




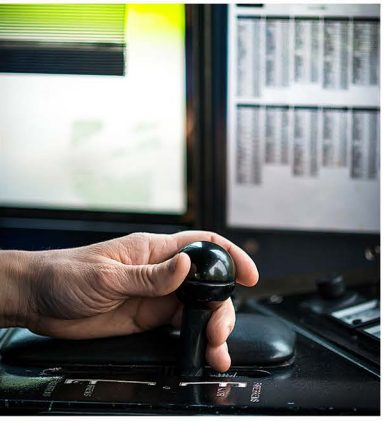




ACTIVITY REPORT 2019

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.

ITXPT

INFORMATION TECHNOLOGY
for PUBLIC TRANSPORT

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2019 in numbers

2019 was a successful year for ITxPT. An important factor and driver of progress was that during the year an increasing number of PTAs and PTOs used the ITxPT specifications as a standardized set of requirements when purchasing vehicles and equipment. ITxPT grows constantly, with 26 new members in 2019. Another important aspect is the increasing interest among suppliers and labels delivered.

Wiki registrations in 2019

776

Wiki registration growth in 2019

+38%

In the ITxPT documentation center anyone can register an account - either member or non-member - and find Technical Specifications, Labeling process, presentations, and a calendar. The wiki users are spread all over the world: Europe, Asia, America, Africa, Australia. They come from various sectors: PTA, PTO, vehicle manufacturers, module suppliers, academics, associations and more.

Wiki registration growth in 2019: +38 % (1511 to 2088 Wiki accounts). 556 monthly logins in 2019, more than 18 logins a day. Logins in 2019 were 45 % ITxPT Members and 55 % Public users.

Working groups and Members Meetings

In 2019 a major effort was made on the technical specification 2.1, and from the beginning of the year, 9 working groups were active, with full focus especially on Siri, NeTEx, FMS needs collection, cyber security and data requirements. During the fall the focus was turned to DPI and MQTT. In total around 100 persons from 30 members have been involved in ITxPT collaborative activities. During the year, 2 Member Meetings were held, with around 200 attendants in total.

MEMBER OF ITxPT

Members from the whole world

In 2019, ITxPT counted 122 members from 26 different countries spanning over 18 time zones. 31 were public transport authorities, operators or partner associations and the remaining were vehicle and system suppliers.

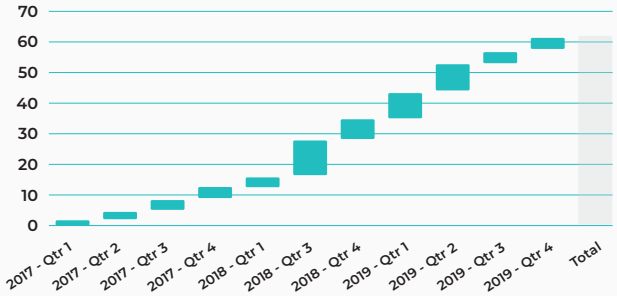
Members

122

Countries

26

ITxPT Label applications



Quarterly label applications 2017–2019

Labeling requests until end of 2019

61

Labeling requests in 2019

27

Labels total: 51	Modules total: 41	Vehicles total: 8	Backoffice interfaces: 2
Labels added 2019: 18	Modules added 2019: 15	Vehicles added 2019: 3	

Secretary General Anders Selling and ITxPT Executive Board member Alain Borruat at the Suisse IT talks.

A word from the Secretary General

Looking at 2019, we can see that ITxPT is strengthening its position in Public Transport. I have reflected over the UITP summits in 2017 and 2019 and the contrast becomes clear. In 2017 we had a tradeshow stand of our own for the first time and were quite unknown. In 2019 we drew a lot of attention, but much more important was that so many members now exposed ITxPT as an ingredient brand, that we actually ran out of roll-ups and display material for display on members' stands.

An important factor for the increase in awareness is the authorities' and operators' use of ITxPT as a qualifier in tenders, with Ruter in Oslo as the pioneer. We see the result in labeling activities, analytics of the ITxPT website, registrations to the ITxPT documentation center, membership growth as well as in collaborations with member states and national associations.

The trend towards open data and standardized interfaces is not unique to Public Transport. In consumer electronics we already know what e.g. Bluetooth, USB or Android have achieved, enabling large and small industry actors to comply to common specifications benefiting innovation, quality, and cost.

In 2019, we have been growing fast, with challenges in defining customer needs and viable technical solutions, but maybe the most important challenge is to manage the growth of the organization, with more members, countries, organizations, and interests involved in the process.

