A Working Group Draft Standard of the Joint Committee

NTCIP 1408 v. 1.03

-- DRAFT Amendment 1

Transit Communications Interface Profiles

Part of the National Transportation Communications for ITS Protocol

Standard on Fare Collection (FC) Business Area Objects

Draft August 2002

Also referenced as TCIP-FC

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American Association of State Highway and Transportation Officials (AASHTO)
444 North Capitol St., N.W., Suite 249
Washington, D.C. 20001

Institute of Transportation Engineers (ITE)
1099 14th Street, N.W., Suite 300 West
Washington, D.C. 20005-3438

National Electrical Manufacturers Association (NEMA)
1300 North 17th Street, Suite 1847
Rosslyn, Virginia 22209-3801

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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:

NTCIP Coordinator
National Electrical Manufacturers Association
1300 North 17th Street, Suite 1847
Rosslyn, Virginia 22209-3801
fax: (703) 841-3331
e-mail: ntcip@nema.org

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 1998 to 1999, this document was referenced as ITE ST-ITS-TCIP-FC and/or NEMA TS 3.TCIP-FC. However, to provide an organized numbering scheme for the NTCIP, this document is now referenced as NTCIP 1408. The technical specification of NTCIP 1408 is identical to the former reference, except as noted in the development history:

ST-ITS-TCIP-FC version 01.0, March 1999. April 1999-Standards Development Report Attachment A listed changes from draft v0.4 to v1.0. May 1999 – User Comment Draft accepted by the Joint Committee on the NTCIP. June 1999 – NTCIP Standards Bulletin B0037 requested user comments on NTCIP 1408.

NTCIP 1408 version 01.00, March 1999. November 1999 – Recommended Standard accepted by the Joint Committee on the NTCIP. February 2000 – No additional changes reported to

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v01.00. May 2000 –NTCIP Standards Bulletin B0053 requested ballot to approve. Approved by AASHTO in December 2000, approved by ITE in May 2001, and approved by NEMA in May 2001.

NTCIP 1408 v01.01, December 31, 2001. October 2001 – Reformatted for printing: incremented version number and updated date; added and revised front matter; updated references to NTCIP and NEMA document numbers in Clause on References; updated references to ITE document numbers; inserted introduction text in Section on Requirements; deleted Annex A Comment Form; and inserted introduction text in Annex for the ASN.1 Script.

Draft NTCIP 1408 v01.02 Amendment 1, August 2002. Updated references and corrected typographic errors.

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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.

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.

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Section 2
TERMINOLOGY

-- no changes

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Section 3
CONCEPT OF OPERATIONS

-- Modified section name to Concept of Operations

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Section 4
REQUIREMENTS

4.1 FARE COLLECTION DATA DICTIONARY

FC_AccountID_id

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

Descriptive Name	FC_AccountID_id
Representation class term	identifier

FC_BadCardID_id

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

Descriptive Name	FC_BadCardID_id
Representation class term	identifier

FC_ComponentErrorType_cd

(1) Removed error codes from code list.

Representation layout

```
FC-ComponentErrorType  ::=  INTEGER {
bill-accept (1), -- bill accept
bill-count (2), -- bill count
bill-escrow (3), -- bill escrow
bill-operation (4), -- bill operation
bill-stacker (5), -- bill stacker
card-read-1 (6), -- card read (1st try)
card-read-2  (7), -- card read (2nd try)
card-read-3  (8), -- card read (3rd try)
card-reject  (9), -- card reject
card-write  (10), -- card write
coin-accept (11), -- coin accept
coin-count (12), -- coin count
coin-operation (13), -- coin operation
power-loss (14), -- power loss
feed (15), -- feed
transport (16), -- transport
printer (17)  -- printer
-- 18-149 reserved
-- 150-255 local use
} (0..255)
```

Valid value rule

1- bill accept
2- bill count
3- bill escrow
4- bill operation
5- bill stacker
6- card read (1st try)

