A Working Group Draft Standard of the Joint Committee

NTCIP 1405 v. 1.03

-- DRAFT Amendment 1

Transit Communications Interface Profiles

Part of the National Transportation Communications for ITS Protocol

Standard on Spatial Representation (SP) 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-SP and/or NEMA TS 3.TCIP-SP. However, to provide an organized numbering scheme for the NTCIP, this document is now referenced as NTCIP 1405. The technical specification of NTCIP 1405 is identical to the former reference, except as noted in the development history:

TCIP draft specifications, version 0.1, September 1997. Distributed for pulic review.

TCIP-SP version 1.0, February 20, 1998. Accepted as a Recommended Standard. Incremented to version 1.1, July 31, 1998, for compilation revisions made in former section numbers 2.1, 2.3, 5.1, 5.2, and Annex C. Distributed for ballot via NTCIP Standards Bulletin B0023 in September 1998.

NTCIP 1405 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 1405 v01.02, December 1, 2000. Reformatted for printing: incremented version number and updated date; added and revised front matter; updated references to NTCIP and NEMA document numbers in References Clauses; 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 1405 v01.03 Amendment 1, September 2002. Updated data dictionary to conform to IEEE 1489:1999 and IEEE 1488:2000. Updated references, corrected typographic errors, revised definitions, message bodies, and added new data elements and messages.

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The information in this publication was considered technically sound by the consensus of persons engaged in the development and approval of the document at the time it was developed. Consensus does not necessarily mean that there is unanimous agreement among every person participating in the development of this 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, September, 2002.

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

USPS Postal Addressing Standards, Publication 28, November 2000

1.2.2 Other 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

3.4 NAMING CONVENTIONS

-- Correct typographical errors in 2nd paragraph.

"Also, for messages that can be composed of either a sequence of points or lines, the name is appended with the respective designation "P_" or "L_". For example, a transit pattern represented by a series of nodes is denoted as SpP_Noderoute. Likewise, a transit pattern represented by a series of links is denoted as SpL_Linkroute."

Section 4
REQUIREMENTS

-- updated the following requirements in Sections 4.1 and 4.2

4.1 SPATIAL REPRESENTATION DATA DICTIONARY

SP_LinkID_id

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

Descriptive Name	SP_LinkID_id
Representation class term	identifier

SP_MilePostID_id

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

Representation class term	identifier

SP_NodeID_id

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

Descriptive Name	SP_NodeID_id
Representation class term	identifier

SP_PostalCode_cd

(1) The definition was modified.

Definition	The six character postal code as defined by the legal jurisdiction of the location.

SP_RoadPrefix_cd/USPS Pub 28

(1) This data element is retired and replaced by SP_RoadSuffix_cd / USPS Pub 28

SP_RoadSuffix_cd/USPS Pub 28

(1) The reference to the USGS Publication 28 was updated to reflect the most recent version.

Definition	The suffix to the road name. For example, in the address 56 Old Main West Street, "west" is the suffix. The road suffix follows the abbreviations of the U.S. Postal Service. Details of each road type can be found in the Postal Addressing Standards, Publication 28, November 2000.

SP_RoadType_cd/USPS Pub 28

(1) This data element is retired and replaced by SP_RoadSuffix_cd / USPS Pub 28

4.2 MESSAGE OBJECTS

4.2.1 4.2.1 Point Class Representation Objects

SpPointclass

(1) Add additional point message (see SpGeoDynamicpoint_message)

Message body

```
SpPointclass ::= CHOICE {
address          SpAddresspoint,
geoPoint         SpGeopoint,
geoLabelPt       SpGeoLpoint,
geoOffset        SpGeoOffsetpoint,
intersection     SpIntpoint,
intOffset        SpIntOffsetpoint,
landmark         SpLandmarkpoint,
milepost         SpMilepostpoint,
node             SpNodepoint,
nodeOffset       SpNodeOffsetpoint,
nodePercentOffset   SpNodePercentOffsetpoint,
statePlanePt       SpSPpoint,
roadLabel          SpRoadLabelpoint,
geoDynamic       SpGeoDynamicpoint  }
```

SpAddresspoint_message

(1) The Message Body of SpAddresspoint was redefined based on the new version of the USPS Publication 28 Addressing Standard [http://pe.usps.gov/cpim/ftp/pubs/Pub28/pbu28.pdf]. Provision for an "exception string" as defined in the USPS standard was also included in the SpAddresspoint definition.

Constraints

The excepttion string should be use only as specficied by USPS Publication 28 [November 2000].

