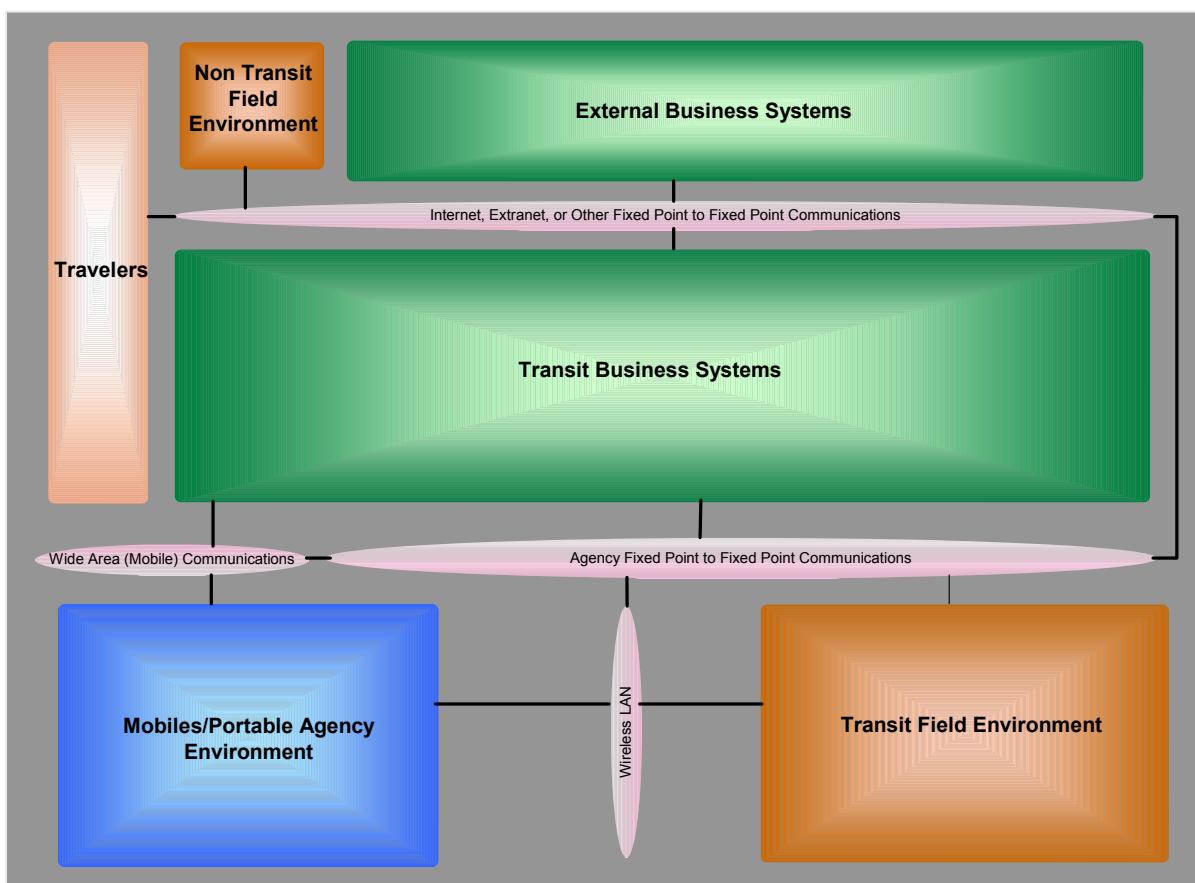


APTA TCIP-S-001 D2.6.1, APTA Draft Standard for Transit Communications Interface Profiles

Version 2.6.1

Volume IV Annexes F - K



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Annex F

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Annex G

National ITS Architecture Traceability Mapping

NIA Mapping

This annex contains two reports:

- A mapping of the TCIP Model Architecture Logical Entities to the Equivalent NIA Pspecs (where an equivalent exists).
- A mapping of the TCIP Dialogs to the NIA data flows (where an equivalent exists).

NIA PSPEC to TCIP Entities Map

<i>NIA Name</i>	<i>NIA Node</i>	<i>NIA TYPE</i>	<i>TCIP Entity</i>	<i>NIA Subsys Ref</i>
Access Transit Vehicle Operator Cost Effectiveness	4.5.3	PSPEC	OAS	Transit Management
Assess Transit Vehicle Operator Availability	4.5.2	PSPEC	OAS	Transit Management
Assess Transit Vehicle Operator Eligibility	4.5.4	PSPEC	OAS	Transit Management
Assess Transit Vehicle Operator Performance	4.5.1	PSPEC	OAS	Transit Management
Bill Traveler for Transit Fare	7.3.1.5	PSPEC	FS	Transit Management
Check for Advanced Transit Fare Payment	7.3.1.4	PSPEC	FS	Transit Management
Collect Bad Transit Fare Payment Data	7.3.1.6	PSPEC	FS	Transit Management
Collect Secure Vehicle Area Sensor Data	5.1.7.3.3	PSPEC	PTV-SEC	Transit Vehicle Subsystem
Collect Transit Fares at the Roadside	4.7.2	DFD		
Collect Transit Fares in the Vehicle	4.6	DFD		
Collect Traveler Secure Area Sensor Data	5.1.7.1.3	PSPEC	PTSF-SEC	Remote Traveler Support
Compute Demand Responsive Transit Vehicle Availability	4.2.1.2	PSPEC		Transit Management
Confirm Demand Responsive Transit Schedule and Route	4.2.1.4	PSPEC		Transit Management
Coordinate Multiple Agency Responses to Transit Incidents	4.4.2	PSPEC	CAD/AVL	Transit Management
Detect Traveler at Roadside	4.7.2.1	PSPEC	PTSF-SEC	Remote Traveler Support
Detect Traveler on Vehicle	4.6.1	PSPEC	PTV-PAS	Transit Vehicle Subsystem
Determine Advanced Transit Fares	7.3.1.2	PSPEC	FS	Transit Management
Determine Transit Fare at Roadside	4.7.2.3	PSPEC	PTSF-CFC	Remote Traveler Support
Determine Transit Fare on Vehicle	4.6.3	PSPEC	PTV-CFC	Transit Vehicle Subsystem
Determine Transit Vehicle Corrective Instructions	4.1.2.2	PSPEC		Transit Vehicle Subsystem
Determine Transit Vehicle Deviation and Corrections	4.1.2	DFD		
Determine Transit Vehicle Deviation and ETA	4.1.2.1	PSPEC	PTV-ADH	Transit Vehicle Subsystem
Determine Traveler Needs at Roadside	4.7.2.2	PSPEC		Remote Traveler Support

NIA PSPEC to TCIP Entities Map

<i>NIA Name</i>	<i>NIA Node</i>	<i>NIA TYPE</i>	<i>TCIP Entity</i>	<i>NIA Subsys Ref</i>
Determine Traveler Needs on Vehicle	4.6.2	PSPEC		Transit Vehicle Subsystem
Generate Demand Responsive Transit Schedule and Routes	4.2.1.3	PSPEC		Transit Management
Generate Responses for Transit Incidents	4.4.3	PSPEC	CAD/AVL	Transit Management
Generate Technician Work Assignments	4.3.3	PSPEC	AM	Transit Management
Generate Transit Routes	4.2.3.1	PSPEC	SCH	Transit Management
Generate Transit Routes	4.2.3.1	PSPEC	GIS	Transit Management
Generate Transit Routes and Schedules	4.2.3	DFD		
Generate Transit Schedules	4.2.3.2	PSPEC	SCH	Transit Management
Generate Transit Vehicle Maintenance Schedules	4.3.2	PSPEC	AM	Transit Management
Generate Transit Vehicle Operator Route Assignments	4.5.5	PSPEC	OAS	Transit Management
Generate Transit Vehicle Operator Schedules	4.5	DFD		
Get Traveler Image for Violation	7.3.3	PSPEC	FS	Transit Management
Manage Indicator Preemptions	1.2.7.3	PSPEC	RDPRG	Roadway Subsystem
Manage Indicator Preemptions	1.2.7.3	PSPEC	RDPRS	Roadway Subsystem
Manage Secure Vehicle Emergencies	5.1.7.3.5	PSPEC	PTV-SEC	Transit Vehicle Subsystem
Manage Transit	4	DFD		
Manage Transit Archive Data	4.2.4	PSPEC	DR	Transit Management
Manage Transit Fare Billing at Roadside	4.7.2.4	PSPEC	PTSF-CFC	Remote Traveler Support
Manage Transit Fare Billing on Vehicle	4.6.4	PSPEC	PTV-CFC	Transit Vehicle Subsystem
Manage Transit Fare Financial Processing	7.3.1.3	PSPEC	FS	Transit Management
Manage Transit Operational Data Store	4.2.3.5	PSPEC	GIS	Transit Management
Manage Transit Operational Data Store	4.2.3.5	PSPEC	DR	Transit Management
Manage Transit Operational Data Store	4.2.3.5	PSPEC	SCH	Transit Management
Manage Transit Vehicle Advanced Payments	4.6.8	PSPEC	FS	Transit Management
Manage Transit Vehicle Deviations	4.1.4	PSPEC	CAD/AVL	Transit Management
Manage Transit Vehicle Operations	4.1.6	PSPEC	TRV	Transit Management
Manage Transit Vehicle Operations	4.1.6	PSPEC	CAD/AVL	Transit Management

NIA PSPEC to TCIP Entities Map

<i>NIA Name</i>	<i>NIA Node</i>	<i>NIA TYPE</i>	<i>TCIP Entity</i>	<i>NIA Subsys Ref</i>
Manage Transit Vehicle Operations	4.1.6	PSPEC	PRK	Transit Management
Manage Transit Vehicle Operations Data Store	4.3.7	PSPEC	DR	Transit Management
Manage Transit Vehicle Operations Data Store	4.3.7	PSPEC	AM	Transit Management
Monitor And Verify Maintenance Activity	4.3.4	PSPEC	AM	Transit Management
Monitor Transit Vehicle Condition	4.3.1	PSPEC	AM	Transit Management
Operate Transit Vehicles and Facilities	4.1	DFD		
Plan and Schedule Transit Services	4.2	DFD		
Prepare and Output In-vehicle Displays	6.2.2	PSPEC	PTV-ANN	Transit Vehicle Subsystem
Process Demand Responsive Transit Trip Request	4.2.1.1	PSPEC		Transit Management
Process Demand Responsive Transit Vehicle Availability Data	4.2.1.5	PSPEC		Transit Vehicle Subsystem
Process On-Board Systems Data	4.1.1	PSPEC	PTV-DAT	Transit Vehicle Subsystem
Process Secure Vehicle Area Sensor Data	5.1.7.3.4	PSPEC	PTV-SEC	Transit Vehicle Subsystem
Process Secure Vehicle Area Surveillance	5.1.7.3.2	PSPEC	PTV-SEC	Transit Vehicle Subsystem
Process Transit Vehicle Sensor Maintenance Data	4.1.9	PSPEC	PTV-HEL	Transit Vehicle Subsystem
Process Traveler Other Services Payments	7.4.1.5	PSPEC	FS	Transit Management
Process Traveler Secure Area Sensor Data	5.1.7.1.4	PSPEC	PTSF-SEC	Remote Traveler Support
Process Traveler Secure Area Surveillance	5.1.7.1.2	PSPEC	PTSF-SEC	Remote Traveler Support
Produce Transit Service Data for External Use	4.2.3.3	PSPEC	TRV	Transit Management
Produce Transit Service Data for External Use	4.2.3.3	PSPEC	SCH	Transit Management
Produce Transit Service Data for External Use	4.2.3.3	PSPEC	DR	Transit Management
Produce Transit Service Data for Manage Transit Use	4.2.3.6	PSPEC	SCH	Transit Management
Produce Transit Service Data for Manage Transit Use	4.2.3.6	PSPEC	GIS	Transit Management
Produce Transit Service Data for Manage Transit Use	4.2.3.6	PSPEC	DR	Transit Management
Provide Demand Responsive Transit Service	4.2.1	DFD		

NIA PSPEC to TCIP Entities Map

<i>NIA Name</i>	<i>NIA Node</i>	<i>NIA TYPE</i>	<i>TCIP Entity</i>	<i>NIA Subsys Ref</i>
Provide Demand Responsive Transit Vehicle Operator Interface	4.2.1.6	PSPEC		Transit Vehicle Subsystem
Provide Interface for Other Transit Management Data	4.2.3.7	PSPEC	DR	Transit Management
Provide Interface for Other Transit Management Data	4.2.3.7	PSPEC	SCH	Transit Management
Provide Interface for Other Transit Management Data	4.2.3.7	PSPEC	GIS	Transit Management
Provide Interface for Transit Service Raw Data	4.2.3.8	PSPEC	DR	Transit Management
Provide Interface for Transit Service Raw Data	4.2.3.8	PSPEC	SCH	Transit Management
Provide Multimodal Route Selection	6.6.1	PSPEC	TRV	Information Service Provider
Provide Transit Advisory Data On Vehicle	6.2.7	PSPEC	PTV-ANN	Transit Vehicle Subsystem
Provide Transit Operations Data Distribution Interface	4.1.8	PSPEC	CAD/AVL	Information Service Provider
Provide Transit Operations Data Distribution Interface	4.1.8	PSPEC	TRV	Information Service Provider
Provide Transit Plans Store Interface	4.2.2	PSPEC		Transit Management
Provide Transit Roadside Passenger Data	4.7.2.7	PSPEC		Remote Traveler Support
Provide Transit Security and Emergency Management	4.4.1	PSPEC	CAD/AVL	Transit Management
Provide Transit Sys Operator Interface for Services Generation	4.2.3.4	PSPEC	SCH	Transit Management
Provide Transit System Operator Security Interface	4.4.4	PSPEC	CAD/AVL	Transit Management
Provide Transit Vehicle Correction Data Output Interface	4.1.2.4	PSPEC	CAD/AVL	Transit Management
Provide Transit Vehicle Deviation Data Output Interface	4.1.7	PSPEC	TRV	Transit Management
Provide Transit Vehicle Deviation Data Output Interface	4.1.7	PSPEC	CAD/AVL	Transit Management
Provide Transit Vehicle Location Data	4.1.3	PSPEC	PTV-LOC	Transit Vehicle Subsystem
Provide Transit Vehicle Operator Information Store Interface	4.5.8	PSPEC	DR	Transit Management
Provide Transit Vehicle Operator Information Store Interface	4.5.8	PSPEC	OAS	Transit Management
Provide Transit Vehicle Operator Interface	4.1.2.3	PSPEC	PTV-OPR	Transit Vehicle Subsystem
Provide Transit Vehicle Operator Interface for Emergencies	5.1.7.3.6	PSPEC	PTV-OPR	Transit Vehicle Subsystem

NIA PSPEC to TCIP Entities Map

<i>NIA Name</i>	<i>NIA Node</i>	<i>NIA TYPE</i>	<i>TCIP Entity</i>	<i>NIA Subsys Ref</i>
Provide Transit Vehicle Passenger Data	4.6.7	PSPEC	PTV-CFC	Transit Vehicle Subsystem
Provide Transit Vehicle Security	5.1.7.3	DFD		
Provide Transit Vehicle Status Information	4.1.5	PSPEC	CAD/AVL	Transit Management
Provide Transit Vehicle Status Information	4.1.5	PSPEC	TRV	Transit Management
Provide Transit Vehicle Traveler Card Interface	7.3.5	PSPEC	PTV-CFC	Transit Vehicle Subsystem
Provide Traveler Advisory Interface	6.2.3	PSPEC	PTV-ANN	Transit Vehicle Subsystem
Provide Traveler and Remote Area Security	5.1.7	DFD		
Provide Traveler Fare Payment Interface on Vehicle	4.6.5	PSPEC	PTV-CFC	Transit Vehicle Subsystem
Provide Traveler Roadside & Vehicle Data Interface	4.7.1	PSPEC		Remote Traveler Support
Provide Traveler Roadside Facilities	4.7	DFD		
Provide Traveler Roadside Fare Interface	4.7.2.5	PSPEC	PTSF-CFC	Remote Traveler Support
Provide Traveler Security	5.1.7.1	DFD		
Register for Advanced Transit Fare Payment	7.3.1.1	PSPEC	FS	Transit Management
Report Transit Vehicle Information	4.3.5	PSPEC	AM	Transit Management
Report Transit Vehicle Operator Information	4.5.7	PSPEC	DR	Transit Management
Report Transit Vehicle Operator Information	4.5.7	PSPEC	OAS	Transit Management
Report Traveler Emergencies	5.1.7.1.5	PSPEC	PTSF-SEC	Remote Traveler Support
Request Transit Vehicle Priorities	4.1.2.5	PSPEC	PTV-PRI	Transit Vehicle Subsystem
Schedule Transit Vehicle Maintenance	4.3	DFD		
Select Transit Route	6.6.4	PSPEC	TRV	Information Service Provider
Support Transit Security and Coordination	4.4	DFD		
Surveil Secure Vehicle Area	5.1.7.3.1	PSPEC	PTV-SEC	Transit Vehicle Subsystem
Surveil Traveler Secure Area	5.1.7.1.1	PSPEC	PTSF-SEC	Remote Traveler Support
Update Roadside Transit Fare Data	4.7.2.6	PSPEC	PTSF-CFC	Remote Traveler Support

