



NeTEx extension for New Modes

COMMISSION WORKSHOP

Integrating alternative modes in
EU-wide multimodal travel
information services –
standardisation challenges

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NeTEx

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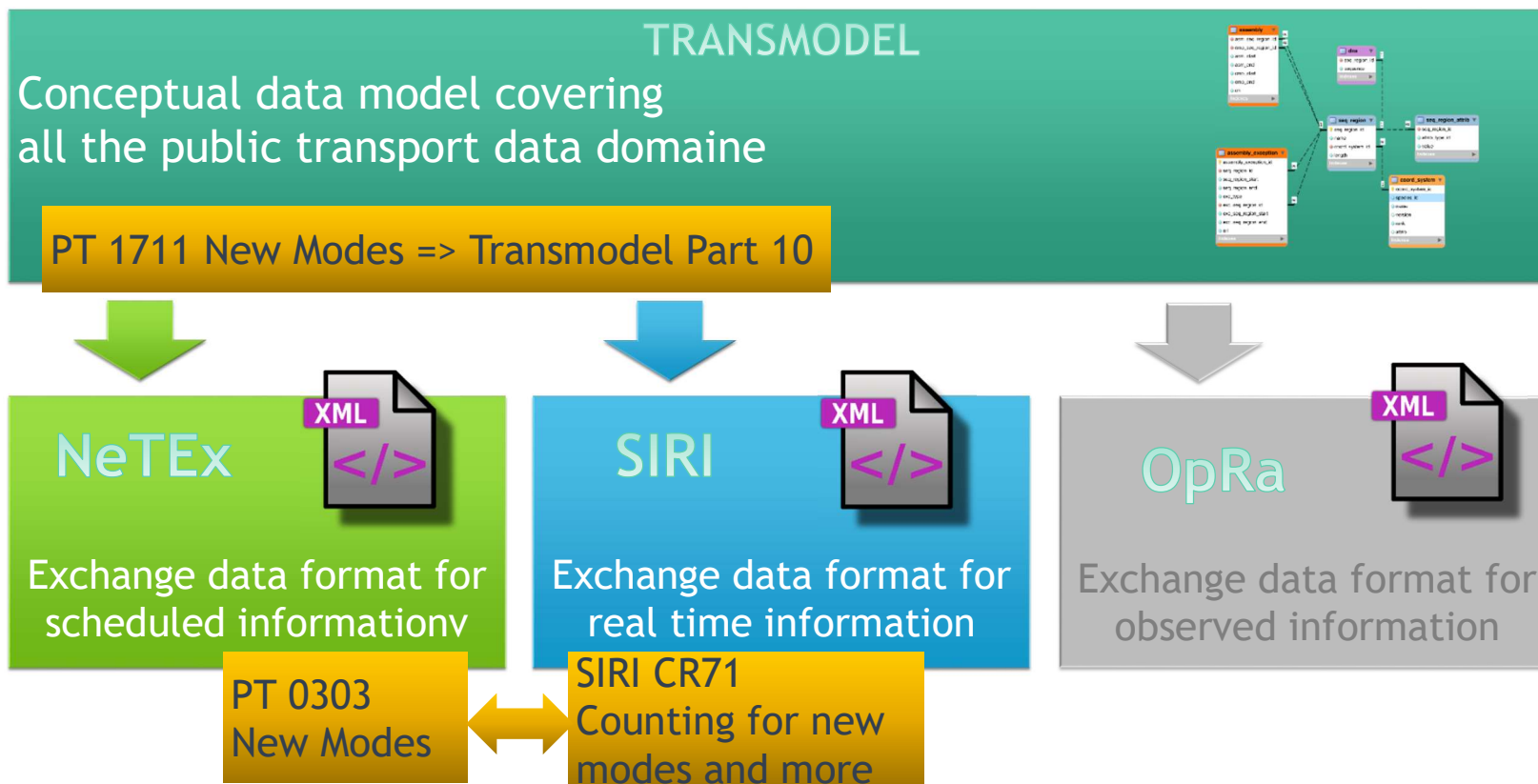


