

Defining Transit Informatics



**5TH NATIONAL TRANSIT GIS
CONFERENCE
ST. PETERSBURG, FL
2009**

Overview



- Introductions
- Defining Discipline of Informatics
- Examples of Informatics
- Why this is important to transit
- Current environment
- Allowing Transit Informatics to help

Research Team



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What is *Transit Informatics*?



- **The study of the development and use of information technologies in the field of transit**
- Analogies: health informatics, community informatics, etc.
- Includes more than information systems, networks, hardware, and data – it also includes the procedures, practices and **data standards** needed to make transit informatics effective

Data Standards



- **What is a Data Standard?**
 - Implementation-independent specification of data concepts, definitions, and structure
 - use may be voluntary or mandatory
- **Data Standards Enable: (more on this later)**
 - integration across systems within organizations
 - Interoperability across proprietary and non-proprietary systems
 - eliminate redundancy of data collection

Examples of Data Standards



- **MARC Format in Library Science**
<http://www.loc.gov/marc/>
 - Now Marc 2, defines fixed fields
 - Idea of a *USABLE SUBSET*: not all libraries have the same data needs (like all transit organizations?)
- **SWIFT/ISO 20022 Data Standard for Financial Transactions** <http://www.iso20022.org/>
 - XML tagged approach

tranSpec – a Transit Data Standard

Example of MARC 21 for Author



1XX - Main Entries-General Information

100 - Main Entry - Personal Name (NR) [Full](#) | [Concise](#)

110 - Main Entry - Corporate Name (NR) [Full](#) | [Concise](#)

111 - Main Entry - Meeting Name (NR) [Full](#) | [Concise](#)

130 - Main Entry - Uniform Title (NR) [Full](#) | [Concise](#)

DEFINITION AND SCOPE

Fields 100, 110, 111 and 130 contain a name or a uniform title heading used as main entry.

For **mixed material**, this idea of authorship is not always clear-cut. The main entry may contain the name of the person, family, or entity responsible for bringing the materials together. Alternatively, the main entry may contain the name of the person, family, or entity for whom or which a collection is named.

Descriptions of the first indicator and all subfield codes, as well as input conventions for the 100, 110, 111, and 130 fields, are given in the following *General Information* sections: [X00](#), [X10](#), [X11](#), and [X30](#). The second indicator is described in the specific section for each field.

SWIFT/ISO 20022 Example



- **Data Type Details**
- **Data Type:** CurrencyAndAmount
- **Representation:** Amount
- **XML Type:** decimal
- **Registration Status:** Registered

Definition Number of monetary units specified in a currency, where the unit of currency is explicit and compliant with ISO 4217. The decimal separator is a dot. Note: A zero amount is considered a positive amount.