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7- card read (2nd try)
8- card read (3rd try)
9- card reject
10- card write
11- coin accept
12- coin count
13- coin operation
14- power loss
15- feed
16- transport
17- printer
18-149 reserved
150-255 local use

codes 150-246 shall be associated with fcEquipmentErrorTypeDescription

FC_ComponentErrorTypeID_id

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

Descriptive Name	FC_ComponentErrorTypeID_id
Representation class term	identifier

FC_ComponentEventID_id

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

Descriptive Name	FC_ComponentEventID_id
Representation class term	idenifier

FC_ComponentEventType_cd

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

Representation layout

FC-ComponentEventType ::= INTEGER {
voltage-dropout (1), -- voltage dropout
voltage-restored (2), -- voltage restored
probe-started (3), -- probe started
probe-completed (4), -- probe completed
cashbox-removed (5), -- cashbox removed
cashbox-restored (6), -- cashbox restored
cashbox-door-timeout (7), -- cashbox door timeout
cashbox-opened-is (8), -- cashbox opened in service
insufficient-fare (9), -- insufficient fare accepted
coinbox-75-full (10), -- coinbox 75% full
coinbox-full (11), -- coinbox full
currencybox-75-full (12), -- currency box 75% full
currencybox-under-75 (13), -- currency box less than 75% full
currencybox-full (14), -- currency box full
cardpassbox-75-full (15), -- card/pass box 75% full
cardpassbox-under-75 (16), -- card/pass box less than 75% full
cardpassbox-full (17), -- card/pass box full
coin-dejam (18), -- coin de-jam operated
farebox-manual-bypass (19), -- farebox set in manual bypass
farebox-automatic (20), -- farebox reset to automatic mode
pass-jam (21), -- pass/transfer jam
pass-jam-cleared (22), -- pass/transfer jam cleared
pass-currency-jam (23), -- pass currency jam
maintenance-access-is (24), -- maintenance access - in service
maintenance-access-oos (25), --maintenance access - out of service

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alarm-module-failure (26), -- alarm module failure
battery-failure (27), -- battery failure
battery-low (28), -- battery low
cardcapturebin-75-full (29), -- card capture bin 75% full
cardcapturebin-full (30), ---card capture bin full
card-stock-1-low (31), -- Fare card stock type 1 is low
card-stock-1-out (32), -- Fare card stock type 1 is out
card-stock-2-low (33), -- Fare card stock type 2 is low
card-stock-2-out (34), -- Fare card stock type 2 is out
card-stock-3-low (35), -- Fare card stock type 3 is low
card-stock-3-out (36), -- Fare card stock type 3 is out
card-stock-4-low (37), -- Fare card stock type 4 is low
card-stock-4-out (38), -- Fare card stock type 4 is out
card-stock-5-low (39), -- Fare card stock type 5 is low
card-stock-5-out (40), -- Fare card stock type 5 is out
card-stock-6-low (41), -- Fare card stock type 6 is low
card-stock-6-out (42), -- Fare card stock type 6 is out
clock-error (43), -- Equipment controller board clock error
coin-acceptor-fault (44), -- Coin acceptor fault
communications-loss (45), -- Loss of communications with local devices
maintenance-door-open (46), -- Maintenance door open
maintenance-door-closed (47), -- Maintenance door closed
motion-sensor-alarm-on (48), -- Motion sensor alarm triggered
power-reset (49), -- Power reset
communications-lost (50), -- Local station communications lost
receipt-low (51), -- Receipt low
receipt-out (52), -- Receipt out
credit-debit-failure (53), -- credit/debit failure (out of service)
gate-failure (54), -- gate failure (turnstile and parking)
banknote-validation-failure (55) -- bank note validation failure
-- 56 - 65399 reserved
-- 65400 - 65535 local use
} (0..65535)

