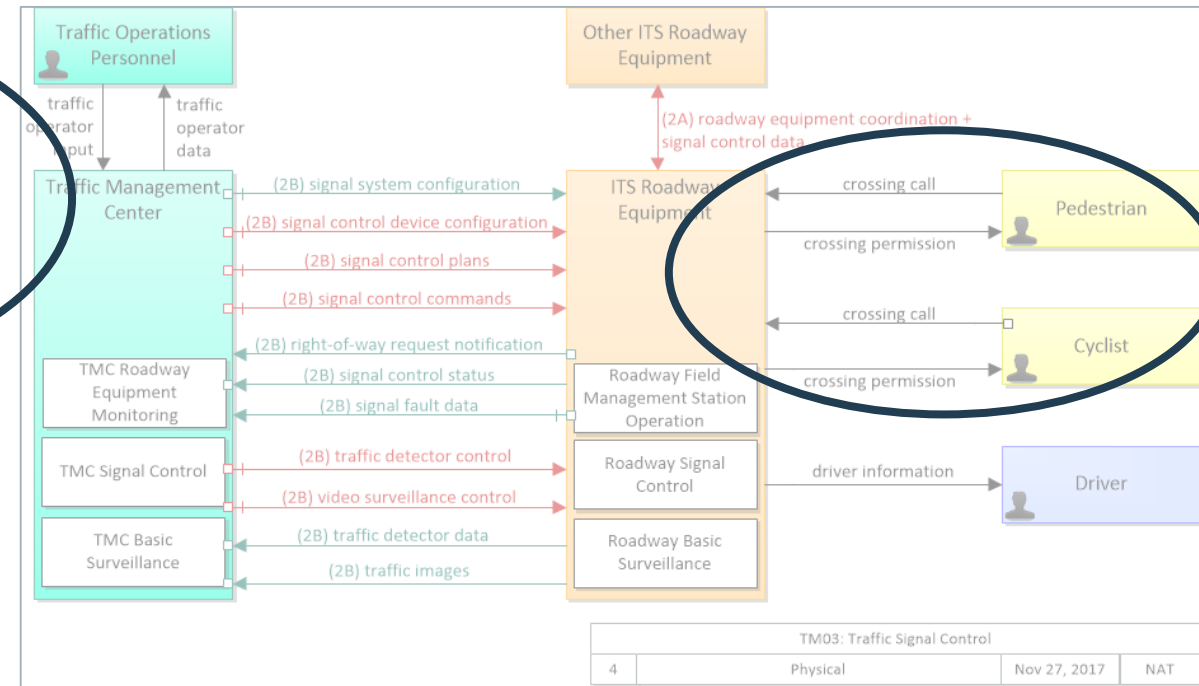
3.0 Introduction to Project

Version 3 Update of the ITS Architecture for Canada

CANADIAN VERSION 3
- ✓ Re-align with ARC-IT 8
    - ✓ Integrate the CVRIA
    - ✓ Restructure views
    - ✓ Add SET-IT Tool
- ✓ Continued support of remaining 'Canadian' Services'
- ✓ Focus on English for now

2019: CAN V3

CVRIA

2017/18: ARC-IT 8

2010: CAN V2

2012: V7

2005: BIFA

2007: V6

2003: V5

2000: CAN V1

2002: V4

1999: V3

1998: V2

1996: Architecture Published

1993: V1

Transport Canada — Transports Canada

U.S. ARC-IT_V8

Connected Vehicle Reference Information Architecture (CVRIA)

Canada Version 2

Canada Version 3

WSP

ITS • STI CANADA
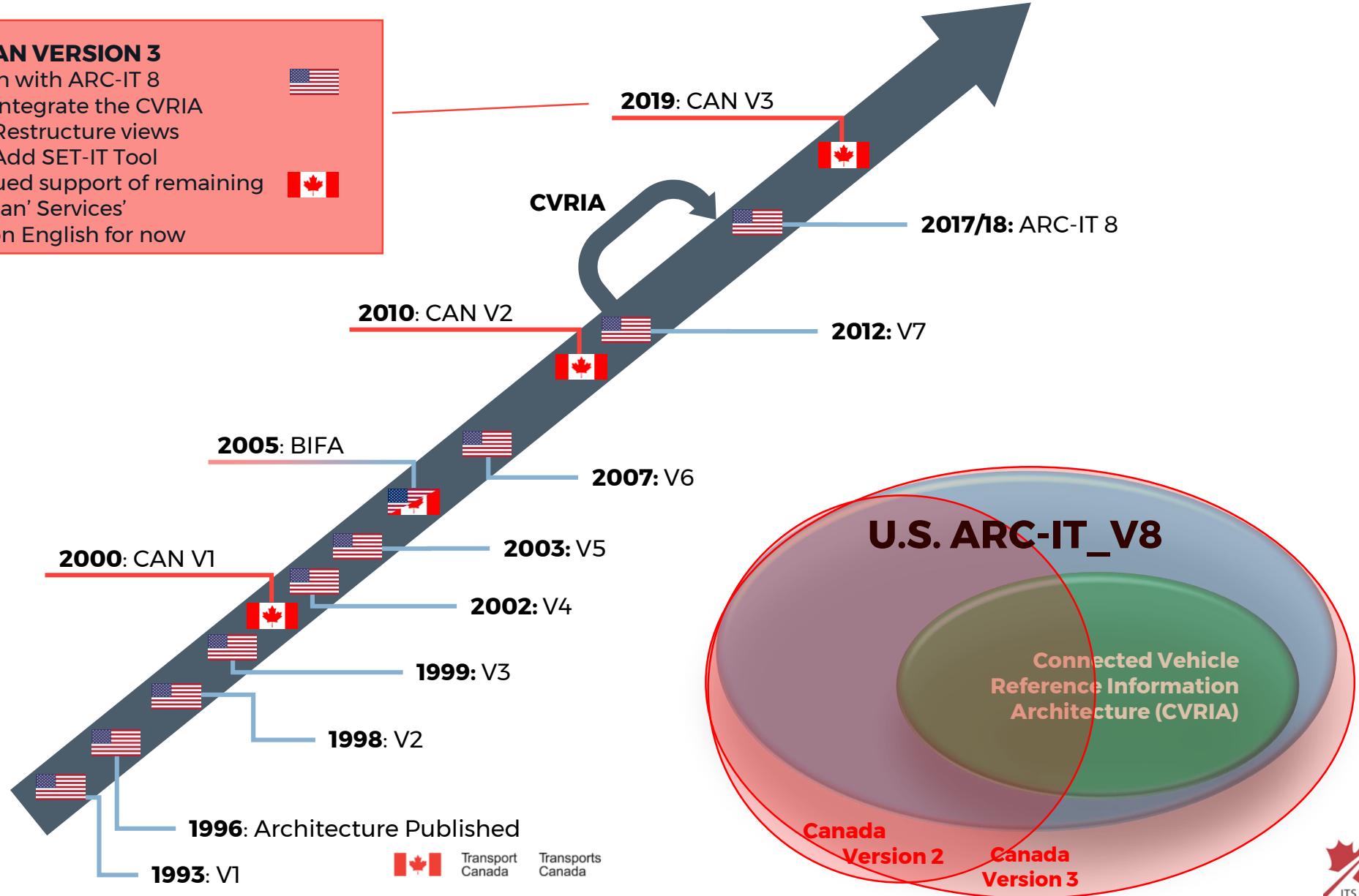
Project Goals

To undertake an English update of the *ITS Architecture for Canada* with the current *U.S. Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT)* and incorporate the recent and substantial Connected Vehicle (CV) related enhancements with a national and international scope by providing a framework and tools that:
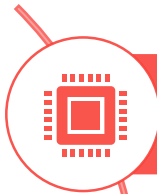
Better reflect new and emerging technologies and initiatives;