Major objectives going forward:

- Drive the ITxPT specification development from customer needs
- Develop the community with the Requirements and Technical Committees and Working Groups
- Provide implementation support for PTA and PTO
- Develop labeling and technical support, lab strategy with local labs
- Support implementation of National Access Points as implementation body in EU project Data4PT

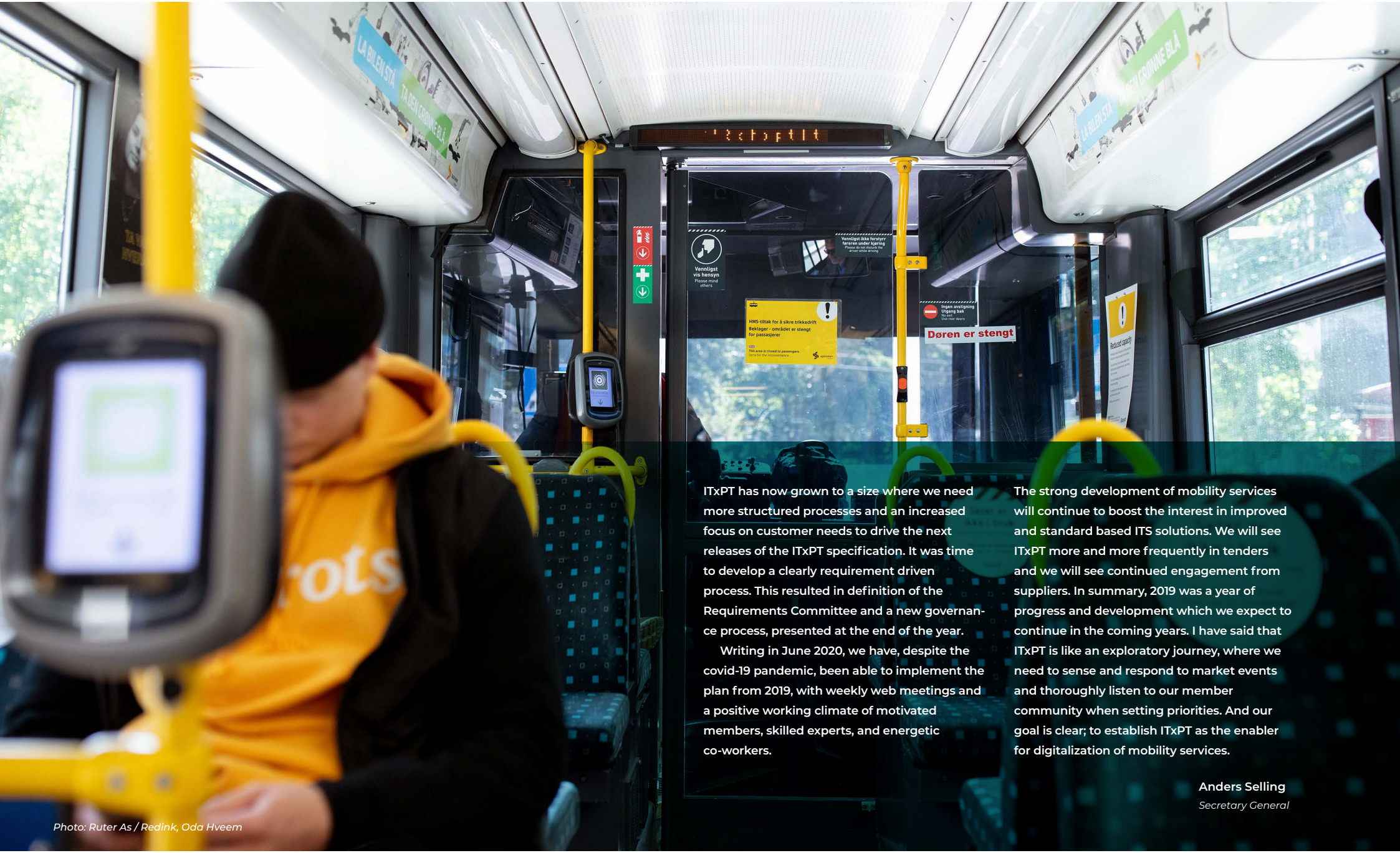


Photo: Ruter As / Redink, Oda Hveem

ITxPT has now grown to a size where we need more structured processes and an increased focus on customer needs to drive the next releases of the ITxPT specification. It was time to develop a clearly requirement driven process. This resulted in definition of the Requirements Committee and a new governance process, presented at the end of the year.