- Project scope overview
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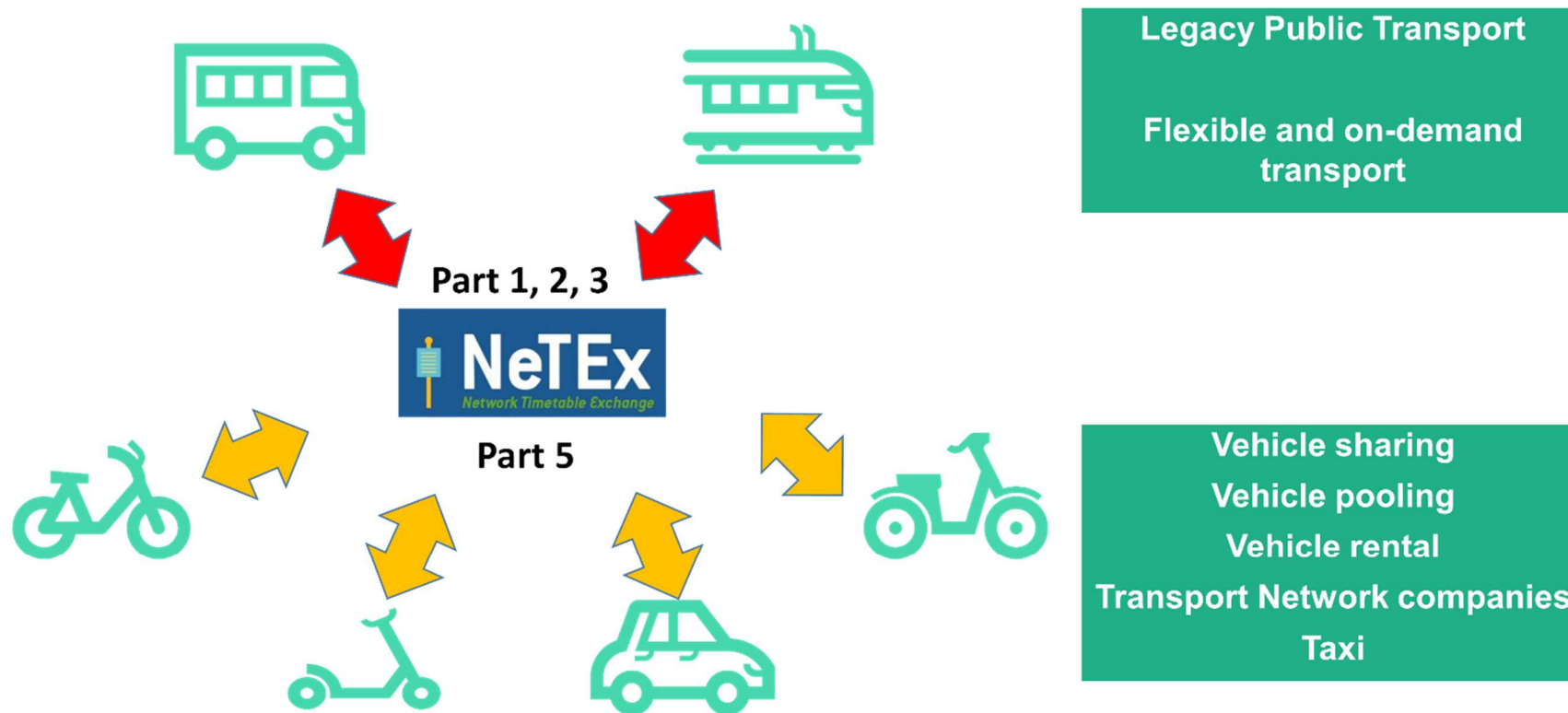
Project scope overview (1/6)

[PT0303]: New Modes Extension



Project scope overview (2/6)

[PT0303]: New Modes Extension



Mode of transport and modes of operation

Transport Mode are enhanced to be able to describe vehicle used in New Modes (bicycle, scooters, etc.). SubModes are enhanced to be able to clearly describe the Modes of Operation (Vehicle Pooling, Vehicle Sharing, Rental, etc.).

Fleet of vehicles

The concept of Feet of vehicle is added (in relation with Organisation, Services, Vehicle and Vehicle Type, etc.).

New mode services and associated online/mobile access

Services are enhanced to cover Sharing Service, Pooling Service (including chauffeured car and taxi) and Rental Services. Online and mobile access to the service are fully described.

Meeting points

Meeting points (i.e. pick-up and drop of points for carpooling, but also any point to meet your vehicle) are added as an equivalent of Public Transport Scheduled Stop Point dedicated to new modes. They can be free, use a dedicated infrastructure (for example a car-pooling area) or located at an existing Site (via a NeTEx Assignment).