Re-align with the current U.S. ARC-IT to better support current and future cooperation; and
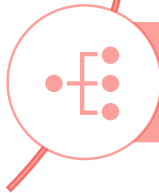
Map to current and relevant standards

* Scope subsequent work for corresponding French update

Transport Canada — Transports Canada

ITS • STI CANADA

Project Work Plan

Task 1:
Project Management & Kick off

Task 1 Objective:
- To provide project management support, organize PSC meetings, communicate with Transport Canada, etc.

Fall 2018

Kick-off Meeting
Nov 29, 2018

Winter 2019

Spring 2019

PSC Meeting #2
Apr 25, 2019

PSC Meeting #3
Jun 24, 2019

Summer 2019

Fall 2019

Transport Canada — Transports Canada

ITS • STI CANADA

Project Work Plan

Task 1:
Project
Management &
Kick off

Task 2:
Coordination and
Cooperation with Transport
Canada and the USDOT

Task 2 Objective:
- To convene two meetings between
  Transport Canada and the USDOT

Fall 2018

Kick-off
Meeting
Nov 29, 2018

Winter 2019

Spring 2019

PSC Meeting #2
Apr 25, 2019

Meeting #1
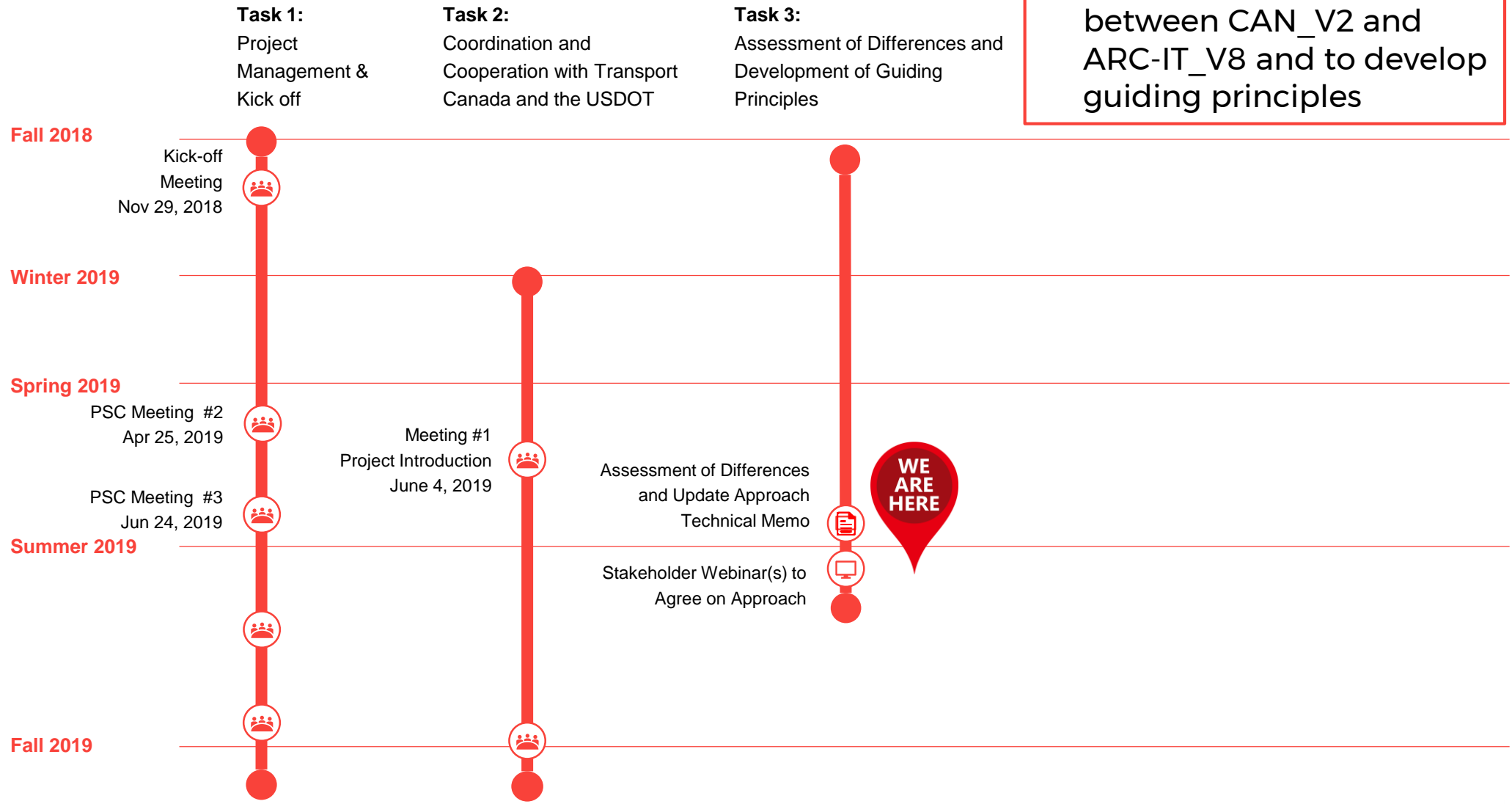Project Introduction
June 4, 2019

PSC Meeting #3
Jun 24, 2019

Summer 2019

Fall 2019

Transport
Canada   Transports
Canada

WSP

ITS • STI
CANADA

Project Work Plan

Task 3 Objective:
- To identify the differences between CAN_V2 and ARC-IT_V8 and to develop guiding principles

Task 1:
Project Management & Kick off

Task 2:
Coordination and Cooperation with Transport Canada and the USDOT

Task 3:
Assessment of Differences and Development of Guiding Principles

Fall 2018

Kick-off Meeting Nov 29, 2018

Winter 2019

Spring 2019

PSC Meeting #2 Apr 25, 2019

Meeting #1 Project Introduction June 4, 2019

Assessment of Differences and Update Approach Technical Memo

WE ARE HERE

PSC Meeting #3 Jun 24, 2019

Summer 2019

Stakeholder Webinar(s) to Agree on Approach

Fall 2019

Transport Canada Transports Canada

wsp

ITS • STI CANADA

Project Work Plan

Task 1:
Project
Management &
Kick off

Task 2:
Coordination and
Cooperation with Transport
Canada and the USDOT

Task 3:
Assessment of Differences and
Development of Guiding
Principles

Task 4:
English Version 3
Update of the ITS
Architecture for Canada

Fall 2018

Kick-off
Meeting
Nov 29, 2018

Winter 2019

Task 4 Objective:
- To update the ITS Architecture for Canada following the finalized approach