Writing in June 2020, we have, despite the covid-19 pandemic, been able to implement the plan from 2019, with weekly web meetings and a positive working climate of motivated members, skilled experts, and energetic co-workers.

The strong development of mobility services will continue to boost the interest in improved and standard based ITS solutions. We will see ITxPT more and more frequently in tenders and we will see continued engagement from suppliers. In summary, 2019 was a year of progress and development which we expect to continue in the coming years. I have said that ITxPT is like an exploratory journey, where we need to sense and respond to market events and thoroughly listen to our member community when setting priorities. And our goal is clear; to establish ITxPT as the enabler for digitalization of mobility services.

Anders Selling
Secretary General

ITxPT – **a strategic choice**

In all industries there is a continuous development of IT systems towards connecting everyone and everything through internet. Public Transport and mobility services are the same, with vehicles, equipment, services, and passengers increasingly connected. In a modern city infrastructure, millions of things are connected, from small sensors to city-wide communication systems.

Access to data – a strategic benefit

The ITxPT standard-based architecture serves many purposes - pursuit of cost benefits, flexibility, efficient installation, easier introduction of new services and maintenance etc. An additional strong driver, expressed by innovative authorities, is the access and value of data. It is a key to the value and competitive advantage of many operations. Designing interoperable systems, with data in a standardized format enables direct access to all data - something proprietary solutions usually do not provide. Therefore, ITxPT has become a strategic choice.

Implemented all over Europe

Today there are several initiatives to develop new opportunities in digitalization, mobility, and new services - often as visions and test projects. ITxPT has since 2017 taken the step from the project stage to implementation, where the ITxPT specifications already are in use all over Europe and the association is carrying its own costs.

ITxPT - an enabler for adoption of EU standards

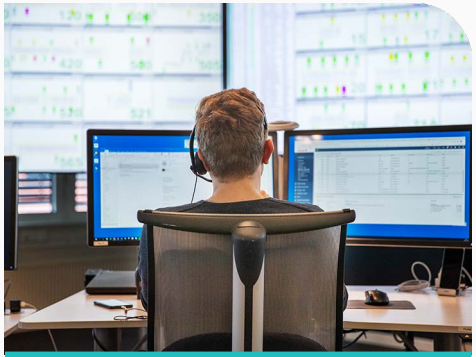
ITxPT supports EU standards and serves as an important link between the definition of the formal standards and implementation by stakeholders. By specifying how to use CEN standards from the TC 278 WG3 like TS13149, SIRI, NeTEx and TRANSMODEL, ITxPT enables the public transport industry to adopt and implement the standards.
In 2019, ITxPT was selected by the EU to be the implementation support organization for SIRI and NeTEx, the standards for timetable- and realtime-data for the National Access points.

A continuously developing scope

ITxPT put PTA and PTO in the driver's seat to - together with the industry - decide what ITxPT's next step in the evolution will be. The specification is sprung out of the needs in a bus, but we now embrace the inclusion of trams, heavy rail, boats, and other modes of transport. Services and data sets are expanded to cover further needs for data which is in progress by the ITxPT member committees to define. In this way ITxPT is an enabler of an ongoing disruption of how we use and access data in mobility.

Innovation and access to the market

Open architecture benefits innovation and flexibility. It provides the buyer and user access to the best of breed in every part-solution. In a modularized architecture the system owner can replace or update one module without having to change the whole system. Standardized hardware and software produced in larger volumes, reduce costs compared with customized and specialized solutions. For IT suppliers it means that competition moves towards innovative services when hardware, data and interfaces become standardized.



Major 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 common internet connection and GPS for each vehicle
- Facilitating hardware exchange and software updates

Photo: Ruter As / Redink, Thomas Haugersveen

2019 in chronological order

January

January: Preparation for Data4PT concession. Answering the European Commission.

January 29: Meeting in Brussels – member states for Data4PT.

February

February: Preparation for Data4PT concession. Answering the European Commission.

February 5: GOF4R (Part of Shift2Rail project). One day conference ITxPT, Paris lab.

March

March 21: Swiss IT talks. The Secretary General was guest speaker.

March 21: Exploitation Manager visits Finnish Public Transport Association.

March 24: Data4PT kickoff.

April

April 2–3: Members Meeting hosted by TPG in Geneva.

April 3: Executive Board meeting - Working Groups put on hold, Nominations Committee assigned.

