

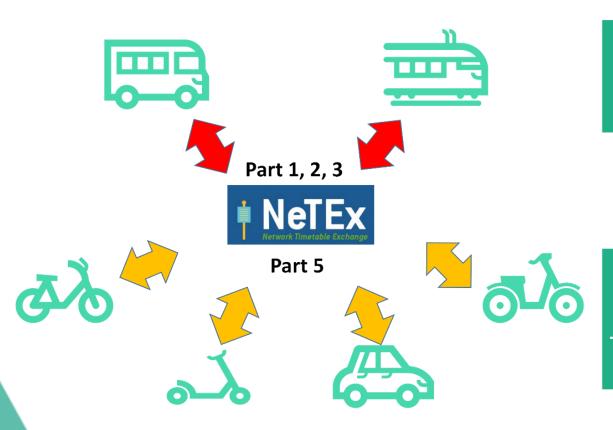
NeTEx Introduction

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NeTEx: covers all public transport modes (collective and on-demand)



Legacy Public Transport

Flexible and on-demand transport

Vehicle sharing
Vehicle pooling
Vehicle rental
Transport Network companies
Taxi





NeTEx: Scope

Planned data

(any information known in advance)

VERSUS "real time" data (but not versus Dynamic data)







NeTEx: Examples of scheduled data

Pricing that changes in a known way during the day is planned



- An "on-demand" service is planned (apart from the final decision to trigger and/or serve): virtual lines, areas, fare offer, etc.
- Replacement service can be scheduled
- An event-based service or pricing (a concert, a football match, incidents, etc.) can be planned





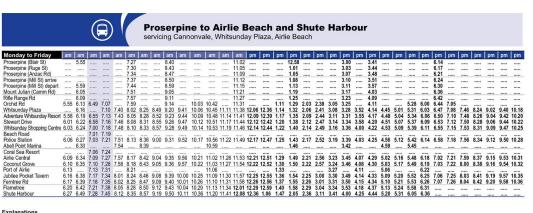


Network structure: lines, stops, zones, connections, etc.



Detailed geography of stops (train station, bus stop, carpool area etc.) and their platforms, structure, equipment, vehicles position, etc.





Shaded area service travels via Beach Rd, Club Crocodile Reception and Coral Sea Resort.

