



ITXPT

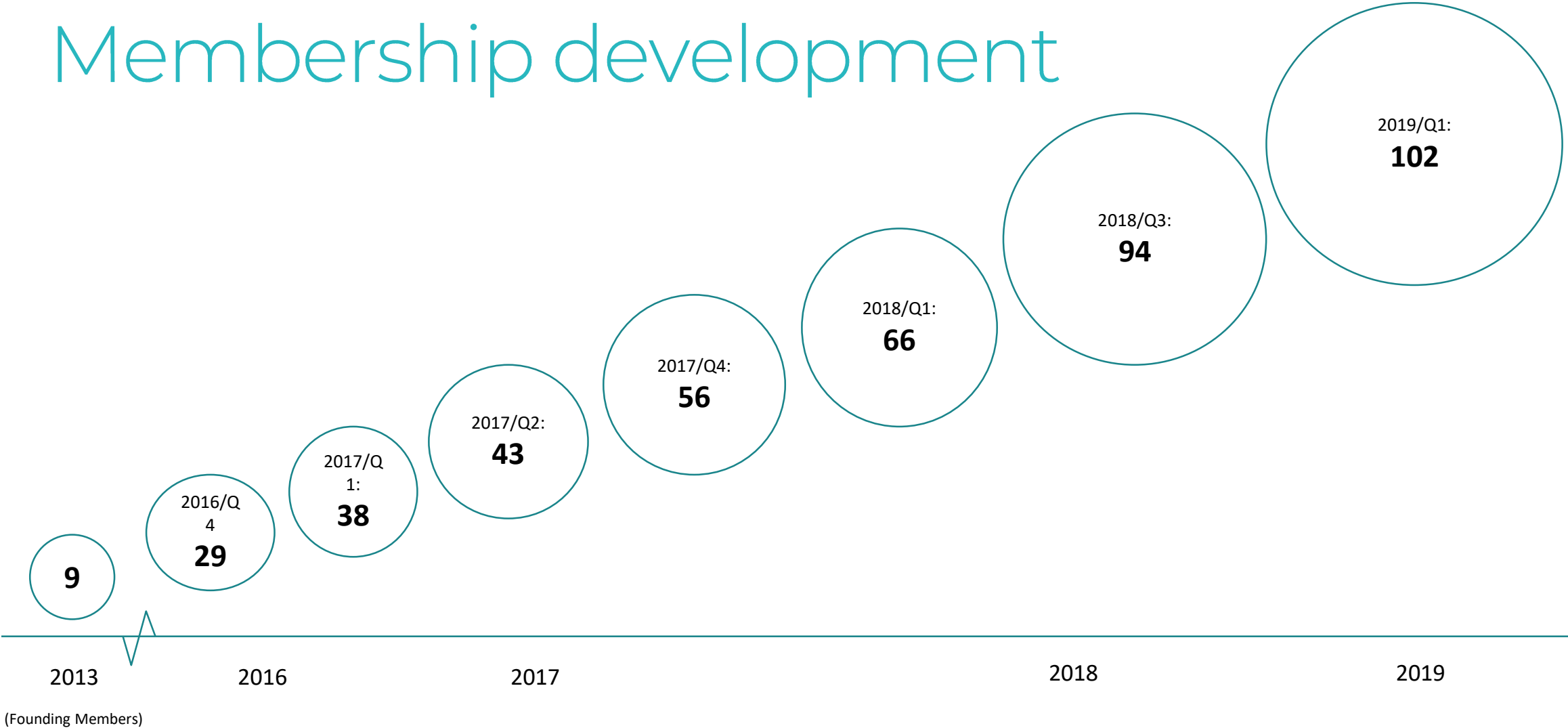
INFORMATION TECHNOLOGY  
for PUBLIC TRANSPORT

# The ITxPT Association: Mission

ITxPT develops and delivers  
**specifications** of a standardized **IT architecture**  
with **open interfaces** enabling **interoperability**  
for on-board and back-office IT-systems  
in public transport.

# Members

# Membership development





# ITxPT members



# ITxPT members: PTAs & PTOs



What is ITxPT?

# This is ITxPT



## AN ARCHITECTURE FOR INTEROPERATBILITY

The ITxPT open architecture brings not only cost advantages but also improves services to travelers and supports innovation.

[Learn more](#)



## A COMMUNITY FOR INNOVATION

The ITxPT community gathers IT suppliers, vehicle manufacturers, operators and authorities from all over the world to define solutions for the next generation mobility.

