A User Comment Draft Amendment of AASHTO, ITE, and NEMA

NTCIP 1403 v01.03
Amendment 1 c

Transit Communications Interface Profiles

Part of the NTCIP

Standard on Passenger Information (PI) Objects

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FOREWORD

This document uses only metric units.

This document is an NTCIP Information Data Dictionary Standard. Information Data Dictionaries Standards formally express management information in terms of objects (data elements, data frames, and messages) for use within TCIP and NTCIP systems.

The TCIP family of standards addresses Advanced Public Transportation Systms (APTS) data interfaces and related automated transit tools and data. The standards address the business requirements of these APTS data interfaces. In some cases, specialized terms were needed to define general classes of information. For example, different business areas needed to define data elements related to time, date and footnotes. Special, constrained data types were developed so that the transit domain data concepts were consistent across business areas, while specific needs were met. These data types are defined within the TCIP family of standards and in this document.

For more information about NTCIP standards, visit the NTCIP Web Site at http://www.ntcip.org. For a hardcopy summary of NTCIP information, contact the NTCIP Coordinator at the address below.

In preparation of this NTCIP document, input of users and other interested parties was sought and evaluated. Inquires, comments, and proposed or recommended revisions should be submitted to:

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Approvals

This document will be separately balloted and approved by AASHTO, ITE, and NEMA after recommendation by the Joint Committee on the NTCIP. Each organization is expected to approve this NTCIP Information Data Dictionary Standard as the following standard type, as of the date:

AASHTO – Standard Specification; Month YYYY
ITE – Software Standard; Month YYYY
NEMA – Standard; Month YYYY

History

From 1997 to 1999, this document was referenced as ITE ST-ITS-TCIP-PI and/or NEMA TS 3.TCIP-PI. However, to provide an organized numbering scheme for the NTCIP, this document is now referenced as NTCIP 1403. The technical specification of NTCIP 1403 is identical to the former reference, except as noted in the development history:

TCIP documents version 0.1. Distributed in September 1997 for public review.

TCIP-PI Recommended Standard version 1.0, February 20, 1998, changed to version 1.1, July 31, 1998. Revisions included: Sections 2.1, 2.3, 4.3, 5.1, and 5.2.

NTCIP 1403 version 97.01.01, July 31, 1998. Approved by AASHTO in July 1999, approved by ITE in October 1999, and approved by NEMA in February 2000.

NTCIP 1403 v01.02, December 1, 2000. Incremented version number and updated date; added and revised front matter; updated references to NTCIP and NEMA document numbers in References Clause; updated references to ITE document numbers; revised section numbering inserted introduction text in Section on Requirements; deleted Annex A Comment Form; and inserted introduction text in Annex on the ASN.1 Script.

Draft NTCIP 1403 v01.03 Amendment 1, August 2002. Updated references, updated data requirements format to conform to IEEE 1489:1999 and 1489:2000, and incorporated changes as described in the document.

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Section 1
GENERAL

1.2.1 Normative References

-- Updated the publications information for Normative References

draft NTCIP 1400:2002 Amendment 1, *Transit Communications Interface Profile Framework*, version 1.05 Amendment 1.

draft NTCIP 1401:2002 Amendment 1, *Transit Communications Interface Profile*, *Standard on Common Public Transportation Objects*, version 1.03 Amendment 1, August, 2002.

draft NTCIP 1404:2002 Amendment 1, *Transit Communications Interface Profile, Standard on Scheduling and RuncuttingObjects*, version 1.03 Amendment 1, August, 2002.

draft NTCIP 1405:2002 Amendment 1, *Transit Communications Interface Profile, Standard on Spatial Representation Objects*, version 1.03 Amendment 1, August, 2002.

draft NTCIP 1408:2002 Amendment 1, *Transit Communications Interface Profile, Standard on Fare Collection Objects*, version 1.03 Amendment 1, August, 2002.

