







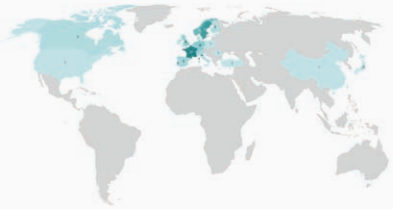
ACTIVITY REPORT 2020

ITXPT

Open IT architecture and interoperability

The non-profit association ITxPT enables an open architecture, data accessibility and interoperability between IT systems. The members of ITxPT develop the IT architecture for public transport and other mobility services together, based on standards and best practices. The specification is publicly available on the ITxPT website.

2020 in numbers



2020 was a successful year for ITxPT, where the enhancement of remote online activities could guarantee and even improve efficiency. ITxPT continually grows, with 20 new members in 2020.

Wiki registrations in 2020

654

Wiki registration growth in 2020

+27%

Anyone can register an account in the ITxPT documentation center and find Technical Specifications, Labeling process, and other information. The wiki users are spread worldwide and represent authorities, operators, vehicle manufacturers, IT suppliers, academics, and more.

2020 monthly logins:

505 login each month, average 17 logins per day

Meetings and activities in numbers

Members meetings: 2	Requirements Committee: 20	Technical Committee: 19
Working groups: 3 RWGs 4 TWG	RC involved members: 44 RC persons involved: 57	TC involved members: 52 TC persons involved: 112

MEMBER OF ITxPT

Members from the whole world

In 2020, ITxPT counted 142 members from 29 different countries spanning over 18 time zones. 76% within and 24% outside of EU. 37 members were public transport authorities, operators, or partner associations, and the remaining were vehicle and system suppliers.

Members

142

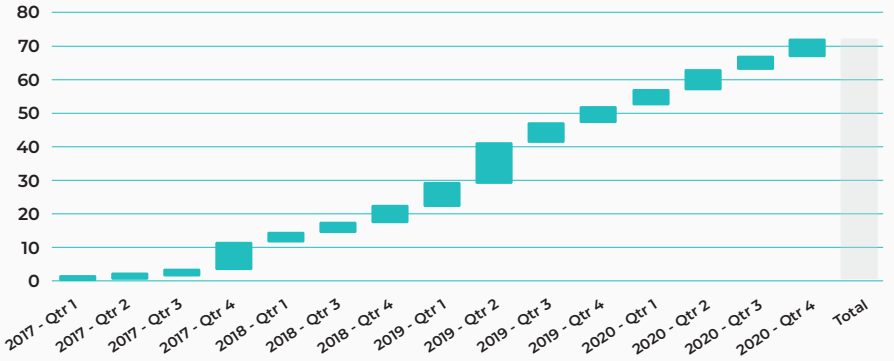
Countries

29

Label applications

Label increase in 2020

+37%



Quarterly label applications 2017–2020

Labels total: 71	Modules total: 50	Vehicles total: 18	Backoffice interfaces: 3
Labels added 2020: 19	Modules added 2020: 16	Vehicles added 2020: 2	BO added: 1

A word from the Secretary General

Looking back at 2020, we see a year of significant progress for ITxPT. We have implemented the 2019 decision to develop our governance process and establish the Requirements Committee. With committee meetings every week and a clear focus on the customer perspective, the new model proved a success in driving the specification development. During 2020, we welcomed 20 new members.

We are now at a point where multinational companies look to the ITxPT roadmap to ensure their plans are on the right track. Many fast-evolving technology areas like electric and autonomous vehicles and Mobility as a Service (MaaS) will impact public transport and mobility significantly. They need standardized solutions, and ITxPT plays a vital role in guiding to applicable standards and best practices.

Since the beginning of 2020, ITxPT manages the technical implementation of the Data4PT project with National Access Points for travel data. The project spans over Europe and involves several EU member states. Of the involved states, nine are members of the Data4PT consortium.

With a new governance process and refined collaboration skills, we will further develop ITxPT collaboration capabilities. We will continue to develop the Paris and Gothenburg labs. We will also launch the new cloud lab with remote access, ensuring a consistent output in all lab facilities. Finally, we are all looking forward to a normalized world where we can meet, use public transport without restrictions and shake hands again.

