

## Massive Open Online Course: Unlocking the potential of Digital Twins for sustainable on-demand urban logistics

### Overview



[LEAD](#) is launching its new Massive Open Online Course, open to all those interested, with the goal to “Unlocking the potential of Digital Twins for sustainable on-demand urban logistics”.

It builds upon the results of the project’s Living Labs to deliver a Digital Twinning Capacity Building Programme, with a first-of-its-kind focus on urban logistics, to improve the capabilities and skills of personnel of authorities and researchers on open-source tools and modelling for Digital Twins. The course will also provide a general introduction to urban freight, with a focus on on-demand and last-mile logistics. **You can consult the programme for Units 1 and 2 below.**

Sign up [here to join the kick-off webinar](#) on **23 February, 11:00 – 12:00 CET** to learn more about what to expect from the e-course and each unit.

#### **Content and workload:**

This course consists of video lectures with accompanying slide sets, as well as complimentary optional reading material, and assignments. The video lectures will be complemented with live Exchange Sessions, where you will get the chance to exchange with lectures and dig deeper in the topics presented. Make sure to stick to the deadlines for each assignment, as the in-time submission is a prerequisite for certification. You can plan approximately 2 hours per week to complete each Unit (incl. lectures and assignments).

#### **Timeline:**

- February to April: Part 1: Units 1 and 2
- May to July 2023: Part 2: Units 3 to 5.

#### **Objectives:**

- Using the results of the LEAD the Living Labs to deliver a Digital Twinning Capacity Building Programme,
- Provide a general introduction to urban freight, with a focus on on-demand and last-mile logistics,



- Establish a mechanism to facilitate knowledge sharing & enabling the exchange between experts,
- Deliver a dynamic course in a flexible and modular format,
- Improve the capabilities and skills of personnel of authorities and researchers on open-source tools and modelling for Digital Twins.

**Target audiences:** Local and regional authorities, Policy-makers, University students, Industrial/business/research sector.

**Platform:** The course will be hosted on the [Mobility Academy](#). Instructions to register [are available here](#).

**Interaction and organisation:**

- Visit the discussion forum regularly to get in touch with other students: [Discussion Forum \(mobility-academy.eu\)](#)
- Make sure to subscribe to the news and events section to keep up with the next webinars and tasks: [Announcements \(mobility-academy.eu\)](#)

**Technical issues?**

You can always reach us at:

- Claudia Ribeiro: [cribeiro@polisnetwork.eu](mailto:cribeiro@polisnetwork.eu)
- Raffaella Vergnani: [rvergnani@polisnetwork.eu](mailto:rvergnani@polisnetwork.eu)

**Learning Programme: Units 1 and 2**

**Unit 1: Introducing Urban Freight & on-demand last-mile logistics (POLIS)**

**Scope:** This unit aims to provide a brief general introduction to urban freight, focusing on on-demand and last-mile logistics, namely current trends, challenges, influencing factors, and decarbonisation of operations. The content shared departs from the activities developed by project partners, from LEAD outputs, and external contributions from cities, local authorities, industry players and other EU-Funded projects.

**Kick-off webinar:** Live event to explain course objectives, *modus operandi*, content, etc.

The **first module** will provide a quick overview of the [POLIS/ALICE guide for advancing together towards zero-emission urban logistics by 2030](#). It will be complemented by the testimony of the leading city of Rotterdam on the challenges and ambitions to reach zero-emission logistics. A lecture will be provided on the main concepts and components of urban freight, describing what last-mile logistics consists of, and different possibilities to organise last-mile deliveries. A final lecture will focus on the main factors and challenges influencing last-mile on-demand logistics as uncovered in the LEAD project.

The **second module** will focus on push and pull policies enabling the transition to zero-emission urban logistics, particularly the last-mile, such as Zero-Emission Zones. The lecture will focus on the context, opportunities, challenges, and requirements, taking hints from the [‘How-To Guidance to support cities and countries considering freight and service deliveries in their decarbonization strategies](#), drafted by POLIS, Transport Decarbonisation Alliance and C40.

The **third module** will shed light on different last-mile distribution schemes, from micro-hubs, to transport to mobile depots with the assistance of e-vehicles, dual flow hubs and cargo hitching. The lecturers will represent the whole chain of knowledge, with city stakeholders, industry players, and fellow H2020 projects providing their insights on the topic.

**Runtime:** Two weeks: 27th of February to 10th of March

1. Introducing Urban Freight & on-demand last-mile logistics (POLIS)	Module 1.1 <i>Trends, challenges and factors influencing city logistics</i>	<b>Towards zero-emission urban logistics by 2030: a guide for action</b>	Yanying Li ALICE	
		<b>Boots on the ground: cities striving for zero-emission logistics</b>	Jos Streng, City of Rotterdam Rotterdam	
		<b>ABCS of urban freight, e-commerce, and on-demand logistics</b>	Edoardo Maruccci and Valerio Gatta, Molde University College	
	Module 1.2 <i>Electrifying the last-mile</i>	<b>Main factors and challenges influencing last-mile on-demand logistics</b>	Edoardo Maruccci and Valerio Gatta, Mold University College	
		<b>Zero-Emission zones for Freight (ZEF)</b>	Claudia Ribeiro, POLIS	
		Module 1.3: <i>Last-mile distribution schemes</i>	<b>Last-mile configuration: from 1-echelon to 2-echelon distribution networks</b>	Beatriz Royo, Zaragoza Logistics Centre
			<b>Microhubs as fixed or mobile depots as a combination with e-vehicles: the experience of the city of Mechelen</b>	Roos Lowette, city of Mechelen
	<b>Dual flow hubs &amp; CargoHitching: ULaaDS</b>	Domien Stubbe, VIL		