ISO/IEC 8824:1998, *Abstract Syntax Notation One* (ASN.1)

1.2.2 Informative References

-- Updated the publications information for Informative References

IEEE Std 1489-1999, *IEEE Standard for Data Dictionaries for Intelligent Transportation Systems.* 27 October 1999.

IEEE Std 1488-2000, *IEEE Trial-Use Standard for Message Set Template for Intelligent Transportation Systems*. 13 July 2000.

Section 2
TERMINOLOGY

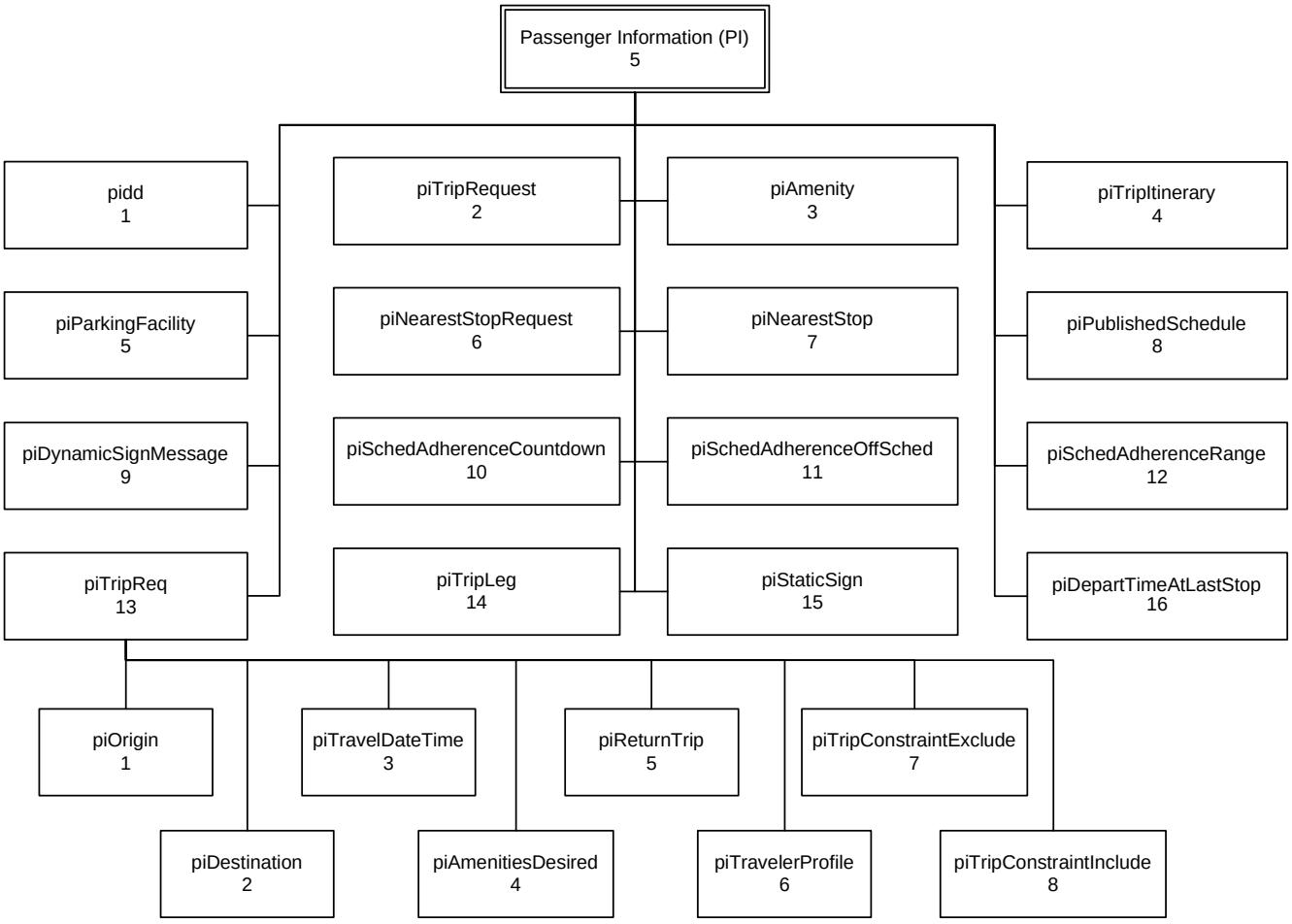
-- no changes

Section 3
CONCEPT OF OPERATIONS

-- Modified section title to Concept of Operations

3.3.2 TCIP Classification Tree

-- updated Figure 3.1 Classification Tree



Section 4
REQUIREMENTS

4.1 PASSENGER INFORMATION DATA DICTIONARY

PI_AccessPreference_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-AccessPreference ::= INTEGER
{ walk (1),  -- (or go to, e.g.,via  wheelchair
  bicycle  (2),
  park-ride (3), -- drive-park
  kiss-ride (4) -- drive and be dropped off
} (0..255)
```

Valid value rule

1 walk (or go to, e.g., via wheelchair)
2 bicycle
3 drive and park/park & ride
4 drive and be dropped off/ kiss & ride
5-149 Reserved for standard codes
150-255 Reserved for local use

PI_ADAAccess_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-ADAAccess      ::=   INTEGER
{   notCompliant          (1),
    fullyCompliant        (2),
    mobilityChallengedAccess      (3),
    visuallyImpairedAccess      (4),
    hearingImpairedAccess      (5),
    mobility-VisuallyImpairedAccess   (6),
    visually-HearingImpairedAccess   (7),
    mobility-MobilityImpairedAccess   (8)
                        -- 9-149 reserved
                        -- 150-255 local use
} (0..255)
```

Valid value rule

1 Not ADA compliant
2 ADA fully compliant
3 Accessible to mobility challenged individuals
4 Accessible to visually impaired individuals
5 Accessible to hearing impaired individuals
6 Accessible to mobility and visually impaired individuals
7 Accessible to visually and hearing impaired individuals
8 Accessible to hearing and mobility impaired individuals