[Join us](#)

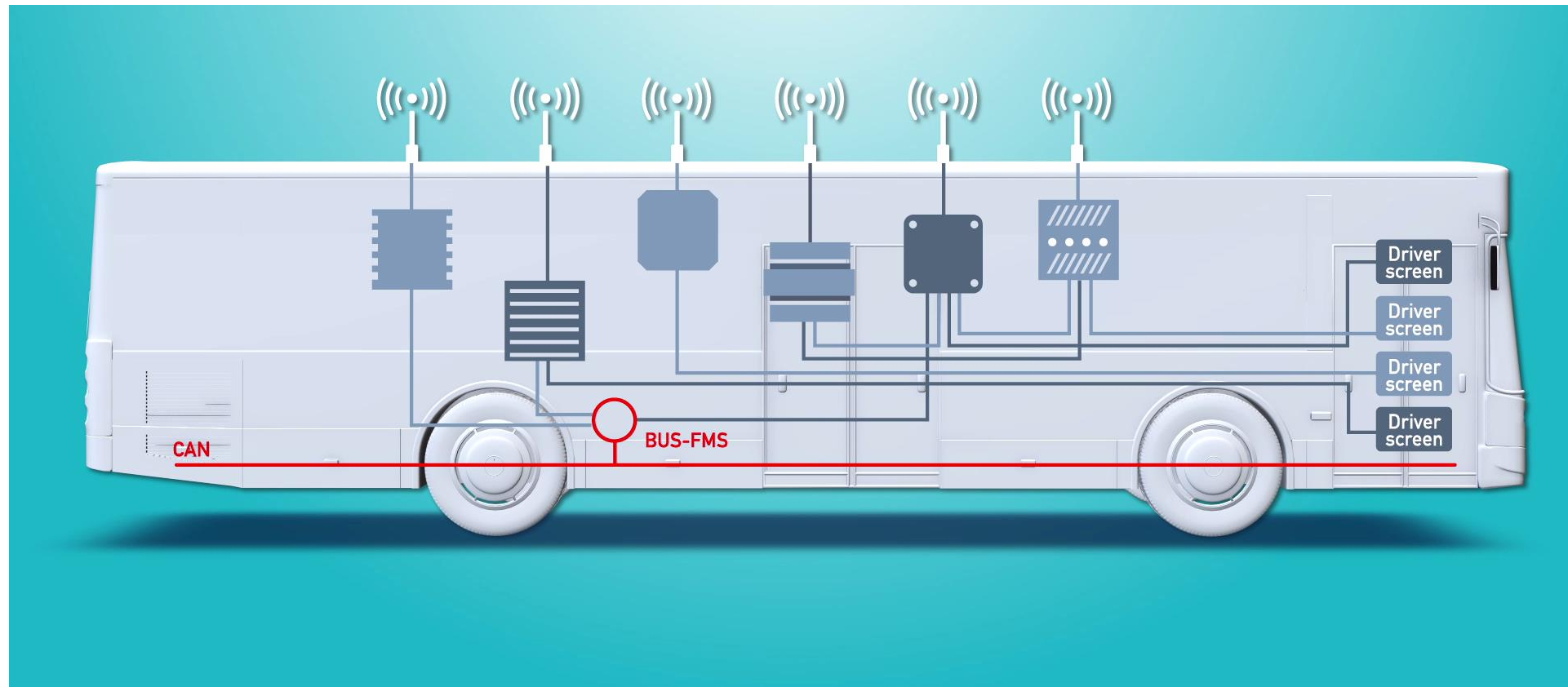


## A LABEL FOR COMPLIANCE

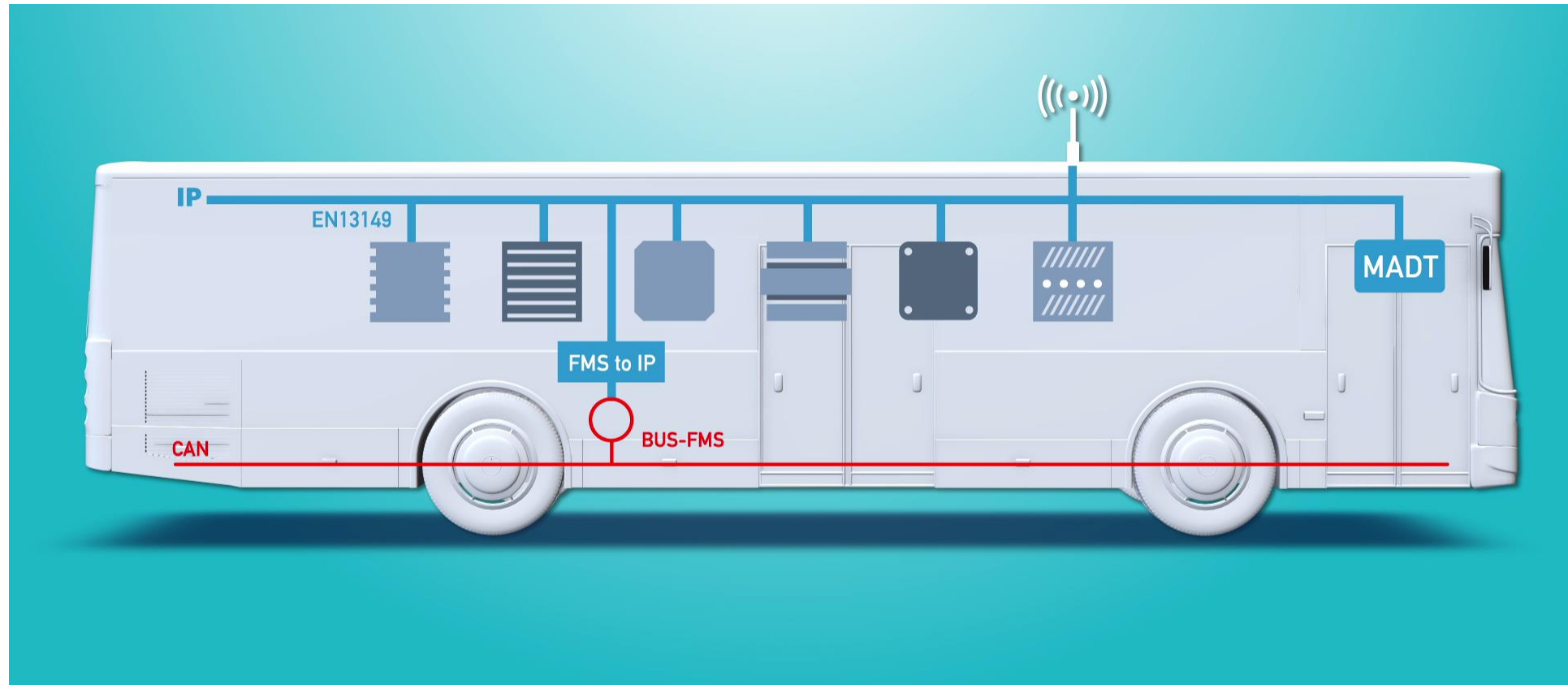
The ITxPT label is the quality seal that equipment, software or service is compliant with the technical specifications.

