

## Appendix A – Regional TSP Message Set Definition

### REGIONAL TSP MESSAGE SET DEFINITION TRACKING TABLE

<u>Version</u>	<u>Date</u>	<u>Description of Changes</u>	<u>Changes Made By:</u>
1.3	02/20/15	Updated draft with correction to length of octet strings for the prgPriorityStatusControl_chi, prgPriorityStatusBuffer_chi, prgPriorityCancel_chi and prgPriorityClear_chi objects.	IBI Group / AECOM
1.2	07/31/14	Data objects were re-ordered by IBI Group to ease the overall testing of the messages later on in the project	IBI Group / AECOM
1.1	05/08/14	Changes to TSP Message Set made after review of RFI Responses from vendors	Battelle / AECOM
1.0	09/30/13	Updated draft included with updated Regional TSP Standards and Implementation Guidelines	Battelle / AECOM
0.1	08/02/13	Initial version for TSP Working Group review and comment	Battelle / AECOM

PRS-MIB1 DEFINITIONS ::= BEGIN

-- This group of objects represents the data elements for priority service requests communication exchange between a Priority Request Generator (PRG) and a Priority Request Server (PRS).

IMPORTS  
OBJECT-TYPE  
FROM RFC-1212

devices  
FROM TMIB-II;

scp OBJECT IDENTIFIER ::= { devices 11 }

-- This group of objects represents the data elements used in the Priority Service Request Messages.

priorityRequestServer OBJECT IDENTIFIER ::= { scp 1 }

priorityRequestTable OBJECT-TYPE  
SYNTAX SEQUENCE OF PriorityRequestTableEntry\_chi  
ACCESS not-accessible  
STATUS optional  
::= { priorityRequestServer 1 }

PriorityRequestTableEntry\_chi OBJECT-TYPE  
SYNTAX PriorityRequestTableEntry\_chi  
ACCESS not-accessible  
STATUS optional  
INDEX { PriorityRequestTableEntryNumber }  
::= { priorityRequestTable 1 }

PriorityRequestTableEntry\_chi ::= SEQUENCE  
{  
PriorityRequestTableEntryNumber                   INTEGER (1..10),  
priorityRequestID                                    INTEGER (1..255),  
priorityRequestVehicleID\_chi                    OCTET STRING (SIZE (6)),  
priorityRequestAgencyID\_chi                    INTEGER,  
priorityRequestVehicleClassType                 INTEGER (1..10),  
priorityRequestVehicleClassLevel                INTEGER (1..10),

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priorityRequestTimeOfServiceDesired          INTEGER (1..65535),
priorityRequestTimeOfEstimatedDeparture      INTEGER (1..65535),
priorityRequestTSPPhaseRequired_chi          INTEGER (0..16),
priorityRequestVehicleLatitude_chi           INTEGER (-900000000..900000001),
priorityRequestVehicleLongitude_chi          INTEGER (-1800000000..1800000001),
priorityRequestIntersectionID_chi            OCTET STRING (SIZE (7)),
priorityRequestRouteID_chi                   OCTET STRING (SIZE (7)),
priorityRequestRunNumber_chi                 OCTET STRING (SIZE (9)),
priorityRequestScheduleLateness_chi          INTEGER (0..65535),
priorityRequestVehicleOccupancy_chi          INTEGER (1..255),
priorityRequestStatusInPRS                    INTEGER
}

PriorityRequestTableEntryNumber OBJECT-TYPE
    SYNTAX INTEGER (1..10)
    ACCESS read-only
    STATUS optional
 ::= { PriorityRequestTableEntry_chi 1 }

priorityRequestID OBJECT-TYPE
    SYNTAX INTEGER (1..255)
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "This object is the 'PRG requested' priority request identifier. It is assigned by the priority
        request generator so that further information related to a priority request can be identified.
        It shall be unique for this intersection from a vehicle ID of vehicle type."
    DEFVAL { 1 }
 ::= { PriorityRequestTableEntry_chi 2 }