Regardless of circumstances, ITxPT continues to enable the digitalization of mobility services and to make shared mobility more accessible and customer-oriented across Europe and the world.

Primary objectives for 2021:

- Evolve the ITxPT specification with customer needs in focus
- Develop the community through ITxPT Committees and Working Groups
- Provide implementation support for PTA and PTO
- Develop labeling, technical support and lab strategy with local labs
- Continue implementation of National Access Points as implementation body in the EU PSA Data4PT

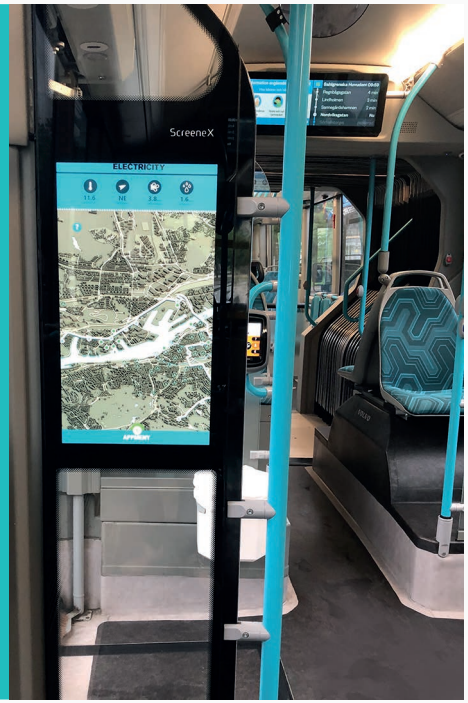
Anders Selling
ITxPT Secretary General

ITxPT – **a strategic choice**

In a world with continually accelerating IT evolution and ever-changing systems and solutions, data is vital. To access and manage your data, the ITxPT IT architecture, and standardized data formats, are essential. Other strategic advantages are streamlined procurements and standards implemented worldwide. The open standards of ITxPT also promote innovation and competition.

Significant benefits of ITxPT:

- Improving data accessibility
- Standardizing data formats
- Promoting innovation and competition
- Avoiding vendor lock-in
- Enabling multi-vendor procurement
- Standardizing hardware connections and enabling preinstalled wiring
- Enabling a shared internet connection and GPS for each vehicle
- Facilitating hardware exchange and software updates



Access to data – a strategic benefit

The standard based ITxPT architecture serves many purposes for example:

- pursuit of cost benefits
- flexibility
- efficient installation
- streamlined introduction of new services and maintenance

Innovative PTA have expressed that access to their data is a key to the value and competitive advantage of their operations. Interoperable systems with data in a standardized format enable direct access to all data - something proprietary solutions do not provide.

Tenders – streamlined procurements

The ITxPT specification streamlines the procurement process and reduces the time and costs of specifying IT systems during tenders for both buyer and seller.

- **Purchaser** – can refer to the ITxPT specifications and only needs to specify add-ons or exceptions.

- **Supplier** – can focus on the add-ons and exceptions and does not have to specify how they will deliver the functionalities already described in the ITxPT specifications.

EU standards and EC policy

The ITxPT specifications provide implementation details for EU standards from CEN TC278 WG3 (ITS Public Transport), such as TS13149 onboard, Transmodel, SIRI, NeTEx. The ITxPT Technical Committee Chair is convenor of **CEN TC278** WG3.

In 2020, EC requested implementation of Transmodel, SIRI, NeTEx for NAP (National Access Point) through delegated regulation 2017/1926 for "Provision of EU-wide multimodal travel information services". ITxPT was chosen as implementing body of this strategic topic in the DATA4PT project dealing with this implementation.

CEN/TC 278
ITS standardization

European Commission

Exchangeable modules evolve the market

Open architecture and Plug and Play functionality facilitate innovation and flexibility. A market can evolve through exchangeable modules, where the system owner can exchange modules without changing the whole system. It provides the buyer access to the best-of-breed in every part-solution and enables standardized hardware and software, giving cost benefits compared with specialized solutions.

2020 ITxPT Timeline

January 8: Extraordinary General Assembly meeting.

20 Requirements Committee meetings

19 Technical Committee meetings

March 24: Data4PT remote kick-off meeting.

April 16: Gothenburg Lab webinar for Swedish stakeholders.