9-149 Reserved for standard codes
150-255 Reserved for local use

PI_ADANeed_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-ADANeed      ::=   INTEGER
```

```
{
    noADANeed           (1),
    mobilityAssistanceRequired   (2),
    visualAssistanceRequired   (3),
    audioAssistanceRequired   (4),
    otherAssistanceRequired   (5),
    visual-AudioAssistanceRequired   (6),
    visual-MobilityAssistanceRequired   (7),
    audio-MobilityAssistanceRequired      (8),
    visual-Audio-MobilityAssistanceRequired   (9)
            -- 10-149 reserved
            -- 150-255 local use
} (0..255)
```

Valid value rule

1 No ADA need
2 Mobility Need
3 Visual assistance required
4 Audio assistance required
5 Other assistance required
6 A combination of visual and audio assistance required
7 A combination of visual and mobile assistance required
8 A combination of audio and mobile assistance required
9 A combination of visual, mobile, and audio assistance required
10-149 Reserved for standard codes
150-255 Reserved for local use

PI_AmenityID_id

(1) The Representative class term (in descriptive name and field) wasmodified to identifier (id).

Descriptive Name PI_AmenityID_id

Representation class term identifer

PI_AmenityStatus_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-AmenityStatus     ::=   INTEGER
{  outOfOrder    (1),
   operational    (2)
       -- 3-149 reserved
       -- 150-255 local use
 } (0..255)
```

Valid value rule

1 Out of order
2 Operational
3-149 Reserved for standard codes
150-255 Reserved for local use

PI_DesiredTrip_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-DesiredTrip     ::=    INTEGER
{  departDesignatedTime      (1),
   -- leave at designated time
      arriveDesignatedTime      (2),
   -- Arrive at a designated time
      firstTrip          (3),   -- First trip of the day
      lastTrip           (4),   -- Last trip of the day
      nextTrip            (5)   -- The next trip
          -- 6-149 reserved
```