May

May 9: Technical Committee – kickoff for the specification review.

May 14: Working group meeting – Gothenburg with Västtrafik.

May 15: Dynamic Passenger Information (DPI) - task force initiated.

May 21: Laboratory visit in Paris – SNCF.

June

June 9-12: UITP Summit in Stockholm. An impressive 49 out of 474 exhibitors were ITxPT members.

June 11: Executive Board elects Chairman Terje Storhaug and Vice Chairman Umberto Guida.

June 11: Executive Board initiates work process update to engage PTA and PTO further. It was also decided to focus on DPI and MQTT.

June 11: Networking evening in Stockholm.

July

July 1: Ruter release of 500 buses with ITxPT specification. Of the 500 buses 115 were electric.

July 5: Technical Committee final review of Specification v2.1.

July 11: Data4PT application passed evaluation by European Commission.

August

August 12: Executive Board decision - additional review of 2.1 to be approved next board meeting.

September

September 24: ITxPT visits DVB and HbbTV to benchmark work processes.

September 26: Secretary General invited to ACEA to present ITxPT.

September 26: Ruter in Oslo held a public demonstration of their ITxPT system.

September 27: Technical Committee meeting Oslo agreed on the final release of the 2.1 specification.

October

October 18–23: Busworld Brussels – 20 proud members displaying ITxPT communication material.

October 23: Executive Board Meeting approves Jemima Woolverton as chair of the Requirements Committee and Emmanuel de Verdalle as chair of the Technical Committee.

October 23: Release of Technical Specification 2.1 was approved by the Executive Board.

November

November 12: Oslo public transport conference - Anders Selling (SG), Terje Storhaug (Ruter, Oslo) and Sandra Schweizer (AtB, Trondheim) speakers.

November 14–15: Membership Meeting, Rome supported by ASSTRA, with 13 non-member Italian PTA and PTO as guests.

December

December 4: Executive Board meeting. Preparation for General Assembly - proposed work plan for 2020, budget and membership fees. First 6 months as trial for new governance process.

December 16: General Assembly. Membership fees unchanged - adaptation in September. Work Plan and budget for 2020 agreed upon.

The **Collaborative Community**

ITxPT is a non-profit organization where the collaboration between the members is the heart of the operation, supported by the ITxPT Office that supports and leads the processes. The work is carried out in committees and working groups composed by members.

ITxPT grows

Following a fast growth, in 2018, the Executive Board agreed that growth in terms of members was not the highest priority for ITxPT in 2019. Therefore, focus was turned to developing processes, organization and improving the technical documentation.

Despite this, ITxPT grows thanks to word of mouth, tenders, and an increased awareness of the need for open data and standardized architecture among PTA and PTO. During the year ITxPT has welcomed 26 new members and the number of participants at members meetings and in working groups is steadily increasing.

Members Meeting in Geneva

In April, ITxPT's first two-day Members Meeting was hosted by TPG in Geneva, with about 100 members, workshops, networking and guest speakers Mario Werren, Managing Director of Lémanis S.A and Anne Hornung-Soukup, Chair of the Board at TPG.

Two workshops with engaged and intense discussions evaluated the progress of the working groups and the work of the specification and concluded a number of action items and priorities. The growth and member involvement clearly called for ITxPT to strategically evolve its working processes from the informal structure of a small enthusiastic startup community to the more process oriented and structured mid-size organization.

Focus on customer needs

It was agreed to focus on PTA and PTO needs and to make ITxPT more efficient, agile and customer oriented. It was also decided to benchmark similar organizations.

In connection to this, the Executive Board decided to prioritize restructuring the governance model and to concentrate and accelerate the work with DPI and MQTT, with Ruter in Norway as a model. A major objective with the work on the governance model was to improve internal processes for turning customer needs into functional requirements.

Initiating the Requirements Committee

After benchmarking activities, and a visit to DVB and HbbTV, the Executive Board meeting at Busworld 2019 initiated a revised governance process and the Requirements Committee.

The new committee was defined to collect requirements from authorities, operators, and other stakeholders to feed to the Technical Committee. This will drive the technical activities and changes of the specification and it affects the process for both working groups and committees - an important step to secure the customer perspective and future ITxPT specification releases.