May 6: Executive Board meeting.

May 14: Meeting with French public transport authorities.

June 25: General Assembly and Members Meeting.

June 30: RIVSILOn project ends.

July 9: Executive Board meeting.

September 9: Executive Board elected Guido Di Pasquale as Chairman of the Requirements Committee and Emmanuel de Verdalle as Chairman of the Technical Committee.

September 2: ITxPT thanked Jemima Woolverton for her work as Requirements Committee Chair.

October 21: Data4PT Consortium meeting.

October 15: Final RIVSILOn meeting at ITxPT office. Discussions of a continuation - RIVSILOn 2.

November 5: Data4PT Stakeholders' Workshop.

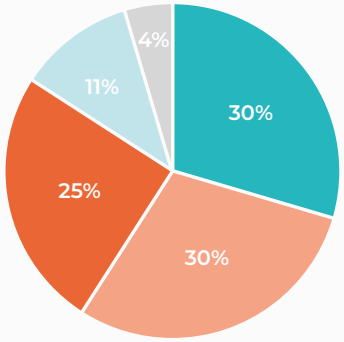
November 26: Executive Board meeting.

December 1–3: IT-Trans online.

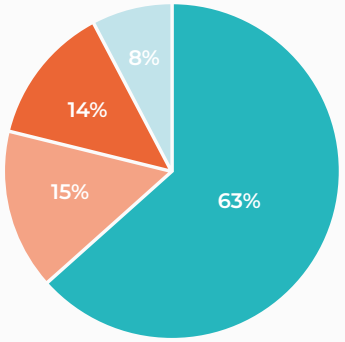
December 10: General Assembly and Members Meeting.

JAN 05 19 · FEB 03 18 · MAR 01 15 29 · APR 03 25 · MAY 08 22 06 20 · JUN 27 03 17 · JUL 10 24 01 08 15 · AUG 19 26 · SEP 02 09 16 23 30 · OCT 07 14 21 28 · NOV 04 11 18 25 · DEC 02 09 16

RC 44 participating organisations



TC 52 participating organisations



PTA · PTO · IT Supplier · Vehicle Manufacturer · Association

MEMBER OF ITXPT

The **Collaborative Community**

ITxPT is a non-profit organization where the collaboration between the members is the heart of the operation. Committees and working groups composed of members carry out the work, with the ITxPT Office supporting and leading the processes.

A year of remote closeness

2020 has been a year of almost only remote work. However, we have maintained an even closer contact within our collaborative community, thanks to online meetings and digital tools. In the future, we will use the best of both; live conferences for deeper connection and networking complemented with frequent remote sessions. Online meetings allow more people to participate from anywhere, saving both time and travel expenses.

A new governance model established

ITxPT grows fast, which demands well-defined customer needs, technical solutions, and a structured governance process. Therefore, we launched the Requirements Committee in early 2020 to collect requirements from authorities, operators, and other stakeholders. The functional requirements feed the Technical Committee and drive the ITxPT specification changes, with the customer in focus.

In 2020, the Requirements Committee played a vital role as the customer's voice, with 42 different organizations participating. Always with the customer in the driver's seat and both authorities, operators, and industry represented.

The September 9 Executive Board meeting consolidated the new governance process through a unanimous decision.

June 25 - Members Meeting

The well attended online meeting concluded a highly intense and productive period for the ITxPT Collaborative Community. Topics addressed were; the new governance process, the Heavy Rail working group, the EU project Data4PT, the RIVSILOn project, and the ITxPT cloud lab. The Technical Committee also presented a plan for a new Data Centric working group.

December 10 - Members Meeting

The ITxPT collaborative community summarized a successful year, with a high degree of remote and online-based activities and a new governance model. The fruitful year also yielded a high outcome from committees and working groups, Data Centric guidelines for writing specifications, and the release of version 2.1.1 of the ITxPT specifications. The Members Meeting attendees had filled in a survey as a foundation for reviewing the ITxPT roadmap. The survey showed a strong interest in interfaces that enable Mobility as a Service and Mobility on Demand:

- Passenger information systems
- Communication channels
- Schedule and real-time data
- Ticketing

The Requirements committee updated the roadmap during the first period of 2021.