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Update Transit Fare Data

7.3.1.7

PSPEC

FS

Transit Management

NIA PSPEC to TCIP Entities Map

<i>NIA Name</i>	<i>NIA Node</i>	<i>NIA TYPE</i>	<i>TCIP Entity</i>	<i>NIA Subsys Ref</i>
Update Transit Map Data	4.2.3.9	PSPEC	GIS	Transit Management
Update Transit Vehicle Fare Data	4.6.6	PSPEC	PTV-CFC	Transit Vehicle Subsystem
Update Transit Vehicle Information	4.3.6	PSPEC	AM	Transit Management
Update Transit Vehicle Operator Information	4.5.6	PSPEC	OAS	Transit Management

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
1.1.2.1	1.2.5.4	Subscribe Stop Point Parking	parking_lot_dynamic_information_req est_by_traffic prediction_data
1.1.3	4.1.4	-----	traffic_data_for_transit
1.1.4.1	4.1.6	-----	traffic_data_for_transit
1.1.4.1	4.2.1.3	-----	transit_highway_priority_given
1.2.2.1	4.1.4	-----	transit_road_priority_given
1.2.2.2	4.1.4	SCP Priority Request Scenario 1,2,4,5	transit_ramp_priority_given
1.2.3	4.1.4	SCP Priority Request Scenario 1,2,4,5	parking_lot_current_state
1.2.5.1	1.1.2.1	Subscribe Stop Point Parking	parking_lot_static_data_operator_update
1.2.5.1	1.2.5.3	Subscribe Stop Point Parking	parking_lot_static_data
1.2.5.1	1.2.5.4	Subscribe Stop Point Parking	static_parking_information_for_transit
1.2.5.1	4.2.3.3	Subscribe Stop Point Parking	other_parking_lot_dynamic_data
1.2.5.2	1.2.5.4	Subscribe Stop Point Parking	other_parking_lot_price_data_request
1.2.5.2	7.2.1.7	Subscribe Stop Point Parking	parking_information_for_dissemination
1.2.5.4	1.2.4.4	Subscribe Stop Point Parking	dynamic_parking_information_for_transit
1.2.5.4	4.1.6	Subscribe Stop Point Parking-	incident_video_image
1.3.1.3	1.3.4.2	Subscribe Video Images	possible_incident_data_update
1.3.2.1	1.3.2.2	IEEE 1512	planned_event_data
1.3.2.2	1.1.2.1	IEEE 1512	planned_events
1.3.2.2	1.1.3	IEEE 1512	incident_data_update
1.3.2.2	1.3.2.3	IEEE 1512	planned_events_new_data
1.3.2.2	1.3.2.4	IEEE 1512	current_incidents_new_data
1.3.2.2	1.3.2.5	IEEE 1512	possible_incidents_data_output
1.3.2.2	1.3.4.1	IEEE 1512	planned_events
1.3.2.2	4.1.4	IEEE 1512	planned_events
1.3.2.2	6.2.1.1	IEEE 1512	planned_events
1.3.2.2	6.6.1	IEEE 1512	planned_events
1.3.2.2	6.6.2.2	IEEE 1512	planned_events
1.3.2.2	6.6.5	IEEE 1512	planned_events
1.3.2.2	9.2.1	IEEE 1512	m_and_c_plan_feedback_from_traffic

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
1.3.2.2	Event Promoters	IEEE 1512	tevp-event_confirmation
1.3.2.3	1.1.2.1	IEEE 1512	current_incident_data
1.3.2.3	1.1.3	IEEE 1512	current_incident_data
1.3.2.3	1.3.2.4	IEEE 1512	request_planned_events_data
1.3.2.3	1.3.2.5	IEEE 1512	current_incidents_data_update
1.3.2.3	1.3.2.5	IEEE 1512	current_incidents_data_request
1.3.2.3	1.3.3	IEEE 1512	current_incidents_data_output
1.3.2.3	1.3.4.1	IEEE 1512	current_incidents
1.3.2.4	1.1.5	IEEE 1512	request_other_planned_events_data
1.3.2.4	1.1.5	IEEE 1512	planned_events_local_data
1.3.2.4	1.3.2.3	IEEE 1512	planned_events_data
1.3.2.4	1.3.4.1	IEEE 1512	planned_events_data_output
1.3.2.5	1.1.5	IEEE 1512	request_other_current_incidents_data
1.3.2.5	1.3.2.3	IEEE 1512	current_incidents_data
1.3.2.5	1.3.2.6	IEEE 1512	incidents_for_routing
1.3.2.6	1.1.5	IEEE 1512	traffic_detour_info_for_other_traffic
1.3.2.6	1.1.5	IEEE 1512	traffic_detour_control_for_other_traffic
1.3.2.6	1.2.4.2	IEEE 1512	freeway_control_request_for_detours
1.3.2.6	1.3.2.5	IEEE 1512	incidents_data_request_for_routing
1.3.2.6	1.3.5	IEEE 1512	request_predetermined_incident_response_data
1.3.2.6	4.1.6	Subscribe Incidents, IEEE 1512	roadway_detours_and_closures_for_transit
1.3.2.6	5.1.4	IEEE 1512	emergency_route_response
1.3.2.6	5.1.4	IEEE 1512	roadway_detours_and_closures_for_em
1.3.2.6	6.5.1	IEEE 1512	roadway_detours_and_closures_for_isp
1.3.3	1.2.1	IEEE 1512	cv_incident_override
1.3.3	1.2.1	IEEE 1512	incident_strategy_override
1.3.3	1.3.4.2	IEEE 1512	undefined_incident_response
1.3.3	5.1.1.3	IEEE 1512	incident_alert
1.3.3	5.1.4	IEEE 1512	incident_response_clear
1.3.3	9.1.7	IEEE 1512	incident_info_from_traffic
1.3.4.1	1.3.2.3	IEEE 1512	current_incidents_request
1.3.4.2	1.3.1.3	Subscribe Video Images, IEEE 1512	incident_video_image_control

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
1.3.4.2	1.3.2.3	IEEE 1512	reclassify_incidents
1.3.4.2	1.3.4.1	IEEE 1512	request_incident_operations_data
1.3.4.2	1.3.4.4	IEEE 1512	request_incident_map_display_update
1.3.4.2	Traffic Operations Personnel	IEEE 1512	ttop-wide_area_alert_notification
1.3.4.2	Traffic Operations Personnel	IEEE 1512	ttop-possible_incidents_data
1.3.4.3	1.3.2.1	IEEE 1512	media_incident_data_updates
1.3.4.3	Media	IEEE 1512	tm-incident_data
1.3.5	1.3.4.2	IEEE 1512	defined_incident_response_data
1.4.2	4.1.5	Subscribe Service Bulletins	transit_conditions_demand_request
1.4.2	4.2.3.3	Subscribe Trip Itinerary List	transit_services_demand_request
1.4.2	7.3.1.7	Subscribe Itinerary Fare	transit_fare_direct_request
1.4.2	7.4.2	Subscribe Stop Point Parking	parking_lot_charge_request
1.4.2	7.4.2	Subscribe Itinerary Fare	transit_fare_request
1.4.4	4.2.3.4	Subscribe Service Bulletins	transit_services_changes_request
2.1.1.5	2.1.1.6	Subscribe Stoppoint List	geofence_data_for_tracking
4.1.1	4.1.2.1	-----	transit_vehicle_arrival_times
4.1.1	4.1.3	-----	transit_vehicle_on_board_data
4.1.1	4.1.6	-----	env_probe_data_from_transit_vehicle
4.1.1	4.1.6	Unload PTV Performance Data	transit_vehicle_collected_trip_data
4.1.2.1	4.1.2.2	-----	transit_vehicle_deviations
4.1.2.1	4.1.2.3	-----	transit_vehicle_deviation_data
4.1.2.1	4.1.4	Subscribe PTV Adherence	transit_vehicle_deviations_from_schedule
4.1.2.1	4.1.6	-----	transit_vehicle_eta
4.1.2.1	4.1.6	Subscribe PTV Adherence	transit_vehicle_schedule_deviation
4.1.2.1	4.2.3.6	Subscribe PTV-AVL	transit_services_for_eta_request
4.1.2.1	6.2.3	-----	transit_vehicle_eta_for_advisory
4.1.2.2	4.1.2.3	-----	transit_vehicle_corrective_instructions
4.1.2.2	4.1.2.4	-----	transit_vehicle_arrival_conditions
4.1.2.2	4.1.2.5	SCP Priority Request Scenario (1, 4-Message, 4-Optical)	transit_vehicle_priority_request
4.1.2.3	4.1.6	Report Operator Message	transit_service_status

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
4.1.2.3	Transit Vehicle Operator	-----	ttvo-corrective_instructions
4.1.2.3	Transit Vehicle Operator	-----	ttvo-transit_vehicle_schedule_deviations
4.1.2.4	Multimodal Transportation Service Provider	-----	tmtsp-transit_arrival_changes
4.1.2.5	1.2.7.3	SCP Priority Request Scenario (1, 4-Message, 4-Optical)	transit_vehicle_roadway_priorities
4.1.3	4.1.2.1	Subscribe Onboard Location	transit_vehicle_location_for_eta
4.1.3	4.1.4	Subscribe PTV Adherence	transit_vehicle_location_for_deviation
4.1.3	4.1.6	Subscribe PTV-AVL	transit_vehicle_location_for_store
4.1.3	4.2.1.2	-----	paratransit_vehicle_location
4.1.3	4.4.1	Subscribe PTV-AVL	transit_vehicle_location_for_security
4.1.3	4.6.5	Subscribe Onboard Location	transit_vehicle_location_for_fares
4.1.3	5.1.7.3.1	Subscribe PTV-AVL	secure_surveillance_transit_vehicle_location
4.1.3	5.1.7.3.3	Subscribe PTV-AVL	secure_sensors_transit_vehicle_location
4.1.3	5.1.7.3.5	Subscribe PTV-AVL	secure_transit_vehicle_location
4.1.3	6.2.7	-----	transit_vehicle_location_for_advisories
4.1.4	1.2.2.1	-----	transit_highway_overall_priority
4.1.4	1.2.2.2	-----	transit_road_overall_priority
4.1.4	1.2.3	-----	transit_ramp_overall_priority
4.1.4	4.1.2.2	Report Dispatch Message	approved_corrective_plan
4.1.4	4.1.6	-----	prediction_request
4.1.4	4.1.6	Subscribe PTV Adherence	transit_vehicle_deviation_update
4.1.4	4.1.7	Subscribe PTV Adherence	transit_vehicle_arrival_deviations
4.1.4	9.2.1	-----	m_and_c_plan_feedback_from_transit
4.1.4	Transit System Operators	-----	ttso-proposed_corrections
4.1.5	1.1.2.5	-----	transit_probe_data
4.1.5	1.4.2	Unload PTV Performance Data	transit_running_data_for_demand
4.1.5	4.1.6	Subscribe Stop Point ETA, Subscribe Service Status	transit_information_request
4.1.5	4.2.3.5	Subscribe Vehicle Inventory	transit_vehicle_data
4.1.5	4.2.4	Subscribe Vehicle Inventory	transit_vehicle_data_for_archive
4.1.5	4.3.1	Subscribe PTV Health Alarms, Subscribe PTV Parameters	transit_vehicle_status

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
4.1.5	4.3.4	-----	transit_vehicle_status
4.1.5	4.7.1	Subscribe Stop Point ETA, Subscribe Service Status	transit_vehicle_arrival_time
4.1.5	6.8.3.2	Subscribe Service Status	transit_vehicle_arrival_time
4.1.5	Transit System Operators	-----	ttso-transit_vehicle_data
4.1.6	1.2.5.4	-----	parking_lot_dynamic_information_request_by_transit
4.1.6	4.1.2.2	-----	road_network_info_for_transit
4.1.6	4.1.5	Subscribe PTV-AVL, Subscribe PTV Adherence, Subscribe PTV Health Alarms, Subscribe PTV Parameters, Unload PTV Performance Data	transit_vehicle_information
4.1.6	4.1.8	-----	transit_vehicle_deviations_details
4.1.6	4.1.8	Subscribe Service Status	transit_deviation_data_received
4.1.6	4.1.9	Subscribe PTV Health Alarms, Subscribe PTV Parameters, Unload PTV Performance Data	transit_vehicle_collected_maintenance_data_request
4.1.6	4.2.3.7	Subscribe Incidents, Subscribe Incident Report History	traffic_incident_data_for_transit
4.1.6	4.4.1	Subscribe PTV Adherence, Subscribe PTV-AVL	transit_vehicle_off_route_indication
4.1.6	4.7.1	-----	transit_vehicle_user_data
4.1.6	5.1.7.3.6	-----	transit_vehicle_operator_authentication_database_update
4.1.6	5.1.7.3.6	Report Operator Sign-on, Report Operator Sign-Off	transit_vehicle_operator_authentication
4.1.6	6.2.3	-----	transit_vehicle_advisory_eta
4.1.6	9.4.2	-----	env_probe_info_from_transit
4.1.6	Media	-----	tm-transit_schedule_deviations_to_media
4.1.6	Surface Transportation Weather Service	-----	tstws-trans_weather_info_request
4.1.7	Multimodal Transportation Service Provider	-----	tmtsp-transit_arrival_deviations
4.1.8	4.1.6	-----	transit_vehicle_deviations_details_request
4.1.8	6.1.5	-----	transit_deviations_personal_request_for_archive
4.1.8	6.1.5	-----	transit_deviation_kiosk_request_for_archive
4.1.8	6.2.1.3	-----	transit_running_data_for_advisory_output
4.1.8	6.3.2	Subscribe Trip Itinerary List	transit_services_for_distribution_to_kiosks
4.1.8	6.3.2	-----	transit_deviations_for_broadcast_to_kiosks

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Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
4.1.8	6.3.2	-----	transit_deviations_for_kiosks
4.1.8	6.5.6	-----	transit_deviations_for_511
4.1.8	6.5.6	Subscribe Trip Itinerary List	transit_services_for_511
4.1.8	6.6.4	Subscribe Stop Service, Subscribe Text Timetable	transit_running_data_for_guidance
4.1.8	6.8.3.2	-----	transit_deviations_for_broadcast_to_personal_devices
4.1.8	6.8.3.2	Subscribe Trip Itinerary List	transit_services_for_distribution_to_personal_devices
4.1.8	6.8.3.2	-----	transit_deviations_for_personal_devices
4.1.8	Media	-----	tm-transit_vehicle_deviations
4.1.9	4.1.6	Subscribe PTV Health Alarms, Subscribe PTV Parameters, Unload PTV Performance Data	transit_vehicle_collected_maintenance_data
4.2.1.1	4.2.1.3	-----	paratransit_request
4.2.1.1	4.2.1.4	-----	paratransit_requested_services
4.2.1.1	4.2.4	-----	paratransit_service_data_for_archive
4.2.1.1	6.1.1	-----	paratransit_personal_schedule
4.2.1.3	4.1.6	-----	request_for_traffic_info
4.2.1.3	4.2.1.1	-----	paratransit_schedule
4.2.1.3	4.2.2	-----	transit_services_demand_response_request
4.2.1.4	4.2.1.6	-----	paratransit_transit_vehicle_operator_instructions
4.2.1.4	4.2.2	-----	paratransit_service_output
4.2.1.4	4.5.5	-----	paratransit_services_for_transit_vehicle_operators
4.2.1.4	Transit System Operators	-----	ttso-paratransit_service
4.2.1.5	4.2.1.2	-----	paratransit_transit_vehicle_availability
4.2.1.6	4.2.1.4	-----	paratransit_service_status
4.2.1.6	Transit Vehicle Operator	-----	ttvo-paratransit_information
4.2.2	4.2.1.3	-----	transit_services_for_demand_response
4.2.2	4.2.3.1	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	transit_routes_current_data
4.2.2	4.2.3.2	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	transit_schedule_current_data