Spring 2019

PSC Meeting #2
Apr 25, 2019

Meeting #1
Project Introduction
June 4, 2019

Assessment of Differences
and Update Approach
Technical Memo

WE ARE HERE

PSC Meeting #3
Jun 24, 2019

Summer 2019

Stakeholder Webinar(s) to
Agree on Approach

Fall 2019

Stakeholder Webinar #2 to present
results and promote usage

Updated Databases
& s/w Tools

Transport Canada Transports Canada

WSP

ITS • STI CANADA

Project Work Plan

Task 1:
Project Management & Kick off

Task 2:
Coordination and Cooperation with Transport Canada and the USDOT

Task 3:
Assessment of Differences and Development of Guiding Principles

Task 4:
English Version 3 Update of the ITS Architecture for Canada

Task 5:
Assessment of Effort for French Version 3 Update

Fall 2018

Kick-off Meeting Nov 29, 2018

Winter 2019

Task 5 Objective:
- To assess where new French translation is needed for the updates

Spring 2019

PSC Meeting #2 Apr 25, 2019

Meeting #1 Project Introduction June 4, 2019

Assessment of Differences and Update Approach Technical Memo

WE ARE HERE

PSC Meeting #3 Jun 24, 2019

Summer 2019

Stakeholder Webinar(s) to Agree on Approach

Fall 2019

Stakeholder Webinar #2 to present results and promote usage

Updated Databases & s/w Tools

French Update Tech. Memo

Transport Canada Transports Canada

4.0 Assessment of Differences

How to Compare and Assess Differences

CANADIAN VERSION 2 (CAN_V2)
✓ Full mapping to US_V6

CVRIA

2010: CAN V2

2017/18: ARC-IT 8

US ARC-IT 8 (ARC-IT_V8)
✓ Full mapping to US_V7

2012: V7

US VERSION 7 (US_V7)
✓ Full mapping to US_V6

2005: BIFA

2007: V6

2000: CAN V1

2003: V5

2002: V4

US VERSION 6 (US_V6)
✓ Common Origin

1999: V3

CAN_V2 → US_V6
+ US_V6 → US ARC-IT_V8
CAN_V2 → US ARC-IT_V8

1998: V2

1996: Architecture Published

Transport Canada   Transports Canada

1993: V1

wsp

ITS•STI CANADA

Functional Comparison
Canadian Unique Elements

WSP

Service Package	Name	Scope/Function of Service Package
APTS101	Multi-Modal Connection Protection	• Multi-modal coordination for travellers, across agencies.
ATMS101	Dynamic Roadway Warning	• Warnings generated based on local conditions (e.g. traffic, weather).
ATMS102	Signal Enforcement	• Red light cameras.
ATMS103	Standard Mixed Use Warning Systems	• Near-term sensing and warning for pedestrians/cyclists.
ATMS104	Advanced Mixed Use Warning Systems	• Advanced sensing and warning for pedestrians/cyclists.
CVO101	Freight Terminal Management	• Supports operations of an intermodal terminal.
CVO102	International Border Registration	• Registration and enrollment of carriers, drivers, etc.
CVO103	International Border Pre-Processing	• Submission and pre-processing of manifest data.
CVO104	International Border Inspection	• Inspection services at the border.
MC101	Roadway Micro-Prediction	• Very localized forecasting of roadway conditions to support maintenance operations.

34

Transport Canada / Transports Canada

CAN_V2 Service Packages with Unique Elements

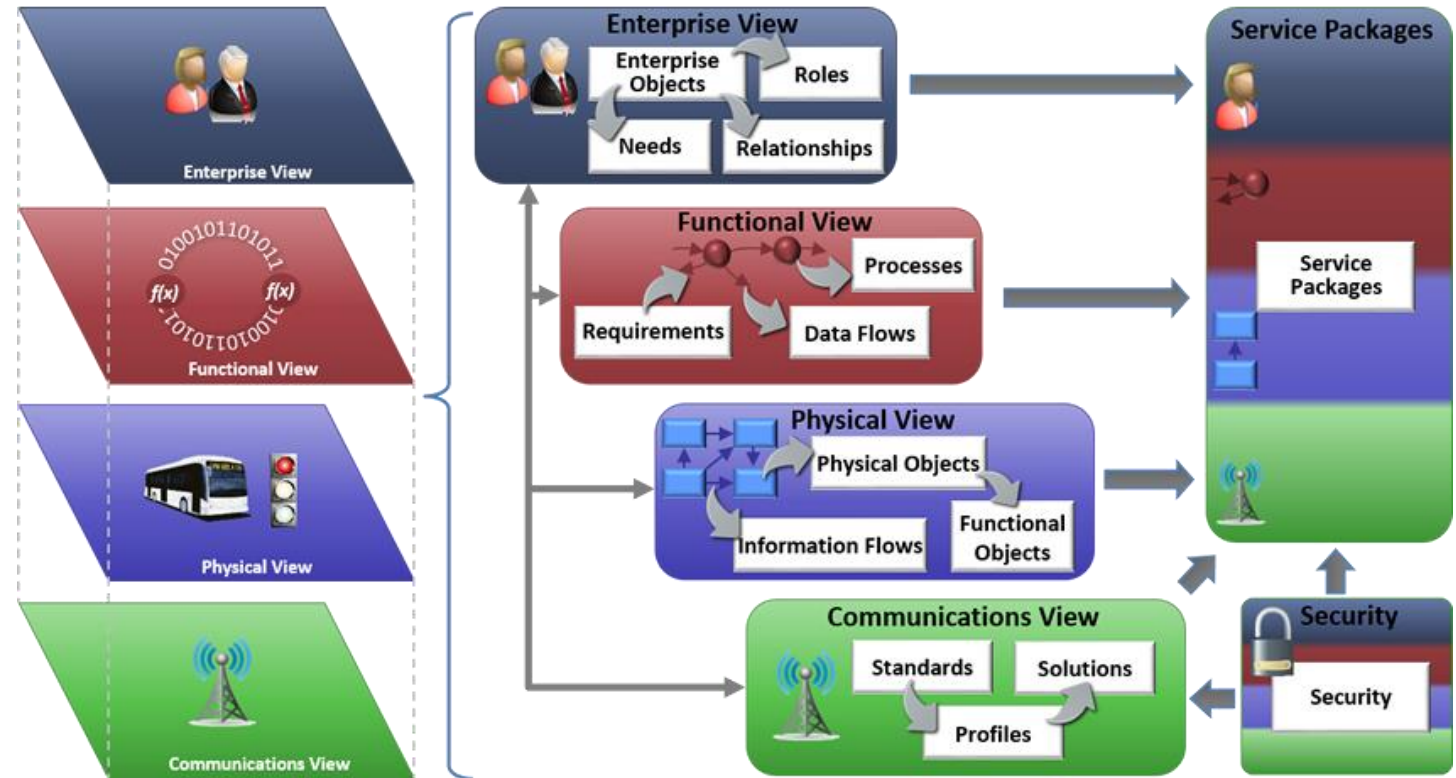| Service Package	Name	Unique Aspects of Service Package
APTS08	Transit Traveller Information	• Multi-modal trip planning.
ATIS01	Broadcast Traveller Information	• Border wait time data.
ATIS02	Interactive Traveller Information	• Border wait time data.
ATMS19	Variable Speed Limit and Enforcement	• Central and local variable speed limits • Violation detection and enforcement
ATMS21	Roadway Closure Management	• Road closure notification
CVO02	Freight Administration	• Support for intermodal container and cargo
CVO04	CV Administrative Processes	• Commercial vehicle and driver permits/registration
CVO07	Roadside CVO Safety	• Violation notification to Enforcement Agency
EM10	Disaster Traveller Information	• Shelter information from Emergency Management (indirect)
MC03	Road Weather Data Collection	• Environmental conditions data shared between Traffic Management and Maintenance & Construction Management