Project participation supports standardization

As a highly active collaborative community, we are leaders, key contributors, and participants in several projects on the EU and national level. Through our contribution, we help to increase implementation of the ITxPT specification and support standardization initiatives on all levels:

- **Data4PT** - support for Siri/NeTEx, and implementation of National Access Points
- **Show** - defines interoperability aspects of autonomous vehicles
- **Nordic Way 3** - a Nordic communication and infrastructure project
- **RIVSILOn 2** - building an ITxPT reference installation in a fully electric vehicle usable in real production
- **Shift2Rail and Connecta3** - compatibility between ITxPT and train control network

The **Technical Specifications**

The technical specifications are the core of ITxPT - a collection of specifications and best practices for an open mobility IT architecture. The specifications can refer to complete or parts of official standards like CEN or ISO.

Specification general content

The ITxPT specifications describe:

- physical requirements
- architecture
- generic mechanisms
- communication protocols
- data models for ITxPT compliance

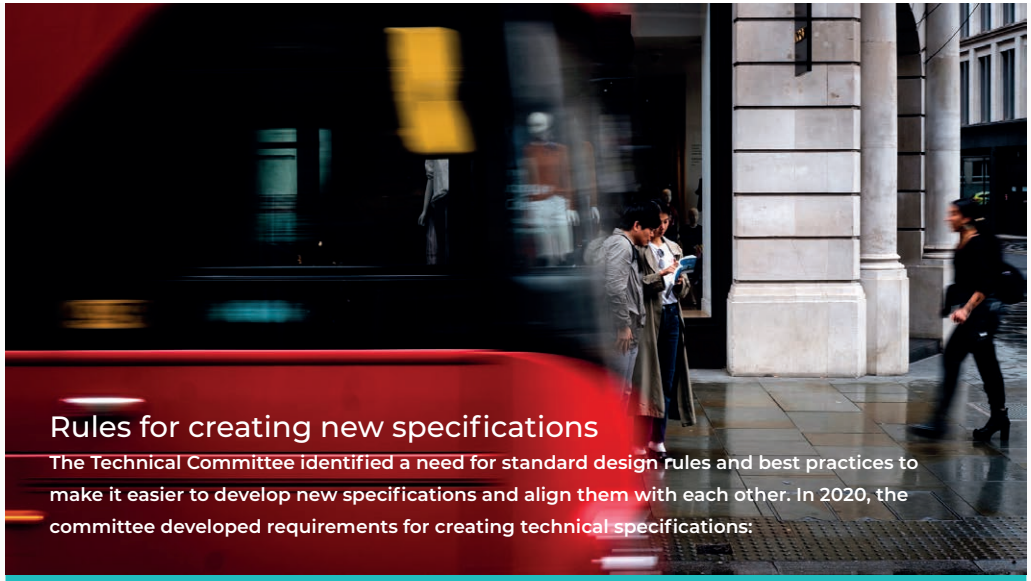
Specifications updated in 2020

Version 2.1.1 of the ITxPT specifications, finished in 2020 and released at the beginning of 2021, is a patch update with adjustments and clarifications to increase its quality. The update addressed sixty comments from users based on labeling experience and technical requests. Read more about version update levels here;
https://itxpt.org/news/itxpt-specification-what-do-the-numbers-mean/

Known Issues document and Client development guideline

In addition to the 2.1.1 specifications, we will release these documents:

- Release notes – overview of changes in the release
- Change log – presents all changes in detail
- Known issues - describes issues that were not fixable as part of the 2.1.1 update
- Client development guidelines – list technical aspects when developing clients towards the ITxPT on-board services



Rules for creating new specifications

The Technical Committee identified a need for standard design rules and best practices to make it easier to develop new specifications and align them with each other. In 2020, the committee developed requirements for creating technical specifications:

- ***General Design Rules*** - apply to all new ITxPT specifications and technical requirements on a conceptual level
- ***Conceptual Design Rules, example Data Centric*** - describe Data Centric architecture principles and how to work with them
- ***Protocol Design Rules, example MQTT*** - requirements for creating technical specifications using the MQTT communication protocol, completed during Q1 2021
- ***Formatting Design Rules, example JSON*** – this area is ongoing and will be addressed during 2021

What is Data Centric?