```
                -- 150-255 local use

        } (0..255)
```

Valid value rule

1 Leave at a designated time
2 Arrive at a designated time
3 First trip of the day
4 Last trip of the day
5 The next trip
6-149 Reserved for standard codes
150-255 Reserved for local use

PI_EstimatedArrivalRange_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-EstimatedArrivalRange    ::=  INTEGER
{  onTime     (1),     -- On-time
early       (2),   -- Early
lateOneMin     (3),    -- 0-1 minutes late
lateOneTwoMin  (4),    -- 1-2 minutes late
lateTwoThreeMin  (5),    -- 2-3 minutes late
lateTwoFourMin  (6),    -- 2-4 minutes late
lateThreeFourMin  (7),    -- 3-4 minutes late
lateThreeFiveMin  (8),    -- 3-5 minutes late
lateFourFiveMin  (9),    -- 4-5 minutes late
lateTwoFiveMin  (10),    -- 2-5 minutes late
lateFiveSevenMin (11),    -- 5-7 minutes late
lateSevenTenMin  (12),    -- 7-10 minutes late
lateFiveTenMin  (13),    -- 5-10 minutes late
lateTenFifteenMin  (14),    -- 10-15 minutes late
lateFifteenTwentyMin  (15),    -- 15-20 minutes late
lateMoreThanTwentyMin (16)
  -- More than 20 minutes late
                -- 17-149 reserved
                -- 150-255 local use
} (0..255)
```

Valid value rule

1 On time
2 Early
3 0-1 minutes late
4 1-2 minutes late
5 2-3 minutes late
6 2-4 minutes late
7 3-4 minutes late
8 3-5 minutes late
9 4-5 minutes late
10 2-5 minutes late
11 5-7 minutes late
12 7-10 minutes late
13 5-10 minutes late
14 10-15 minutes late
15 15-20 minutes late
16 More than twenty minutes late
17-149 Reserved for standard codes
150-255 Reserved for local use

PI_InformationType_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-InformationType    ::=  INTEGER
{  staticSign     (1),    -- static sign with station stop ID/name
routes     (2),
schedules     (3),
```



```
fares        (4),
system-map   (5),
area-map     (6),
timetables   (7),   -- printed and removable
real-time-information   (8),
attended  (9)   -- agent or attended phone for information
                -- 10-149 reserved
                -- 150-255 local use
} (0..255)
```

Valid value rule

1 static sign with station stop ID/name
2 routes
3 schedules
4 fares
5 system map
6 area map
7 timetables (printed and removable)
8 real-time information
9 agent/attendant or attended phone for information
10-149 Reserved for standard codes
150-255 Reserved for local use

PI_MarkerType_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-MarkerType     ::=   INTEGER
{   posted        (1),   -- Posted Sign
    shelter       (2),   -- at Station or Shelter
    post          (3)  -- concrete post
                  -- 4-149 reserved
                  -- 150-255 local use
} (0..255)
```

Valid value rule

1 Posted Sign
2 Station/Shelter
3 Concrete Post
4-149 Reserved for standard codes
150-255 Reserved for local use

PI_Minimize_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-Minimize     ::=   INTEGER
{   transfers   (1),    -- Minimize transfers
    travelTime  (2),    -- Minimize travel time
    cost        (3),    -- Minimize cost
    walking     (4),    -- Minimize walking distance
    waitTime    (5)     -- Minimize wait time
            -- 6-149 reserved
            -- 150-255 local use
} (0..255)
```

Valid value rule

1 Minimize transfers
2 Minimize travel time
3 Minimize cost
4 Minimize walking distance
5 Minimize wait time
6-149 Reserved for standard codes
150-255 Reserved for local use

PI_NextLeg_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-NextLeg      ::=   INTEGER
{   no      (1),
    yes       (2)
              -- 3-149 reserved
              -- 150-255 local use
} (0..255)
```

Valid value rule

1 No
2 Yes
3-149 Reserved for standard codes
150-255 Reserved for local use

PI_ParkingEntranceID_id

(1) The Representative class term (in descriptive name and field) was modified to identifier (id).