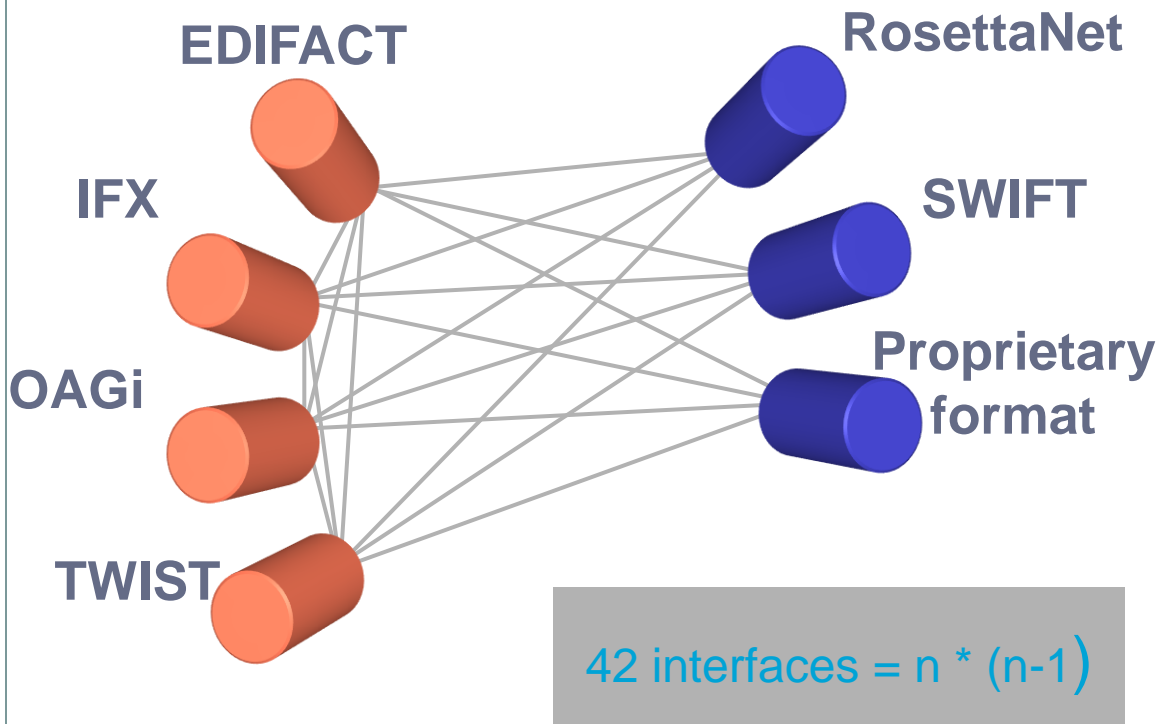
XML Attribute: Currency

XML Tag: <Ccy>

Data Type [CurrencyCode](#)

XML Facet	Value
fractionDigits	5
minInclusive	0
totalDigits	18

Example of Need for SWIFT/ISO 20022



Without common building blocks:

- Point-to-point connection
- Data is mapped directly from one application to another
- Costly, unscalable and difficult to implement and maintain
- Process, routing, rules logic needs to be coded to specific message types

Does Informatics Apply to Transit?



- Bus Stop Data
- Ridership data
- Performance data
- Vehicle Location
- Vehicle Maintenance
- Passenger Amenities
- Customer Information