Dialog Flow-NIA Flow Mapping

<i>Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
4.2.3.1	4.2.2	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	transit_routes_updates
4.2.3.1	4.2.2	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	transit_routes_request
4.2.3.1	4.2.3.8	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	transit_routes_data
4.2.3.2	4.2.2	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	transit_schedule_request
4.2.3.2	4.2.2	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	transit_schedule_updates
4.2.3.2	4.2.3.8	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	transit_schedule_data
4.2.3.3	1.2.5.1	Subscribe Stoppoint Parking	parking_lot_static_information_request_by_transit
4.2.3.3	1.4.2	Subscribe Text Timetable, Subscribe Stop Service, Subscribe Transfers, Subscribe Running Times, Subscribe Trip Itinerary	transit_services_for_demand
4.2.3.3	4.1.2.1	Subscribe Text Timetable, Subscribe Stop Service, Subscribe Transfers, Subscribe Running Times, Subscribe Trip Itinerary	traveler_transit_information
4.2.3.3	4.1.8	Subscribe Text Timetable, Subscribe Stop Service, Subscribe Transfers, Subscribe Running Times, Subscribe Trip Itinerary	transit_services_for_isp
4.2.3.3	4.2.3.8	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	request_transit_service_external_data
4.2.3.3	4.2.4	-----	transit_services_for_deployment
4.2.3.3	4.7.1	Subscribe Text Timetable, Subscribe Stop Service, Subscribe Transfers, Subscribe Running Times, Subscribe Trip Itinerary	transit_services_for_travelers

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transit_services_for_advisory_data

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
4.2.3.3	6.2.7	Subscribe Service Bulletins	traveler_transit_information_for_transit_advisories
4.2.3.3	6.3.2	Subscribe Text Timetable, Subscribe Stop Service, Subscribe Transfers, Subscribe Running Times, Subscribe Trip Itinerary List	transit_services_for_kiosks
4.2.3.3	6.6.4	Subscribe Trip Itineraries List	transit_services_for_guidance
4.2.3.3	6.8.3.2	Subscribe Text Timetable, Subscribe Stop Service, Subscribe Transfers, Subscribe Running Times, Subscribe Trip Itinerary	transit_services_for_personal_devices
4.2.3.3	Multimodal Transportation Service Provider	Subscribe Text Timetable, Subscribe Stop Service, Subscribe Transfers, Subscribe Running Times, Subscribe Trip Itinerary	tmtsp-transit_service_data
4.2.3.4	1.4.4	-----	transit_services_changes_response
4.2.3.4	4.2.3.1	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	update_routes
4.2.3.4	4.2.3.2	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	update_schedules
4.2.3.4	4.2.3.8	-----	request_transit_services_data_for_output
4.2.3.4	4.2.3.9	Load Map Image, Subscribe Map Image	request_transit_map_update
4.2.3.4	Transit System Operators	-----	ttso-parameters
4.2.3.4	Transit System Operators	-----	ttso-transit_services_output
4.2.3.5	4.2.4	Unload PTV Performance Data	transit_operational_data_for_archive
4.2.3.5	4.7.2.7	-----	transit_roadside_passenger_data_request
4.2.3.5	Transit System Operators	-----	ttso-passenger_loading_error
4.2.3.6	4.1.2.1	-----	transit_services_for_eta
4.2.3.6	4.1.2.2	-----	transit_services_for_corrections
4.2.3.6	4.1.4	-----	transit_services_for_scenarios
4.2.3.6	4.2.3.8	-----	request_transit_service_internal_data
4.2.3.6	4.5.5	-----	transit_services_for_transit_vehicle_operators
4.2.3.6	4.6.2	-----	transit_services_for_vehicle_fares
4.2.3.6	4.7.2.2	-----	transit_services_for_roadside_fares
4.2.3.6	7.3.1.2	Subscribe Itinerary Fare	transit_services_for_advanced_fares

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
4.2.3.7	4.2.3.8	-----	trmc_list
4.2.3.7	4.2.3.8	-----	other_transit_management_service_data
4.2.3.7	6.1.1	Subscribe Transfers, Subscribe Transfer Cluster List	transit_transfer_point_list
4.2.3.7	Other Transit Management	-----	totrm-transit_traveler_information
4.2.3.7	Other Transit Management	-----	totrm-transit_service_data
4.2.3.7	Other Transit Management	-----	totrm-transit_fare_data_coordination
4.2.3.8	4.2.3.3	-----	transit_service_external_data
4.2.3.8	4.2.3.4	-----	transit_services_data_for_output
4.2.3.8	4.2.3.6	-----	transit_service_internal_data
4.2.3.8	4.2.3.7	-----	transit_services_for_other_transit_management
4.2.3.9	Map Update Provider	Subscribe Map Image, Load Map image	tmup-transit_map_update_request
4.2.4	8.1	-----	transit_archive_data
4.2.4	Transit System Operators	-----	ttso-archive_status
4.3.1	4.3.2	-----	transit_vehicle_maintenance_information
4.3.1	4.3.7	-----	transit_vehicle_maintenance
4.3.2	4.2.3.5	Subscribe Unassigned Vehicles(Deprecated)	transit_vehicle_availability
4.3.2	4.3.3	-----	transit_vehicle_maintenance_schedule_data
4.3.2	4.3.7	-----	transit_vehicle_maintenance_schedule
4.3.2	4.4.1	Subscribe Unassigned Vehicles(Deprecated)	available_transit_vehicles
4.3.2	4.5.5	Report PTV Not Service Ready, Subscribe Unassigned Vehicles(Deprecated)	transit_vehicle_availability
4.3.3	4.2.4	-----	transit_technician_info
4.3.3	4.3.4	-----	transit_technician_work_assignment
4.3.3	Transit System Operators	-----	ttso-work_schedule
4.3.3	Transit System Operators	-----	ttso-technician_information
4.3.4	4.3.3	-----	transit_vehicle_maintenance_verification_results
4.3.4	4.3.7	-----	transit_vehicle_maintenance_log_data
4.3.5	4.3.7	-----	transit_vehicle_maintenance_specs_update

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
4.3.5	4.3.7	-----	transit_vehicle_maintenance_data_request
4.3.5	Transit System Operators	-----	ttso-transit_vehicle_maintenance_information
4.3.6	4.3.7	-----	transit_vehicle_maintenance_data_update
4.3.7	4.2.4	-----	transit_vehicle_maintenance_info
4.3.7	4.3.1	-----	transit_vehicle_maintenance_specs
4.3.7	4.3.4	-----	transit_vehicle_maintenance_specs
4.3.7	4.3.5	-----	transit_vehicle_maintenance_data
4.4.1	1.3.2.6	-----	emergency_transit_schedule_information_for_traffic
4.4.1	1.3.7	-----	evacuation_transit_schedule_information_for_traffic
4.4.1	4.1.6	-----	transit_vehicle_operator_wide_area_alerts
4.4.1	4.2.3.1	Command Load PTV Trips, Report Detour	emergency_transit_route
4.4.1	4.2.3.2	-----	emergency_transit_schedule
4.4.1	4.2.4	-----	transit_emergency_data_for_archive
4.4.1	4.2.4	Subscribe Incident, Subscribe Incident Report History	transit_incident_info_for_archive
4.4.1	4.4.2	Subscribe Incident, Report Incident, Report Incident Update	transit_incident_information
4.4.1	4.4.2	-----	secure_transit_vehicle_emergency_information
4.4.1	4.4.4	Report Operator Alarm, Report Passenger Alarm	transit_operator_emergency_request
4.4.1	4.4.4	----- (Not in NA DDE Descriptions)	transit_emergency_response_plan_to_personnel
4.4.1	4.4.4	Report Passenger Alarm, Report Operator Alarm	transit_operator_incident_information
4.4.1	4.6.6	-----	emergency_transit_fares
4.4.1	4.7.1	-----	transit_wide_area_alert_info
4.4.1	5.1.1.3	-----	transit_emergency_data
4.4.1	5.1.1.3	Subscribe Incident, Report Incident, Report Incident Update	transit_incident_details
4.4.1	5.1.4	-----	transit_system_status
4.4.1	5.1.4	-----	response_for_emergency_transit_support
4.4.1	5.1.4	-----	transit_schedule_information_during_emergencies
4.4.1	5.1.7.3.5	Command Remote PTV Disable	remote_transit_vehicle_disable
4.4.1	5.1.7.3.5	Silent Alarm, Report Passenger Alarm, Report Operator Alarm	secure_transit_vehicle_alarm_acknowledge_for_transit
4.4.1	5.1.7.3.5	Command Remote PTV Enable	transit_vehicle_disable_reset

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
4.4.1	5.1.8	-----	alert_notification_status_from_transit
4.4.1	5.7.2	-----	disaster_response_plan_coordination_from_transit
4.4.1	5.7.4	-----	evacuation_plan_coordination_from_transit
4.4.1	5.7.5	-----	transit_schedule_information_during_evacuation
4.4.1	5.7.5	-----	transit_evacuation_status
4.4.1	6.2.1.3	-----	transit_incident_data
4.4.1	6.2.7	-----	transit_traveler_wide_area_alert_info
4.4.1	6.5.1	-----	transit_evacuation_data_for_isp
4.4.1	Media	-----	tm-transit_incident_information
4.4.1	Media	-----	tm-transit_emergency_information
4.4.2	4.4.3	-----	request_transit_preplanned_incident_responses
4.4.2	5.1.4	-----	transit_coordination_data
4.4.2	Transit System Operators	-----	ttso-coordination_request
4.4.3	4.4.1	-----	transit_preplanned_responses_for_archive
4.4.3	4.4.2	-----	transit_preplanned_incident_responses
4.4.3	Transit System Operators	-----	ttso-response_parameter_output
4.4.4	4.4.1	-----	transit_media_interface_parameters
4.4.4	4.4.1	-----	wide_area_alert_notification_status
4.4.4	4.4.1	-----	transit_operator_security_action
4.4.4	4.4.1	-----	transit_emergency_response_plan_from_personnel
4.4.4	4.4.1	Silent Alarm	transit_vehicle_disable_from_operator
4.4.4	4.4.1	Silent Alarm, Operator Alarm	transit_operator_request_acknowledge
4.4.4	Transit System Operators	-----	ttso-potential_incidents_alarm
4.4.4	Transit System Operators	-----	ttso-infrastructure_integrity_status
4.4.4	Transit System Operators	-----	ttso-media_parameters
4.4.4	Transit System Operators	-----	ttso-emergency_request
4.4.4	Transit System Operators	-----	ttso-emergency_plan_response
4.4.4	Transit System Operators	-----	ttso-wide_area_alert_notification

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
4.4.4	Transit System Operators	-----	ttso-transit_vehicle_disable_status
4.5.1	4.5.4	-----	transit_vehicle_operator_performance_data
4.5.1	4.5.8	-----	transit_vehicle_operator_performance
4.5.2	4.4.1	Subscribe Unassigned Operators	available_transit_operators
4.5.2	4.5.4	-----	transit_vehicle_operator_availability_data
4.5.2	4.5.8	-----	transit_vehicle_operator_availability
4.5.3	4.5.4	-----	transit_vehicle_operator_cost_effectiveness_data
4.5.3	4.5.8	-----	transit_vehicle_operator_cost_effectiveness
4.5.4	4.5.5	-----	transit_vehicle_operator_eligibility_data
4.5.4	4.5.8	-----	transit_vehicle_operator_eligibility
4.5.5	4.2.4	-----	transit_route_assign_for_archive
4.5.5	Transit Vehicle Operator	-----	ttvo-route_assignments
4.5.6	4.5.8	-----	transit_vehicle_operator_consideration_inputs
4.5.7	4.5.8	-----	transit_vehicle_operator_consideration_updates
4.5.7	4.5.8	-----	transit_vehicle_operator_information_output_request
4.5.7	Transit System Operators	-----	ttso-transit_vehicle_operator_information
4.5.8	4.2.4	-----	transit_vehicle_operator_info_for_archive
4.5.8	4.5.1	-----	transit_vehicle_operator_performance_considerations
4.5.8	4.5.2	-----	transit_vehicle_operator_availability_considerations
4.5.8	4.5.3	-----	transit_vehicle_operator_cost_effectiveness_considerations
4.5.8	4.5.4	-----	transit_vehicle_operator_eligibility_considerations
4.5.8	4.5.5	-----	transit_vehicle_operator_route_assignment_considerations
4.5.8	4.5.7	-----	transit_vehicle_operator_information_output
4.6.1	4.6.2	-----	traveler_vehicle_tag_identity
4.6.1	4.6.4	-----	traveler_vehicle_tag_identity
4.6.1	7.3.3	-----	traveler_vehicle_image
4.6.2	4.6.3	-----	traveler_vehicle_ride
4.6.2	4.6.7	-----	traveler_vehicle_ride_data
4.6.3	4.6.4	-----	traveler_vehicle_fare
4.6.4	4.6.5	-----	traveler_vehicle_payment_response

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
4.6.4	4.6.7	-----	traveler_vehicle_processed_fare_data
4.6.4	5.4.5	-----	fare_collection_vehicle_violation_infor mation
4.6.4	7.3.1.4	-----	request_vehicle_fare_payment
4.6.4	7.3.1.5	Load Fare Collection Data	bad_tag_list_request
4.6.4	Transit Vehicle Operator	-----	ttvo- request_fare_transaction_mode_set_u
4.6.4	Transit Vehicle Operator	-----	ttvo-batch_mode_data_transfer_status
4.6.4	Traveler	-----	tt-vehicle_access_message
4.6.5	4.6.2	-----	traveler_vehicle_information
4.6.5	4.6.8	-----	transit_vehicle_advanced_payment_re quest
4.6.5	Traveler	-----	tt-vehicle_payment_confirmed
4.6.5	Traveler Card	-----	ttc- debited_traveler_payment_at_vehicle
4.6.6	4.6.3	Load Fare Collection Data	transit_fares_for_vehicle
4.6.7	4.2.3.5	Unload Fare Collection Data, Unload PTV Performance Data	transit_vehicle_passenger_data
4.6.8	4.6.5	-----	transit_vehicle_advanced_payment_re sponse
4.6.8	7.3.2	-----	advanced_tolls_and_charges_vehicle_ request
4.7.1	4.2.3.3	-----	transit_services_travelers_request
4.7.1	Traveler	-----	tt-transit_information
4.7.1	Traveler	-----	tt-transit_vehicle_information
4.7.2.1	4.7.2.2	-----	traveler_roadside_tag_identity
4.7.2.1	4.7.2.4	-----	traveler_roadside_tag_identity
4.7.2.1	7.3.3	Unload Video Images	traveler_roadside_image
4.7.2.2	4.7.2.3	-----	traveler_roadside_ride
4.7.2.2	4.7.2.7	-----	traveler_roadside_ride_data
4.7.2.3	4.7.2.4	Load Fare Collection Data	traveler_roadside_fare
4.7.2.4	4.7.2.5	-----	traveler_roadside_payment_response
4.7.2.4	4.7.2.7	Unload Fare Collection Data	traveler_roadside_processed_fare_dat a
4.7.2.4	5.4.7	-----	fare_collection_roadside_violation_info rmation
4.7.2.4	7.3.1.4	-----	request_roadside_fare_payment
4.7.2.4	Traveler	-----	tt-roadside_access_message
4.7.2.5	4.7.2.2	-----	traveler_roadside_information