Saturday	am	am	am	am	am	am	am	am	am	am	am	pm	pm	pm	pm	pm	pm	pm	pm	pm	pm	pm	pm	pm	pm	pm	pm	pm	pm
Proserpine (Blair St)		6.32				8.40									1.03								6.14						
Proserpine (Ruge St)				*****		8.43									1.06								6.17						
Proserpine (Anzac Rd)						8.47									1.10								6.21						
Proserpine (Mill St) arrive						8.50									1.13								6.24						
Proserpine (Mill St) depart		6.35				8.59									1.19								6.30						
Mount Julian (Camm Rd)		6.41				9.05									1.25								6.36						
Rifle Range Rd		6.47				9.11									1.31								6.42						
Orchid Rd	5.52	6.49			8.21	9.13		10.03		11.08	11.35	12.17	12.33		1.33				3.53	4.38			6.44	7.05					
Whitsunday Plaza		6.52	7.10	8.04	8.24	9.16	9.31	10.06	10.38	11.11	11.38	12.20	12.36	1.22	1.36	2.06	2.45	3.32	3.56	4.41	5.31	5.59	6.47	7.08	7.46	8.24	9.02	9.40	10.18
Adventure Whitsunday Resort	5.55	6.55	7.13	8.07	8.27	9.19	9.34	10.09			11.41		12.39		1.39	2.09	2.48	3.35	3.59	4.44	5.34	6.02	6.50	7.10	7.48	8.26	9.04	9.42	10.20
Stewart Drive	5.58	6.58	7.16	8.10	8.30	9.22	9.37	10.12	10.44	11.17	11.44	12.26	12.42	1.28	1.42	2.12	2.51	3.38	4.02	4.47	5.37	6.05	6.53	7.12	7.50	8.28	9.06	9.44	10.22
Whitsunday Shopping Centre	6.00	7.00	7.18	8.12	8.32	9.24	9.39	10.14	10.46	11.19	11.46	12.28	12.44	1.30	1.44	2.14	2.53	3.40	4.04	4.49	5.39	6.07	6.55	7.15	7.53	8.31	9.09	9.47	10.25
Beach Road		7.01	7.19																										
Police Station	6.03	7.03	7.21	8.15	8.35	9.27	9.42	10.17	10.49	11.22	11.49	12.31	12.47	1.33	1.47	2.17	2.56	3.45	4.07	4.52	5.42	6.10	6.58	7.18	7.56	8.34	9.12	9.50	10.28
Abell Point Marina	6.06				8.38				10.52						1.50			3.46		4.55	5.45								
Coral Sea Resort		7.04	7.24					*****																					
Airlie Central	6.09	7.06	7.26	8.18	8.41	9.30	9.45	10.20	10.55	11.25	11.52	12.34	12.50	1.36	1.53	2.20	2.59	3.49	4.10	4.58	5.48	6.13	7.01	7.21	7.59	8.37	9.15	9.53	10.31
Coconut Grove	6.10	7.07	7.27	8.19	8.42	9.31	9.46	10.21	10.56	11.26	11.53	12.35	12.51	1.37	1.54	2.21	3.00	3.50	4.11	4.59	5.49	6.14	7.02	7.22	8.00	8.38	9.16	9.54	10.32
Port of Airlie	6.13	7.10	7.30			9.34			10.59				12,54						4.14	5.02									
Jubilee Pocket Tavern	6.16	7.13	7.33	8.23	8.46	9.37	9.50	10.25	11.02	11,30	11.57	12.39	12.57	1.41	1.58	2.25	3.04	3.54	4.19	5.05	5.53	6.18	7.06	7.25	8.03	8.41	9.19	9.57	10.35
Ferntree Rd	6.17	7.14	7.34	8.24	8.47	9.38	9.51	10.26	11.03	11.31	11,58	12.40	12.58	1.42	1.59	2.26	3.05	3.55	4.20	5.06	5.54	6.19	7.08	7.26	8.04	8.42	9.20	9.58	10.3€
Flametree	6.20	7.17	7.37	8.27	8.50	9.41	9.54	10.29	11.06	11.34	12.01	12.43	1.01	1.45	2.02	2.29	3.08	3.58	4.23	5.09	5.57	6.22							
Shute Harbour	6.27	7.24	7.44	8.34	8.57	9.48	10.01	10.36	11.13	11.41	12.08	12.44	1.08	1.51	2.09	2.36	3.14	4.05	4.30	5.16	6.04	6.29							

Detailed timetables
(arrival and departure
time) with all days
where timetable
applies, the calendars,
the notes, the
exceptions, etc.







The vehicles (train, wagons, bus, school bus, bicycle ...) and their equipment.



The points of interest, or places that generate traffic/displacements (cinema, touristic points, city hall, etc.) and their address and entrance.

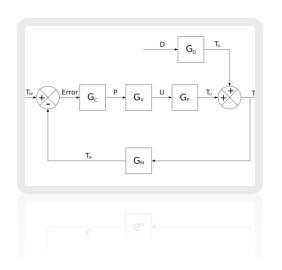




The parking areas (detailed parking bays plan, entrances for vehicles and pedestrians, etc.) and parking services, their character istics and pricing.





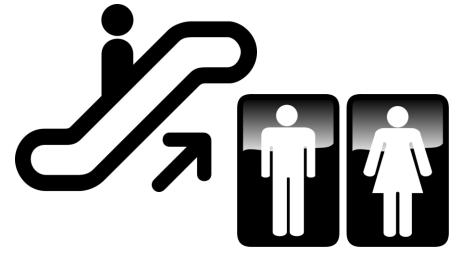


The data and processes of operations: time points, vehicle services, journey duration, etc.