priorityRequestVehicleID_chi OBJECT-TYPE
    SYNTAX OCTET STRING (SIZE (6))
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "This object is the 'PRG requested' identifier of the entity requesting priority. For fleet
        vehicles, this is a 6-byte alphanumeric identifier assigned by the operating agency. For
        management centers, the value is not defined but shall still be unique to differentiate the
        source of the priority request."
    DEFVAL { "" }
 ::= { PriorityRequestTableEntry_chi 3 }

priorityRequestAgencyID_chi OBJECT-TYPE
    SYNTAX INTEGER {
        cta (1),
        pace (2)
    }
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "This object is an enumerated value that identifies the agency requesting priority for
        logging and TSP monitoring purposes."
    DEFVAL { cta }
 ::= { PriorityRequestTableEntry_chi 4 }

```

priorityRequestVehicleClassType OBJECT-TYPE

SYNTAX INTEGER (1..10)

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object is the PRG requested class type to establish the relative priority of a request.

The order of precedence is by class type with:

1 highest

...

10 lowest

A request with a higher class type will override a lower class type."

DEFVAL { 10 }

::= { PriorityRequestTableEntry\_chi 5 }

priorityRequestVehicleClassLevel OBJECT-TYPE

SYNTAX INTEGER (1..10)

ACCESS read-only

STATUS optional

DESCRIPTION

"This object is the 'PRG requested' class level indicating the relative priority of a request within each class of request. The order of precedence is by class type and then class level with:

1 highest

...

10 lowest

A request with a higher class level will NOT override a lower class level."

DEFVAL { 10 }

::= { PriorityRequestTableEntry\_chi 6 }

priorityRequestTimeOfServiceDesired OBJECT-TYPE

SYNTAX INTEGER (1..65535)

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object is the 'PRG requested' desired time in seconds to arrive at the intersection's stopping point relative to the receipt of the message. A near side stopping point is assumed to be sufficiently close to the intersection's stop bar that regular queues frequently back up across the stopping point. In this case, advance queue clearance prior to the arrival of fleet vehicle will be normally required. For all practical purposes, arrival at the stopping point is the same as arrival at the stop bar. This is a relative time. It is the responsibility of the PRG to take into account any communications delays between the PRG and the PRS."

DEFVAL { 1 }

::= { PriorityRequestTableEntry\_chi 7 }

priorityRequestTimeOfEstimatedDeparture OBJECT-TYPE

SYNTAX INTEGER (1..65535)

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object is the 'PRG requested' estimated time in seconds of departure from the intersection's stopping point relative to the receipt of the message. This is a relative time. It is the responsibility of the PRG to take into account any communications delays between the PRG and the PRS."

DEFVAL { 1 }

::= { PriorityRequestTableEntry\_chi 8 }

priorityRequestTSPPhaseRequired\_chi OBJECT-TYPE

SYNTAX INTEGER (0..16)

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object indicates the traffic signal controller NEMA-based phase that service the direction of TSP desired at the intersection. A value of 0 indicates that there is no direction indicated and the message is for log purposes only."

DEFVAL { 0 }

::= { PriorityRequestTableEntry\_chi 9 }

priorityRequestVehicleLatitude\_chi OBJECT-TYPE

SYNTAX INTEGER (-900000000..900000001)

ACCESS read-only

STATUS mandatory

DESCRIPTION

"Adapted from SAEJ2735. This object is geographic latitude of the vehicle expressed in 1/10th integer micro-degrees, providing a range of plus-minus 90 degrees. The value 900000001 shall be used when unavailable."

DEFVAL { 900000001 }

::= { PriorityRequestTableEntry\_chi 10 }

priorityRequestVehicleLongitude\_chi OBJECT-TYPE

SYNTAX INTEGER (-1800000000..1800000001)

ACCESS read-only

STATUS mandatory

DESCRIPTION

"Adapted from SAEJ2735. This object is geographic longitude of the vehicle expressed in 1/10th integer micro-degrees, providing a range of plus-minus 180 degrees. The value 1800000001 shall be used when unavailable."