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
4.7.2.5	7.3.2	-----	advanced_tolls_and_charges_roadside_request
4.7.2.5	7.4.1.5	-----	other_services_roadside_request
4.7.2.5	7.5.2	-----	traveler_advanced_payment_at_roadside
4.7.2.5	Traveler	-----	tt-other_services_roadside_confirmed
4.7.2.5	Traveler	-----	tt-roadside_payment_confirmed
4.7.2.7	4.2.3.5	Unload Fare Collection Data	transit_roadside_passenger_data
5.1.1.2	5.1.1.1	-----	incident_cvo_data
5.1.1.4.1	4.4.1	-----	infrastructure_integrity_status_for_transit
5.1.1.4.1	5.1.7.3.3	-----	vehicle_threat_sensor_control
5.1.1.4.1	5.1.7.3.3	-----	vehicle_object_detection_sensor_control
5.1.1.4.1	5.1.7.3.4	-----	vehicle_secure_area_sensor_field_proc_parameters
5.1.1.4.2	5.1.7.3.1	-----	vehicle_secure_area_surveillance_control
5.1.1.4.2	5.1.7.3.2	-----	vehicle_secure_area_surveillance_field_proc_parameters
5.1.1.4.4	4.4.1	-----	threat_info_for_transit
5.1.1.4.6	5.1.7.4	Silent Alarm, Report Passenger Alarm, Report Operator Alarm	silent_and_audible_alarm_response
5.1.3	4.4.1	-----	emergency_data_for_transit
5.1.3	4.4.1	-----	deactivate_traveler_information_restrictions_for_transit
5.1.3	4.4.1	-----	traveler_information_restrictions_for_transit
5.1.3	4.4.2	-----	transit_incident_coordination_data
5.1.3	5.1.7.3.5	-----	secure_transit_vehicle_broadcast_message
5.1.4	4.4.1	-----	request_for_emergency_transit_support
5.1.7.1.1	5.1.1.4.2	Unload Video Images, Subscribe Video Images	traveler_secure_area_images
5.1.7.1.1	5.1.7.1.2	Unload Video Images, Subscribe Video Images	traveler_secure_area_images_for_field_proc
5.1.7.1.2	5.1.1.4.2	Unload Video Images, Subscribe Video Images	field_processed_traveler_secure_area_images
5.1.7.1.5	5.1.7.4	Report Passenger Alarm	traveler_alarm_request
5.1.7.2.1	5.1.1.4.2	Subscribe Video Images	secure_area_images
5.1.7.3.1	5.1.1.4.2	Silent Alarm	vehicle_secure_area_audio
5.1.7.3.1	5.1.1.4.2	-----	vehicle_secure_area_images
5.1.7.3.1	5.1.1.4.2	-----	vehicle_secure_area_surveillance_status
5.1.7.3.1	5.1.1.4.2	Subscribe PTV-AVL	transit_vehicle_location_for_surveillance_and_security

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
5.1.7.3.1	5.1.7.3.2	Silent Alarm	vehicle_secure_area_audio_for_field_p roc
5.1.7.3.1	5.1.7.3.2	-----	vehicle_secure_area_images_for_field _proc
5.1.7.3.1	5.1.7.3.6	-----	vehicle_secure_area_surveillance_for_ transit_operator
5.1.7.3.2	5.1.1.4.2	-----	field_processed_vehicle_secure_area_ images
5.1.7.3.2	5.1.1.4.2	Silent Alarm	field_processed_vehicle_secure_area_ audio
5.1.7.3.2	5.1.1.4.2	-----	vehicle_secure_area_surveillance_thre at_data
5.1.7.3.3	5.1.1.4.1	-----	vehicle_threat_sensor_data
5.1.7.3.3	5.1.1.4.1	-----	vehicle_object_detection_sensor_status
5.1.7.3.3	5.1.1.4.1	-----	vehicle_threat_sensor_status
5.1.7.3.3	5.1.1.4.1	-----	vehicle_object_detection_sensor_data
5.1.7.3.3	5.1.1.4.1	Subscribe PTV-AVL	transit_vehicle_location_for_sensors
5.1.7.3.3	5.1.7.3.4	-----	vehicle_threat_sensor_data_for_field_ proc
5.1.7.3.3	5.1.7.3.4	-----	vehicle_object_detection_sensor_data _for_field_proc
5.1.7.3.4	5.1.1.4.1	-----	vehicle_secure_area_sensor_threat_da ta
5.1.7.3.4	5.1.1.4.1	-----	field_processed_vehicle_threat_sensor _data
5.1.7.3.4	5.1.1.4.1	-----	field_processed_vehicle_object_detect ion_sensor_data
5.1.7.3.5	4.4.1	Silent Alarm, Report Passenger Alarm, Report Operator Alarm	secure_transit_vehicle_alarm_request_ for_transit
5.1.7.3.5	5.1.7.3.6	Command Remote PTV Disable	transit_vehicle_disabled
5.1.7.3.5	5.1.7.3.6	Silent Alarm, Report Passenger Alarm, Report Operator Alarm	emergency_response_to_transit_opera tor
5.1.7.3.5	5.1.7.4	Report Operator Alarm, Report Passenger Alarm, Silent Alarm, Subscribe PTV Health Alarm	transit_vehicle_location_for_alarms
5.1.7.3.5	5.1.7.4	Silent Alarm, Report Passenger Alarm, Report Operator Alarm	secure_transit_vehicle_alarm_request
5.1.7.3.5	Basic Transit Vehicle	Command Remote PTV Disable	tbtv-transit_vehicle_disable_command
5.1.7.3.5	Basic Transit Vehicle	Command Remote PTV Enable	tbtv- transit_vehicle_disable_reset_command
5.1.7.3.5	Traveler	-----	tt- secure_transit_vehicle_broadcast_mes tt-
5.1.7.3.5	Traveler	-----	secure_transit_vehicle_emergency_re transit_vehicle_operator_authentication _status
5.1.7.3.6	4.1.6	Report Operator Sign-Off, Report Operator Sign-On	request_transit_operator_authentication
5.1.7.3.6	4.1.6	-----	n
5.1.7.3.6	5.1.7.3.1	-----	vehicle_secure_area_surveillance_con trol_from_transit_operator
5.1.7.3.6	5.1.7.3.5	Report Operator Sign-on, Report Operator Sign-Off	local_transit_operator_authentication

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
5.1.7.3.6	5.1.7.3.5	Report Operator Alarm, Silent Alarm	emergency_request_from_transit_operator
5.1.7.3.6	Transit Vehicle Operator	-----	ttvo-secure_transit_vehicle_surveillance
5.1.7.3.6	Transit Vehicle Operator	-----	ttvo-secure_transit_vehicle_emergency_re
5.1.7.3.6	Transit Vehicle Operator	Command Remote PTV Enable, Command Remote PTV Disable	ttvo-transit_vehicle_disable_status
5.1.7.4	5.1.1.3	Report Traveler Alarm, Report Operator Alarm, Report Passenger Alarm, Silent Alarm	silent_and_audible_alarm_data
5.1.7.4	5.1.1.4.6	Report Traveler Alarm, Report Operator Alarm, Report Passenger Alarm, Silent Alarm	silent_and_audible_alarm_request
5.1.7.4	5.1.7.1.5	Report Traveler Alarm	traveler_alarm_acknowledge
5.1.7.4	5.1.7.3.5	Report Operator Alarm, Report Passenger Alarm, Silent Alarm	secure_transit_vehicle_alarm_acknowledge
5.1.8	4.4.1	Report Dispatch Message	wide_area_alert_notification_for_transit
5.4.4	4.2.4	-----	bad_transit_collected_fare_payment
5.4.5	4.2.4	-----	bad_transit_vehicle_fare_payment
5.4.7	4.2.4	-----	bad_transit_roadside_fare_payment
5.7.1	4.4.1	-----	disaster_transportation_system_status_for_transit
5.7.2	4.4.1	-----	disaster_response_plan_coordination_to_transit
5.7.3	4.4.1	-----	evacuation_transportation_system_status_for_transit
5.7.4	4.4.1	-----	evacuation_plan_coordination_to_transit
5.7.5	4.4.1	-----	evacuation_information_for_transit_management
5.7.5	4.4.1	-----	transit_evacuation_resource_request
6.1.1	1.2.5.1	Subscribe Stop Point Parking	parking_lot_static_information_request_by_isp
6.1.1	1.2.5.4	Subscribe Stop Point Parking	parking_lot_dynamic_information_request_by_isp
6.1.1	4.2.1.1	-----	paratransit_trip_request
6.1.1	4.2.3.7	Subscribe Transfers, Subscribe Transfer Clusters	request_transit_transfer_points
6.1.1	6.6.1	-----	paratransit_route_response
6.1.1	6.8.3.2	Report New Customer Profile, Report Update Customer Profile	traveler_personal_trip_information
6.1.2	4.2.1.1	-----	paratransit_service_confirmation
6.2.1.3	4.1.8	-----	transit_conditions_advisories_request
6.2.1.3	4.2.3.3	Subscribe Service Bulletins	transit_services_advisories_request
6.2.3	6.2.7	-----	transit_advisory_data_request

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
6.2.7	4.6.2	-----	transit_advisory_vehicle_information
6.2.7	6.2.3	-----	transit_advisory_data
6.3.2	4.1.8	-----	transit_deviation_kiosk_request
6.3.2	4.1.8	-----	transit_services_for_distribution_kiosk_request
6.3.2	4.2.3.3	Subscribe Trip Itinerary List	transit_services_kiosk_request
6.5.6	4.1.8	-----	transit_deviations_511_request
6.5.6	4.1.8	-----	transit_services_511_request
6.6.1	6.1.1	-----	paratransit_route_request
6.6.1	6.1.2	-----	paratransit_route_confirm
6.6.4	4.1.8	-----	transit_conditions_guidance_request
6.6.4	4.2.3.3	Subscribe Trip Itinerary List	transit_services_guidance_request
6.6.4	6.6.1	-----	transit_route
6.7.2.2	4.1.3	-----	vehicle_location_for_transit
6.8.3.1	4.1.8	Subscribe Trip Itinerary List	traveler_transit_profile
6.8.3.2	4.1.8	-----	transit_services_for_distribution_personal_request
6.8.3.2	4.1.8	-----	transit_deviations_personal_request
6.8.3.2	4.2.3.3	Subscribe Trip Itinerary List	transit_services_personal_request
7.3.1.3	4.2.4	Unload Fare Collection Data	transit_fare_transactions
7.3.1.5	4.6.4	-----	confirm_vehicle_fare_payment
7.3.1.5	4.6.4	Load Fare Collection Data	bad_tag_list_update
7.3.1.5	4.7.2.4	-----	confirm_roadside_fare_payment
7.3.1.5	7.3.4	-----	transit_roadside_fare_payment_request
7.3.1.5	7.3.4	-----	transit_roadside_fare_payment_debited
7.3.1.5	7.3.5	-----	transit_vehicle_fare_payment_debited
7.3.1.5	7.3.5	-----	transit_vehicle_fare_payment_request
7.3.1.7	1.4.2	-----	transit_fare_direct_details
7.3.1.7	4.6.6	Load Fare Collection Data	transit_vehicle_fare_data
7.3.1.7	4.7.2.6	-----	transit_roadside_fare_data
7.3.1.7	7.3.1.2	-----	transit_fares_for_advanced_payments
7.3.1.7	7.4.2	-----	transit_fare_data
7.3.2	4.6.8	-----	advanced_tolls_and_charges_vehicle_confirm
7.3.2	4.7.2.5	-----	advanced_tolls_and_charges_roadside_confirm

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
7.3.2	7.3.1.1	Subscribe Itinerary Fare	advanced_other_fares_request
7.3.3	4.6.1	-----	request_traveler_vehicle_image
7.3.3	4.7.2.1	-----	request_traveler_roadside_image
7.3.4	4.7.2.1	-----	traveler_roadside_tag_data
7.3.4	7.3.1.5	-----	transit_roadside_fare_payment_confirmation
7.3.5	4.6.1	-----	traveler_vehicle_tag_data
7.3.5	7.3.1.5	-----	transit_vehicle_fare_payment_confirmation
7.4.1.5	4.2.4	-----	traveler_payments_transactions
7.4.1.5	4.7.2.5	-----	other_services_roadside_response
7.4.2	1.4.2	-----	transit_fare_details
7.4.2	7.3.1.7	-----	transit_fare_data_request
7.5.2	4.7.2.5	-----	traveler_roadside_credit_identity_for_transit
8.1	4.2.4	-----	transit_archive_status
8.1	4.2.4	-----	transit_archive_request
9.2.1	4.1.4	-----	m_and_c_work_plans_for_transit
9.2.2	4.1.4	-----	roadway_maint_status_for_transit
9.2.2	4.1.6	-----	asset_restrictions_for_transit
9.3.2.3	4.1.6	-----	work_zone_info_for_transit
9.4.4	4.1.6	-----	road_weather_info_for_transit
Alerting and Advisory Systems	4.4.1	-----	faas-alerts_and_advisories_for_transit
Basic Transit Vehicle	4.1.1	-----	fbtv-vehicle_trip_data
Basic Transit Vehicle	4.1.9	-----	fbtv-vehicle_maintenance_data
Basic Transit Vehicle	4.2.1.5	-----	fbtv-availability
Map Update Provider	4.2.3.9	-----	fmup-transit_map_update
Media	4.1.6	-----	fm-transit_schedule_deviations_request
Media	4.1.8	-----	fm-transit_vehicle_deviations_request
Media	4.4.1	-----	fm-transit_incident_information_request
Multimodal Transportation Service Provider	4.2.3.8	Subscribe Transfers, Subscribe Transfer Clusters	fmsp-transit_service_data
Other ISP	6.2.1.3	-----	foisp-transit_information_request
Other ISP	6.2.1.3	-----	foisp-transit_data

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA Flow</i>
Other Transit Management	4.2.3.7	----- (not in NA DDE Definitions)	fotrm-transit_traveler_information
Other Transit Management	4.2.3.7	-----	fotrm-transit_fare_data_coordination
Other Transit Management	4.2.3.7	-----	fotrm-transit_service_data
Roadway Environment	4.1.1	-----	fre-environmental_conditions
Secure Area Environment	5.1.7.3.1	Silent Alarm	fsae-area_audio_for_transit_vehicle
Secure Area Environment	5.1.7.3.1	-----	fsae-area_image_for_transit_vehicle
Secure Area Environment	5.1.7.3.3	-----	fsae-area_characteristics_for_transit_vehicle
Surface Transportation Weather Service	4.1.6	-----	fstws-surface_trans_weather_observations
Surface Transportation Weather Service	4.1.6	-----	fstws-surface_trans_weather_forecasts
Telecommunications System for Traveler Information	6.5.6	Subscribe Trip Itinerary List	ftsti-511_caller_request
Telecommunications System for Traveler Information	6.5.6	-----	ftsti-511_batch_regional_info_request
Transit System Operators	4.1.4	-----	ftso-approved_corrections
Transit System Operators	4.1.5	-----	ftso-request_transit_vehicle_data
Transit System Operators	4.2.3.4	-----	ftso-transit_display_update_request
Transit System Operators	4.2.3.4	-----	ftso-planning_parameters
Transit System Operators	4.2.3.4	-----	ftso-initiate_service_updates
Transit System Operators	4.2.3.4	Subscribe Master Schedule Version, Subscribe Route Schedule, Subscribe Pattern List, Subscribe Timepoint List, Subscribe Stoppoint List (No Paratransit data)	ftso-transit_services_output_request
Transit System Operators	4.2.3.4	-----	ftso-planning_parameters_update_request
Transit System Operators	4.2.3.5	-----	ftso-passenger_loading_updates
Transit System Operators	4.2.4	-----	ftso-archive_commands

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ftso-technician_information_updates

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
Transit System Operators	4.3.3	-----	ftso-technician_information_request
Transit System Operators	4.3.5	-----	ftso-transit_vehicle_maintenance_informati
Transit System Operators	4.3.5	-----	ftso-transit_vehicle_maintenance_specs
Transit System Operators	4.3.6	-----	ftso-transit_vehicle_maintenance_updates
Transit System Operators	4.4.2	-----	ftso-coordination_data
Transit System Operators	4.4.3	-----	ftso-response_parameters
Transit System Operators	4.4.3	-----	ftso-request_response_parameter_output
Transit System Operators	4.4.4	-----	ftso-media_parameter_updates
Transit System Operators	4.4.4	-----	ftso-media_parameter_request
Transit System Operators	4.4.4	-----	ftso-alert_notification_status
Transit System Operators	4.4.4	Command Remote PTV Disable	ftso-disable_transit_vehicle
Transit System Operators	4.4.4	-----	ftso-emergency_plan_response
Transit System Operators	4.4.4	-----	ftso-security_action
Transit System Operators	4.5.7	-----	ftso-transit_vehicle_operator_information_u
Transit System Operators	4.5.7	-----	ftso-transit_vehicle_operator_information_r
Transit System Operators	4.5.7	-----	ftso-transit_vehicle_operator_route_prefere
Transit System Operators	7.3.1.7	-----	ftso-fare_updates
Transit System Operators	7.3.1.7	-----	ftso-request_fare_output
Transit Vehicle Operator	4.1.2.3	-----	ftvo-transit_service_status
Transit Vehicle Operator	4.2.1.6	-----	ftvo-paratransit_status
Transit Vehicle Operator	4.5.6	-----	ftvo-information_updates
Transit Vehicle Operator	4.6.4	-----	ftvo-fare_transaction_mode_set_up
Transit Vehicle Operator	4.6.4	-----	ftvo-request_batch_mode_data_transfer