[Request a label](#)

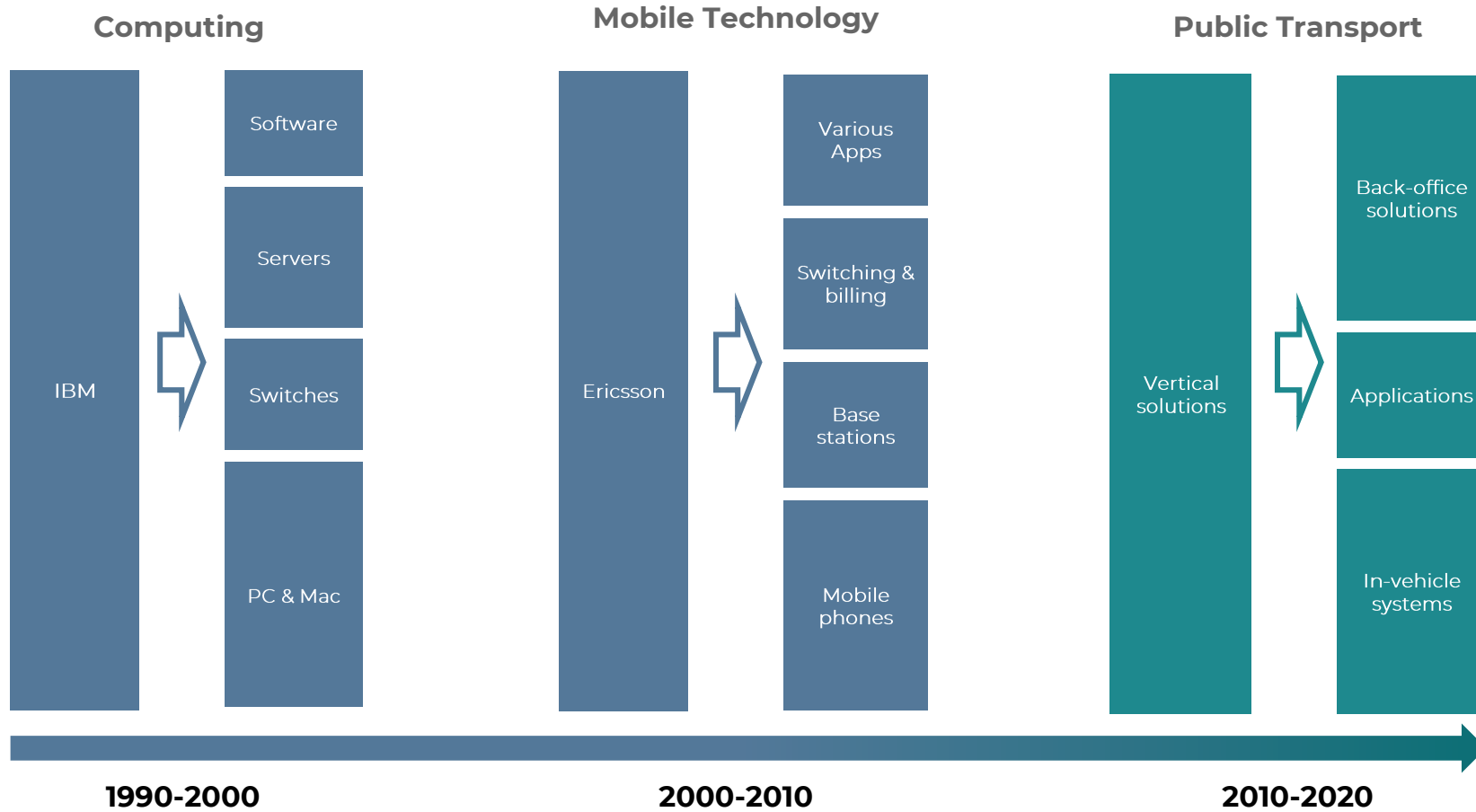
# Legacy with “silo”/proprietary systems