Functional Comparison New and Updated U.S. Elements

WSP

— Defined around 4 views:

— **Enterprises** *to carry out services*

— **Functions** *to implement services*

— **Physical** *objects and information flow to implement that functionality*

— **Communications** *protocols required for implementation*

— Organized by Service Packages
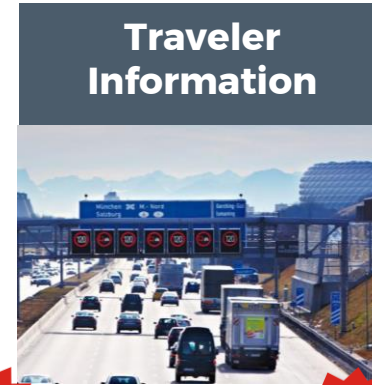

37

ARC-IT Service Package Organization

Traffic Management

Public Transportation

Maintenance & Construction

Commercial Vehicle Operations

RENAMED

Public Safety

Parking Management *NEW*

Vehicle Safety

Traveler Information

RENAMED

Data Management

Sustainable Travel *NEW*

Weather *NEW*

Support *NEW*

38

ARC-IT Service Package Reorganization

— Example of 137 Service Packages
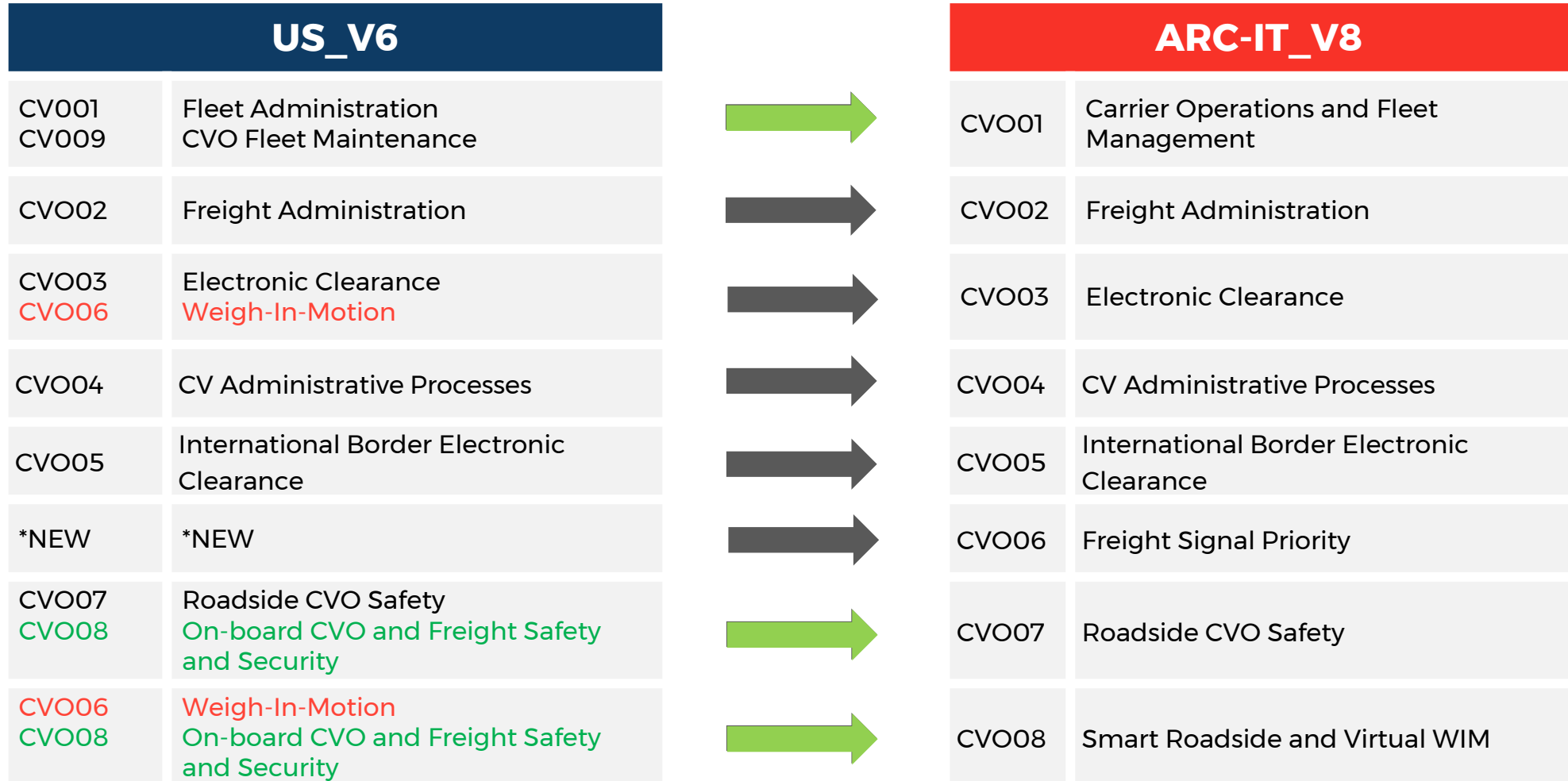
US_V6		ARC-IT_V8	
CV001 CV009	Fleet Administration CVO Fleet Maintenance	CVO01	Carrier Operations and Fleet Management
CVO02	Freight Administration	CVO02	Freight Administration
CVO03 CVO06	Electronic Clearance Weigh-In-Motion	CVO03	Electronic Clearance
CVO04	CV Administrative Processes	CVO04	CV Administrative Processes
CVO05	International Border Electronic Clearance	CVO05	International Border Electronic Clearance
*NEW	*NEW	CVO06	Freight Signal Priority
CVO07 CVO08	Roadside CVO Safety On-board CVO and Freight Safety and Security	CVO07	Roadside CVO Safety
CVO06 CVO08	Weigh-In-Motion On-board CVO and Freight Safety and Security	CVO08	Smart Roadside and Virtual WIM