The tariffs offer: access rights, user profiles, sales conditions, distribution, prices, etc.





The equipments: escalator, lifts, ticketing devices, gates, displays, toilets, services, etc for places and vehicles.





Accessibility information and the available services



Pedestrians' paths (in stations, correspondances, around the stops, etc.) and their characteristcs





NeTEx: Information systems

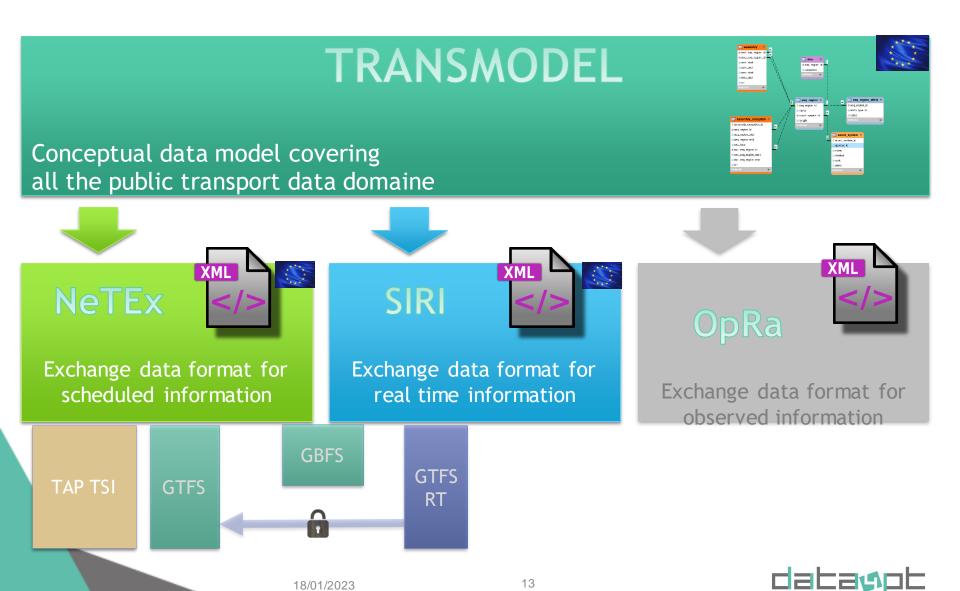
 The tools and concepts used for information systems are different per type of system
 NeTEx ensures consistency