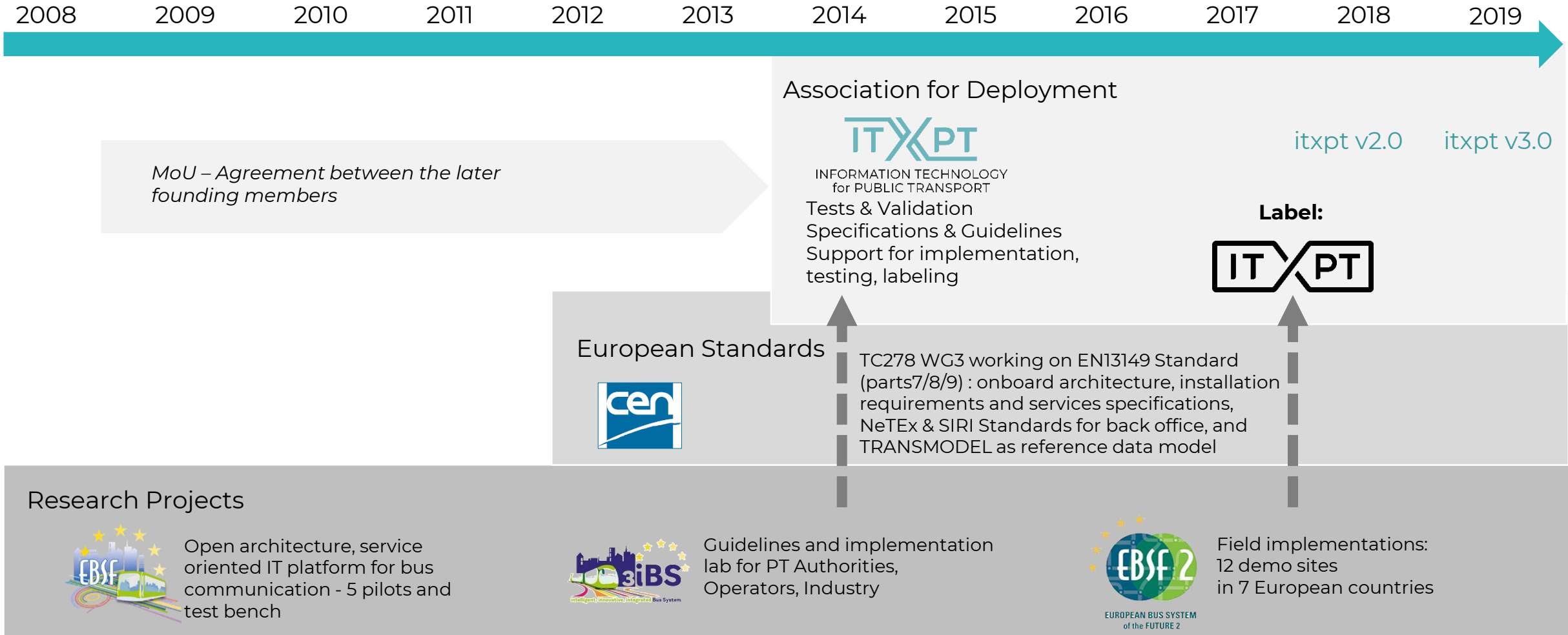
# Integrated Architecture with ITxPT



# Industry references



# ITxPT was founded as a result of European research projects and standardization activities



# Implementations

# London implementation



**Most Innovative Transport Project Winner**  
Transport for London, EBSF\_2 London Demo:  
**Introducing breakthrough IT standardisation on an existing bus fleet**



**TRANSPORT FOR LONDON**  
EVERY JOURNEY MATTERS



Pilotfish®



EUROPEAN BUS SYSTEM  
of the FUTURE 2



# Oslo implementation

 NEWS



## RUTER WILL REQUEST ALL IT VENDORS TO COMPLY WITH ITXPT

Published on 24 March 2017

Ruter, the Oslo and Akershus PT authority, is actively preparing its 2020 future of zero fossil-powered public transport and the renewal of the legacy on-board systems. Consequently, not only vehicles and related equipment but also the definition...