Valid value rule

1- voltage dropout
2- voltage restored
3- probe started
4- probe completed
5- cashbox removed
6- cashbox restored
7- cashbox door timeout
8- cashbox opened in service
9- insufficient fare accepted
10- coin box 75% full
11- coin box full
12- currency box 75% full
13- currency box less than 75% full
14- currency box full
15- card/pass box 75% full
16- card/pass box less than 75% full
17- card/pass box full
18- coin de-jam operated
19- fare box set in manual bypass
20- fare box reset to automatic mode
21- pass/transfer jam
22- pass/transfer jam cleared
23- pass currency jam
24- maintenance access- in service
25- maintenance access- out of service
26- alarm module failure
27- battery failure
28- battery low
29- card capture bin 75% full
30- card capture bin full
31- Fare card stock type 1 is low
32- Fare card stock type 1 is out
33- Fare card stock type 2 is low
34- Fare card stock type 2 is out

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35- Fare card stock type 3 is low
36- Fare card stock type 3 is out
37- Fare card stock type 4 is low
38- Fare card stock type 4 is out
39- Fare card stock type 5 is low
40- Fare card stock type 5 is out
41- Fare card stock type 6 is low
42- Fare card stock type 6 is out
43- Equipment controller board clock error
44- Coin acceptor fault
45- Loss of communications with local devices
46- Maintenance door open
47- Maintenance door closed
48- Motion sensor alarm triggered
49- Power reset
50- Local station communications lost
51- Receipt low
52- Receipt out
53- credit/debit failure (out of service)
54- gate failure (turnstile and parking
55- bank note validation failure
56-65399 reserved
65400-65535 local use

FC_ComponentID_id

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

Descriptive Name	FC_ComponentID_id
Representation class term	identifier

FC_ComponentStatusType_cd

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

Representation layout

```
FC-ComponentStatusType  ::=  INTEGER {
in-service (1), -- In-service
out-of-service (2), -- Out of service
maintenance-mode (3), -- Maintenance mode
freewheel-mode (4), -- Freewheel mode (no pay)
diagnostic-mode (5), -- Diagnostic mode
alarm-triggered (6), -- Alarm triggered
gate-entry-only (7), -- Gate mode open for entry only
gate-exit-only (8), -- Gate mode open for exit only
gate-entry-and-exit (9) -- Gate mode open for entry/exit
 -- 10-149  reserved
 -- 150-255 local use
} (0..255)
```

Valid value rule

1- In-service
2- Out of service
3- Maintenance mode
4- Freewheel mode (no pay)
5- Diagnostic mode
6- Alarm triggered
7- Gate mode open for entry only
8- Gate mode open for exit only
9- Gate mode open for entry/exit
10-149 reserved
150-255 local use

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

Descriptive Name	FC_CountTypeID_id
Representation class term	identifier

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

Descriptive Name	FC_FareCharacterCostIndex_id
Representation class term	identifier

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

Descriptive Name	FC_FareDistanceIndex_id
Representation class term	identifier

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

Descriptive Name	FC_FareDistanceTableID_id
Representation class term	identifier

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

Representation layout	FC-FareDistanceType ::= INTEGER { line-of-sight (1), -- line of sight linear (2) -- linear -- 3-149 reserved -- 150-255 local use } (0..255)
Valid value rule	1- line of sight 2- linear 3-149 reserved 150-255 local use

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

Descriptive Name	FC_FareExceptionCellIndex_id
Representation class term	identifier

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

Descriptive Name	FC_FareExceptionTableID_id
Data type	IDENS
Representation class term	identifier

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

Descriptive Name	FC_FareInstrumentID_id
Representation class term	identifier

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

Descriptive Name	FC_FareMediaID-txt_id
Representation class term	identifier

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

Descriptive Name	FC_FareMediaID-nbr_id
Representation class term	identifier

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

Descriptive Name	FC_FareMediaOtherID_id
Representation class term	identifier

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

Descriptive Name	FC_FareTableID_id
Representation class term	identifier

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

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Descriptive Name FC_FareZoneIndex_id
Representation class term identifier

FC_FareZoneTableID_id

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

Descriptive Name FC_FareZoneTableID_id
Representation class term identifier

FC_FinancialTransactionID_id

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

Descriptive Name FC_FinancialTransactionID_id
Representation class term identifier