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
Transit Vehicle Operator	5.1.7.3.6	Subscribe Operator Sign On, Report Operator Sign-On, Report Operator Sign-Off	ftvo-request_logon_authentication
Transit Vehicle Operator	5.1.7.3.6	Silent Alarm, Operator Alarm	ftvo-secure_transit_vehicle_emergency_re
Transit Vehicle Operator	5.1.7.3.6	-----	ftvo-secure_transit_vehicle_surveillance_c
Traveler	4.6.1	-----	ft-traveler_vehicle_image
Traveler	4.6.4	-----	ft-traveler_vehicle_image
Traveler	4.7.1	Subscribe Stop Point Service, Subscribe Nearest Stop List, Subscribe Text Timetable, Subscribe Landmarks List, Subscribe Trip Itineraries List	ft-transit_information_request
Traveler	4.7.2.1	-----	ft-traveler_roadside_image
Traveler	4.7.2.4	-----	ft-traveler_roadside_image
Traveler	4.7.2.5	-----	ft-destination_at_roadside
Traveler	4.7.2.5	Subscribe Amenities	ft-other_services_roadside_request
Traveler	5.1.7.1.5	-----	ft-remote_emergency_request
Traveler	5.1.7.3.5	Report Passenger Alarm	ft-secure_transit_vehicle_emergency_re
Traveler	6.2.3	-----	ft-request_advisory_information
Traveler	6.2.7	-----	ft-other_services_vehicle_request
Traveler	6.2.7	-----	ft-destination_on_vehicle
Traveler	6.3.3	Subscribe Stop Point Service, Subscribe Nearest Stop List, Subscribe Text Timetable, Subscribe Landmarks List, Subscribe Trip Itineraries List	ft-trip_planning_requests
Traveler	6.3.3	-----	ft-extra_trip_data
Traveler	6.8.1.2	Subscribe Trip Itinerary List, Subscribe Nearest Stop List, Subscribe Stop Service	ft-guidance_request
Traveler	6.8.1.2	Subscribe Trip Itinerary List, Subscribe Nearest Stop List, Subscribe Stop Service	ft-guidance_data
Traveler	6.8.1.2	-----	ft-guidance_map_update_request
Traveler	6.8.1.2	-----	ft-guidance_route_accepted
Traveler	6.8.2.1	-----	ft-personal_emergency_request
Traveler	6.8.3.3	-----	ft-personal_trip_planning_requests
Traveler	6.8.3.3	-----	ft-personal_map_display_update_request
Traveler	6.8.3.3	-----	ft-personal_extra_trip_data
Traveler Card	4.6.5	-----	ftc-

Dialog Flow-NIA Flow Mapping

<i>NIA Source</i>	<i>NIA Sink</i>	<i>Dialog</i>	<i>NIA FLOW</i>
Weather Service	4.1.6	-----	fws-current_weather_observations
Weather Service	4.1.6	-----	fws-weather_forecasts

Annex H

Base Type Definitions

H.1 ASN.1 Data Types

TCIP uses the following ASN.1 data types as the base types to define TCIP data:

Table H.1 List of ASN.1 Types	
ASN.1 Type	Purpose
BOOLEAN	This base type supports True and False values. The data element CPT-Boolean uses this type.
ENUMERATED	This base type restricts a variable to a specified list of values. Data elements are defined using ENUMERATED, and a specification of the allowed values.
INTEGER	This base type is used to create several TCIP numeric subtypes in section 3.1.2.1.1 and in 3.1.2.1.3.
UTF8String	This base type is used to create several TCIP string subtypes in section 3.1.2.1.3.
Numeric String	This base type is similar to a UTF8String, but limited to numeric values. It is used to create base types in section 3.1.2.1.3.
OCTET String	This base type is used to create base types in section 3.1.2.1.3.

H.2 TCIP Subtypes of ASN.1 Data Types

The ASN.1 data types above are extended through the creation of subtypes. These subtypes and are defined in the following sections.

H.2.1 Subtype Definitions

This section lists the specialized subtypes based on ASN.1 that may be used in the TCIP family of standards (in addition to ASN.1 universal types).

H.2.1.1 Integer Subtypes

The subtypes include BYTE, UBYTE, SHORT, USHORT, LONG and ULONG. These subtypes are defined as follows:

Table H.2.1.1		
ASN.1 Definition	XML Simple Type	Narrowband Encoding
BYTE ::= INTEGER (-128..127)	Byte	Binary signed 8 bits
UBYTE ::= INTEGER (0..225)	Unsigned Byte	Binary unsigned 8 bits
SHORT ::= INTEGER (-32,768 .. 32,767)	Short	Binary signed 16 bits
USHORT ::= INTEGER (0 .. 65,535)	Unsigned Short	Binary unsigned 16 bits
LONG ::= INTEGER (-2,147,483,647 .. 2,147,483,647)	Long	Binary signed 32 bits
ULONG ::= INTEGER (0 .. 4,294,967,295)	Unsigned Long	Binary unsigned 32 bits

H.2.1.2 Date and Time Subtypes

TCIP Subtypes for defining time artifacts are TIME, DATE, DATETIME, SCHEDULE, and DURATION. These Subtypes are defined as follows.

Table H.2.1.2		
Date and Time Subtype Definitions		
Subtype Name	XML Simple Type	Narrowband Encoding Definition
TIME	time	ULONG constrained to the range 0...235960999. The value is masked by digits as HHMMSS.FFF where HH represents hours, MM represents minutes, SS represents seconds and FFF represents fractions of seconds. Seconds are allowed to equal 60 to allow for a leap second.
DATE	date	ULONG constrained to the range 0...99991231. The value is masked by digits as CCYYMMDD where CC represents the century, YY represents the century, YY represents the year MM represents the month, and DD represents the day of the month.
DATETIME	dateTime	A six octet grouping where the first 2 octets are treated as a USHORT conveying the century and year. The last 4 octets are treated as a ULONG conveying the date and time. The value is masked by digits as MMDDhhmmss where MM is the Month, DD is the date, hh is the hour mm is the minutes and ss is the seconds.
SCHEDULE	duration, however only the seconds field is allowed. All other fields are to be unspecified. The specified number of seconds indicates time since midnight, negative values indicate the time before midnight (previous calendar day).	LONG interpreted as seconds since midnight. Negative values indicate seconds prior to midnight on the schedule day.
DURATION	duration	LONG interpreted as an interval in seconds.

H.2.1.3 String, Name and Identifier Subtypes

These subtypes are identified as follows:

Table H.2.1.3			
ASN.1 Definition	Description	XML Types	Narrowband Encoding
TELEPHONE ::= NUMERIC STRING (SIZE(1..16))	A string of up to 16 digits to dial	xs:string	One octet length field followed by 1-16 characters defining digits to dial.
FOOTNOTE ::=UTF8String (SIZE(1...255))	Footnote is a memo field for defining comments and other free form text.	xs:string	One or two octet length field followed by 1-255 characters.
MEMSHORT16 ::= OCTET STRING (SIZE(1..16))	A binary field of up to 16 octets.	xs:base64binary	One octet length field followed by 1-16 octets of data.
MEMSHORT2 ::= OCTET STRING (SIZE(1..2))	A binary field of up to 2 octets.	xs:base64binary	One octet length field followed by 1-2 octets of data.
MEMSHORT23 ::= OCTET STRING (SIZE 1..23))	A binary field of up to 23 octets.	xs:base64binary	One octet length field followed by 1-23 octets of data.
MEMSHORT32 ::= OCTET STRING (SIZE(1..32))	A binary field of up to 32 octets.	xs:base64binary	One octet length field followed by 1-32 octets of data.
MEMVSHORT ::= OCTET STRING (SIZE(1..255))	A binary field of up to 255 octets.	xs:base64binary	One or two octet length field followed by 1-255 octets of data.
MEMSHORT ::=OCTET STRING (SIZE(1..2047))	A binary field of up to 2047 octets.	xs:base64binary	One or two length octet field followed by 1-2047 octets of data.
MEMLONG ::= OCTET STRING (SIZE(1..2,000,000))	A binary field of up to 2,000,000 octets.	xs:base64binary	One to three octet length field followed by 1-2,000,000 octets of data.
NAME1 ::=UTF8String (SIZE (1))	A string of 1 character.	xs:string	One octet length field followed by 1 character of data.
NAME2 ::=UTF8String (SIZE(1..2))	A string of 2 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME3 ::=UTF8String (SIZE (1..3))	A string of 3 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME4 ::=UTF8String (SIZE (1..4))	A string of 4 characters.	xs:string	One octet length field followed by up to 2 characters of data.

Table H.2.1.3			
ASN.1 Definition	Description	XML Types	Narrowband Encoding
NAME5 ::=UTF8String (SIZE (1..5))	A string of 5 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME6 ::=UTF8String (SIZE (1..6))	A string of 6 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME7 ::=UTF8String (SIZE (1..7))	A string of 7 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME8 ::= UTF8String (SIZE(1..8))	A string of 8 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME9 ::=UTF8String (SIZE (1..9))	A string of 9 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME10 ::=UTF8String (SIZE (1..10))	A string of 10 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME11 ::=UTF8String (SIZE (1..11))	A string of 11 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME12 ::=UTF8String (SIZE (1..12))	A string of 12 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME13 ::=UTF8String (SIZE (1..13))	A string of 13 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME14 ::=UTF8String (SIZE (1..14))	A string of 14 characters.	xs:string	One octet length field followed by up to 2 characters of data.
NAME15 ::=UTF8String (SIZE (1..15))	A string of 15 characters.	xs:string	One octet length field followed by up to 15 characters of data.
NAME16 ::= UTF8 String (SIZE(1...16))	A string of 16 characters.	xs:string	One octet length field followed by up to 16 characters of data.

Table H.2.1.3			
ASN.1 Definition	Description	XML Types	Narrowband Encoding
NAME17 ::=UTF8String (SIZE (1..17))	A string of 17 characters.	xs:string	One octet length field followed by up to 17 characters of data.
NAME18 ::=UTF8String (SIZE (1..18))	A string of 18 characters.	xs:string	One octet length field followed by up to 18 characters of data.
NAME19 ::=UTF8String (SIZE (1..19))	A string of 19 characters.	xs:string	One octet length field followed by up to 19 characters of data.
NAME20 ::=UTF8String (SIZE (1..20))	A string of 20 characters.	xs:string	One octet length field followed by up to 20 characters of data.
NAME21 ::=UTF8String (SIZE (1..21))	A string of 21 characters.	xs:string	One octet length field followed by up to 21 characters of data.
NAME22 ::=UTF8String (SIZE (1..22))	A string of 22 characters.	xs:string	One octet length field followed by up to 22 characters of data.
NAME23 ::=UTF8String (SIZE (1..23))	A string of 23 characters.	xs:string	One octet length field followed by up to 23 characters of data.
NAME24 ::=UTF8String (SIZE (1..24))	A string of 24 characters.	xs:string	One octet length field followed by up to 24 characters of data.
NAME25 ::=UTF8String (SIZE (1..25))	A string of 25 characters.	xs:string	One octet length field followed by up to 25 characters of data.
NAME30 ::= UTF8String (SIZE(1..30))	A string of 30 characters.	xs:string	One octet length field followed by up to 30 characters of data.
NAME32 ::=UTF8String (SIZE(1..32))	A string of 32 characters.	xs:string	One octet length field followed by up to 32 characters of data.
NAME40 ::=UTF8String (SIZE (1..40))	A string of 40 characters.	xs:string	One octet length field followed by up to 40 characters of data.

Table H.2.1.3			
ASN.1 Definition	Description	XML Types	Narrowband Encoding
NAME60 ::=UTF8String (SIZE (1..60))	A string of 60 characters.	xs:string	One octet length field followed by up to 60 characters of data.
IDENS ::= USHORT	An identifier 16 bits in length	xs:unsignedshort	A two octet binary unsigned numeric field.
IDENL ::= ULONG	An identifier 32 bits in length	xs:unsignedlong	A four octet binary unsigned numeric field.
TEXTLONG ::=UTF8String (SIZE(1..50000))	A field for conveying large text sequences.	xs:string	1-3 octet length field followed by 1050,000 character text field.

Annex I

This Material Intentionally Deleted

Annex J

Polling Protocol

This annex provides an optional data communications protocol that may be used to provide PTV-to central communications over a dedicated private radio channel. If an agency elects to use this protocol, then all requirements defined in this Annex apply.

J.2 Overview

The polling function provides the following capabilities:

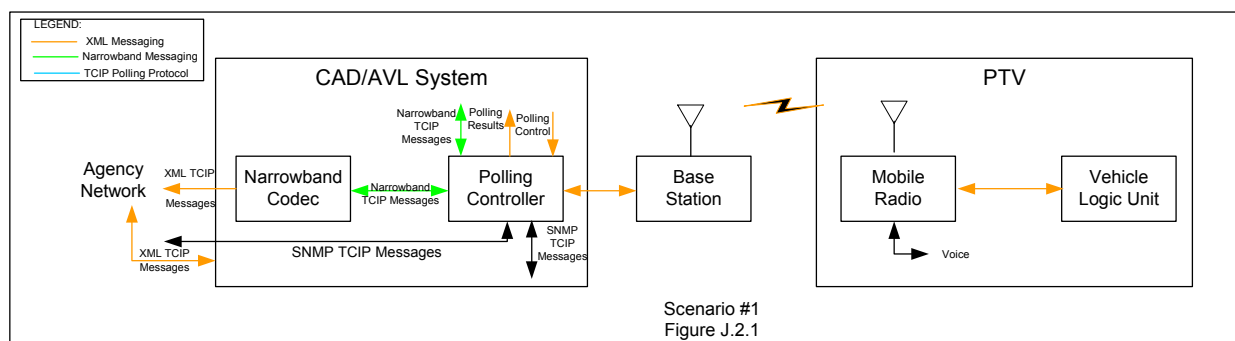
- Allocation/deallocation of polling slots to PTVs
- Unacknowledged transfer of state information from PTVs to the CAD/AVL System via the polling controller
- Priority polls to allow PTVs to send emergency information ahead of the normal poll cycle
- Acknowledged transfer of TCIP messages between PTVs and authorized transit business systems including the CAD/AVL System
- Notification from the polling controller to the CAD/AVL System of vehicles joining, leaving, or losing contact with the polling session
- Fast polling of selected vehicles based on operating conditions
- Group address message transfer to PTVs
- Packetization and reassembly of large messages from a business system to a PTV

The polling controller shall manage the radio channel and shall pass messages between the agency’s fixed communications network and the PTV (VLU). PTV operating status information shall be passed to the polling controller in poll responses from the PTV. The polling controller shall forward this status information to the CAD/AVL System using the “Notify PTV Polling Result” dialog. The polling controller shall by default request the minimum operating information with each poll. The polling controller shall be configured by the CAD/AVL System to request additional information on a PTV-specific basis using the Subscribe PTV-Polled Parameters dialog.

The polling controller may send a narrowband TCIP message, an SNMP TCIP message, or packets of a long TCIP narrowband-encoded message (in a message wrapper) to any PTV in the polling session at any time, except when that PTV is the ‘currently polled’ PTV. The PTV shall send a narrowband-encoded TCIP message or an SNMP-encoded TCIP message to the polling controller immediately following a Poll Response if the PTV has such a message queued to send. The polling function defines the interactions between a “polling controller” and a PTV. The functions described in this section can be implemented in a variety of ways as shown in the following scenarios.