DEFVAL { 1800000001 }

::= { PriorityRequestTableEntry\_chi 11 }

priorityRequestIntersectionID\_chi OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (7))

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object is the 'PRG requested' globally unique identifier of the intersection for which priority is being requested. It is comprised of a one-byte agency code followed by a 6-byte alphanumeric intersection identifier."

DEFVAL { "" }

::= { PriorityRequestTableEntry\_chi 12 }

priorityRequestRouteID\_chi OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (7))

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object is an alphanumeric string representing a unique route ID that will be used for logging and TSP monitoring purposes."

DEFVAL { "" }

::= { PriorityRequestTableEntry\_chi 13 }

priorityRequestRunNumber\_chi OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (9))

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object is a 9-Byte alphanumeric value that identifies the run number of the bus making a TSP request for logging and TSP monitoring purposes."

DEFVAL { "" }

::= { PriorityRequestTableEntry\_chi 14 }

priorityRequestScheduleLateness\_chi OBJECT-TYPE

SYNTAX INTEGER (0..65535)

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object is the schedule lateness at the time of the priority request in seconds used for logging and TSP monitoring purposes."

DEFVAL { 0 }

::= { PriorityRequestTableEntry\_chi 15 }

priorityRequestVehicleOccupancy\_chi OBJECT-TYPE

SYNTAX INTEGER (1..255)

ACCESS read-only

STATUS optional

DESCRIPTION

"This object is the vehicle occupancy at the time of the priority request used for logging and TSP monitoring purposes. A value of 255 indicates that occupancy equipment is not available."

DEFVAL { 255 }

::= { PriorityRequestTableEntry\_chi 16 }

priorityRequestStatusInPRS OBJECT-TYPE

SYNTAX INTEGER {

idleNotValid (1),

readyQueued (2),

readyOverridden (3),

activeProcessing (4),

activeCancel (5),

activeOverride (6),

activeNotOverridden (7),

closedCanceled (8),

reserviceError (9),

closedTimeToLiveError (10),

closedTimerError (11),

reserved (12),

closedCompleted (13),

activeAdjustNotNeeded (14),

closedFlash (15)

}

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object provides status information about requests in the PRS.  
 idleNotValid: PRS determined that row does not contain valid data  
 readyQueued: PRS has validated the request but is waiting for the CO to activate  
 readyOverridden: CO has overridden the request  
 activeProcessing: CO is processing the requested strategy  
 activeCancel: PRS has asked that request be canceled  
 activeOverride: PRS has asked that request be overridden  
 activeNotOverridden: CO did not process the requested override  
 closedCanceled: CO has canceled the request  
 reserviceError: PRS determined that the request came too soon after a previous  
 request  
 closedTimeToLiveError: CO determined that TSD exceeds the time to live  
 closedTimerError: CO indicated that the requested times could not be met  
 reserved: reserved for future use  
 closedCompleted: CO has completed the requested strategy previous request  
 activeAdjustNotNeeded: CO indicated that the request can be met by the current  
 timing and no adjustment is necessary  
 closedFlash: CO indicated that the controller is in flash"

DEFVAL { idleNotValid }

::= { PriorityRequestTableEntry\_chi 17 }

priorityRequestMessages OBJECT IDENTIFIER ::= { scp 2 }

prgPriorityRequest\_chi OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (49))

ACCESS write-only

STATUS mandatory

DESCRIPTION

"This object defines the elements that make up the priority request message. The object values in this octet string are as follows:

priorityRequestID	(1 byte)
priorityRequestVehicleID_chi	(6 bytes)
priorityRequestAgencyID_chi	(1 byte)
priorityRequestVehicleClassType	(1 byte)
priorityRequestVehicleClassLevel	(1 byte)
priorityRequestTimeOfServiceDesired	(2 bytes)
priorityRequestTimeOfEstimatedDeparture	(2 bytes)