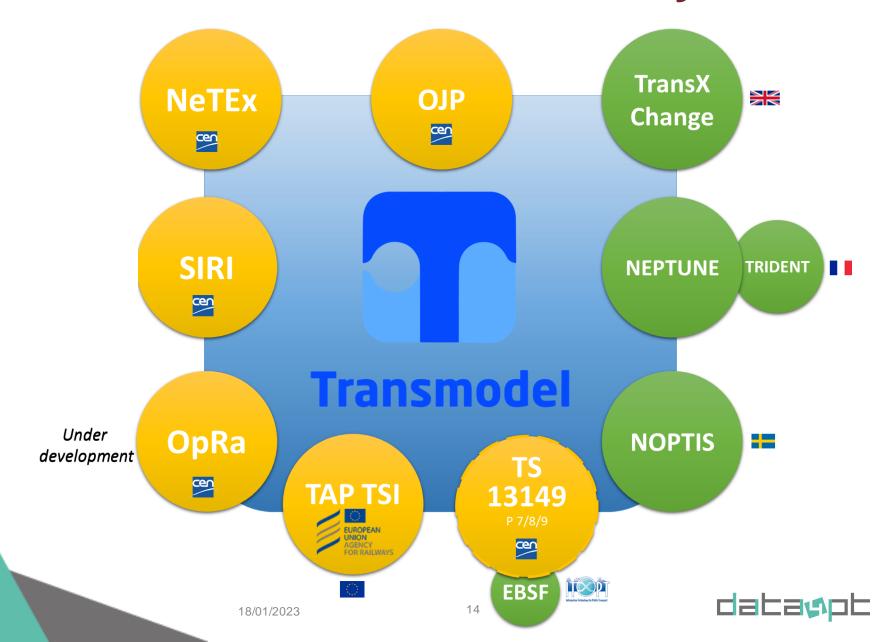


NeTEx: a consistent ecosystem





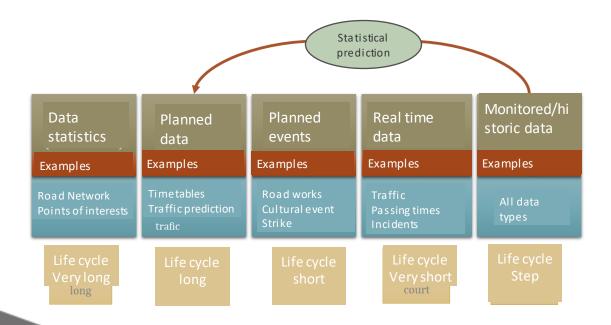
NeTEx: a consistent ecosystem





NeTEx: life cycle of data

- Data has a life cycle and must be updated regularly... this goes hand in hand with the notion of Version
- Each data version can have a Validity Period (global to the dataset or by object)
- It is important to be able to broadcast updates in advance, so that the systems have time to take them into account (addition of new stops from next week) and propose them in the route calculations







NeTEx: life cycle of data

- The unique and permanent Identification is fundamental in particular when there are several suppliers: this mechanism is specified by NeTEx and its profiles
- NeTEx allows to reference objects inside and outside a dataset (necessary for a good use of reference data, like stops)





NeTEx: exchange format

```
<!-- Frame NETEX ARRÊT-->
<GeneralFrame version="001" id="AURIGE:TypeOfFrame:NETEX ARRET-Le-Corbusier:LOC">
      <Name>Frame NETEX ARRET Le Corbusier
      <Description>Frame NETEX ARRET pour l'exemple d'arrêt Le Corbusier/Description>
      <TypeOfFrameRef ref="FR:TypeOfFrame:NETEX ARRET">version="1.01:FR-NETEX ARRET-1.0"
      <members modificationSet="all">
            <!-- LIEU D'ARRET MONOMODAL Jules Michelet -->
            <StopPlace version="001" id="FR:78197:StopPlace:00004:LOC">
                  <!-- le "LOC" sera supprimé si l'on dispose d'un référentiel d'arrêt partagé -->
                  <Name>Jules Michelet
                  <Description>Lieu d'arrêt monomodal Jules Michelet/Description>
                  <Centroid>
                         <Location id="AURIGE:Location:00011:LOC">
                               <Longitude>2.071341</Longitude>
                               <Latitude>48.766715</Latitude>
                        </Location>
                  </Centroid>
                  <placeTypes>
                         <TypeOfPlaceRef ref="monomodalStopPlace"/>
                  </placeTypes>
                  <RoadAddress version="any" id="AURIGE:RoadAddress:address11:LOC">
                         <RoadName>Rue Le Corbusier
                  </RoadAddress>
                  <Landmark>Face à l'école maternelle Jeanne Moreau</Landmark>
                  <TopographicPlaceRef ref="INSEE:TopographicPlace:78297"/>
                  <OrganisationRef version="001" ref="AURIGE:Operator:768:LOC"/>
                  <!-- Fait partie du Pôle Monomodal Le Corbusier -->
                  <ParentSiteRef version="001" ref="FR:78197:StopPlace:00001:LOC"/>
                  <TransportMode>bus</TransportMode>
                  <StopPlaceType>onstreetBus</StopPlaceType>
                  <quays>
                         <QuayRef ref="AURIGE:Quay:008:LOC" version="001"/>
                         <QuayRef ref="AURIGE:Quay:008:LOC" version="001"/>
                  </quays>
            </StopPlace>
            <Quay version="001" id="AURIGE:Quay:008:LOC">
                  <Name>Jules Michelet
```