Single Journey, running only once (can be planned, even a short time ahead)

The Vehicle Journey concept is enhanced to a Single Journey concept allowing a Journey running only once on a specific day (not associated Day Type or Calendar). Moreover, the Single Journey does not require a Line.

Parking (for any type of vehicle)

Parking are enhanced in order to fully cover the need of New Modes: places (bays) dedicated to carpooling drivers, parking for bikes, dedicated to vehicle sharing, meeting points in parkings, taxi stand, etc.

Connections (multimodal)

Connections are enhanced to be able to cover connection with New Modes (between legacy public transport and New Modes, or between two different New Modes).

Passing times

NeTEx Passing Times are reused to provide information for New Modes.

Vehicle path (Routes)

NeTEx Routes are enhanced to cover New Mode's Vehicle route description.

Refueling/recharging

Refueling and recharging Equipment are enhanced for New Modes.

Specific Equipments (for example Vehicle Release Equipment)

Some existing NeTEx Equipment are specialized for New Modes (Bikes padlock, possibly being IOT, other Vehicle Release Equipment, etc.)

Vehicle Access (code, etc.)

Vehicle access information are added to Customer Account (in relation with existing Contract and Medium Access Devices)

Vehicle profiles

Vehicle profiles are enhanced to cover carpooling vehicle description, bike, scooter, etc.

Passenger Trip (multimodal)

Leg of Passenger Trip are enhanced to be able to describe Leg using New Modes (with possible connections to other Legs of course).

Booking

Booking information are enhanced in order to cover New Modes needs.

Planned availability

Planned availability (opening time of a bike station or of a car sharing parking, etc.) are provided using NeTEx existing Availability Conditions.

Fare offers for new Modes

Fare Offer for New Modes is described using the very comprehensive NeTEx Fare Offer description.

SIRI (CEN/TS 15531) is covering:

- Real time information about available vehicles (and devices):
 - Including reserved ones, out of order, etc.
- Real time information about available spaces to bring a vehicle (and devices) back:
 - Can differentiate free from free but reserved.
- Updated location of a vehicle (and facility)
 - Typically covering free floating service
- Charging level and/or remaining distance per vehicle can also be added (via profile).

Project scope overview (6/6)

Use cases



Public Transport
Operator



Public Transport
Authority

Comprehensive use case overview share between **Transmodel** (CEN/EN 12896) and **NeTEx** (CEN/TS 16614) available in the document

Information provision

- Booking
- Service availability
- Vehicle availability
- Infrastructure access
- Vehicle location
- Vehicle access
- Fares
- Area equipment
- Payment
- Parking area
- Registration
- Repair facilities

Traveller services

- Information services
- Trip planning
- Traveller guidance
- Booking
- Registration
- Vehicle access control
- Payment

Operational services

- Vehicle shipping
- Repairing and maintenance
- Recharging and refueling

- A first version of the Technical Specification (TS) document is ready:
 - The structure is the traditional CEN one.
 - Use cases and functional scope detailed description shared with Transmodel (will be in an annex to avoid duplication but still keep the documents as standalone as possible).
 - Includes Model and exchange protocol for New-Modes.
 - Enhancements to NeTEx Part 1, 2 and 3.
 - Annexes including:
 - Trip model (result of a multimodal journey planner).
 - Mappings (GBFS, etc.) and Interoperability Summary (link with SIRI, relation with other exchange protocols, etc.).
 - Relations with Transmodel NWI Part 10 (and PT1711).
- Since the scope is huge, the TS document itself is also quite large:
 - It may also require some previous NeTEx knowledge (an overview of EPIP, the European Passenger Information Profile, should be sufficient).
- The document is currently under internal review.
- It will be circulated for review to the interested liaisons:
 - A dedicated meeting will be organized to help navigating in the document

- The NeTEx XSD is ready:
 - Currently under integration in the NeTEx Github (but can already be downloaded from NeTEx Basecamp project)
 - <https://github.com/NeTEx-CEN/NeTEx>
 - Already contains a set of examples
 - We are currently working on the addition of more examples
- Some profiles will most probably be helpful to focus on the provision of information from some specific new modes (for example a NeTEx Carpooling Profile, only describing carpooling related information, etc.)
 - But that's probably a next step to be managed within Data4PT project.