**Unit 2: Living Labs as innovation accelerators for mobility and logistics (ZLC)**

**Scope:** This unit aims to explain how real-life experiments are implementing the theoretical content of module 1. To this end, the course counts on the participation of LEAD Living Labs and other existing demonstrators will be the basis for the modules.

The **first module** will introduce the concepts of a community of practice, Living Labs, and the LEAD project. The last part of the module will explain the evaluation framework the LEAD project defined for assessing the sustainability impacts of the demonstrators.

The **second module** will explain the physical implementation of an Urban Consolidation Centre in the inner city in the [LEAD Living Lab Madrid](#). The Living Lab Madrid members will describe:

- a) The objectives of the Living Lab, the members of the CoP and their roles.
- b) The real-life implementation: BAU vs new business model. It will focus on the technical implementation of the Proof of Concept, the challenges and drivers experienced during the testing period. Finally, the pilot will explain the outcomes (benefits and drawbacks).



- c) The Living Lab Madrid digital twin: this video will explain the digital twin pipeline representing the real-life experiments (inputs, outputs (KPIs, operational information [routes]), sequence of models). The Living Lab Madrid will explain how the digital twin helps policymakers and business decision-makers in their daily and strategic decisions.

The **third module** focuses on crowdshipping and hyperconnectivity concepts in the [LEAD Living Lab The Hague](#). The Living Lab The Hague members will describe:

- a) The objectives of the Living Lab, the members of the CoP and their roles.
- b) The real-life implementation: BAU vs new business model. It will focus on the technical implementation of the Proof of Concept, and the challenges and drivers experienced during the testing period. Finally, the pilot will explain the outcomes (benefits and drawbacks).
- c) The Living Lab The Hague digital twin: this video will explain the digital twin pipeline representing the real-life experiments (inputs, outputs (KPIs, operational information [routes]), sequence of models). The Living The Hague will explain how the digital twin helps policymakers and business decision-makers in their daily and strategic decisions.

Exchange session with contributions from other projects: an on-streaming webinar by April with open questions from the audience. People subscribed to the course can attend the webinar, but it will also be open to a wider audience as a stand-alone webinar (*hands on training workshop and lab*). It will be made available on the website as complementary work for Unit 2.

**Runtime:** Three weeks: 13<sup>th</sup> of March to 31<sup>st</sup> of March

2.Living Labs as innovation accelerators for mobility and logistics (ZLC)	<i>Module 2.1: Future city logistics: the role of CoPs, the Living Labs &amp; sustainable evaluation frameworks</i>	<b>Introduction to the Living Labs Concept</b>	Carolina Cipres, ZLC	
		<b>Communities of Practice: role in the future of logistics</b>	Carolina Cipres, ZLC	
		<b>LEAD LLs sustainable evaluation framework: description of the list of KPIs the LLs are using</b>	Jose Manuel Vassalo, UPM	
	<i>Module 2.2: UCC centers in the inner city</i>	<b>LEAD Living Lab Madrid: Explain the physical implementation of an Urban Consolidation Centre in the inner city in the LEAD Living Lab Madrid</b>	<ul style="list-style-type: none"> <li>• <a href="#">LEAD LL Madrid introduction</a></li> </ul>	Sergio Balaguer Fernandez, EMT Madrid
			<ul style="list-style-type: none"> <li>• <a href="#">LEAD LL Madrid physical implementation</a></li> </ul>	Alfonso Molina, CityLogin
			<ul style="list-style-type: none"> <li>• <a href="#">LEAD LL Madrid Digital Twin</a></li> </ul>	Angel Batalla, LastMile Team
			<ul style="list-style-type: none"> <li>• <a href="#">LEAD LL Madrid Conclusions</a></li> </ul>	Sergio Balaguer Fernandez, EMT Madrid
	<i>Module 2.3: Crowdshipping and hyper connectivity</i>	<ul style="list-style-type: none"> <li>• <b>LEAD Living Lab The Hague: Explain the crowdshipping and hyperconnectivity concepts in the LEAD Living Lab The Hague</b></li> <li>• <a href="#">LEAD LL The Hague introduction:</a></li> </ul>	Thomas Robbers, Next2Company	



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		<ul style="list-style-type: none"><li>• <u><i>LEAD LL The Hague physical implementation</i></u></li></ul>	Thomas Robbers, Next2Company
		<ul style="list-style-type: none"><li>• <u><i>LEAD LL The Hague Digital Twin</i></u></li></ul>	Rodrigo Tapia, TU Delft
		<ul style="list-style-type: none"><li>• <u><i>LEAD LL The Hague: Conclusions</i></u></li></ul>	Thomas Robbers, Next2Company