Descriptive Name PI_ParkingEntranceID_id

Representation class term identifier

PI_ParkingFacID_id

(1) The Representative class term (in descriptive name and field) was modified to identifier (id).

Descriptive Name PI_ParkingFacID_id

Representation class term identifier

PI_ParkingType_cd

(1) The error codes were removed from the code list.
(2) The Valid value rules were modified to provide additional clarity.

Representation layout

```
PI-ParkingType      ::=   INTEGER
{   open        (1),   -- Open lot
    garage      (2),
    permit      (3),
    contract      (4),
    free        (5),
    pay       (6),
    other       (7)
              -- 8-149 reserved
              -- 150-255 local use
} (0..255)
```

Valid value rule

-- types are not mutually exclusive

1 Open lot -- uncovered or surface lot
2 Garage
3 Permit parking
4 Contract Parking
5 Free Parking
6 Paid Parking
7 Other
8-149 Reserved for standard codes
150-255 Reserved for local use

PI_ParkingVehicleClass_cd

(1) Reorganized codes to reflect the following:
all (1), compact (2), standard (3), van (4), oversized (5), truck (6), bus (7)

Representation layout

```
PI-ParkingVehicleClass      ::=   INTEGER
{   all   (1),
    compact   (2),
    standard      (3),
    van  (4),
    oversized   (5),
   truck (6),
   bus (7)
        -- 8-149 reserved
        -- 150-255 local use
} (0..255)
```

Valid value rule

1 all
2 compact
3 standar
4 van
5 oversized
6 truck
7 bus
8-149 Reserved for standard codes
150-255 Reserved for local use

PI_SignID_id

(1) The Representative class term (in descriptive name and field) was modified to identifier (id).

Descriptive Name PI_SignID_id
Representation class term identifier

PI_SignType_cd

(1) The error codes were removed from the code list.

Representation layout

```
PI-SignType      ::=   INTEGER
{   dynamic            (1),
     notDynamic            (2),
     other             (3)
                  -- 4-149 reserved
                  -- 150-255 local use
} (0..255)
```

Valid value rule

1Dynamic,
2 Not dynamic
3 Other,
4-149 Reserved for standard codes
150-255 Reserved for local use

PI_TravelerID_id

(1) The Representative class term (in descriptive name and field) was modified to identifier (id).

Descriptive Name PI_TravelerID_id
Representation class term identifier

PI_TripOptionID_id
(1) The Representative class term (in descriptive name and field) was modified to identifier (id).

Descriptive Name	PI_TripOptionID_id
Representation class term	identifier

4.2 MESSAGE SET

PiTripLeg_message

(1) In message body, changed Type Reference for fareTransaction to FcFareCharacterCost.
(2) Add 3 OPTIONAL fields for route identifier or name (also added WITH COMPONENTS to ensure use of at least one of the fields in the message).

