

# ONLINE TRAINING PROGRAMME ON IN MOTION CHARGING TROLLEYBUS AS AN ELECTRIC BUS SOLUTION

19 – 28 November 2024, ONLINE

In Motion Charging is based on proven trolleybus systems that are largely standardised and operating in almost 300 cities across the world. Global standardisation allows trolleybuses from any bus manufacturer to operate in any city worldwide. Battery electric trolleybuses with In Motion Charging are highly effective technology with huge economic and environmental potential: High passenger capacity, an infinite range, uninterrupted 24/7 operation, the flexibility of off-wire service and energy-efficient emission-free travel. In Motion Charging is particularly suited for high-pace, high-volume operations, such as long vehicles operating at high frequency or at elevated commercial speeds on electric bus rapid transit (e-BRT) routes, in challenging environments requiring strong air conditioning or heating.

The course is aimed at providing an overview of best practices and solutions of in motion charging systems and trolleybus. This training is open to all relevant learners and will be delivered via 5 online sessions of 2 hours across 2 weeks.

## ONLINE

Join Zoom Meeting

<https://uitp-org.zoom.us/j/87886960375?pwd=YJ0nvHuy65lk5Gbh074xypaKoFbjt.1>

Meeting ID: 878 8696 0375

Passcode: w!6GG&df

## Here is what you will learn

- A worldwide overview of best practices and solutions of in motion charging systems and its synergies with other public transport modes
- Learn from the experts on basics of onboard in motion charging technology, as well as energy management trolleybus infrastructure
- How to be able to plan and develop in motion charging trolleybus operations
- How to define and implement the procurement and commissioning process as well as promotion activities
- Allow exchange of knowledge by tapping on UITP's international expertise
- Provide a conducive platform for networking opportunities and interaction amongst participants

## A Top-Level Methodology

- Get inspired by our trainers, understand the **main concepts** and learn from successful **best practice**
- Participate in **interactive plenary sessions** with introductions by course leaders, presentations by trainers and open discussions with participants

- Challenge **your practical knowledge** on emergency preparedness and response
- Address the topic from **an international perspective**, enriched by different cultural approaches and points of view
- Participate in **workshops** allowing you to apply to a concrete case the main principles and tools learned
- Benefit from a unique exchange of knowledge and experience between professionals

### Who is it for?

- Staff from Bus transport operators or authorities
- Staff from the industry worldwide involved in the market uptake in this area
- Professionals from Bus planning operations, engineering, finance departments
- Professionals interested in obtaining a wider and international perspective on this topic and eager to learn more from best practice worldwide

### Inspiring Trainers

All UITP trainers are top level transport and mobility professionals with extensive experience in public transport and operations from different regions of the world e.g. Eastern, northern and central Europe to East Asia on e-mobility systems, electrical and mechanical engineering, artificial intelligence, e-bus, trolleybus, zero-emission bus systems, electric traction and sustainable mobility. In addition, UITP invites guest speakers to illustrate specific solutions, practices, and case studies.

### *Time zone CET*

Day 1, Tuesday 19 November 2024

#### 16.00 **Welcome, objective and introduction to the programme**

Charles DRANE, Chairman of UITP Trolleybus Committee  
Yussup KHASSIEV, Senior Manager – Knowledge and Innovation, UITP

#### 16.30 **Session 1: Introduction and Overview of Trolleybus**

Arnd BÄTZNER, Founder, Baetzner Metropolitan

- Worldwide overview of trolleybus systems, in numbers and pictures
- Place and role of trolleybus in Public Transport system, within the modes hierarchy and within the zero-emission bus family
- Trolleybus champions league (Salzburg, Mexico, Beijing)
- New developments with battery modes
- Trolleybus and demonstrations have contributed to this success and in recent years, new technological advances, in-motion charging
- Why is In Motion Charging the most energy efficient road vehicle and most effective e-BRT solution?
- The normative landscape of trolleybus as a vehicle, international panorama and contrasts?

