Appendix A – Regional TSP Message Set Definition

REGIONAL TSP MESSAGE SET DEFINITION TRACKING TABLE

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

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),
}
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),
reserveError    (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)
- priorityRequestStatusInPRS (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 thePRS 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