Next Steps:

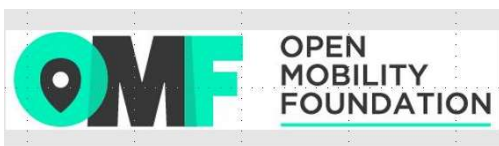
- Finalize the internal TS review by April 2021.
- Circulate the TS document to interested liaisons and manage comments.
- Open the Github XSD review (ASAP): it will be possible to initiate some implementation and Pull Request (Github comment and change request mechanism) will be available.
- Finalize mappings and examples by April 2021.
- CEN submission by May 2021.

- As part of the PT0303 work an Important task is the Liaison with groups developing standards (DATEX II, WG3, WG17, etc.) and exchange protocols overing a similar scope
- Taking into account the work of other group, managing compatibility and harmonizing the work are key points
- A list of 23 stakeholders has been identified and contacted
- We established a strong technical collaboration with stakeholders, via meetings, documents exchanges and news





- There is a partial overlap on **Parking management** and **Charging Stations**, but also a complementarity since DATEX doesn't cover micro-mobilities and connections with public transport



- **Mobility Data Specification (MDS)** are taken into account in NeTEx Part5 extension, for the topic relevant to collaboration between public and industry stakeholders,



- The **TOMP-WG** (Transport Operator, MaaS Provider – Working Group) is a collaborative initiative to create a standardized language for the technical communication between Transport Operators and MaaS Providers within the MaaS ecosystem by means of an API (Applicable Programming Interface). The standard language describes **how the different stakeholders should communicate** with each other.



- In complement to managing the GTFS ecosystem, **MobilityData** is in charge to manage GBFS (Bike sharing availability, currently extending to Vehicle sharing) : a mapping with NeTEx New Modes and SIRI is under production



Liaison (3/3)

[PT0303]: New Modes Extension



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- Data4PT's overall objective is to support the development of **data exchange standards** and models, to fulfil the needs of multimodal travel information service providers. This project is addresses the Project Support Actions 2



- Under CEN standardization work has been set a strong Liaison with WG3 "*ITS for Public Transport*" and WG17 "*Urban ITS*", PT1711 standard model for Alternative Modes



- Interesting overlap with **IXSI 5.0** protocol designed to exchange information on car sharing, like Vehicle availability for every point in time, full potential of station based carsharing realized, ongoing renewal of availability info (even after interrupted connection)



- In touch with *Technology & Standards subgroup*, for the management of overlaps



- A detailed mapping has been started with the latest GBFS version
- A conversion of data from other existing, or under definition/evolution protocol will be done to check that no feature are missing:
 - IXSI
 - RDEX+
 - TOMP when relevant
 - Etc.

- A comprehensive mapping is provided in 2 ways: mapping table and concrete mapping examples

1. Mapping table

CORRESPONDENCE OF XXXXXXXXXXXX: Source (Contributor) GBFS / Target (Reference) NeTEx								QUALIFICATION OF THE CORRESPONDENCE (mark with 'x')							
#	Source Class	A (O=Own; R=Relationship)	Source Attribute Relationship (blue)	Source Attribute type, Simple Type, Complex type, Enumeration	Source multiplicity	Description (as in the Source)	Target correspondence indicator; comments	Corresponding Target class/attribute	Exact corresp. to Target class 1:1	Exact corresp. to Target attribute 1:1	Source-specific class without contradiction to any Target element(s) 1:0	Source-specific attribute without contradiction to any Target element 1:0	Source element belonging to a group of Source elements corresponding to a Target class N:1	Source element derived from several Target elements (before-attributes) 1:N	Other
	Station_information.json					All stations included in station_information.json are considered public (e.g., can be shown on a map for public use). If there are private stations (such as Capital Bikeshare's White House station), these should not be included here.	the description in the source should provide the semantics if this is a source-specific class, then you cannot indicate in column I that it corresponds to PARKING								
	Stations					Array that contains one object per station as defined		PARKING							x
	Stations		station_id	ID		Identifier of a station (string).		PARKING.id		x					
	Stations		lat	Latitude		Latitude of the station in decimal degrees. This field		LOCATION.latitude		x					
	Stations		lon	Longitude		Longitude of the station in decimal degrees. This field SHOULD have a precision of 6 decimal places (0.000001).		LOCATION.longitude		x					
	Stations		name	String		Public name of a station.	to consider the correspondence of an attribute "Name". In transmodel we have ALTERNATIVE NAME/Name and it is meant to be used for any class. Place does not have an explicit attribute "Name"	ALTERNATIVE.NAME.Name		x					
	Stations		short_name	String		Short name or other type of identifier.		ALTERNATIVE.NAME.ShortName		x					
	Stations		address	String		Address (street number and name) where station is located. This MUST be a valid address, not a free-form text description. Example: 1234 Main Street		POSTAL ADDRESS.HouseNumber + POSTAL ADDRESS.Street							x
	Stations		cross_street	String		Cross street or landmark where station is located.		SITE ELEMENT.Landmark		x					
	Stations		region_id	ID		Identifier of the region where the station is located.		TOPOGRAPHIC PLACE.id		x					
	Stations		post_code	String		Postal code where station is located.		POSTAL ADDRESS.PostCode		x					
	Stations		rental_methods	Enumeration: KEY (e.g. operator issued key/job/card); CREDITCARD; PAYPASS; APPLEPAY; ANDROIDPAY; TRANSITCARD; ACCOUNTNUMBER; PHONE.		Payment methods accepted at this station.	corresponds to TYPE OF PAYMENT METHOD in Transmodel. TypeOfPaymentMethod is a TypeOfValue in NeTEx	PaymentMethodEnum		x					