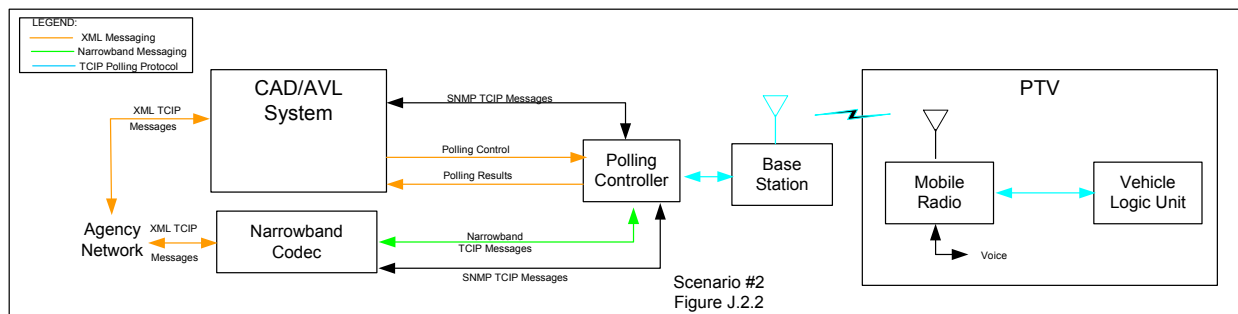
J.2.1 Scenario 1

This scenario incorporates the Polling Controller with the CAD/AVL System. Figure J.2.1 depicts the relationships in this scenario. The narrowband codec provides a two-way translation function between an agency-specified list of TCIP-XML messages and their TCIP narrowband encoded equivalents.



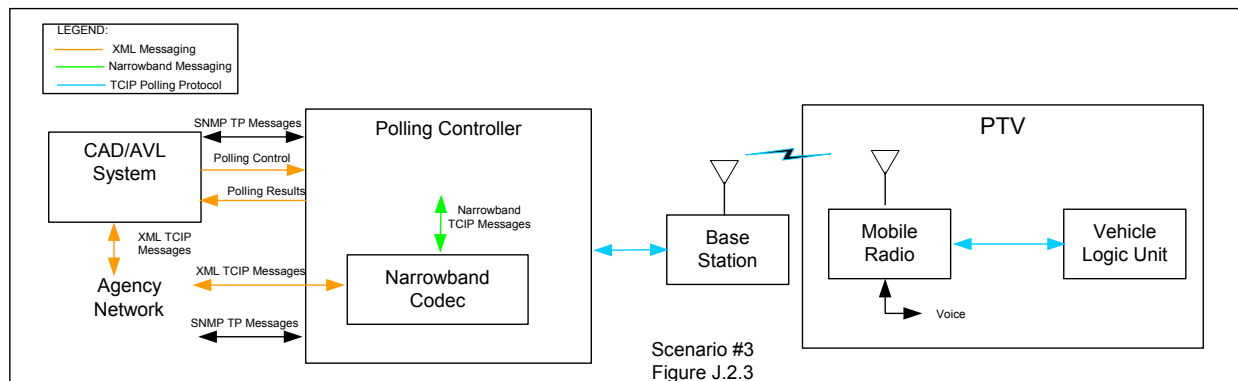
J.2.2 Scenario 2 Separate Units

This scenario separates the polling controller, CAD/AVL System, and Narrowband Codec into separate physical devices. This approach may be useful where narrowband messages are to be distributed to more than one polling controller, or to a non-TCIP polling controller. TCIP does not specify the wrapper or protocol to be used to convey narrowband messages between the Narrowband Codec and the polling controller. Figure J.2.2 depicts the relationships in this scenario.



J.2.3 Scenario 3 Integrated Codec/Polling controller

This scenario incorporates the Narrowband Codec into the polling controller. Figure J.2.3 depicts the relationships in this scenario.



J.3 Assumptions

The TCIP Polling Protocol is based on the following assumptions:

- The agency owns a private radio network, that is shared for voice and data. Separate channels are allocated for voice and data. The Operator Initiated Voice Radio Call and Dispatcher Initiated Voice Radio Call dialogs are used to control the transfers between voice and data modes.
- Radio system characteristics including band, channel allocation, bit rate and radio performance vary from agency to agency. See section J.8 for a list of parameters that affect the operation of the TCIP Polling Protocol.

- Base (fixed) radios communicate on the voice and data channel(s) simultaneously, and possibly in full duplex mode on the data channel. Mobile radios communicate on only one channel (voice or data) at a time and may be limited to simplex two-way alternate mode on the data channel.
- All PTVs (on power-up) are initially not allocated to a polling slot. A PTV which has been turned off or out of contact must 'join' the polling session and be allocated a slot by the polling controller.
- The protocol allows for very large numbers of PTVs on a channel as well as for very long message lengths (approximately 64k in each case) however, real-world implementations will be limited to much smaller values in each case to achieve reasonable performance levels. In particular agencies will assign upper limits on narrowband-encoded TCIP message length. These maximum message lengths may be different for messages to and from the PTV.

J.4 Definitions

Allocation Update – a data structure sent across the radio channel from the polling controller to the PTV announcing recent allocations and deallocations.

Polling controller – A fixed software entity that controls access to a data channel, by allocating and deallocating polling slot numbers to mobile units, and by issuing polls that allow PTVs to access the channel.

Join Request – A Data structure sent across the radio channel from the PTV to the polling controller requesting that the PTV be allocated a polling slot number. Also used in response to a priority poll to notify the polling controller of an urgent message queued on the PTV.

Leave Request – a data structure sent across the radio channel from the PTV to the polling controller requesting deallocation of its polling slot.

Message Wrapper – A data structure sent across the radio channel in either direction conveying a TCIP – Narrowband –encoded message.

Poll – A data structure sent across the radio channel from the polling controller to the PTV giving the PTV permission to transmit.

Poll Response – A data structure, containing PTV operating information, sent across the radio channel from the PTV to the polling controller in response to a poll.

Priority Poll – A data structure sent across the radio channel from the polling controller to the PTV to allow any PTV to notify the polling controller of an urgent message waiting.

Session Poll – a data structure sent from the polling controller to the PTV to allow a PTV without a polling slot to send a join request.

J.5 Data Structure Definitions

The data structures used by the TCIP Polling Protocol are the: Poll, Poll Response, Priority Poll, Session Poll, Packeted Message Wrapper, Narrowband Message Wrapper, SNMP Message Wrapper, Group Reset, Join Request, Leave Request, and Allocation Update. All of these structures share the same basic data frame structure. Each data structure is defined in the following subsections.

J.5.1 Basic Polling Data Frame Structure

The Basic Polling Data Frame structure shall be used to convey all TCIP Polling Protocol Data Structures. It shall be defined as follows:

FIELD #	NAME	CONTENT	NOTES
1	Bit Sync	Minimum 1 octet value AAH	Agencies/vendors may extend the length of this field by adding additional octets of AAH if the radio system cannot reliably achieve bit sync in one octet time.
2	Frame Sync Flag	One octet value 7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	Two octet field-most significant octet first	Identifies the slot number associated with this data structure.
4	Length	Two octet field denoting the length in octets of the contents of this structure	Measured from the Frame Sync Flag to the End Sync Flag – non-inclusive.
5	ID	Octet field identifying the type of this data structure.	Values 01-10H are reserved for TCIP Business areas, and signify a message wrapper. Other values are identified with each data structure.
6-N	Structure Type-specific content		
N+1	Checksum	Modulo – 256 sum of values in fields 3-N	
N+2	End Sync Flag	One octet value 7EH	Allows receiver to verify end of transmission

Important Note: The decoders in both the TCIP Controller and the VLU shall detect the end of frame by calculating the octets left until the end of the frame. The End Sync Flag shall be used only as a verification that the receiver remained in sync throughout the frame. Nonconformant use of the end sync flag as a “trigger” will result in random premature end of frame detections and failures to decode frames.

J.5.2 Poll Data Structure

The Poll Data Structure shall be used to elicit a response from a PTV, after the PTV has been allocated a polling slot. The Poll Contents field contains fields to acknowledge the most recently received message wrapper from the PTV and to direct the PTV as to what information should be returned in the poll response.

FIELD #	NAME	CONTENT	NOTES
1	Bit Sync	Minimum 1 octet value AAH	Agencies/vendors may extend the length of this field by adding additional octets of AAH if the radio system cannot reliably achieve bit sync in one octet time.
2	Frame Sync Flag	One octet value 7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	Two octet field-most significant octet first	Identifies the mobile, by slot number, that should respond to this poll.
4	Length	Two octets-variable	
5	ID	1 octet field value =A1H	
6	Poll Contents	Narrow-band encoded TCIP data frame.	CCPollContents
7	Checksum	Modulo - 256 sum of values in fields 3-N	
8	End Sync Flag	One octet value 7EH	Allows receiver to verify end of transmission

J.5.3 Poll Response Data Structure

The Poll Response Data Structure shall provide the PTV response to a poll from the PTV to the polling controller. This structure has three alternative identifiers:

- A2H indicates the poll response is the complete data transmission from the PTV to the polling controller.
 - A3H indicates that the poll response is followed by a message wrapper from the PTV to the polling controller.
- Note that field #6 uses a TCIP data frame, not a message as its contents.

FIELD #	NAME	CONTENT	NOTES
1	Bit Sync	Minimum 1 octet value AAH	Agencies/vendors may extend the length of this field by adding additional octets of AAH if the radio system cannot reliably achieve bit sync in one octet time.
2	Frame Sync Flag	One octet value 7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	Two octet field-most significant octet first	Identifies the mobile, by slot number, sending the poll response
4	Length	Two octets-variable	
5	ID	A2H – No wrapper A3H – Wrapper follows	
6	Response Contents	Narrow-band encoded TCIP –data frame	CCPollResponseContents
7	Checksum	Modulo – 256 sum of values in fields 3-N	
8	End Sync Flag	One octet value 7EH	Allows receiver to verify end of transmission

J.5.4 Priority Poll

The Priority Poll Data Structure shall be used by the polling controller to create a contention-based opportunity for a PTV to send a Join Request signifying a high-priority message to the CAD/AVL System without waiting for its regular poll. The selection of what messages the Vehicle Logic Unit deems high-priority is local agency-defined.

FIELD #	NAME	CONTENT	NOTES
1	Bit Sync	AAH	Agencies/vendors may extend the length of this field by adding additional octets of AAH if the radio system cannot reliably achieve bit sync in one octet time.
2	Frame Sync Flag	7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	FFFFH	Broadcast- for use by any authorized PTV
4	Length	Two octets 0006H	
5	ID	One octet A4H	
6	Checksum	Modulo – 256 sum of values in fields 3-N	
7	End Sync Flag	One octet value 7EH	Allows receiver to verify end of transmission

J.5.5 Session Poll

The Session Poll Data Structure shall be used by the polling controller to invite PTVs that do not have an allocated polling slot to request a slot.

FIELD #	NAME	CONTENT	NOTES
1	Bit Sync	AAH	
2	Frame Sync Flag	7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	FFFFH	Broadcast- for use by any unallocated PTV
4	Length	Two octets 0006H	
5	ID	One octet A5H	
6	Checksum	Modulo – 256 sum of values in fields 3-N	
7	End Sync Flag	One octet value 7EH	Allows receiver to verify end of transmission

J.5.6 Narrowband Message Wrapper

The Narrowband Message Wrapper Data Structure shall be used by the PTV or the polling controller to convey a Narrowband TCIP message.

FIELD #	NAME	CONTENT	NOTES
1	Bit Sync	AAH	
2	Frame Sync Flag	7EH	Allows the receiver to detect the end of bit sync and transition to start of contents
3	Slot Number		Identifies the mobile originator or destination to which the message pertains. Value FFFFH indicates all mobiles (broadcast from polling controller)
4	Length	Two octets 0005H	Measured from the Frame Sync Flag to the End Sync Flag – non-inclusive.
5	ID	Identifies the TCIP business area	Value 01-20H. This matches as the BID field for the narrowband encoded message.
6	Fixed IP address	16 octets	IPV6 Format, Same as CPT-IP-Address
7	Fixed Port	1 octet	Same as CPT-UDP-TCP-Port-Number
8	Message Number	1 octet	Same as CC-MessageCounter
9	Last Received Message Number	1 octet	Same as CC-MessageCounter
10	Message Data	TCIP Narrowband-Encoded Message	Variable Length
11	Checksum	Modulo – 256 sum of values in fields 3-10	
12	End Sync Flag	One octet value 7EH	Allows receiver to verify end of transmission

J.5.7 Join Request Data Structure

The Join Request Data Structure shall be used by the PTV to request to join the TCIP polling session, or in response to a Priority Poll to notify the polling controller of a high-priority message.

FIELD #	NAME	CONTENT	NOTES
1	Bit Sync	Minimum 1 octet value AAH	
2	Frame Sync Flag	One octet value 7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	Two octets	0000H in response to a Session Poll, assigned slot number in response to a priority poll.
4	Length	Two octets - 000AH	
5	ID	One octet - Value = A6H	
6	vehicle ID	Four octets	Same value as CPT-VehicleID to identity requester
7	Checksum	Modulo - 256 sum of values in fields 3-N	
8	End Sync Flag	One octet value 7EH	Allows receiver to verify end of transmission

J.5.8 Leave Request Data Structure

The Leave Request Data Structure shall be used by a PTV to ask to be removed from the polling cycle by the polling controller. The Leave Request shall be sent in lieu of a Poll Response by the PTV.

FIELD #	NAME	CONTENT	NOTES
1	Bit Sync	Minimum 1 octet value AAH	
2	Frame Sync Flag	One octet value 7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	Two octets	Currently assigned slot
4	Length	Two octets - Value = 000AH	
5	ID	One octet - Value = A7H	
6	Vehicle ID	Four octets	Same value as CPT-VehicleID
7	Checksum	Modulo - 256 sum of values in fields 3-N	
8	End Sync Flag	One octet value 7EH	Allows receiver to verify end of transmission

J.5.9 Allocation Update Data Structure

The Allocation Update Data Structure shall be used by the polling controller to notify PTVs that they have been added or deleted from the poll cycle. A history of the last 6 adds and deletes are included to allow multiple opportunities for a PTV to receive a copy of the Allocation Update and recognize its revised status.

The polling controller shall not include the same slot identifier in the added and deleted lists except for slot zero which is always valid.

FIELD #	NAME	CONTENT	NOTES
1	Bit Sync	Minimum 1 octet value AAH	
2	Frame Sync Flag	One octet value 7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	FFFFH	Broadcast
4	Length	Two octets - Value =0037H	
5	ID	One octet - Value = A8	
6	Delete all	Boolean (1 octet)	Value 1 all slots rescinded due to polling controller restart, value 0 normal operations.
7	Added slot 1	Two Octets	Slot # Assigned
8	Added Vehicle 1	Four Octets	CPT-VehicleID
9	Added slot 2	Two Octets	Slot # Assigned
10	Added Vehicle 2	Four Octets	CPT-VehicleID
11	Added slot 3	Two Octets	Slot # Assigned
12	Added Vehicle 3	Four Octets	CPT-VehicleID
13	Added slot 4	Two Octets	Slot # Assigned
14	Added Vehicle 4	Four Octets	CPT-VehicleID
15	Added slot 5	Two Octets	Slot # Assigned
16	Added Vehicle 5	Four Octets	CPT-VehicleID
17	Added slot 6	Two Octets	Slot # Assigned
18	Added Vehicle 6	Four Octets	CPT-VehicleID
19	Deleted slot 1	Two Octets	Slot # Vacated
20	Deleted slot 2	Two Octets	Slot # Vacated
21	Deleted slot 3	Two Octets	Slot # Vacated
22	Deleted slot 4	Two Octets	Slot # Vacated
23	Deleted slot 5	Two Octets	Slot # Vacated
24	Deleted slot 6	Two Octets	Slot # Vacated
25	Checksum	Modulo - 256 sum of values in fields 3-N	
26	End Sync Flag	One octet value 7EH	Allows receiver to verify end of transmission

J.5.10 Packetized Message Wrapper

The Packetized Message Wrapper shall be used by the Polling Controller to convey a segment of a long TCIP narrowband message to a PTV.