# Activities

# ITxPT Technical Specifications - Content

## S 01

### **Installation Requirements**

- Power Supply Interface
- FMS Interface
- Other Interfaces (audio, antenna, wireless, etc)
- IP network
- Space
- On-board IP
- Harness

## S 02

### **On-board**

- Protocols DNS and MQTT
- 1 Module Inventory
- 2 Time service
- 3 GNSS Location
- 4 FMStoIP
- 5 VEHICLEtoIP
- 6 AVMS
- 7 APC
- 8 MADT
- 9 MQTT Broker

## S 03

### **Back-Office**

- Architecture
- TRANSMODEL
- NeTeX (Network Timetable exchange)
- SIRI (Service Interface for Real-time Information)
- OJP (Open Journey Planning)
- TiGR (Telediagnostic for Intelligent Garage in Real-time)

## S 04

### **Over-the-air**

- MQTT bridge OTA
- Protobuf
- EBSF
- RTIG

# ITxPT Documentation Center



[Overview](#)

[General information](#)

[Standards](#)

[Implementations](#)

[Communication](#)

[Terminology](#)

[FAQ](#)

[Specifications & Guidelines](#)

[Technical Specifications](#)

[Deployment Guidelines](#)

[Releases](#)

[ITxPT label](#)

[Catalogue](#)

[Procedure](#)

[Technical platform](#)

[Test templates](#)

[Tools](#)

[Working groups](#)

Page [Discussion](#)

Read

[View source](#)

[View history](#)



## ITxPT Technical Specifications

The first ITxPT technical specifications came from EBSF project and have been updated ITxPT Working Groups and feedbacks from the field, validated by ITxPT Technical Committee and ITxPT Executive Board.

### S01- Installation Requirements specifications v2.0.1

This page describes the installation requirements to pre-equip vehicles with compliant ITxPT Onboard Architecture and PT networks with Backoffice Architecture.

### S02- Onboard Architecture specifications v2.0.1

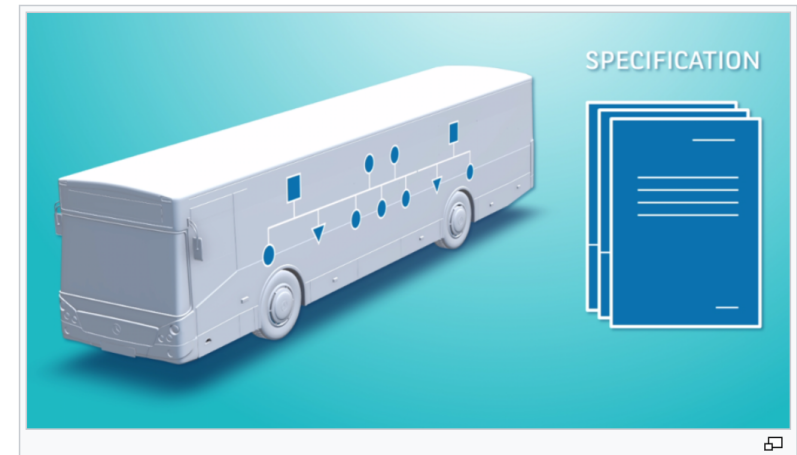
This page defines the detailed specifications of ITxPT onboard architecture.

### S03- Backoffice Architecture specifications v2.0

This page defines the detailed specifications of ITxPT backoffice architecture.

### S04- Over-the-air Architecture specifications v2.0

This page defines the detailed specifications of ITxPT Over-the-air architecture.



# ITxPT working groups

#	Working group	Objective
5	FMS needs collection	Analyze feedback from FMS group regarding ITxPT collection needs Evaluate impact for coming FMS release
6	MQTT	Identify relevant use case to implement MQTT Define related MQTT services specification (content and data structure) Propose related update of S02 and G02 accordingly
7	Additional IP services	Define specification for new services: DPI for formatted data in relation to Passenger Information, CCTV, bandwidth announcement and low battery Propose related update of S02 and G02 accordingly
8	Security	Perform the risk analysis with the consultant Issue recommendations and propose related update of S02
9	Over the air protocol	Analyse return from experiences and working group #9 outcomes Propose related update of S04
10	SIRI/NeTEx	Preparation of EU call in the frame of EU priority action A: training action and Project Support Action (PSA)
11	PT Trends to specification strategy	Understand impact of current and future trends (electrification, autonomous vehicles, mobility as a service, cooperative ITS, zero emission, etc.) to roadmap for developing the ITxPT specification
12	Virtualization	Define technical solutions to decouple services from hardware, host multiple application on common hardware. Define impact and requirements on ITxPT specification
13	Responsibility Model for interoperability	Legal, commercial, governance aspects when building an integrated ITxPT architecture

# SIRI / NeTEx / Transmodel support group

## **Facilitate Transmodel-Siri-NeTEx implementations across Europe**

- Development and maintenance of:
  - shared resources
  - shared tools
  - training and support
- To support the tuning of XSD and WSDL for specific tools and programming languages
- To update and possibly debug the technical artefacts when necessary
- To provide (open source) validation tools
- To provide validation platform hosting online (SaaS) the validation tools



# TiGR protocol

## Telediagnostic for Intelligent Garage in Real-time

- Technical requirements for connecting a data provider system implemented by a third party to a Telediagnostic back-office
- To provide vehicle operating and diagnostic data required for Telediagnostic service
- Operated in multi-suppliers environment
- Standard data format and communication protocol
- FMS based + additional vehicle data