Message body

```
PiTripLeg ::=SEQUENCE {
  optionID  PI-TripOptionID,
  toOriginWalk  PI-WalkingDirections OPTIONAL,
  directionDriving  PI-DrivingDirections  OPTIONAL,
  parking-lots  SEQUENCE OF PiParkingFacility  OPTIONAL,
  stopName CPT-StopPointName,
  stopDescr  CPT-StopPointDescription  OPTIONAL,
  mode  CPT-Mode  OPTIONAL,
  agencyID   CPT-AgencyID  OPTIONAL,
  routeDirection  SCH-RouteDirectionName,
  routeID    SCH-RouteID  OPTIONAL,  -- **added new field
  routeDesignator SCH-RouteDesignator OPTIONAL --**added new field
  routeName  SCH-RouteName OPTIONAL --**added new field
  sign  PiStaticSign  OPTIONAL,
  departPoint  SpPointclass  OPTIONAL,
  departSchedule  PI-DepartTimeScheduled,
  departSchedNext  PI-DepartTimeSchedNext  OPTIONAL,
  arriveSchedule  PI-ArriveTimeScheduled  OPTIONAL,
  arrivePoint  SpPointclass  OPTIONAL,
  toEndWalk  PI-WalkingDirections  OPTIONAL,
  fareTransaction  FcFareCharacterCost  OPTIONAL,
  schedAdhCountdown  PiSchedAdherenceCountdown  OPTIONAL,
  footnote  PI-Footnote  OPTIONAL,
  nextLeg  PI-NextLeg OPTIONAL
}      -- at least one route index must be included
   (WITH COMPONENTS {..., routeID PRESENT} |
    WITH COMPONENTS {..., routeDesignator PRESENT} |
    WITH COMPONENTS {..., routeName PRESENT}  )
```

PiParkingFacility_message

(1) Reorganized message to provide information on parking availability information for different types of vehicle classes.

Message body

```
PiParkingFacility ::=SEQUENCE {
  parkingFacID  PI-ParkingFacID,
  stopID  CPT-StopPointID,
  owner  PI-ParkingOwnerName  OPTIONAL,
  phone  PI-ParkingFacPhone  OPTIONAL,
  spacesTotal   PI-ParkingSpacesTotal  OPTIONAL,
  modes  SEQUENCE OF CPT-Mode  OPTIONAL,
  spacesTotal  PI-ParkingSpacesTotal OPTIONAL,
  operatingHours  PI-ParkingHoursofOperation OPTIONAL,
  parkingProvided  SEQUENCE OF {
      vehicleClass  PI-ParkingVehicleClass,
      spacesAvailable PI-ParkingAvailibility OPTIONAL,
      rates PI-ParkingRates OPTIONAL,
      entrances  SEQUENCE OF PI-ParkingEntranceID  OPTIONAL,
      fillTime PI-ParkingFillTime OPTIONAL,
      footnote  PI-Footnote  OPTIONAL   } OPTIONAL
}
```

PiNearestStop_message

(1) Add field name in last field of message body. Call field name stopPtAttribute-list.

Message body

```
PiNearestStop ::= SEQUENCE {
stopID  CPT-StopPointID,
location  SpPointclass,  -- the location of the nearest stop
mode  CPT-Mode  OPTIONAL,
routeID  SCH-RouteID   OPTIONAL,
rtDirection  SCH-RouteDirectionName OPTIONAL,
stopPtAttribute-list  SEQUENCE OF CPT-StopPointAttribute  OPTIONAL
}
```

PiSchedAdherenceRange_message

(1) Add new field in message to reflect confidence level of value.

Message body

```
PiSchedAdherenceRange ::=SEQUENCE {
routeID  SCH-RouteID,
routeName  SCH-RouteName OPTIONAL,
tripID   SCH-TripID,
vehicleID   CPT-PTVehicleID,
stopID   CPT-StopPointID,
estimatedArrivalRange  PI-EstimatedArrivalRange,
tolerance OB-ConfidenceMeasure OPTIONAL  -- measurement is in seconds
}
```

PiSchedAdherenceCountdown_message

(1) Add new field in message to reflect confidence level of value.

Message body

```
PiSchedAdherenceCountdown ::= SEQUENCE {
routeID  SCH-RouteID,
routeName  SCH-RouteName OPTIONAL,
tripID    SCH-TripID,
vehicleID  CPT-PTVehicleID,
stopID    CPT-StopPointID,
nextArrivalCountdown  PI-NextArrivalCountdown,
tolerance OB-ConfidenceMeasure OPTIONAL  -- measurement is in seconds
}
```

PiSchedAdherenceOffSched_message

(1) Add new field in message to reflect confidence level of value.