Exchange formats (example GTFS)

```
stop id, stop code, stop name, stop desc, stop lat, stop lon, zone id, stop url, location type, parent station, stop timezone, wheelchair boarding
"1001", "1001", "Longs Champs", "Rennes", "48.1290770000", "-1.6325300000", "", "", "", "", "", "1"
"1002", "1002", "Bouzat", "Rennes", "48.1282830000", "-1.6377820000", "", "", ""
"1003","1003","Gallet","Rennes","48.1273690000","-1.6404330000","","","","","",""
"1004","1004","Donzelot","Rennes","48.1252440000","-1.6426760000",
"1005", "1005", "Mirabeau", "Rennes", "48.1233630000", "-1.6463170000",
"1006","1006","Turmel","Rennes","48.1222900000","-1.6507420000","","",""
"1007","1007","Assomption","Rennes","48.1214460000","-1.6550360000",""
"1008","1008","Painlevé","Rennes","48.1232120000","-1.6602160000","",""
"1009","1009","Metz Volney","Rennes","48.1216350000","-1.6631860000",
"1010", "1010", "Guéhenno", "Rennes", "48.1192410000", "-1.6676930000", "", "
"1011","1011","Fac de Droit","Rennes","48.1183120000","-1.6713150000","",""
"1012", "1012", "Sévigné", "Rennes", "48.1160500000", "-1.6742450000", "", ""
"1014", "1014", "Sainte-Anne", "Rennes", "48.1137390000", "-1.6790380000", "", "", ""
"1015", "1015", "Champ Jacquet", "Rennes", "48.1125200000", "-1.6803520000"
"1016","1016","République","Rennes","48.1100730000","-1.6801010000","","
"1017","1017","Les Halles","Rennes","48.1084150000","-1.6802130000","","","'
"1018", "1018", "Plélo Colombier", "Rennes", "48.1062040000", "-1.6809990000",
"1019","1019","Cité Judiciaire","Rennes","48.1050840000","-1.6847310000","","
"1020","1020","Mermoz","Rennes","48.0974420000","-1.6895660000","","","","","","
"1021","1021","Cité Judiciaire","Rennes","48.1054440000","-1.6840050000",""
"1022","1022","Plélo Colombier","Rennes","48.1062220000","-1.6807360000","","
"1023","1023","Les Halles","Rennes","48.1080660000","-1.6800480000","","",""
"1024", "1024", "République", "Rennes", "48.1099770000", "-1.6802680000", "", "", "'
"1025","1025","Champ Jacquet","Rennes","48.1127380000","-1.6802110000"
"1026","1026","Sainte-Anne","Rennes","48.1148200000","-1.6792420000","","",
"1027","1027","Hôtel Dieu","Rennes","48.1171630000","-1.6773510000","","","'
"1028","1028","Sévigné","Rennes","48.1175130000","-1.6735380000","","","","",""
"1029","1029","Fac de Droit","Rennes","48.1182810000","-1.6695910000","","",
"1030","1030","Guéhenno","Rennes","48.1195720000","-1.6666290000","","","","
```





NeTEx: Profiles

- A profile makes it possible to focus only on the part of NeTEx corresponding to a given use case, and to specify the specific rules in a territory
 - They much smaller document and it is usually much easier to star by reading the profiles
 - There a EU and national profiles
- Profiles can focus on Stops, Network, Timetable, Fare, Parking, Accessibility, New Mode, etc.









Thank you for your attention

https://data4pt-project.eu/

Illustrations https://openclipart.org

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