Data Centric refers to an architecture where data is the primary and permanent asset, and applications come and go. In the Data Centric architecture, the data model precedes the implementation of any given application and will be around and valid long after it is gone.

In an ITxPT context, Data Centric is a governing principle in the design work that avoids lock-in effects. It aims to establish an architecture for exchanging self-describable sets of information. In the model, the Data Producers need no knowledge about the Consumers since they can fully and accurately identify the data. Likewise, the Consumers don't need to know how the data is produced, making the data a permanent asset, independent of applications.

ITxPT **Laboratories and Services**

ITxPT has labs in Paris and Gothenburg. The labs help members and non-members with labeling, compliance testing, and other aspects of implementing the ITxPT specifications. ITxPT is also ready to launch a cloud lab in 2021.

Guidance through the labeling process

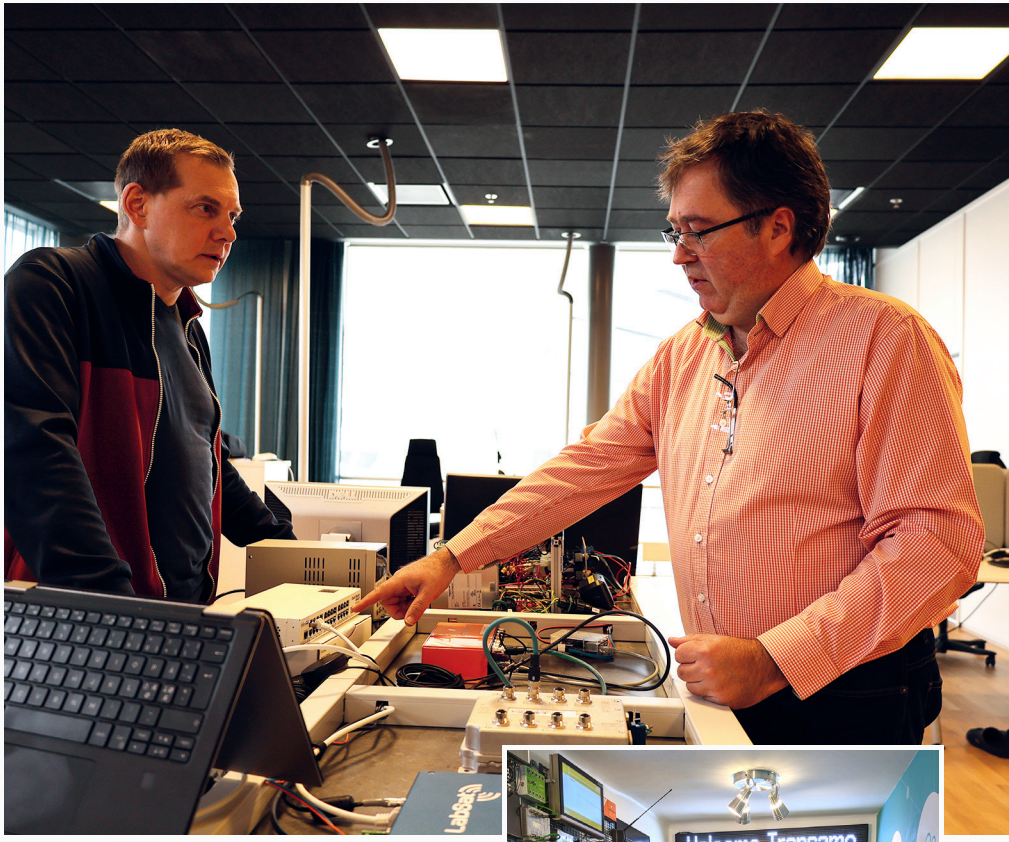
ITxPT guides and supports label applicants in developing compliant modules, services, backoffices and vehicles. The tests are iterative, and the applicant can adjust configurations along the way to achieve compliance with the specifications. You can find all ITxPT labels listed in the ITxPT catalog on the ITxPT website. Labeling applications in progress are also displayed there. The labels are key triggers to secure implementation, integration and deployment of the ITxPT specification.