priorityRequestTSPPhaseRequired_chi	(1 byte)
priorityRequestVehicleLatitude_chi	(4 bytes)
priorityRequestVehicleLongitude_chi	(4 bytes)
priorityRequestIntersectionID_chi	(7 bytes)
priorityRequestRouteID_chi	(7 bytes)
priorityRequestRunNumber_chi	(9 bytes)
priorityRequestScheduleLateness_chi	(2 bytes)
priorityRequestVehicleOccupancy_chi	(1 byte)

The byte order for packing shall follow the rules of ASN with the MSB first. If an optional data object is not to be transmitted, then its bits shall be set to zero so that the resulting data object shall always be exactly 49 bytes in length."

::= { priorityRequestMessages 1 }

prgPriorityUpdate\_chi OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (25))

ACCESS write-only

STATUS mandatory  
DESCRIPTION

"This object defines the elements to update an existing priority request.  
The object values in this octet string are as follows:

priorityRequestID	(1 byte)
priorityRequestVehicleID_chi	(6 bytes)
priorityRequestAgencyID_chi	(1 byte)
priorityRequestVehicleClassType	(1 byte)
priorityRequestVehicleClassLevel	(1 byte)
priorityRequestTimeOfServiceDesired	(2 bytes)
priorityRequestTimeOfEstimatedDeparture	(2 bytes)
priorityRequestTSPPhaseRequired_chi	(1 byte)
priorityRequestVehicleLatitude_chi	(4 bytes)
priorityRequestVehicleLongitude_chi	(4 bytes)
priorityRequestScheduleLateness_chi	(2 bytes)

The byte order for packing shall follow the rules of ASN with the MSB first. If an optional data object is not to be transmitted, then its bits shall be set to zero so that the resulting data object shall always be exactly 25 bytes in length."

::= { priorityRequestMessages 2 }

prgPriorityStatusControl\_chi OBJECT-TYPE  
SYNTAX OCTET STRING (SIZE (10))  
ACCESS write-only  
STATUS mandatory  
DESCRIPTION

"This object defines the elements to request the status of an existing priority request. The object values in this octet string are as follows:

priorityRequestID	(1 byte)
priorityRequestVehicleID_chi	(6 bytes)
priorityRequestAgencyID_chi	(1 byte)
priorityRequestVehicleClassType	(1 byte)
priorityRequestVehicleClassLevel	(1 byte)

The byte order for packing shall follow the rules of ASN with the MSB first. This message will cause the PRS to initialize the contents of the priority status buffer"

::= { priorityRequestMessages 3 }

prgPriorityStatusBuffer\_chi OBJECT-TYPE  
SYNTAX OCTET STRING (SIZE (11))  
ACCESS read-only  
STATUS mandatory  
DESCRIPTION

"This object defines the elements to define the status of a priority request. The object values in this octet string are as follows:

priorityRequestID	(1 byte)
priorityRequestVehicleID_chi	(6 bytes)
priorityRequestAgencyID_chi	(1 byte)
priorityRequestVehicleClassType	(1 byte)
priorityRequestVehicleClassLevel	(1 byte)
priorityRequestStatusInPRS	(1 byte)

The byte order for packing shall follow the rules of ASN with the MSB first. The contents of the priority status buffer is initialized by the PRS in response to a Priority Status Control message."

::= { priorityRequestMessages 4 }

prgPriorityCancel\_chi OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (10))

ACCESS write-only

STATUS mandatory

DESCRIPTION

"This object defines the elements to cancel an existing priority request.

The object values in this octet string are as follows:

priorityRequestID	(1 byte)
priorityRequestVehicleID_chi	(6 bytes)
priorityRequestAgencyID_chi	(1 byte)
priorityRequestVehicleClassType	(1 byte)
priorityRequestVehicleClassLevel	(1 byte)

The byte order for packing shall follow the rules of ASN with the MSB first."

::= { priorityRequestMessages 5 }

prgPriorityClear\_chi OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (10))

ACCESS write-only

STATUS mandatory

DESCRIPTION

"This object defines the elements to clear an existing priority request. The object values in this octet string are as follows:

priorityRequestID	(1 byte)
priorityRequestVehicleID_chi	(6 bytes)
priorityRequestAgencyID_chi	(1 byte)
priorityRequestVehicleClassType	(1 byte)
priorityRequestVehicleClassLevel	(1 byte)

The byte order for packing shall follow the rules of ASN with MSB first."

::= { priorityRequestMessages 6 }

END