# ITxPT Label

# Why an ITxPT Label?

- A “**quality seal**” to ensure compliance:
  - Standard and specifications can be subject to **interpretation**
  - One single standard may result in several **implementations**
  - There is a risk in failing in delivering **interoperability**
- Limit the risk during **integration** phase
- Avoid self-compliance
- Rely on a **trusted third party**



# What is the ITxPT label?

- As defined in “Guidelines for the use of the ITxPT label”:
  - “a **recognizable sign**, owned by ITxPT and granted by ITxPT, which clearly identifies ITxPT and confirms compliance at a given point in time of the Entity’s Module, Vehicle, Backoffice with the specification developed by ITxPT
  - a visible sign, declaring: “**compliant with ITxPT**, tested by the ITxPT laboratory, and that a test report is available on request”
  - ITxPT label should be required in a **tender** or a specification issued by any Public Transport entity



# ITxPT Membership and ITxPT Label

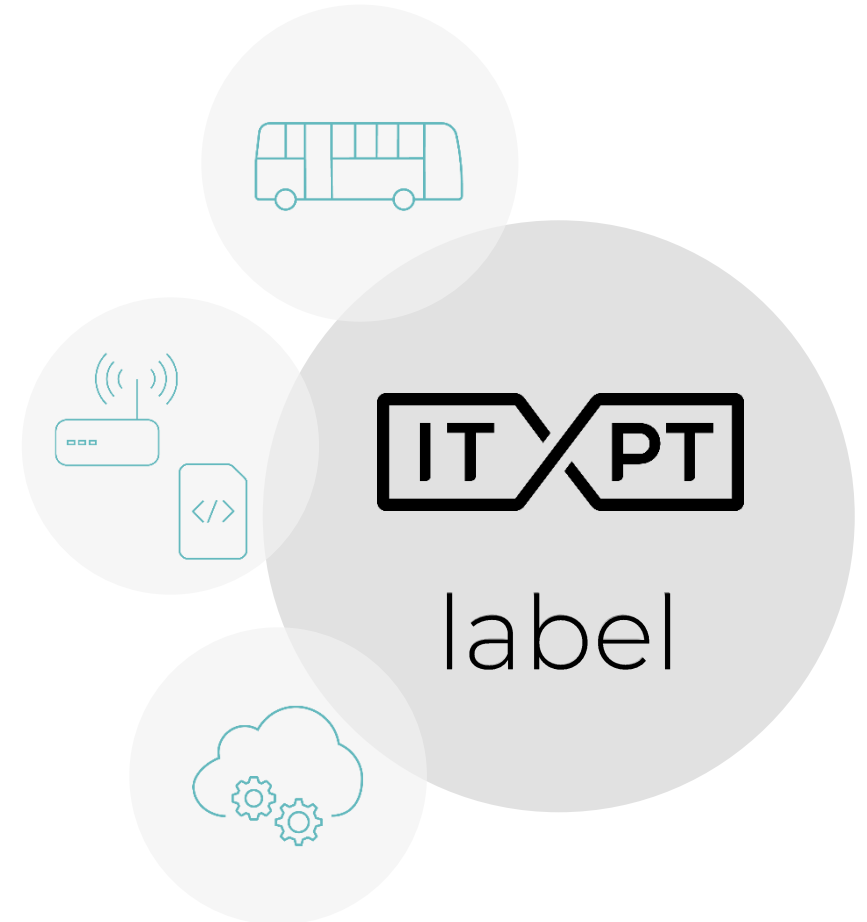


- Logotype
  - Applicable once membership approved by ITxPT executive board
  - Delivered to a **company**
- Label
  - Applicable once labelling procedure finalised and label delivered by the ITxPT laboratory
  - Delivered for a **product**: module, vehicle type, backoffice

No dependency between  
ITxPT membership and ITxPT compliance

# ITxPT Labeling Procedure

- Dedicated section available in ITxPT documentation center
- Test reports are available defined for vehicle, IT module and backoffice
- ITxPT label is delivered by ITxPT laboratory
- ITxPT labels catalogue is publicly published on ITxPT website