2. Concrete mapping examples

GBFS

```

{
  "last updated": 1434054678,
  "ttl": 0,
  "version": "v2.1-RC",
  "data": {
    "stations": [
      {
        "station id": "station2",
        "is installed": true,
        "is renting": true,
        "is returning": true,
        "last reported": 1434054678,
        "num docks available": 8,
        "vehicles": [
          {
            "bike id": "stu901",
            "is reserved": false,
            "is disabled": false,
            "vehicle type id": "moped1",
            "current range meters": 1234
          },
          {
            "bike id": "vwx234",
            "is reserved": false,
            "is disabled": false,
            "vehicle type id": "escoot3",
            "current range meters": 4321
          }
        ]
      }
    ]
  }
}

```



```

<siri:FacilityMonitoringDelivery namespaces, etc.>
  <siri:ResponseTimestamp>2001-12-17T09:30:47Z</siri:ResponseTimestamp>
  <siri:RequestMessageRef>aRequestIdentifier</siri:RequestMessageRef>
  <siri:Status>true</siri:Status>
  <siri:ValidUntil>2001-12-17T09:30:47Z</siri:ValidUntil>
  <siri:ShortestPossibleCycle>PLY2M2DT10H30M</siri:ShortestPossibleCycle>

```

```

<siri:FacilityCondition>
  <siri:FacilityRef>SOMEWHERE:ParkingArea:station2</siri:FacilityRef>
  <siri:FacilityStatus>
    <siri:Status>available</siri:Status>
  </siri:FacilityStatus>
  <siri:MonitoredCounting>
    <siri:CountingType>availabilityCount</siri:CountingType>
    <siri:CountedFeatureUnit>bays</siri:CountedFeatureUnit>
    <siri:Count>8</siri:Count>
  </siri:MonitoredCounting>
  <siri:MonitoredCounting>
    <siri:CountingType>availabilityCount</siri:CountingType>
    <siri:CountedFeatureUnit>vehicles</siri:CountedFeatureUnit>
    <siri:TypeOfCountedFeature>
      <siri:TypeOfValueCode>moped1</siri:TypeOfValueCode>
      <siri:NameOfClass>moped</siri:NameOfClass>
      <siri:Name xml:lang="en-us">moped</siri:Name>
    </siri:TypeOfCountedFeature>
    <siri:Count>1</siri:Count>
    <siri:CountedItemsIdList>
      <siri:ItemId>stu901</siri:ItemId>
    </siri:CountedItemsIdList>
  </siri:MonitoredCounting>
  <siri:MonitoredCounting>
    <siri:CountingType>availabilityCount</siri:CountingType>
    <siri:CountedFeatureUnit>vehicles</siri:CountedFeatureUnit>
    <siri:TypeOfCountedFeature>
      <siri:TypeOfValueCode>escoot3</siri:TypeOfValueCode>
      <siri:NameOfClass>escoot</siri:NameOfClass>
      <siri:Name xml:lang="en-us">moped</siri:Name>
    </siri:TypeOfCountedFeature>
    <siri:Count>1</siri:Count>
    <siri:CountedItemsIdList>
      <siri:ItemId>vwx234</siri:ItemId>
    </siri:CountedItemsIdList>
  </siri:MonitoredCounting>
</siri:FacilityCondition>

```





TECNOLOGIE
TELEMATICHE
TRASPORTI
TRAFFICO
TORINO



THANK YOU

See You Next Time

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