Organizational Pillars of Activity



Logistics

Run Cutting

Block
Assignments

Planning

Ridership

Stop Level
Activity

Asset Management

Vehicle
Maintenance

Stop
Improvements

Multiple Users



Regulatory

USDOT /
FTA

State DOT/
MPO

Organizational

Planning

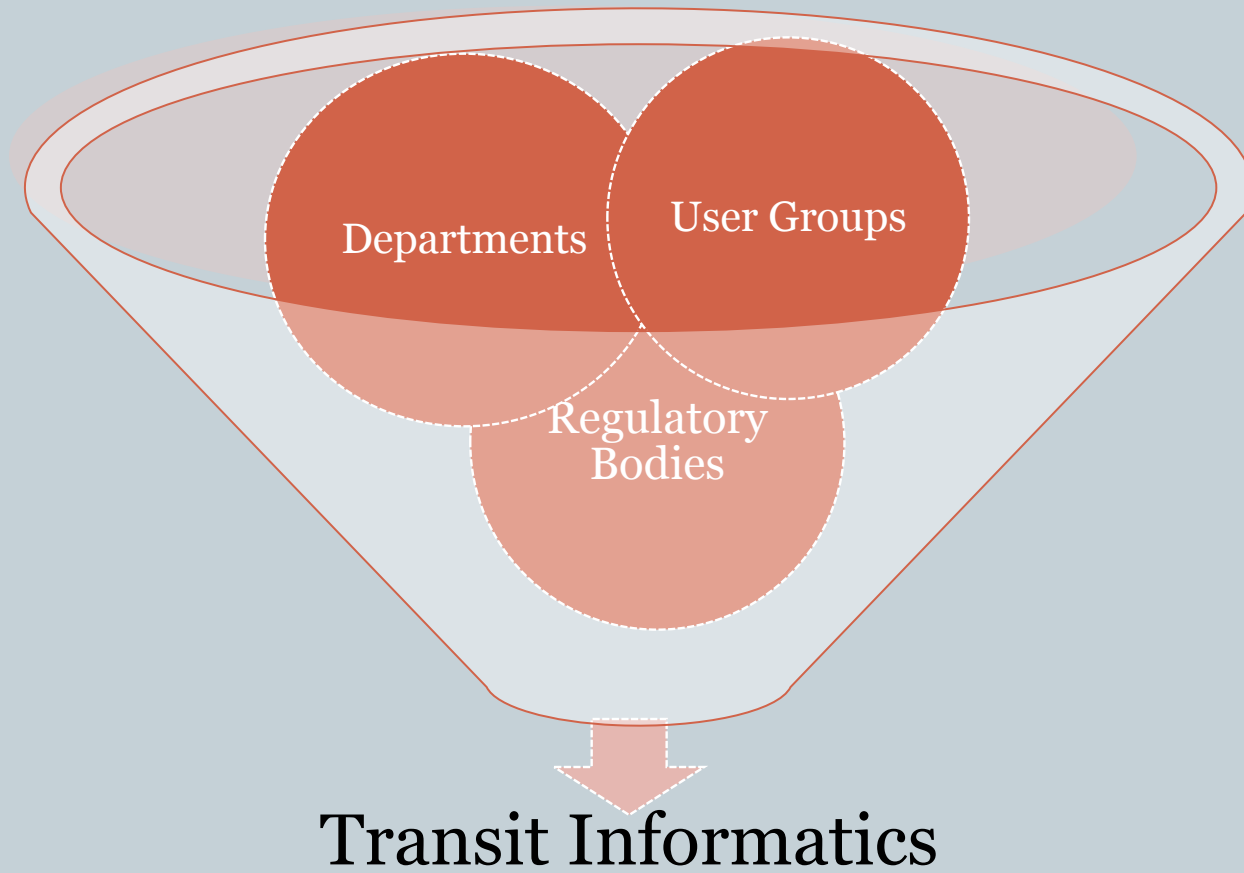
Operations

Public Consumers

Transit
Riders

Stakeholders

Organizing Your Data



What does it look like now



- **Current Standards**

- Transit Communications Interface Profiles (TCIP) – APTA Standard
- TransXchange – U.K standard exchanging bus schedules and related data
- Google Transit Feed Specification – for distribution and use of bus schedule information

- **Few Implementations**

- TCIP pilot program
- GTFS only schedule data

What does it look like now?



- Smokestacks
 - Data models are for specific actions
 - ✦ Scheduling,
 - ✦ performance measures,
 - ✦ planning,
 - ✦ run cutting,
 - ✦ capital improvements and
 - ✦ maintenance
 - Little or no interoperability

Problem with Smokestacks



Inefficiency

Duplication of Effort

Manual effort

Isolated data

Poor Data

Multiple Incomplete Data

Loss of Data Utility

Out of date

Narrow Solutions

Single data user

No Interoperability

Human Assets

Illustration of smokestacks



- **Bus Stop Inventory**
 - Scheduling
 - Customer Service
 - Planning
 - Capital improvements
 - Asset Management

Lack of Access



- **Between Organizational User Groups**
 - Little access
 - Stop Ridership
 - ✦ Planners
 - ✦ Capital improvement decisions
 - Stop Location
 - ✦ Customer Service