18.00 End of Day

**Time zone CET**

**Day 2, Thursday 21 November 2024**

**16.00 Session 2A: In Motion Charging system, advantages and synergies with other PT modes - PART A**

*And BÄTZNER, Member of the Board of Directors, MOBILITY GENOSSENSCHAFT*

- What is In Motion charging?
- Assessment matrix at planning stage
- Synergies with other PT modes
- Perception of overhead wires (the track in the sky) and stakeholders' matrix

17.30 End of Day

**Time zone CET**

**Day 3, Monday 25 November 2024**

**16.00 Session 2B: In Motion Charging system, advantages and synergies with other PT modes – PART B**

*Per Gunnar ANDERSSON, Executive Vice President, Trivector Traffic, Lund*

- Benefits of using In Motion Charging (and pros and cons, from an operator perspective, a city or PTA perspective), comparison with other ways of charging and advantages
- Which e-vehicle for which demand? Pros and Cons for tram vs In Motion Charging bus
- Rail or road vehicle? (national differences)
- Successful implementation, best practices

17.00 End of Day

**Time zone CET**

**Day 4, Tuesday 26 November 2024**

**16.00 Session 3: In Motion Charging and electric batteries and Energy Management**

*Klaus Peter CANAVAN, Kiepe Electric LLC, USA*

*Marta WORONOWICZ, Public Transport In-house Expert / trolley:motion, Gdynia, Poland*

- Basics on battery chemistry, trends
- Basics on electrics (Power vs Energy, charging and charging time)

- Basics of electrical bus (double traction, traction control, energy demand, battery charging)
- The difference for In Motion Charging buses to other e-buses
- Double insulation requirement,
- Current collector (how to connect2charge)
- On board charger
- Opportunity charging e-buses with on-board chargers using the same In Motion Charging infrastructure
- Depot equipment for In Motion Charging and e-bus: how do they compare?

18.00 End of Day

**Time zone CET**

**Day 5, Wednesday 27 November 2024**

**16.00 Session 4: Planning and developing in motion charging trolleybus operation combined with E-Bus**

Kevin PLIMBLEY P.Eng. Program Manager, Trolleybus Fleet Replacement, Fleet Project Delivery, Coast Mountain Bus Company, Canada

- Total Cost Ownership TCO comparison – how to do that objectively
- Charging road – where to install the wires?
- Principles and ratio of wired street section versus overheadless road
- Blueprint concepts how to electrify a city with In Motion Charging
- E-BRT concept
- Operational aspects - route planning, timetable possibilities, winter and summer operation, terminals
- Drivers' education
- Standard activity model for the operators (maintenance and fixes installations)

**17.00 Case Study: CTM's experience with IMC technology Line 5ZeUS**

Luigi DI STASIO, CTM SpA, Cagliari, Italy

18.00 End of Day

**Time zone CET**

**Day 6, Thursday 28 November 2024**

**16.00 Session 5: The promotion, procurement and commissioning process to complement clean energy vehicles**

Wolfgang BACKHAUS, RUPPRECHT CONSULT - FORSCHUNG & BERATUNG GmbH

- How to sell the idea to the politics / lessons learned from previous trails of introduction (type of city, route structure and topography, etc.)

- Summary of experiences when introducing new In Motion Charging lines
- Inclusion of In Motion Charging in planning and feasibility studies in early stage
- Tendering of in motion charging trolleybus operations
- Financial constraints
- Launching a request for quotation: deliverables – specifications – valuing tender criteria
- Design of an explanatory campaign for the public, gaining public support
- Incorporation into modern urbanism and architecture
- Promotion of high efficiency of In Motion Charging solution, positive effects on reducing the carbon footprint
- Accordance with EU Clean Vehicle Directives (or other national legislation) in inclusion of the National quotas of the member states
- Ownership of vehicles and infra across variety of PTO/PTA combinations and their evolution, municipal owned scenarios versus commercial tendered concessions

18:00            End of programme

*\*UITP reserves the right to make amendments to the programme or any related activity at its discretion*