Message body

```
SpAddresspoint ::= SEQUENCE {
  pre-directional   SP-CompassDirection  OPTIONAL,
  number     SP-RoadNumber,
  prefix       SP-RoadPrefix  OPTIONAL,
  name        SP-RoadName,
  type         SP-RoadType,
  suffix       SP-RoadSuffix OPTIONAL,
  post-directional  SP-CompassDirection OPTIONAL,
  exception-string  UTF8String (SIZE (1..30)) OPTIONAL,
       -- use as specified by USPS Publication 28
  city        SP-CityName  OPTIONAL,
  community    SP-CommunityName  OPTIONAL,
  county   SP-County  OPTIONAL,
  province   SP-Province  OPTIONAL,
  state   SP-State  OPTIONAL,
  postalCode   SP-PostalCode,
  country   SP-Country  OPTIONAL
}
(WITH COMPONENTS  {..., number PRESENT, name  PRESENT, suffix PRESENT} |
 WITH COMPONENTS  {..., exception-string PRESENT} }
```

SpLandmarkpoint_message

(1) A typo was corrected in the Message body.

Message body

```
SpLandmarkpoint  ::=SEQUENCE {
name     SP-LandmarkName,
level      SP-Level  OPTIONAL,
```



```
description    SP-LandmarkDesc  OPTIONAL,
address        SpAddresspoint  OPTIONAL,
geoPoint       SpGeopoint  OPTIONAL
}
```

SpGeoDynamicpoint_message

-- add new point message to deal with dynamic (moving) "points"

Message identifier	spp 10
Metadata source	Direct
Descriptive name	SpGeoDyanmicpoint
Descriptive name context	Manage Transit
Definition	A dynamic point expressed by the magnitude of the path of a moving object.
Source	
Class name	SP
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	
Constraints	

Message body	`SpGeoDynamicpoint ::= SEQUENCE {`
	`  latitude . SP-Latitude,`
	`  longitude .SP-Longitude,`
	`  direction  SP-AngularDirection, -- direction of travel [deg]`
	`  speed      OB-J1587-VelocityVectorSpeed OPTIONAL,`
	`  altitude ..SP-Altitude OPTIONAL,`
	`  datum .    SP-Datum OPTIONAL  }`

4.2.2 Line Class Representation Objects

SpGeoLline_message

(1) Message body: OPTIONAL shall be removed from label SP-GeoLabel. The label distinguishes this message from SpGeoline.

Message body

```
SpGeoLline ::= SEQUENCE{
label   SP-GeoLabel,
geopoints  SEQUENCE OF SpGeopoint  }
```

SpIntOffsetline_message

(1) A typo was corrected in the message body field "intersectionPoints".

Message body

```
SpIntOffsetline ::=SEQUENCE{
intersectionPoints  SEQUENCE OF SpIntOffsetpoint,
label  SP-GeoLabel  OPTIONAL
}
```

4.2.3 Polygon Class Representation Objects

-- standardize the naming convention to be consistent with the other spatial feature types:
spPolygonclass OBJECT IDENTIFIER ::= {spl 3}

SpPolygonclass_message

(1) geoline-Poly SpL-Geopolygon shall be included in the CHOICE field.

Message body

```
SpPolygonclass ::=SEQUENCE {
label       SP-GeoLabel  OPTIONAL,
polygon  CHOICE {
   centroid   SpCentroidpolygon,
   geoPoint-Poly   SpP-Geopolygon,
   intersection-Poly SpP-Intpolygon,
   node-Poly    SpP-Nodepolygon,
   stPlanePt-Poly  SpP-SPpolygon,
   addressRange-Poly  SpL-AddressRangepolygon,
   link-Poly   SpL-Linkpolygon,
   geoline-Poly  SpL-Geopolygon }
}
```

SpL_Geopolygon_message

(1) A typo was corrected in the Descriptive and ASN.1 names.

Descriptive name	SpL_Geopolygon_message
ASN1 Name	SpL-Geopolygon

4.2.4 Route Class Representation Objects

-- standardize the naming convention to be consistent with the other spatial feature types:
spRouteclass OBJECT IDENTIFIER ::= {spl 4}

SpRouteclass_message

(1) In the message body, the field name shall be changed from roadName to routeName.
(2) Add field name to choice field so consistent with ASN.1:1998.

Message body

```
SpRouteclass ::= SEQUENCE {
routeName   SP-RoadName,
route         CHOICE{
   address-rt      SpP-Addressroute,
   geoPt-rt        SpP-Georoute,
   intersection-rt SpP-Introute
   intOffset-rt    SpP-IntOffsetroute,
   milepost-rt     SpP-Milepostroute,
   node-rt         SpP-Noderoute,
   stPlanePt-rt  SpP-SProute,
   geoLine-rt     SpL-GeoLroute,
  link-rt          SpL-Linkroute  }
}
```


Section 5
CONFORMANCE REQUIREMENTS

5.2 LEVEL TWO CONFORMANCE

-- import SAE J1708 object OB-J1587-VelocityVectorSpeed from NTCIP 1406 Annex A.

Object Name	Reference
OB-J1587-VelocityVectorSpeed	NTCIP 1406 Annex A

Annex A
DATA ELEMENT/MESSAGE USE CROSS REFERENCE TABLE

(Informative)

TBD

Annex B
ASN.1 Script

(Informative)

TBD