Transport Canada Transports Canada

ARC-IT Service Package Reorganization

— Example of 137 Service Packages

US_V6		ARC-IT_V8	
CV001 CV009	Fleet Administration CVO Fleet Maintenance	CVO01	Carrier Operations and Fleet Management
CVO02	Freight Administration	CVO02	Freight Administration
CVO03 CVO06	Electronic Clearance Weigh-In-Motion	CVO03	Electronic Clearance
CVO04	CV Administrative Processes	CVO04	CV Administrative Processes
CVO05	International Border Electronic Clearance	CVO05	International Border Electronic Clearance
*NEW	*NEW	CVO06	Freight Signal Priority
CVO07 CVO08	Roadside CVO Safety On-board CVO and Freight Safety and Security	CVO07	Roadside CVO Safety
CVO06 CVO08	Weigh-In-Motion On-board CVO and Freight Safety and Security	CVO08	Smart Roadside and Virtual WIM

40

Transport Canada   Transports Canada

# New ARC-IT_V8 Service Packages

Service Package	Name
CVO06	Freight Signal Priority
CVO09	Freight-Specific Dynamic Travel Planning
CVO10	Road Weather Information for Freight Carriers
CVO11	Freight Drayage Optimization
DM02	Performance Monitoring
PM02	Smart Park and Ride System
PM06	Loading Zone Management
PS06	Incident Scene Pre-Arrival Staging Guidance for Emergency Responders
PS07	Incident Scene Safety Monitoring
PT10	Intermittent Bus Lanes
PT11	Transit Pedestrian Indication
PT12	Transit Vehicle at Station/Stop Warnings
PT13	Vehicle Turning Right in Front of a Transit Vehicle
PT15	Transit Stop Request
PT16	Route ID for the Visually Impaired
PT17	Transit Connection Protection
ST02	Eco-Traffic Signal Timing
ST03	Eco-Traffic Metering
ST05	Electric Charging Stations Management
ST08	Eco-Approach and Departure at Signalized Intersections
ST09	Connected Eco-Driving
ST10	Low Emissions Zone Management

Service Package	Name
SU01	Connected Vehicle System Monitoring and Management
SU02	Core Authorization
SU04	Map Management
SU05	Location and Time
SU06	Object Registration and Discovery
SU07	ITS Communications
SU08	Security and Credentials Management
SU09	Device Certification and Enrollment
SU10	Center Maintenance
SU11	Field Equipment Maintenance
SU12	Vehicle Maintenance
SU13	Personal Device Maintenance
TM04	Connected Vehicle Traffic Signal System
TM11	Road Use Charging
TM12	Dynamic Roadway Warning
TM20	Variable Speed Limits
TM21	Speed Harmonization
TM22	Dynamic Lane Management and Shoulder Use
TM23	Border Management Systems
VS07	Road Weather Motorist Alert and Warning
VS08	Queue Warning
VS12	Pedestrian and Cyclist Safety
VS17	Traffic Code Dissemination

Transport Canada / Transports Canada

WSP

ITS·STI CANADA

New ARC-IT_V8 Physical Objects
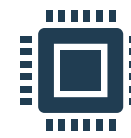
Name
Authorizing Center
Basic Emergency Vehicle

Center
- A generic Center physical object has been defined that may be attributed to any central system for common enterprise/support functions (e.g. permission management, map management, data collection).

- This minimizes the need for system-specific interfaces.

Name
Field
Field Maintenance Equipment
Field System Operator
Freight Consolidation Station
Freight Distribution and Logistics Center
Identifier Registry
ITS Communications Equipment

ITS Object
- A generic ITS Object has been defined that includes core capabilities common to any class of object, whether it is a device or central system, such as security support.

Name
ORDS Operator
Other Authorizing Centers
Other Connected Vehicle Roadside Equipment
Other Credentials Management Systems
Other Data Distribution Systems
Other EV OBEs
Other Freight Distribution and Logistics Centers
Other Identifier Registries
Other ITS Objects
Other Map Update Systems
Personnel Device
Population and Housing Data System
Position Corrections Source
Service Monitor System
Service Monitor System Operator
Social Media
Special Needs Registry
Support Maintenance Equipment
Support Maintenance Personnel
Traffic Regulatory Authority Center
Vehicle Service Center
Wide Area Information Disseminator System
ORDS Operator

Other ARC-IT_V8 Changes since US_V6

Element Type	Changes
Service Packages (137)	45 New (detailed on slide 41) 81 Modified Note: only 11 are same from US_V6
Physical Objects (140)	45 New (detailed on slide 42) 21 Modified
Information Flows (810)	312 New
Triples (1675)	874 New
Functional Objects (345)	136 New

WSP

Transport Canada / Transports Canada

ITS•STI CANADA

U.S. Linkage to International Service Packages

WSP

Linkage to International Service Packages

Service Package	Name	Scope/Function
CVO16	Electronic Work Diaries	• Designed to collect information salient to the operation of a commercial vehicle, to log driver activity (work), and to report that information to regulators as well as fleet managers.
CVO17	Intelligent Access Program	• Enables commercial vehicle operators simplified access to permit operations in exchange for remote compliance monitoring.
CVO18	Intelligent Access Program - Weight Monitoring	• Enables commercial vehicle operators simplified access to permit operations in exchange for remote weight monitoring.
CVO19	Intelligent Speed Compliance	• Uses the Global Navigation Satellite System (GNSS) to independently monitor the speed of a heavy vehicle and provide that information to regulatory authorities.

Functional Comparison Reconciliation Between Canada and U.S.

wsp

Reconciliation by Service Package

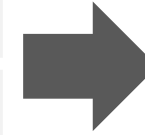| CAN_V2 |
|---|
| **APTS08** — Transit Traveller Information |
| **3 Unique Triples** to support for multimodal trip planning. |
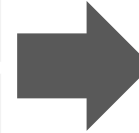
ARC-IT_V8
PT08 — Transit Traveler Information
Triples are included in separate *ARC-IT_V8 PT17 Transit Connection Protection*

Reconciliation by Service Package

CAN_V2

APTS101 — Multi-Modal Connection Protection

Fully Unique

Multi-modal coordination for travellers, across agencies.

ARC-IT_V8

PT17 — Transit Connection Protection

Maps fully to *ARC-IT_V8 PT17 Transit Connection Protection*, including all functional objects.

Reconciliation by Service Package

CAN_V2	
ATIS01	Broadcast Traveller Information
1 Unique Triple to support 'border crossing status information' (i.e. border crossing times).	

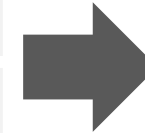| ARC-IT_V8	
TI01	Broadcast Traveler Information
Is included in the 'border crossing status information' in the mapped *ARC-IT_V8 TI01 Broadcast Traveler Information*.	

Reconciliation by Service Package

CAN_V2	
ATIS02	Interactive Traveller Information
1 Unique Triple to support 'border crossing status information' (i.e. border crossing times). 🔗	

ARC-IT_V8	
TI02	Personalized Traveler Information
Is included in the 'border crossing status information' in the mapped *ARC-IT_V8 TI02 Personalized Traveler Information*.	