FC_FinancialTransactionType_cd

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

Representation layout

```
FC-FinancialTransactionType ::= INTEGER {
money-received (1), --Money received
money-dispensed (2), --Money dispensed
electronic-credit (3), --Electronic - credit
electronic-debit (4), --Electronic - debit
smart-card (5), --Smart card
combo (6), --Combo (split payment)
transit-check (7) --Transit check
  -- 8-149 reserved
  -- 150-255 local use
} (0..255)
```

Valid value rule

1- Money received
2- Money dispensed
3- Electronic- credit
4- Electronic- debit
5- Smart Card
6- Combo (split payment)
7- Transit check
8-149 reserved
150-255 local use

FC_FIStandard_cd

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

Representation layout

```
FC-FIStandard ::= INTEGER {
none (1), -- none
iso-8583-1995 (2), -- ISO 8583:1993 (parts 1-3)
iso-4909-1987 (3), -- ISO 4909:1987
iso-9992-1990 (4), -- ISO 9992:1990 (parts 1 and 2)
vei-1997 (5) -- VEI:1997
   -- tbd
   -- 10-149 reserved
   -- 150-255 local use
} (0..255)
```

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Valid value rule

1- none
2- ISO 8583:1993 (parts 1-3)
3- ISO 4909:1987
4- ISO 9992:1990 (parts 1 and 2)
5 - VIE: 1997
6-149 reserved
150-255 local use

FC_MonetaryInstrumentTypeID_id

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

Descriptive Name FC_MonetaryInstrumentTypeID_id
Representation class term identifier

FC_PassInstrumentID_id

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

Descriptive Name FC_PassInstrumentID_id
Representation class term identifier

FC_RideInstrumentID_id

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

Descriptive Name FC_RideInstrumentID_id
Representation class term identifier

FC_RiderClassification_cd

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

Descriptive Name FC_RiderClassification_cd
Representation class term code

FC_SubassemblyType_cd

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

Representation layout

```
FC-SubassemblyType  ::=  INTEGER {
recycled-coin-hopper (1),  --recycled coin hopper
recycled-bill-hopper (2),  --recycled bill hopper
change-storage (3),  --change storage unit
coin-bill-counter (4),  --coin/bill counter
coin-hopper (5),  --coin hopper
bill-hopper (6),  --bill hopper
coin-bill-hopper (7),  --coin/bill hopper
coin-mechanism (8),  --coin mechanism
bill-acceptor (9),  --bill acceptor
ticket-supply (10)  --ticket supply
-- 11- 149 reserved
-- 150 -255 local use
} (0..255)
```

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Valid value rule

1- recycled coin hopper
2- recycled bill hopper
3- change storage unit
4- coin/bill counter
5- coin hopper
6- bill hopper
7- coin/bill hopper
8- coin mechanism
9- bill acceptor
10- ticket supply
11-149 reserved
150-255 local use

FC_TimePeriodIndex_id

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

Descriptive Name FC_TimePeriodIndex_id

Representation class term identifier

FC_TimePeriodTableID_id

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

Descriptive Name FC_TimePeriodTableID_id

Representation class term identifier

FC_TransactionResult_cd

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

Representation layout

FC-TransactionResult ::= INTEGER {
comment (0), -- comment
successful-transaction (1), -- successful transaction
-- 2-9 reserved
read-error (10), -- read error
-- 11-19 reserved
write-error (20), -- write error
-- 21-29 reserved
verify-error (30), -- verify error
-- 31-39 reserved
validation-status-error (40), -- validation status error
-- 41-49 reserved
status-error (50), -- status error
-- 51-59 reserved
other (60) -- other
-- 61-255 reserved
} (0..255)

Valid value rule

0 -- comment
1-- successful transaction
2--9 reserved
10-- read error
11-19 reserved
20-- write error
21-29 reserved
30-- verify error
31-39 reserved
40-- validation status error
41-49 reserved

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50- status error
51-59 reserved
60- other
61-255 reserved

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Annex B
ASN.1 Script

(Informative)

-- removed from document

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