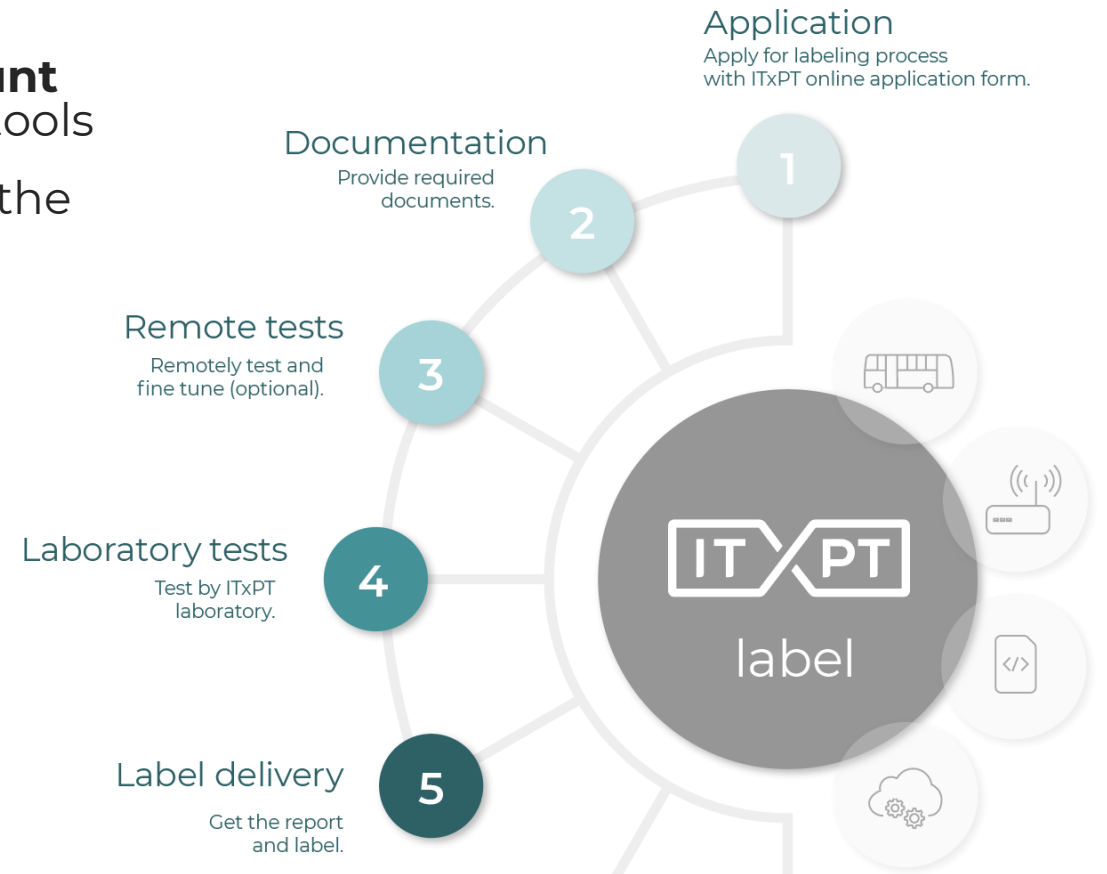
# Labeling Procedure update

## DELIVERED

- Dedicated ITxPT documentation center **application form**
- When applied, documentation center **account update** to access to the test templates and tools
- **Tolerances** are now defined for each test of the test procedure to let flexibility in the implementation without impacting the interoperability issue.
- 3-month **commitment**

## IN PROGRESS

- Software Development Kit
- Services simulator



# Declaration of change

- Update management
  - In case of a new configuration or update of a labeled unit linked:
    - either to an **ITxPT specification new release**
    - or to a unit **new feature**
  - ITxPT laboratory evaluates the impacts of change on results:
    - Either **new labeling procedure**
    - Or **report and label update**
- Dedicated declaration form on ITxPT documentation center