Field #	Name	Content	Notes
1	Bit Sync	AAH	Agencies/vendors may extend the length of this field by adding additional octets of AAH if the radio system cannot reliably achieve bit sync in one octet time.
2	Frame Sync Flag	7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number		Identifies the mobile(s) to which this frame is sent.
4	Length	Two Octets-variable	Measured from the Frame Sync Flag to the End Sync Flag – non-inclusive.
5ID	Two Octets-identifies the TCIP Business Area	Value = BI-DHO. This matches the BID field plus BOH for the narrowband-encoded message	
6	Fixed IP Address	16 Octets	IPV6 Format, Same as CPT-IP-Address
7	Fixed Port	1 octet	Same as CPT-UDP-TCP-Port-Number
8	Message Number	1 octet	Same as CC-MessageCounter
9	Last Received Message Number	1 octet	Same as CC-MessageCounter
10	Segment Numbers	1 octet	High order 4 bits = m, low order 4 bits=n. This is segment m of n.
11	Message Data	TCIP-Narrowband Encoded Message Segment	Variable Length
12	Checksum	Modulo – 256 sum of fields 3-11	
13	End Sync Flag	1 octet Value 7EH	Allows receiver to verify end of transmission

J.5.11 SNMP Message Wrapper

The SNMP Message Wrapper Data Structure shall be used to convey SNMP-encoded messages over the TCIP-Polled radio link.

Field #	Name	Content	Notes
1	Bit Sync	Minimum 1 octet value = AAH	Agencies/vendors may extend the length of this field by adding additional octets of AAH if the radio system cannot reliably achieve bit sync in one octet time.
2	Frame Sync Flag	1 Octet value 7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	2 Octet field, most significant octet first	Identifies the mobile that originated, or should receive this frame.
4	Length	2 Octet field-variable	
5	ID	The octet value = AAH	
6	Fixed IP Address	16 Octets	IPV 6 Format – Same as CPT-IP-Address
7	Fixed Port	1 Octet	Same as CPT-UDP-TCP-Port Number
8	Message Number	1 Octet	Same as CC-MessageCounter
9	Last Received Message	1 Octet	Same as CC-MessageCounter
10	Message Data	TCIP-SNMP Encoded Message	Variable Length
11	Checksum	Modulo-256 sum of values in fields 3-10	
12	End Sync Flag	One Octet Value 7EH	Allows receiver to verify end of transmission

J.5.12 Group Reset

The Group Reset Data Structure shall be used to notify PTVs that one or more polling group has been reset. If not enough groups are reset to fill the frame, the last reset group is repeated until the frame is filled.

Field #	Name	Content	Notes
1	Bit Sync	Minimum 1 octet value AAH	Agencies/vendors may extend the length of this field by adding additional octets of AAH if the radio system cannot reliably achieve bit sync in one octet time.
2	Frame Sync Flag	7EH	Allows the receiver to detect the end of bit sync and transition to start of contents.
3	Slot Number	FFFFH	Broadcast-let everybody know about this event
4	Length	2 Octets value = 0010H	
5	1D	1 Octet value = A9	
6	Reset Group 1	Number of Group to Reset	Type = CC=PollingGroup
7	Reset Group 2	Number of Group to Reset	Type = CC=PollingGroup
8	Reset Group 3	Number of Group to Reset	Type = CC=PollingGroup
9	Reset Group 4	Number of Group to Reset	Type = CC=PollingGroup
10	Reset Group 5	Number of Group to Reset	Type = CC=PollingGroup
11	Reset Group 6	Number of Group to Reset	Type = CC=PollingGroup
12	Reset Group 7	Number of Group to Reset	Type = CC=PollingGroup
13	Reset Group 8	Number of Group to Reset	Type = CC=PollingGroup
14	Reset Group 9	Number of Group to Reset	Type = CC=PollingGroup
15	Reset Group 10	Number of Group to Reset	Type = CC=PollingGroup
16	Checksum	Modulo 256 sum of values in fields 3-15	
17	End Sync Flag	1 Octet value = 7EH	Allows receiver to verify end of transmission.

J.6 Polling Controller Rules of Procedure

J.6.1 Allocation of Slot Numbers

The polling controller shall allocate slot numbers in the range 0101H – FFFE_H. Slot number 0000H shall be reserved as a null slot number, and slot FFFF_H shall be reserved as a broadcast slot number. The polling controller shall assign slot numbers beginning with 0101H and increasing sequentially, skipping any already assigned slot numbers. Upon allocating slot number FFFE_H, the polling controller shall make new allocations starting with slot number 0101H, or the lowest currently unallocated slot number. Slot numbers 0001H – 00FF_H shall be reserved for PTV group addresses.

The polling controller shall allocate slot numbers only to PTVs requesting a slot allocation by sending a Join Request to the polling controller. When the polling controller allocates a slot number, it shall immediately send an Allocation Update. The polling controller may repeat the Allocation Update transmission $N_{\text{ALLOCTRETRY}}$ times, to increase the probability of success. The polling controller shall log each allocation event.

For each allocated slot, the polling controller shall maintain the following slot data:

- Slot-number (from allocation algorithm)
- PTV ID (from join request)
- Last-message-number-sent (initialize to zero)
- Last-message-number-received (initialize to zero)
- Queue of up to N_{CTLPTVQ} (default 8) TCIP messages to the PTV (initialize to empty). Elements in this queue may be SNMP-encoded messages in a SNMP message wrapper, TCIP-narrowband encoded messages in a narrowband message wrapper or a segment of a TCIP narrowband –encoded message in a Packetized Message Wrapper
- Message-try-count (initialize to zero)
- Message ready to send (initialize to false)
- Poll-no-response-count (initialize to zero)
- Agency-data (CC-AgencyData=Initialize to none)
- Agency-data-try-count (initialize to zero)
- Poll-data (initialize to zero)

J.6.2 Deallocation of Slot Numbers

The polling controller shall deallocate slot numbers upon incrementing the Poll-no-response-count for the slot to $(1 + N_{\text{MAXBADPOLL}})$, or upon receipt of a Leave Request from the PTV.

J.6.3 Session Polls

The polling controller shall issue a Session Poll to the radio channel at least once per polling cycle, and at least once per $T_{\text{SESSIONPOLL}}$ seconds. Upon issuing a Session Poll the polling controller shall refrain from issuing any additional polls (of any kind) while it waits for a poll answer.

J.6.4 Priority Polls

The polling controller shall issue a Priority Poll to the radio channel at least once per polling cycle or at least once per $T_{\text{PRIORITYPOLL}}$ seconds. Upon issuing a Priority Poll, the polling controller shall refrain from issuing any additional polls (of any kind) while it waits for a poll answer.

J.6.5 Normal Polls

The polling controller shall issue Polls to the radio channel on a cyclical basis to each allocated slot number. Additionally up to $N_{\text{MAXFASTPOLL}}$ PTVs may be assigned to be 'fast polled' at a rate of once every $T_{\text{FASTPOLLINTERVAL}}$ seconds. Fast polls are identical to other polls, except the designated PTVs are polled every $T_{\text{FASTPOLLINTERVAL}}$ in addition to their normal poll cycle. The polling controller may be optionally configured to automatically provide additional polls to vehicles with Poll Responses reporting queued messages to the polling controller.

When the polling controller issues a poll to a PTV, it shall populate the poll data structure using the internally stored values for the PTV to be polled including Last-message-number-received, Poll-data, and Agency-data (if present). If Agency data is present, the polling controller shall increment the Agency-data-try-count and shall compare it with the configured value $N_{\text{AGENCYDATAMAXTRIES}}$. If the Agency-data-try-count is greater or equal to $N_{\text{AGENCYDATAMAXTRIES}}$, then the polling controller shall delete the agency data and shall reset Agency-data-try-count to zero.

After issuing a poll, the polling controller shall refrain from issuing any additional polls (of any kind) while it waits for a poll answer.

J.6.6 Waiting for a Poll Answer

Upon issuing a Session or Priority Poll, the polling controller shall wait for a valid received answer (Join Request) for up to $T_{\text{SESSIONWAIT}}$ milliseconds. If a valid Join Request is received, the polling controller shall cease waiting and immediately process it as described in section J.6.8. If a Join Request is not received and $T_{\text{SESSIONWAIT}}$ expires, the polling controller shall resume polling.

Upon issuing a Normal Poll, the polling controller shall wait for a valid received answer (Poll Response) for up to $T_{\text{NORMALWAIT}}$ milliseconds. If a valid Poll Response is received, the polling controller shall cease waiting and immediately process it as described in section J.6.11. If a Poll Response is not received and $T_{\text{NORMALWAIT}}$ expires, the polling controller shall:

- Increment the Poll-no-response-count variable for the polled PTV
- If Poll-no-response-count $\geq N_{\text{MAXBADPOLL}}$ then
 - Log a loss of contact event
 - Deallocate the polling slot for the polled PTV
- Resume polling (with next allocated slot number)

J.6.7 Sending a PTV Message

The polling controller shall send messages to PTVs interspersed with polls "messages" in this context include:

- A complete narrowband TCIP message in a message wrapper
- A complete SNMP encoded TCIP message
- A segment of a TCIP-narrowband encoded message in a packetized message wrapper

If the base station(s) is full-duplex, the polling controller may send a message to a PTV while waiting for an answer to a poll, however the polling controller shall not send a message to a PTV while it is waiting for an answer to a poll from that specific PTV. The polling controller shall send each pending outbound message at least once per polling cycle, until it is acknowledged by a received SNMP or Narrowband message wrapper, or Poll Response, or discarded based on the value of PTV Message Try Count (see below).

The polling controller shall increment the PTV message try count each time the PTV is polled. If the Message-try-count exceeds $N_{\text{MSGMAXTRIES}}$, the polling controller shall:

- Reset Message-try-count to zero for that PTV
- Discard the message at the head of the queue for that PTV
- If there is another message in the queue to that PTV, assign the next sequential message number to the new message at the head of the queue.

J.6.8 Receiving a Join Request

Upon receipt of a Join Request in response to a Session Poll, the polling controller shall allocate a polling slot to the requesting PTV (see J.6.1), and check for any duplicate slot for the same PTV. If the polling controller finds a duplicate polling slot assignment, the polling controller shall move the message queue, poll data and agency data from the old slot to the new slot and deallocate the old slot. The polling controller shall send an Allocation Update immediately, or immediately following the current message or poll transmission if one is in progress. The Allocation update shall be transmitted $N_{\text{ALLOCRETRY}}$ times, after which the polling controller shall resume the poll cycle.

J.6.9 Receiving a Message Wrapper

Upon receipt of a message wrapper from the PTV, the polling controller shall:

- Check the last received message number in the wrapper and compare with the message to the PTV awaiting acknowledgement (if any). If the message is acknowledged:
 - Reset PTV Message Try Count to zero for that PTV
 - Discard the message at the head of the queue for that PTV
 - If there is another message in the queue to that PTV, assign the next sequential message number to the message at the head of the queue.
- Check the message number in the wrapper and determine if it matches Last-message-number-received for that PTV.
 - If the numbers match discard the message wrapper (duplicate)
 - If the numbers don't match set Last-message-number-received to the value in the wrapper and forward the message to its recipient.

J.6.10 Receiving a Leave Request

Upon receipt of a Leave Request, the polling controller shall deallocate the polling slot of the requesting PTV, discard any queued message for that PTV, and send an Allocation Update immediately or immediately following the current message or poll transmission if one is in progress.

J.6.11 Receiving a Poll Response

Upon receipt of a Poll Response from a PTV, the polling controller shall:

- Check the last received message number in the response and compare with the message to the PTV awaiting acknowledgement (if any). If the message is acknowledged:
 - Reset PTV Message Try Count to zero for that PTV
 - Discard the message at the head of the queue for that PTV
 - If there is another message in the queue to that PTV, assign the next sequential message number to the message at the head of the queue.
- Package the CcPollResponseContents for the Poll Response into a CcPTVPollInfo message and send to the CAD/AVL System (Notify PTV Polling Result dialog.)

J.6.12 Receiving a CcPollParameters Message

The polling controller shall establish and maintain an event-driven subscription to polling control and configuration information from the CAD/AVL System using the Subscribe Poll Control dialog. Upon receipt of a CcPollParameters message from the CAD/AVL System, the polling controller shall:

- Update any configured timer and/or counter values to the values specified in the received message.

- Set the fast poll PTV list to match the list in the received message, or remove all PTVs from the list if no fast poll PTVs are listed in the message.
- If any init-polling-groups are present:
 - For each init-polling-group present find all stored PTV records with the stored group ID set to the received group-id value and update the stored GroupID field to zero. Commentary: Newly initialized groups should have no members.
 - For each init-polling-group present create a group record for the initialized group containing the group id, the group's IP address, and a last-message-sent counter (initialize to zero) for that group. Overwrite or delete any old group record containing the same group ID.
 - For each init-polling-group log the initialization event
 - Send as many Group Reset frames as are required to reset all groups specified by the CcPollParameters message
- If any add-group-PTVs are present; find the indicated PTV's stored data, and update the Group ID field. If a PTV is listed, but does not have an allocation, log this event.
- For each PTV for which a PTV-poll-infosets entry is present:
 - If a poll-data field is present, replace the Poll-data for that PTV with the received value.
 - If an agency-data field is present, replace the stored Agency-data for that PTV with the received value and set the Agency-data-try-count to zero.
 - Update the stored Group-id to the received value provided in group-id

J.6.13 Receiving a TCIP Message for Delivery to a PTV

The polling controller upon receiving a message from an agency for transmission to a PTV shall:

1. Determine if the message length exceeds $N_{\text{MASMSGLENTOPTV}}$ for a narrowband encoded message or exceeds $N_{\text{MAXPACKET}}$ for an SNMP encoded message.
2. Determine if the message is to a PTV with an allocated slot, if the PTV's slot is not allocated, the polling controller shall discard the message and log the event
3. Determine if the message is a narrowband encoded message of length less than $N_{\text{MAXPACKET}}$, a narrowband encoded message of length greater than $N_{\text{MAXPACKET}}$, or an SNMP encoded message.
4. If the message is a narrowband encoded message of length less than $N_{\text{MAXPACKET}}$:
 - a. Encode the message in a narrowband message wrapper
 - b. Determine if the addition of the message to the queue for the destination PTV would cause the queue length to exceed N_{CTLPTVQ} , and if so discard the message and log the event
 - c. Otherwise add the message to the queue for the PATV. If the message is at the head of the queue, transmit the message and set the Message-try-count to zero.
5. If the Message is a narrowband encoded message of length greater than $N_{\text{MAXPACKET}}$ and less than or equal to $N_{\text{MAXNSGLEN}}$:
 - a. Encode the message into a sequence of packetized message wrappers. Include $N_{\text{MAXPACKET}}$ octets of the message into each wrapper until the final wrapper has less than $N_{\text{MAXPACKET}}$ octets to include.
 - b. Determine if the addition of the message segments to the queue for the destination PTV would cause the queue length to exceed N_{CTLPTVQ} , and if so discard the message (all segments) and (e.g. the event)
 - c. Otherwise add the message segments to the queue for the PTV. If the first segment is at the head of the queue, transmit the message segment and set the Message-try-count to zero.
6. If the message is an SNMP-encoded message of length less than $N_{\text{MAXPACKET}}$:
 - a. Encode the message in an SNMP message wrapper
 - b. Determine if the addition of the message to the queue for the destination PTV would cause the queue length to exceed N_{CTLPTVQ} , and if so discard the message and log the event
 - c. Otherwise add the message to the queue for the PTV. If the first segment is at the head of the queue, transmit the message and set the message-try-count to zero

Alternative Queue Overflow Procedure:

In steps 4.b, 5.b, and 6.b above the TCIP Polling Controller may optionally handle the queue overflow situation by sending all messages in the queue (in order) followed by the new message (or all message segments) leaving the queue empty. This alternative has the advantage of giving every message an opportunity to be successfully transmitted (albeit with acknowledgements/retries) and clears the queue so that message delays are controlled.

The disadvantage of this alternative is that if many queues (to different PTVs) overflow in a short interval of time, a substantial percentage of the channel capacity can be consumed dumping overflowed queues.

J.6.14 Receiving a TCIP Message for Delivery to a Group of PTVs.

The Polling Controller upon receiving a message from an agency network for transmission to a group of PTVs shall:

1. Determine if the message length exceeds NMAXPACKET, or if the message is SNMP-encoded, and if so discard the message and log the event. Commentary: SNMP group addressing and multipacket group addressing are not supported.
2. Verify that a group has been initialized with the indicated IP address. If the group does not exist discard the message and log the event.
3. Assign the value ((last-message-sent)+1) modulo 256 to the message number field in the message wrapper, and set the last-message-sent value for the group to the same number.
4. Transmit the message in a narrowband message wrapper three successive times. Commentary: Three transmission increases the probability of success. This is implemented because group messages are not acknowledged.