Cloud lab

The cloud lab is a virtual lab under development, which will be an essential part of deploying future local labs by connecting them. The cloud lab is a very efficient tool for remote access and remote tests that ensures a consistent outcome for all lab tests. The members can also create virtual test environments and run tests in the cloud. The cloud lab will supply validation tools, simulations reachable through an enhanced VPN server, and project tools dedicated to each project. By the end of 2020, the cloud lab was running internally, testing the first services for release to ITxPT members in 2021.

New Gothenburg facilities

In 2020, the Gothenburg lab moved into a new office at Lindholmen Science Park, with enough space to build a more comprehensive lab with a second test bench for parallel tests and an expanded office. The lab is currently under development in connection to the Paris lab and the cloud lab. An important aspect is implementing the ReQtest test management tool.



Lab manager Anders Fromell and Joakim Jardeby in the Gothenburg lab.

Lab manager Victor Dardenne and guests in the Paris lab.

ITxPT lab services

The ITxPT labs today deliver a handful of different services:

Development - supporting the developers when implementing the specifications

Implementation validation - ensures that implementations are compliant

Project platform - hosts technical activities of European projects

Integration - helps integrating units after testing them

ITxPT members 2020

21st Century
Access IS
Actia Automotive SA
ADIBUS
AESYS SPA
AllianceSwissPass
Alstom Transport
Arcobel
Arriva PLC
Arriva Trains UK
ASSTRA
AtB (Sør-Trøndelag)
ATRON
Axis Communications AB
Belden Group
BESTMILE
Bus Eireann
BusInfo SARL
Bustec Info
BYD Europe B.V
Cango Hard & Soft
CARD4B
CIBEST
CLEVER DEVICES
Conduent Business Solutions
Consat Telematics
CS GROUP - France
Daimler - Evobus GmbH
DATIK (Irizar Group)
Digimobee
DILAX Intelcom
DRESEARCH FAHRZEUGELEKTRONIK
Egis Rail
Engie - Ineo Systrans
Eurotech
Expleo Group
Fara
Finnish Public Transport Association (PLL)
FLOWBIRD
FourC
Gaia
Giro
GMV Sistemas S.A.U.
GVB
Hanover Displays
Hogia Public Transport Systems
HostMobility
HSL Finland
Icomera
INDRA SISTEMAS
Infodev
INIT GmbH
InTraffic
ISR Technologies
IVECO CNH-Industrial
IVU Traffic Technologies
KentKart
KEOLIS
Kiho Oy
Kollektivtrafikkforeningen
Kontron
Lantech Communications Global Inc
LECIP
LIT-Transit
LTA Singapore
Luminator Technology Group
LUMIPLAN DUHAMEL
Maestronic
METATRONIX
METRON
METROTEK AS
MLC-ITS
Movia
MultiQ
M_Comp
Navocap
NEC
NetModule AG
NFK - Nordland County Council
Nobina Europe AB
Norgesbuss
Norled
Observit AB
OPENMATICS
Owasys
Oxyfi
Pilotfish
PPTexcellence
R2P
RATP
Ridango
RTM
Ruter AS
Scania CV AB
SEE
Seipra Score
Sesaly
Sigmax Public Transport
Skanetrafiken
Skantech
SKYSS (Bergen, Norway)
SLL
SNCB/NBMS
SNCF
Solaris
SPEC
Squarell
ST ENGINEERING
STIB
Stratio Automotive
Streamax
Swarco
SYNECTICS MOBILE SYSTEMS
Tait Europe Ltd
TELEXIS
Telia Company
Tenix
TEQ
THALES Revenue Collection Systems France
Thoreb
Tide
TIMESPACE
Tisseo Collectivités
Tom Tom
TPG
Transdev
Transport for London
Transports publics de la région lausannoise
Trapeze
Triona Group
TRONTEQ Electronic
UITP
Unibuss
Västtrafik
Vix Technology
Volvo
Vy Buss
Wavecom
WESTERMO
Xee
Ximedes
Xovis

ITXPT

INFORMATION TECHNOLOGY
for PUBLIC TRANSPORT

ITxPT

Information Technology for Public Transport
Rue Sainte-Marie 6
1080 Brussels, Belgium
Tel: +32 492 08 36 78
itxpt.org

ITxPT Paris lab

Rue Notre Dame de Lorette 10
75009 Paris, France

ITxPT Gothenburg lab

Lindholmspiren 3–5
402 78 Gothenburg, Sweden