Reconciliation by Service Package

CAN_V2	
ATMS19	Variable Speed Limit and Enforcement

2 Unique Functional Objects and **4 Unique Triples** to support:

> Central and local variable speed limits
> Violation detection and enforcement

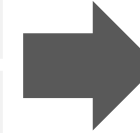| ARC-IT_V8	
TM17	Speed Warning and Enforcement
TM20	Variable Speed Limits

The functional objects and information flows relating to setting the variable speed limits map directly to *ARC-IT_V8 TM20 Variable Speed Limits.*

Two unmapped triples relate to sending violation information provided to Traffic Management and Maintenance Management. *ARC-IT_V8 TM17 Speed Warning and Enforcement* **only shares violation data with the Enforcement Agency.**

CANADA

Reconciliation by Service Package

CAN_V2	
ATMS21	Roadway Closure Management
1 Unique Triple to support road closure notifications.	

ARC-IT_V8	
TM19	Roadway Closure Management
Notifications are included in *ARC-IT_V8 TM19 Roadway Closure Management*.	

WSP

Transport Canada / Transports Canada

ITS•STI CANADA

Reconciliation by Service Package
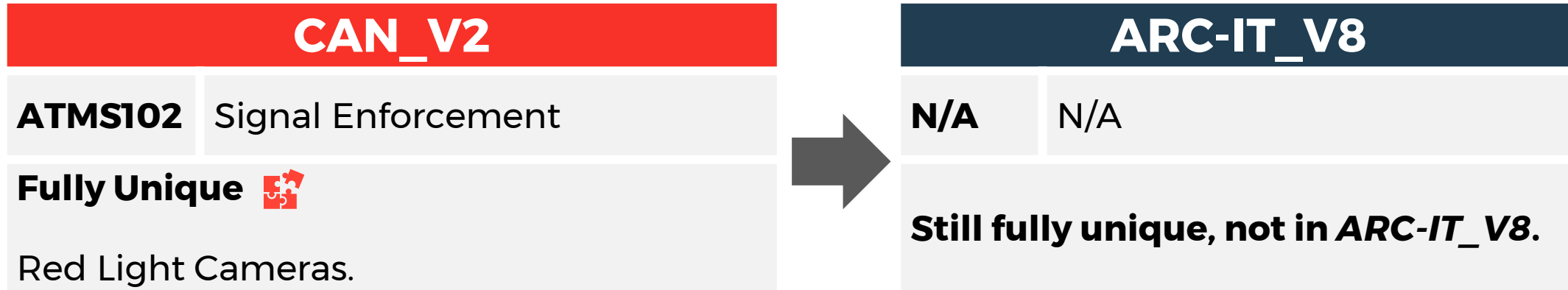
CAN_V2	
ATMS101	Dynamic Roadway Warning
Fully Unique Warnings generated based on local conditions (e.g. traffic, weather).	

ARC-IT_V8	
TM12	Dynamic Roadway Warning
Maps fully to *ARC-IT_V8 TM12 Dynamic Roadway Warning*, including all functional objects.	

Reconciliation by Service Package

CAN_V2	
ATMS102	Signal Enforcement
Fully Unique	
Red Light Cameras.	

ARC-IT_V8	
N/A	N/A
Still fully unique, not in *ARC-IT_V8*.	

Reconciliation by Service Package

CAN_V2

ATMS103	Standard Mixed Use Warning Systems

Fully Unique

Near-term sensing and warning for pedestrians/cyclists.

ATMS104	Advanced Mixed Use Warning Systems

Fully Unique

Advanced sensing and warning for pedestrians/cyclists.
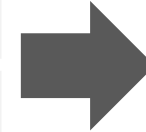
ARC-IT_V8

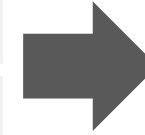| **VS12**	Pedestrian and Cyclist Safety

Both map fully to a combination of *ARC-IT_V8 VS12 Pedestrian and Cyclist Safety* and *TM03 Traffic Signal Control.*

Functional objects map to *Roadway Mixed Use Crossing Safety* in *ARC-IT_V8 VS12 Pedestrian and Cyclist Safety.*

Reconciliation by Service Package

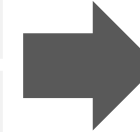| CAN_V2	
CVO02	Freight Administration
1 Unique Functional Object and **many Unique Triples** to support intermodal container and cargo.	

ARC-IT_V8	
CVO02	Freight Administration
ARC-IT_V8 CVO02 Freight Administration now includes functionality, with a simplified structure (i.e. a single information flow that includes cargo, chassis and container data), that fully maps to the unique elements.	

wsp

Transport Canada / Transports Canada

ITS•STI CANADA

Reconciliation by Service Package

CAN_V2	
CVO04	CV Administrative Processes
6 Unique Triples to support commercial vehicle and driver permits/registration.	

ARC-IT_V8	
CVO04	CV Administrative Processes
ARC-IT_V8 CVO04 CV Administrative Processes now includes similar information sharing.	

Reconciliation by Service Package

CAN_V2	
CVO07	Roadside CVO Safety
1 Unique Triple to support violation notification to Enforcement Agency.	
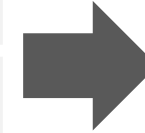
ARC-IT_V8	
CVO07	Roadside CVO Safety
ARC-IT_V8 CVO07 Roadside CVO Safety now includes such notifications.	

Reconciliation by Service Package

CAN_V2	
CVO101	Freight Terminal Management
Fully Unique	
Supports operations of an intermodal terminal.	
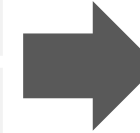
ARC-IT_V8	
CVO11	Freight Drayage Optimization
Maps fully to *ARC-IT_V8 CVO11 Freight Drayage Optimization* , including all functional objects.	

Reconciliation by Service Package

CAN_V2

CVO102	International Border Registration
Fully Unique Registration and enrollment of carriers, drivers, etc.	

ARC-IT_V8

CVO05	International Border Electronic Clearance
Maps partially to *ARC-IT_V8 CVO05 International Border Electronic Clearance.* **The following functional objects are not in *ARC-IT_V8*:** • **Traveller Border Registration** • **Border Registration**	

wsp

Transport Canada Transports Canada

ITS•STI CANADA

Reconciliation by Service Package

CAN_V2

CVO103	International Border Pre-Processing

Fully Unique

Registration and enrollment of carriers, drivers, etc.
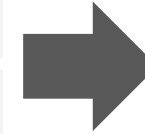
ARC-IT_V8

CVO05	International Border Electronic Clearance

Maps partially to *ARC-IT_V8 CVO05 International Border Electronic Clearance.*

The following functional objects are not in *ARC-IT_V8*:
- **Border Pre-Processing**

wsp

Transport Canada   Transports Canada

ITS•STI CANADA

Reconciliation by Service Package

CAN_V2	
CVO104	International Border Inspection
Fully Unique	
Inspection services at the border.	
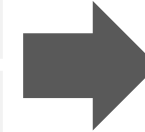
ARC-IT_V8	
TM23	Border Management Systems
Maps fully to *ARC-IT_V8 TM23 Border Management Systems*, including all functional objects.	

Transport Canada / Transports Canada

Reconciliation by Service Package

CAN_V2	
EM10	Disaster Traveller Information
2 Unique Triples to support 'shelter information' from Emergency Management and Traffic Management.	