Members Meeting in Rome – joint event with ASSTRA

The following Membership Meeting in Rome was supported by ASSTRA, the National Association in Italy. 13 non-member Italian PTA and PTO participated as guests as a part of focusing on PTA/O's needs and the customer experience. The guest speakers Emanuele Proia, president of ASSTRA, Proto Tilloca - Cagliari, Pasquale Rovito - Napoli, Paulo d'Angelo - Torino and Mirco Armandi - Bologna shared valuable input about on the aging bus fleet in Italy, the importance of the reliability in information coordination, how business intelligence depends on data managing and the need for service integration.

MEMBER OF ITXPT

The **Technical Specification**

The technical specification is the heart of ITxPT - a collection of specified standards and best practices for an open IT architecture related to public transport and mobility. It describes physical requirements, architecture, generic mechanisms, communication protocols and data models for ITxPT compliance.

Specification updated in 2019

In 2019, the specification was updated. Thanks to feedback from implementations, the labeling process and user experiences. After collecting 428 comments in 17 topics, split into 5 categories and going through two rounds of reviews, the v2.1.0 was released. It offers improved readability definition updates, clarifications and corrections of misspellings. This should make the specification easier to understand, implement and to use in tenders. To facilitate quality improvements and maintenance of the specification, the document was split into several documents with dedicated topics. In the updating process, feedback and proposals for future releases were also collected.

1. Installation requirements:

The installation requirements got a structure update with clearer differentiation between mandatory vs. optional and vehicle vs. module side.

Recommendations for connectors and cable requirements were updated according to Gigabit Ethernet, and some clarifications were made regarding analog signals.

2. Onboard architecture:

The architecture was organized by related services and the process of naming the services was aligned with standardized convention. For MQTT, JSON is now recommended.

There were also updates made regarding http-based subscriptions, FMStoIP, power consumption at sleep mode, ITS mode vs Vehicle Use Phase and time service. Also, optional support for “main switch” was added to align with “Ignition”. Improved version control was added.

3. Back-office architecture:

The document was reorganized according to related protocols, clarifications for data providers were made and the back-office data structure was aligned with the onboard architecture. There were also updates made regarding framework independence and data mapping vs vehicle energy.

> ***“The needs of mobility providers and travelers shall drive the development of ITxPT. The Association’s fast-growing collaborative community is a great enabler for the digitalization of Public Transport. Within ITxPT, we drive the development together and not from individual corporate agendas, this is what makes us so strong.”***

Terje Storhaug

Chairman of ITxPT and CIO of Ruter, Oslo PTA.

Customer focus in next update

The next update will have a clear focus on customer needs, driven by the Requirements Committee.

Design rules implemented

Within the new work-flow process for the Requirements Committee and the Technical Committee, a new concept using Technical Requirement documents was implemented. It is a set of “design rules” to be used when writing Technical Specifications. This helps keeping the solution designs homogeneous over the platform and to keep the concept together.

ITxPT **Laboratories and Services**

Strong interest in local labs among members

The objectives for standardized local labs are to:

- Deliver labeling and compliance testing
- Participate in projects and to engage in experimental development activities
- Offer a place for meetings, seminars, demos, and collaborations

In 2019, we set up a new lab in Paris, in our dedicated ITxPT office. It includes showroom, office, and meeting room. We also improved labelling procedures, tools, and support for delivering ITxPT labels.

Guiding applicants through the process

ITxPT guides and supports applicants in developing compliant products, modules or services, as a fundamental part of the collaborative process. The tests are iterative, and the applicant can adjust configurations along the way to achieve compliance with the specifications. It is of course in everyone's interest that the applicant can comply and get approved for the label.

Labels issued in Paris lab

During 2019, the Paris lab issued 18 new labels - an important indicator of the certification's importance for ITS suppliers from Europe and other parts of the world. All labels are continuously listed in the ITxPT catalogue on www.itxpt.org. Labeling applications in progress are also displayed.

Improving test procedures

To improve the quality of the compliance tests, ITxPT has started to migrate to a web-based test tool (ReQtest) where new and extended test-cases are under creation. During 2020 a cloud lab will be developed, where services and tests will be remotely accessible.

The Gothenburg lab

In 2019 we took the first step by developing a lab in Gothenburg in collaboration with national partners and members of ITxPT. Lindholmen Science Park created the opportunity through a close relation with ITxPT.

The lab played an important role as meeting point for the Electricity/Rivsilon project, which has run over several years, managed by Volvo, Västtrafik and other ITxPT members. Now ITxPT takes over to finish building the lab.