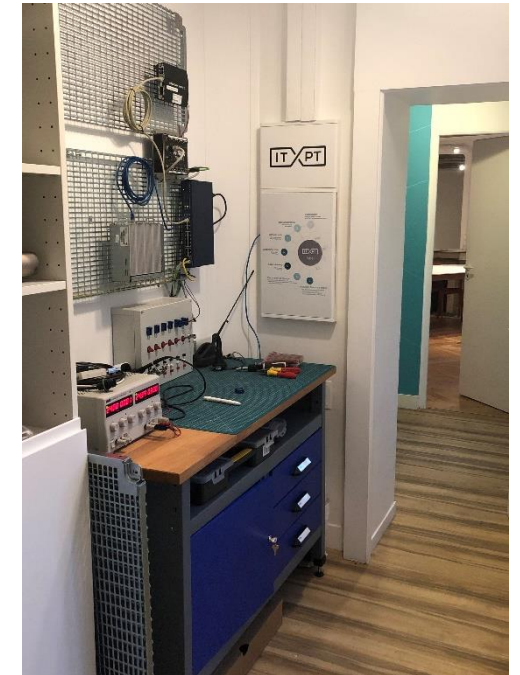
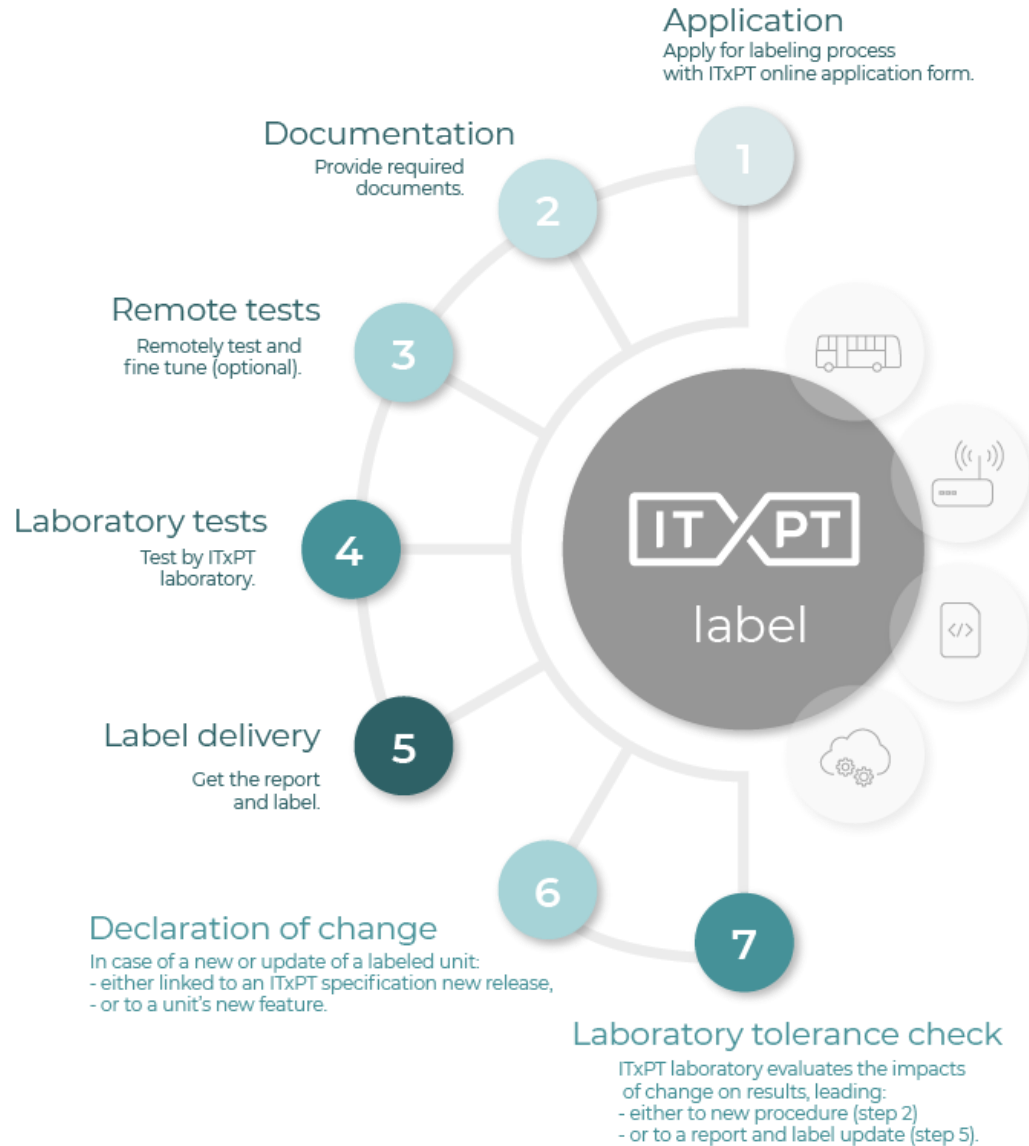


Declaration of change



Laboratory tolerance check

# Labeling Activities Procedure & Laboratory



# ITxPT Community

# ITxPT Members Meetings and Events



**2018**  
March

**Karlsruhe, IT Trans**  
Exhibitor (joint UITP)  
ITxPT Open Seminar  
Members Meeting

June

**Paris, Transport Public**  
Exhibitor  
Members Meeting

September

**Berlin, Innotrans**  
Exhibitor (joint UITP)

October

**Stockholm, Persontrafik**  
Exhibitor (joint UITP)  
Members Meeting

**2019**  
April

**Geneva**  
Members Meeting  
Technical Workshop

June

**Stockholm, UITP summit**  
Exhibitor (joint UITP)  
Members Meeting

October

**Brussels, Busworld**  
Exhibitor  
Members Meeting

# ITxPT Membership

**Strategic Member** – This level is for those members who want to take an active part in the development and governance of ITxPT. Strategic Members are active contributors in our working groups and are eligible for the Executive Board. Furthermore, they have access to all sections of the Documentation Centre, technical support, events (such as ITxPT Members Meetings) and are able to use the ITxPT laboratory, free of charge.

**Principal Member** – This level entitles members to actively contribute to the working groups' progress and to have access to most sections of the Documentation Centre, technical support, events (such as ITxPT Members Meetings) and the ITxPT laboratory, free of charge.

**Associated Member** – This level allows members to gain insight into ITxPT progress and the community by accessing certain sections of the Documentation Centre and participating in the organization events, such as ITxPT Members Meetings.

The logo for ITXPT, featuring the letters 'ITXPT' in a bold, white, sans-serif font. The 'X' is stylized with a double-stroke effect, and the 'P' has a unique, angular design. The logo is centered horizontally and vertically in the upper half of the image.

ITXPT

The website address 'www.itxpt.org' in a white, sans-serif font, positioned below the logo. The text is centered horizontally and occupies the lower middle portion of the image.

[www.itxpt.org](http://www.itxpt.org)