Message body

```
PiSchedAdherenceOffSched ::= SEQUENCE {
routeID   SCH-RouteID,
routeName  SCH-RouteName OPTIONAL,
tripID   SCH-TripID,
vehicleID   CPT-PTVehicleID,
stopID     CPT-StopPointID,
arriveTimeScheduled  PI-ArriveTimeScheduled,
vehicleLocation  SpPointclass,   --The real-time location of a transit vehicle
offScheduleTime  PI-OffSchedule,
tolerance OB-ConfidenceMeasure OPTIONAL  -- measurement is in seconds
}
```

PiDynamicSignMessage_message

(1) Add field to reflect new type of schedule status PiDepartAtLastStop. Also added WITH COMPONENTS clause for option.

Message body	PiDynamicSignMessage ::=SEQUENCE{
	datetime CPT-DateTime OPTIONAL,
	route-name SCH-RouteName OPTIONAL,
	service-type SCH-ServiceType OPTIONAL,
	direction SCH-RouteDirectionName OPTIONAL,
	arrive-time PI-ArriveTimeScheduled OPTIONAL,
	depart-time PI-DepartTimeSched OPTIONAL,
	adh-range PiSchedAdherenceRange OPTIONAL,
	adh-countdown PiSchedAdherenceCountdown OPTIONAL,
	adh-offsched PiSchedAdherenceOffSched OPTIONAL,
	depart-at-last-stop PiDepartAtLastStop OPTIONAL,
	message SEQUENCE OF PI-DMSMessage OPTIONAL
	}
	(WITH COMPONENTS {...,datetime PRESENT}|
	WITH COMPONENTS {..., route-name PRESENT}|
	WITH COMPONENTS {..., service-type PRESENT}|
	WITH COMPONENTS {..., direction PRESENT}|
	WITH COMPONENTS {..., arrive-time PRESENT}|
	WITH COMPONENTS {..., depart-time PRESENT}|
	WITH COMPONENTS {...,adh-range PRESENT}|
	WITH COMPONENTS {..., adh-countdown PRESENT}|
	WITH COMPONENTS {..., adh-offsched PRESENT}|
	WITH COMPONENTS {..., depart-at-last-stop PRESENT}|
	WITH COMPONENTS {..., message PRESENT})

PiDepartTimeAtLastStop_message

Add new message

Message identifier	pi 16
Metadata source	Direct
Descriptive name	PiDepartTimeAtLastStop_message
Descriptive name context	Manage Transit
Definition	The time a PTV left the last stop point zone. (Note: The time a passenger vehicle left the stop point zone and closed the doors may not be at the same time.)
Source	
Class name	PI
Classification scheme name	TCIP
Classification scheme version	NTCIP 1400
Data concept type	Message
Keyword	
Related data concept	
Relationship type	
Remarks	
Symbolic name	
Symbolic name usage	
ASN1 Name	PiDepartAtLastStop
Constraints	
Message body	PiDepartAtLastStop ::= SEQUENCE { departTimeAtLastStop OB-StopPointZoneExit, stopID CPT-StopPointID, routeID SCH-RouteID OPTIONAL, routeName SCH-RouteName OPTIONAL, routeDirection SCH-RouteDirectionID OPTIONAL, tripID SCH-TripID OPTIONAL, vehicleID CPT-PTVehicleID OPTIONAL, tolerance OB-ConfidenceMeasure OPTIONAL -- measurement is in seconds

```
} (WITH COMPONENTS {..., routeID PRESENT)|
   WITH COMPONENTS {..., routeName PRESENT} )
```

Section 5
CONFORMANCE REQUIREMENTS

Annex A
DATA ELEMENT/MESSAGE USE CROSS REFERENCE TABLE

(Informative)

Annex B
ASN.1 Script

(Informative)

-- removed from document