ARC-IT_V8	
PS14	Disaster Traveler Information
The information flows relate to Traffic Management and Emergency management providing information on shelter availability, which is still not supported in _ARC-IT_V8_. However, _ARC-IT_V8 PS14 Disaster Traveler Information_ does have shelter information provided directly from the shelters.	

Reconciliation by Service Package

CAN_V2
MC10   Road Weather Data Collection
2 Unique Triples to support 'environmental conditions data' shared between Traffic Management and Maintenance & Construction Management. .

ARC-IT_V8
WX01   Weather Data Collection
ARC-IT_V8 WX01 Weather Data Collection now includes similar information sharing.

Reconciliation by Service Package

CAN_V2	
MC101	Roadway Micro-Prediction
Fully Unique Very localized forecasting of roadway conditions to support maintenance operations.	
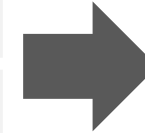
ARC-IT_V8	
N/A	N/A
Still fully unique, not in *ARC-IT_V8*.	

Summary of Service Package Reconciliation

CAN_V2 (unique)	ARC-IT_V8 (mapped)
APTS08 Transit Traveller Information	PT08 Transit Traveler Information*
APTS101 Multi-Modal Connection Protection	PT17 Transit Connection Protection
ATIS01 Broadcast Traveller Information	TI01 Broadcast Traveler Information
ATIS02 Interactive Traveller Information	TI02 Personalized Traveler Information
ATMS19 Variable Speed Limit and Enforcement	*TM17 Speed Warning and Enforcement* *TM20 Variable Speed Limits*
ATMS21 Roadway Closure Management	TM19 Roadway Closure Management
ATMS101 Dynamic Roadway Warning	TM12 Dynamic Roadway Warning
ATMS102 Signal Enforcement	**N/A**
ATMS103 Standard Mixed Use Warning Systems	VS12 Pedestrian and Cyclist Safety
ATMS104 Advanced Mixed Use Warning Systems	
CVO02 Freight Administration	CVO02 Freight Administration
CVO04 CV Administrative Processes	CVO04 CV Administrative Processes
CVO07 Roadside CVO Safety	CVO07 Roadside CVO Safety
CVO101 Freight Terminal Management	CVO11 Freight Drayage Optimization
CVO102 International Border Registration	*CVO05 International Border Electronic Clearance*
CVO103 International Border Pre-Processing	
CVO104 International Border Inspection	TM23 Border Management Systems
EM10 Disaster Traveller Information	*PS14 Disaster Traveler Information*
MC03 Road Weather Data Collection	WX01 Weather Data Collection
MC101 Roadway Micro-Prediction	**N/A**
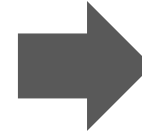
Other Differences Between Canada and U.S.

wsp

US_V6 Acr	US_V6 Name	US_V6 Description	C_V2 Acr	C_V2 Name	C_V2 Description
ATMS08	Traffic Incident Management System	This market package manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. The market package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination with other traffic management, maintenance and construction management and emergency management centers as well as rail operations and event promoters. Information from these diverse sources is collected and correlated by this market package to detect and verify incidents and implement an appropriate response. This market package supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between center subsystems. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination market package and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information market packages. The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with emergency management might be through a CAD system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel.	ATMS08	Traffic Incident Management System	This ~~market~~service package manages both unexpected incidents and planned events so that the impact to the transportation network and ~~traveler~~traveller safety is minimized. The ~~market~~service package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination with other traffic management, maintenance and construction management and emergency management ~~centers~~centres as well as rail operations and event promoters. Information from these diverse sources is collected and correlated by this ~~market~~service package to detect and verify incidents and implement an appropriate response. This ~~market~~service package supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between ~~center~~centre subsystems. Incident response also includes presentation of information to affected ~~travelers~~travellers using the Traffic Information Dissemination ~~market~~service package and dissemination of incident information to ~~travelers~~travellers through the Broadcast ~~Traveler~~Traveller Information or Interactive ~~Traveler~~Traveller Information ~~market~~service packages. The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with emergency management might be through a CAD system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel.
ATMS09	Traffic Decision Support and Demand Management	This market package recommends courses of action to traffic operations personnel based on an assessment of current and forecast road network performance. Recommendations may include predefined incident response plans and regional surface street and freeway control strategies that correct network imbalances. Where applicable, this market package also recommends transit, parking, and toll strategies to influence traveler route and mode choices to support travel demand management (TDM) programs and policies managing both traffic and the environment. TDM recommendations are coordinated with transit, parking, and toll administration centers to support regional implementation of TDM strategies. Incident response and congestion management recommendations are implemented by the local traffic management center and coordinated with other regional centers by other market packages (see ATMS07-Regional Traffic Management and ATMS08-Traffic Incident Management). All recommendations are based on historical evaluation, real-time assessment, and forecast of the roadway network performance based on predicted travel demand patterns. Traffic data is collected from sensors and surveillance equipment, other traffic management centers. Forecasted traffic loads are derived from historical data and route plans supplied by the Information Service Provider Subsystem. This market package also collects air quality, parking availability, transit usage, and vehicle occupancy data to support TDM, where applicable.	ATMS09	Traffic ~~Decision Support~~Forecast and Demand Management	This ~~market~~service package recommends courses of action to traffic operations personnel based on an assessment of current and forecast road network performance. Recommendations may include predefined incident response plans and regional surface street and freeway control strategies that correct network imbalances. Where applicable, this ~~market~~service package also recommends transit, parking, and toll strategies to influence ~~traveler~~centre route and mode choices to support travel demand management (TDM) programs and policies managing both traffic and the environment. TDM recommendations are coordinated with transit, parking, and toll administration ~~centers~~centres to support regional implementation of TDM strategies. Incident response and congestion management recommendations are implemented by the local traffic management ~~center~~centre and coordinated with other regional ~~centers~~centres by other ~~market~~service packages (see ATMS07-Regional Traffic Management and ATMS08-Traffic Incident Management). All recommendations are based on historical evaluation, real-time assessment, and forecast of the roadway network performance based on predicted travel demand patterns. Traffic data is collected from sensors and surveillance equipment, other traffic management ~~centers~~centres. Forecasted traffic loads are derived from historical data and route plans supplied by the Information Service Provider Subsystem. This ~~market~~service package also collects air quality, parking availability, transit usage, and vehicle occupancy data to support TDM, where applicable.