J.6.15 Polling Controller Start Up

Upon startup the polling controller shall delete all allocations, and log the startup event. The polling controller shall send twenty (20) sequential Allocation Update data structures indicating that all slots are deallocated due to a restart. The polling controller shall then send a Session Poll. The polling controller shall continue to send Session Polls until a Join Request is received.

After the first Join Request is received, the polling controller shall send an Allocation Update, and resume sending Session Polls. The polling controller shall transmit only Session Polls and Allocation Updates for the first $T_{SESSIONONLY}$ seconds following the receipt of the first Join Request. At the end of $T_{SESSIONONLY}$ the polling controller shall begin the polling cycle, however for the first $T_{STARTUP}$ minutes after startup, the polling controller shall issue a Session Poll within every $T_{SESSIONPOLLSTART}$ interval (rather than the normal $T_{SESSIONPOLL}$ interval). The requirement to issue a Session Poll every polling cycle shall be in effect throughout the startup period.

Commentary: This faster Session Poll generation rates during $T_{SESSIONONLY}$ and $T_{STARTUP}$ expedite the process of allocating slots to all PTVs in a large fleet after a polling controller restart.

J.7 VLU Rules of Procedure

J.7.1 Transmitting on the Channel

The VLU shall not transmit on the radio channel, (except to transmit a Join Request in response to a Session Poll), until it receives an Allocation Update from the polling controller indicating that the PTV has been allocated a slot number.

Once a slot number is obtained, the VLU shall transmit on the channel only:

- In response to a poll from the polling controller containing the PTVs assigned slot number
- In response to a Priority Poll while the VLU has a high-priority message queued.

J.7.2 Joining the Channel

The VLU shall join the channel as described below unless the VLU receives an Allocation Update indicating a polling controller restart. In the event of a polling controller restart the VLU must use the process defined in section

The normal process for Joining the channel is:

- The VLU shall set the message Try Count last-message-number-sent GroupID, and last-message-number-received values to zero
- The VLU shall select a random number, N_{SKIP} , in the range $0-N_{\text{RANDOM}}$
- The VLU shall monitor the radio channel and skip the first N_{SKIP} Session Polls, (none if $N_{\text{SKIP}} = 0$)
- The VLU shall transmit a Join Request in response to the next Session Poll.
- The VLU shall monitor the radio channel for 3 seconds awaiting an Allocation Update from the polling controller.
- If no Allocation Update is received within 2 seconds, or if an Allocation Update is received that does not allocate a slot to the PTV, the VLU shall restart the join process at the first bullet above.
- If an Allocation Update is received allocating a slot to the PTV, the VLU shall begin operating on the channel using the allocated slot number.

J.7.3 Polling Controller Restart

If the VLU receives a Allocation Update indicating a polling controller restart (at any time), the VLU shall immediately discard any assigned slot allocation, and abandon any ongoing attempt to join the channel (see J.7.2 above).

The VLU shall:

- Select a new skip count based on the formula $N_{\text{SKIP}} = (\text{vehicle ID}) \text{ modulo } (N_{\text{FLEETSIZE}})$ where vehicle ID is the PTV's value of type CPT-VehicleID.
- Monitor the radio channel and skip the first N_{SKIP} Session Polls (none if $N_{\text{SKIP}}=0$)
- Send a Join Request in response to the next Session Poll.
- Monitor the radio for 2 seconds awaiting an Allocation Update from the polling controller.
- If an Allocation Update is received within 2 seconds allocating a slot to the PTV, the VLU shall begin operating on the channel using the allocated slot number. This would complete this process, otherwise continue with the next bullet.
- Assign $N_{\text{SKIP}} = N_{\text{FLEETSIZE}}$
- Monitor the channel and skip the first N_{SKIP} Session Polls
- Send a Join Request in response to the next Session Poll
- Monitor the radio channel for 2 seconds awaiting an Allocation Update from the polling controller
- If an Allocation Update is received within 2 seconds allocating a slot to the PTV, the VLU shall begin operating on the channel using the allocated slot number. This would complete this process, otherwise begin the Joining the Channel process defined in section 10.7.2.

J.7.4 Responding to a Normal Poll

Upon receipt of a normal poll with a slot number matching the slot number allocated to the PTV, the VLU shall:

- Determine if it should attempt to leave the channel (e.g. vehicle shutdown in progress) . If so transmit a Leave Request, and discard the slot allocation for the PTV.
- Determine if there is a message to the polling controller at the head of the queue and if so:
 - Determine if the poll acknowledges the message
 - If the poll acknowledges the message, discard the message, set message Try Count to zero, bring the next queued message (if any) to the head of the queue and assign the next send message number.
 - If the poll does not acknowledge the message and $\text{Message-try-count} \geq N_{\text{MSGMAXTRIES}}$, discard the message, set Message-try-count to zero bring the next queued message (if any) to the head of the queue and assign the next send message number.

- Otherwise leave the message at the head of the queue
- If there is a message at the head of the queue to be sent to the polling controller then ID=A3H, otherwise ID=A2H
- Generate and transmit a Poll Response using the ID from above, and containing the available fields requested in the poll. Note: a poll may ask for alarms or agency-data and there may be none to include.
- If the ID=A3H, transmit a message wrapper containing the message at the head of the queue, and increment Message-try-count.
- Update the stored GroupID value for the PTV based on the groupID received in the poll.

J.7.5 Discarding a Slot Allocation

When the VLU discards a previously provided slot allocation for the PTV, it shall discard any queued messages for the polling controller, and take any related manufacturer-defined recovery procedures and reset the Message-try-count the Last-message-number-sent, and Last-message-number-received values to zero.

J.6.7 Responding to a Priority Poll

Upon receipt of a Priority Poll, the VLU shall determine if it has any high-priority messages to send to the polling controller. If so the VLU shall respond with a Join Request containing the PTV's slot allocation, and reset the flag indicating that a high-priority message is waiting. Note: The assignment of messages to a high-priority status is a local agency decision.

J.7.7 Receipt of an Allocation Update

If the VLU receives an Allocation Update containing a polling controller restart indication, it shall conform to section J.7.3.

If the VLU receives an Allocation Update containing an allocation of the PTV's allocated slot number to another PTV, or containing a deleted slot matching the PTV's allocated slot number, the VLU shall discard the slot allocation and begin the Joining the Channel process as defined in section J.7.2

If the VLU receives an Allocation Update allocating the PTV to another slot (adds PTV with new slot number), the VLU shall discard the existing slot number and join the channel with the newly assigned slot number.

J.7.8 Receipt of a Message Wrapper

If the VLU receives a narrowband or SNMP message wrapper containing the PTV's allocated slot number, the VLU shall:

- Determine if there is a message to the polling controller at the head of the queue, and if so:
 - Determine if the received message wrapper acknowledges the message
 - If the wrapper acknowledges the message, discard the message, set Message-try-count to zero, bring the next queued message (if any) to the head of the queue and assign the next send message number
- Determine if the message is a duplicate (message number in wrapper matches Last-received-message-number); discard the message if a duplicate
- If the message is not a duplicate deliver it to its destination within the PTV.

If the VLU receives a packetized message wrapper containing the PTV's allocated slot number, the VLU shall:

- Determine if there is a message to the polling controller at the head of the queue, and if so:
 - Determine if the received message wrapper acknowledges the message

- If the received wrapper acknowledges the message, set Message-try-count to zero, bring the next queued message (if any) to the head of the queue and assign the next send message number.
- Determine if the received wrapper is a duplicate (message number in wrapper matches Last-received-message-number); discard the received wrapper if a duplicate.
- Determine if the received wrapper is segment 1 of a new message. If so discard any precious multi-segment message being reassembled, and flag the message wrapper as part of the current message being reassembled.
- Determine if the received wrapper is the next segment of a multi-segment message in progress. If so add the new segment to the message being assembled. If the message is complete, deliver it to its destination in the PTV.
- Determine if the received wrapper is an out of sequence segment of a multipacket message. If so discard the current multi-segment message in progress (if any) and the received message wrapper.

If the VLU receives a narrowband message wrapper containing the PTV's stored GroupID in the slot number field (upper octet=0, lower octet matches Group ID), the VLU shall:

- Determine if the received wrapper is a duplicate (message number in wrapper matches Last-received-message-number of the group), discard the message wrapper if a duplicate
- Otherwise set Last-received-message-number for the group to the message number value from the wrapper and forward the message to its destination within the PTV.

J.7.9 Receipt of Generation or a Message to Send

Upon generating a message to send to the polling controller, or receipt of such a message from another onboard component, the VLU shall:

- Determine if the queue length equals $N_{PTVCTLQ}$, and if so discard the message and perform any necessary error recovery.
- Otherwise add the new message to the end of the queue
- If the new message is at the head of the queue, assign the next message number, and set the Message-try-count to zero

J.7.10 Receipt of Generation or a High Priority Message to Send

Upon generating a high-priority message to send to the polling controller, or receipt of such a message from another onboard component, the VLU shall:

- Determine if the queue length equals $N_{PTVCTLQ}$, and if so, discard the last message in the queue and perform any necessary error recovery
- Add the message to the front of the queue, assign the next sequential message number and set the Message-try-count to zero
- Set a flag indicating that a high-priority message is awaiting transmission to trigger the VLU to respond to the next priority poll.

Commentary: Local agencies determine which messages are to be considered high-priority for this purpose. Two examples that an agency might choose are CcOperatorCallRequest, and ImSilentAlarm.

J.8 TCIP Polling Protocol Parameters

Parameter	Description	Formula	Default
$N_{\text{AGENCYDATAMAXTRIES}}$	Number of tries to deliver agency data	Locally defined parameter	5
$N_{\text{ALLOCRETRY}}$	Number of sends on Allocation Updates	Locally defined parameter	2
N_{BITRATE}	Number of bits per second transmitted on the radio channel	Locally defined parameter	4800
N_{BITSYNC}	Number of AAH bit sync octets to send at the beginning of each transmission.	Locally defined parameter	1
N_{SKIP}	The number of Session Polls to be skipped by a VLU before generating a Join Request. This parameter reduces the rate of Join Request Collisions between PTVs.		
N_{PTVCTLQ}	Length of message queue to the polling controller in each allocated PTV	Locally defined parameter	8
N_{CTLPTVQ}	Length of message queue to each allocated PTV	Locally defined parameter	8
$N_{\text{MAXBADPOLL}}$	Number of bad polls before deallocating a slot	Locally defined parameter	10
$N_{\text{MAXMSGLENFROMPTV}}$	Maximum number of octets in a narrowband encoded TCIP message from a PTV	Locally defined parameter	100
$N_{\text{MAXMSGLENTOPTV}}$	Maximum number of octets in a narrowband encoded TCIP message to a PTV	Locally defined parameter, Cannot Exceed $15 * N_{\text{MAXPACKET}}$	500
$N_{\text{MAXPACKET}}$	Maximum number of octets in a segment of a multi-segment controller to PTV message.		300
$N_{\text{MSGMAXTRIES}}$	Number of tries to deliver a message wrapper	Locally defined parameter	5
$N_{\text{FLEETSIZE}}$	Approximate peak number of PTVs sharing the radio channel.	Locally defined parameter.	1200 -- illustrative only
N_{RANDOM}	Highest value in random number range used to randomize access to Session Polls.	Locally defined parameter	30
$T_{\text{MESSAGEWAIT}}$	Wait in milliseconds for a message to be sent following a poll response (ID=A3H).	$T_{\text{RADIOTIME}} + [({12+N_{\text{BITSYNC}}+ N_{\text{MAXMSGLENGTH}} } * 8) * (1000/N_{\text{BITRATE}})]$	200
T_{PRMAX}	Time in milliseconds to wait for a poll response (possibly containing agency data or alarms) before declaring a dry poll.	$T_{\text{PRMED}} + [(116 * 8) * (1000/N_{\text{BITRATE}})]$	317
T_{PRMED}	Time in milliseconds to wait for a medium poll response (optional fields, but no alarms or agency data) before declaring a dry poll.	$T_{\text{PRMIN}} + [(36 * 8) * (1000/N_{\text{BITRATE}})]$	122

T_{PRMIN}	Time in milliseconds to wait for a minimal poll response (no optional fields) before declaring a dry poll.	$T_{RADIOTIME} + [({13+N_{BITSYNC}+ 17 } * 8) * (1000/N_{BITRATE})]$	62
$T_{RADIOTIME}$	Time in milliseconds added to each poll wait to allow for radio and VLU latency	Locally defined parameter	10
$T_{FASTPOLLINTERVAL}$	Maximum time in seconds between normal polls to a PTV in fast poll mode	Locally defined parameter	20
$T_{PRIORITYPOLL}$	Maximum time in seconds between priority polls	Locally defined parameter	5
$T_{SESSIONONLY}$	Length of interval in seconds after receipt of the first Join Request during which only session polls and no priority or normal polls are issued.	Locally Defined parameter	60
$T_{SESSIONPOLLSTART}$	Maximum time in seconds between Session Polls during startup.		2
$T_{STARTUP}$	Time in minutes, after a polling controller restart during which Session Polls are sent at a higher than normal rate	Locally defined parameter. Suggest a minimum value of $(PTV \text{ count}) * T_{SESSIONPOLLSTART} * 2/60$	40
$T_{SESSIONPOLL}$	Maximum time in seconds between Session Polls.	Locally defined parameter	8
$T_{SESSIONWAIT}$	Wait in Milliseconds after a Session Poll before declaring a dry poll.	$T_{RADIOTIME} + (8+N_{BITSYNC}) * (1000/N_{BITRATE})$	35

Annex K**Sample Profile Implementation Conformance Statement (PICS)**

This annex provides a sample PICS. A PICS is required as part of the development of a conformant TCIP Implemented Interface as defined in Section 8 Conformance.

Profile Implementation Conformance Statement (PICS)		
Agency/Company Name: Sample Transit Vendor		
Project Name: PICS Demo		
Application Name: Example System		
Implementation IP/Network Address: 130.102.103.104 (IP V4)		
Implementation Port/Transport Address: 2149		
Other System Interfaces		
System	IP/Network Address:	Port/Transport Address:
Data Repository	130.102.103.115 (IP V4)	2149
Scheduling System	130.102.113.178 (IP V4)	2148
VLU(PTV-DAT)	130.102.X.Y ¹	2222
Network Configuration:		
<i>To set the network address and port number used by Example System:</i>		
Use the edit/settings/network/address/self pull-down menu, in the pop-up dialog box, type in the desired IP V4 or IP V6 address and port number, click the “ Accept ” button to change the address, or the “ Cancel ” button to leave the settings unchanged.		
<i>To set the network address and port number used by a corresponding system:</i>		
Use the edit/settings/network/address/external pull-down menu, in the pop-up dialog box, select an existing application address to edit from the pick list, or click on the “ New Application ” button. Enter (or edit) the application name, IP V4 or IP V6 address and port number on the pop-up Edit Application dialog, click the “ Accept ” button to change the address, or the “ Cancel ” button to leave the settings unchanged.		
<i>To set the network address and port number used by a PTVs:</i>		
Use the edit/settings/network/address/vehicles pull-down menu, in the pop-up dialog box, enter a formula for calculating PTV IP addresses in IPV4 or IPV6 based on vehicleID (for formula requirements refer to section 3.4.7 of the Example System Administrator Guide), or click on the “Table” button to explicitly enter or edit PTV addresses and port numbers click the “ Accept ” button to change the address, or the “ Cancel ” button to leave the settings unchanged.		
CAUTION: Settings take effect immediately, and may disrupt ongoing communications.		
Non TCIP Interfaces Supported:		
Implementation shall support the importation of Sample Transit’s personnel files using a legacy comma delimited file format to be provided after contract award, per the Sample Transit’s RFP requirements.		
Exceptions to TCIP Requirements:		
Subscribe Sample B dialog, only periodic subscriptions are supported.		

Otherwise implementation fully complies with TCIP Version 2.6.
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¹ -X.Y are calculated by taking the lower 2 octets of the CPT-VehicleID which must be in the range 1-18000D (1-4650H) and unique for each PTV.

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³- Present only if subscriber is Data Repository.