Consequences



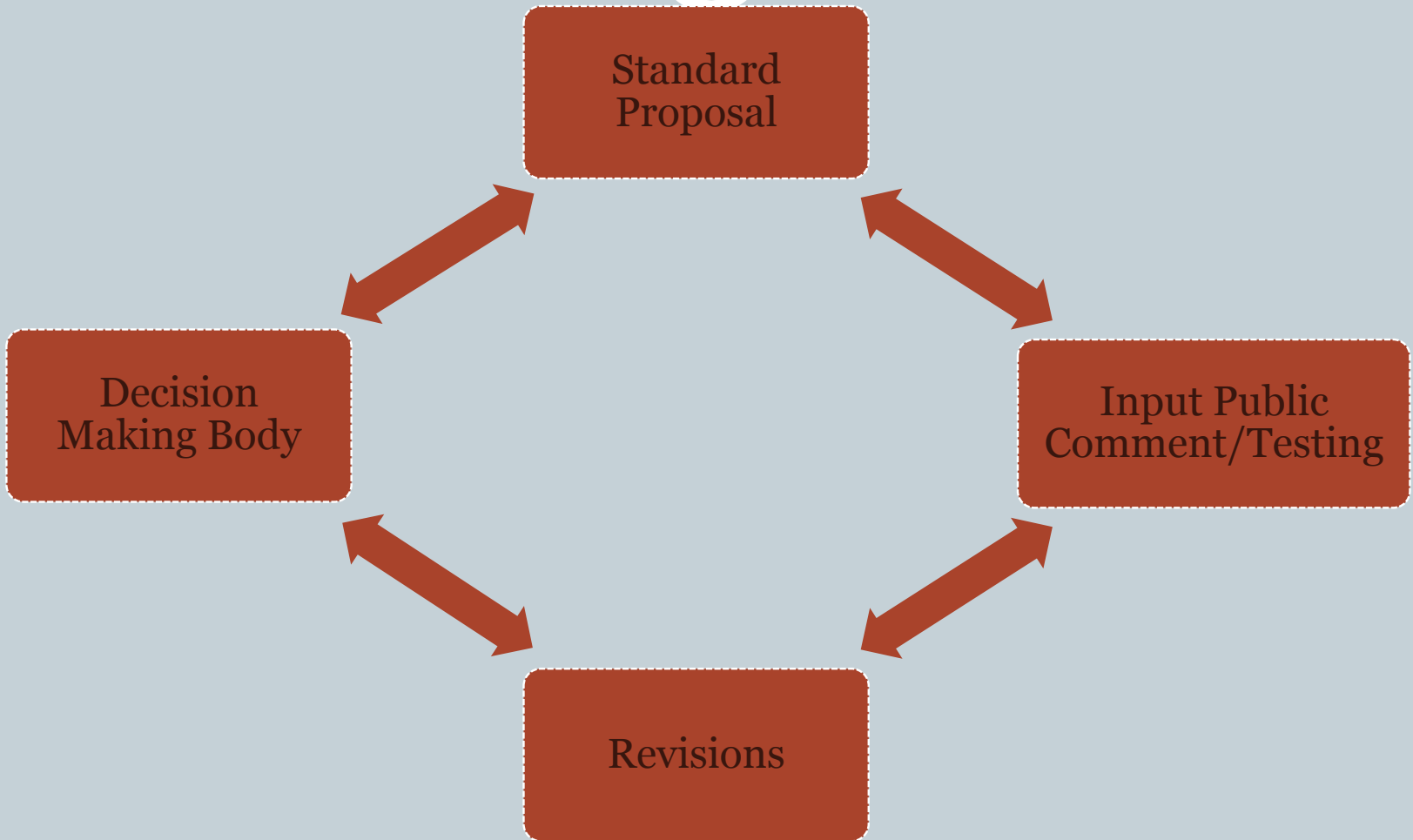
- No integration
- Duplication of effort and data redundancy
 - Multiple Stop Inventories
- Incomplete data
 - Unknown attribute information
 - ✦ How many shelters, benches
 - ✦ How old stop sign and amenities
 - ✦ How many are ADA accessible

How to overcome



- **Transit Informatics is a first step**
 - Defining relationships and data standards
 - Identifying opportunities to remove data redundancy
 - Creating a dialog
- **Embracing Web 2.0 environment and Collaboration**
 - Wiki – developing a location for comment and debate
 - Open development – providing user communities to access all information
 - Recognizing the iterative nature of such endeavors

Mechanism



Governing Body / Discussion



- Who should make this decision?
 - APTA
 - FTA
 - Transit Agencies

Questions



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