Experimental projects

ITxPT takes active part or is involved in experimental projects, like:

- Rivsilon, plug and play tests and migrating from legacy platforms
- Data4PT, support for Siri/NeTEx and implementation of National Access Points
- Nordic Way 2&3, a Nordic communication and infrastructure project
- MASAI - an R&D project for seamless travel within the Horizon 2020 EU program

The idea of local labs is to create a network of labs that mirror the Paris lab and extend the technical support, although in the future we will develop a special area of expertise for each lab.

The labs are also utilized for demos, meetings, and members visits, like when the GOF4Rproject (from Shift2Rail) visited Paris for a full day conference in February, with 16 attendants.

ITxPT members until June 2020

21st Century
Access IS
Actia Automotive
Adibus
AESYS SPA
AllianceSwissPass
Alstom Transport
Arcobel
Arriva PLC
Arriva Trains UK
AtB (Sør-Trøndelag)
ATRON
Axis Communications AB
Bestmile
BusInfo SARL
Bustec
BYD Europe B.V
Cango
CARD4B
CIBEST
Clever Devices
Conduent Business Solutions
Consat Telematics
Daimler - Evobus GmbH
Datik
Digimobee
Diginext
DILAX Intelcom
DRESEARCH Fahrzeugelektronik GMBH
Egis Rail
Engie
Eurotech
Expleo Group
Fara
Finnish Public Transport Association (PLL)
FLOWBIRD
FourC
Gaia
Giro
GMV
GVB
Hanover Displays
Hogia Public Transport Systems
HostMobility
HSL Finland
Icomera
Infodev
INIT GmbH
InTraffic
ISR Technologies
IVECO CNH-Industrial
IVU Traffic Technologies
KentKart
KEOLIS
Kollektivtrafikkforeningen
Kontron
Lantech Communications Global Inc
LECIP
LIT-Transit
LTG Sweden
Lumiplan
Maestronic
Mastercom Oy/Kiho
M-Comp
METATRONIX
METRON
METROTEK AS
MLC-ITS
Movia
MultiQ
Navocap
NEC
NetModule AG
Nettbuss
NFK - Nordland County Council
NOBINA
Norgesbuss
Norled
Observit AB
OPENMATICS
Owasys
Pilotfish
PPTexcellence
R2P
RATP
Ridango
RTM
Ruter
Scania CV AB
Seipra Score
Sesaly
Sigmax Public Transport
Skantech
SKYSS (Bergen, Norway)
Skånetrafiken
SNCB/NBMS
SNCF
Solaris
SPEC
Squarrel
STIB
Stratio Automotive
Streamax
Swarco
SYNECTICS Mobile Systems
Tait Communications
Telexis
Telia
Tenix
TEQ
THALES
Thoreb
Tide
Tisseo Collectivités
TOMTOM
TPG
Trafikförvaltningen Region Stockholm
Transdev
Transport for London
Transports publics de la région lausannoise
Trapeze
Triona Group
TRONTEQ Electronic
UITP
Unibuss
Vix Technology
Volvo
Västtrafik
Xee
Ximedes
Xovis

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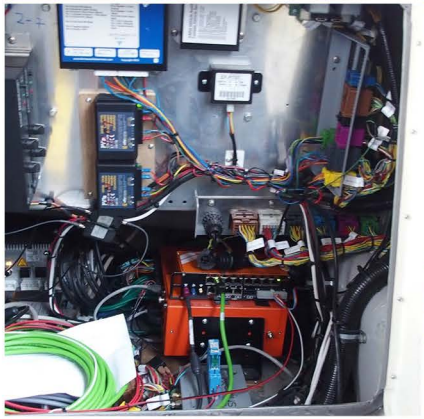

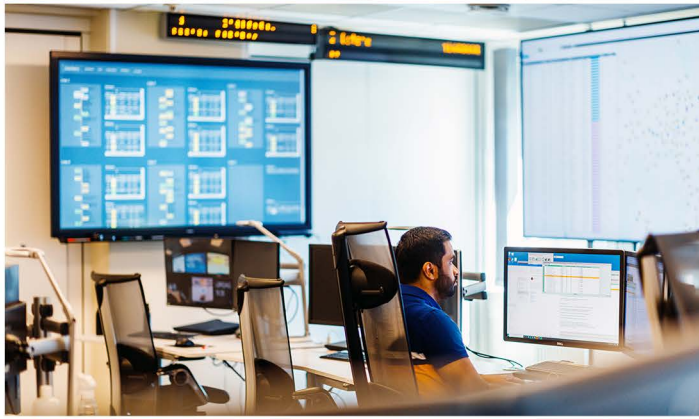

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