68

Transport Canada / Transports Canada

ITS · STI CANADA

Element Names

Type	CAN_V2 Name	US_V6 Name	ARC-IT_V8 Name
Service Package	Automated Highway System	Automated Vehicle Operations	Automated Vehicle Operations
	Hazardous Material Planning and Incident Response	HAZMAT Management	HAZMAT Management
	Multimodal Operations Coordination	Railroad Operations Coordination	Railroad Operations Coordination
	Pre-Collision Restraint Deployment	Pre-Crash Restraint Deployment	*Autonomous Vehicle Safety Systems*
			V2V Basic Safety
	Roadside Hazardous Material Security Detection and Mitigation	Roadside HAZMAT Security Detection and Mitigation	Roadside HAZMAT Security Detection and Mitigation
	Traffic Forecast and Demand Management	Traffic Decision Support and Demand Management	*Integrated Decision Support and Demand Management*
	Traveller Services Payment and Reservation	Yellow Pages and Reservation	*Travel Services Information and Reservation*
	Variable Speed Limit and Enforcement	Speed Monitoring	*Speed Warning and Enforcement*
			Variable Speed Limits
Physical Objects	Business Directory Service Providers	Yellow Pages Service Providers	*Travel Services Provider System*
	Department of Motor Vehicles	DMV	DMV
	Intermodal Customer	Intermodal Freight Shipper	*Intermodal Customer System*
	Intermodal Freight Equipment	Freight Equipment	Freight Equipment
	Intermodal Terminal	Intermodal Freight Depot	*Intermodal Terminal*
	Meteorological Service Provider	Surface Transportation Weather Service	Surface Transportation Weather Service
Information Flows	business directory information	yellow pages information	*travel services information*
	business directory request	yellow pages request	*travel services request*
	Commercial Vehicle Check override mode	CVC override mode	CVC override mode
	traffic enforcement control	speed monitoring control	speed monitoring control
	traffic enforcement information	speed monitoring information	speed monitoring information
	volume weather information	weather information	weather information
Functional Objects	Infrastructure Provided Business Directory Service and Reservation	Infrastructure Provided Yellow Pages and Reservation	*TIC Travel Services Information and Reservation*

Transport Canada / Transports Canada

WSP

ITS•STI CANADA

Spelling

Element Type	Center		Traveler	
	Name	**Description**	**Name**	**Description**
Service Package	1	22	4	22
Physical Object	33	58	4	18
Information Flow	10	27	28	65
Functional Object	26	88	15	61
TOTAL	**70**	**195**	**51**	**166**

References

Element Name (CAN_V2)¤	Element Description¤		
	CAN_V2¤	US_V6¤	ARC-IT_V8¤
Department of Motor Vehicles¤	This terminator represents a specific (stateprovincial) public organization responsible for registering vehicles, e.g., the Ministry of Transportation Department of Motor Vehicles.¤	This terminator represents a specific (state) public organization responsible for registering vehicles, e.g., the Department of Motor Vehicles.¤	This terminator representsThe 'DMV' is a specific (state) public organization responsible for registering vehicles, e.g., the Department of Motor Vehicles.¤
Government Reporting Systems¤	This terminator represents the system and associated personnel that prepare the inputs to support the various local, stateprovincial, and federal government transportation data reporting requirements (e.g. Highway Performance Monitoring System, Fatality Analysis Reporting System) using data collected by ITS systems. This terminator represents a system interface that would provide access to the archived data that is relevant to these reports. In most cases, thisThis terminator would manually combine data collected from the ITS archives with data from non ITS sources to assemble and submit the required information.¤	This terminator represents the system and associated personnel that prepare the inputs to support the various local, state, and federal government transportation data reporting requirements (e.g. Highway Performance Monitoring System, Fatality Analysis Reporting System) using data collected by ITS systems. This terminator represents a system interface that would provide access to the archived data that is relevant to these reports. In most cases, this terminator would manually combine data collected from the ITS archives with data from non ITS sources to assemble and submit the required information.¤	This terminator'Government Reporting Systems' represents the system and associated personnel that prepare the inputs to support the various local, state, and federal government transportation data reporting requirements (e.g. Highway Performance Monitoring System, Fatality Analysis Reporting System) using data collected by ITS systems. This terminatorIt represents a system interface that would provideprovides access to the archived data that is relevant to these reports. In most cases, this terminator would manuallysystem will combine data collected from the ITS archives with data from non ITS sources to assemble and submit the required information.¤

wsp

Transport Canada Transports Canada

ITS·STI CANADA

4.0 What to Expect Tomorrow

What to Expect Tomorrow – Webinar Part 2

1.0 Review of Part 1 Webinar

      - Background / Primer

      - Summary of Assessed/Reconciled Differences

2.0 Proposed Approaches for Update

      - why approach is recommended

      - using examples to illustrate the approach and anticipated result and relationship with U.S.

      - allow participants to provide feedback (Menti)

3.0 Next Steps

- July 31st, 2019 – 1:30-2:30EST
- Registration URL: https://attendee.gotowebinar.com/register/8945327936600349697

Was the Quick ITS Architecture Primer useful?

Mentimeter

20
1
Yes   No

75

👤 21

Welcome to the new plugin

Add Mentimeter slides directly to your PowerPoint presentation!
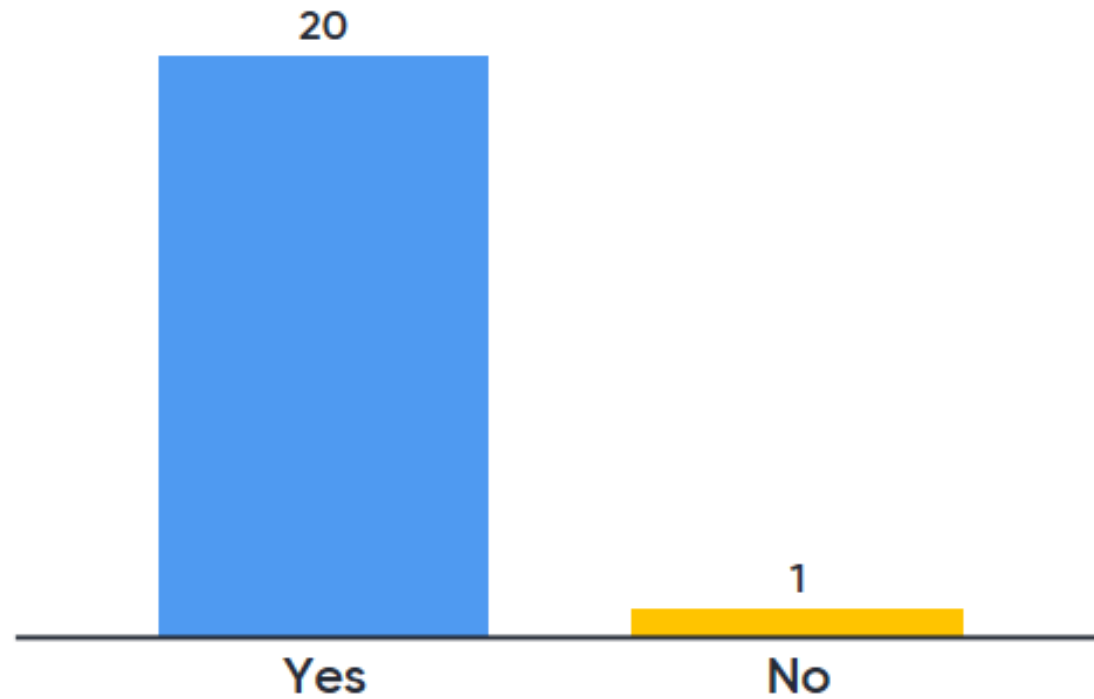
Paste the link to the slide you want to display here:

Slide link   **How does it work?**

https://www.mentimeter.com/s/asdfakn3290{

Select

Log out

Thank you!