

## SCIENTIFIC SEMINAR

# Challenges for a Sustainable City Logistics

Thursday 16<sup>th</sup> of October at 14:00 – 18:00  
**Room C3 – School of Engineering**  
**Via del Politecnico 1, 00133 Rome (IT)**

Mariusz Nürnberg

### ***Transforming urban e-commerce supply chains towards Electromobility***

*process of switching fleet of cars being used in urban transport from IC to BEV vehicles. Including technical, infrastructural and administrative (legal) aspects.*

### ***Creating Sustainable Supply Chains in the CEP industry***

*building structure of delivery system regarding sustainable approach (parcel lockers, cargo bikes, urban depots, etc.)*

Francesco Russo

### ***Dynamic approach to update utility and choice by emerging technologies: methods and models to sustainable city logistics (Part A and Part B)***

*opportunity to extend the path cost definition with a within-day and day-to-day learning process, including the specification of the attributes provided by e-ICTs.*



*further info:*

Antonio Comi

comi@ing.uniroma2.it

## Mariusz Nürnberg

Mariusz Nürnberg, PhD Eng – graduated Maritime University of Szczecin at master degree in Logistics in 2017. PhD degree in Management and quality sciences received in 2023 at Czestochowa University of Technology. Since 2017 works at Faculty of Economics and Transport Engineering at Maritime University of Szczecin. First at position Research Assistant, since 2023 as Assistant Professor.

The scope of his science interest consists urban logistics, sustainable transport, electromobility, smart cities and telematics. Author and co-author of several publications in international scientific journals on sustainable transport, urban logistics management, and smart cities. Member of research teams on international projects such as Low Carbon Logistic, European Urban Freight and Logistic, and GRASS-NEXT (GReen and Sustainable - kNoWledge EXpanded freight Transport in cities). His current research activity focuses on the implementation of electromobility in urban logistics systems, with particular emphasis on the CEP sector.

### *Abstract*

In an era of increasing digitalization and the dynamically growing e-commerce industry, the CEP sector plays a special role, creating the final link in the supply chain, directly connecting customers with producers of goods. The annual turnover of the e-commerce industry in Poland is €226 billion, representing 9% of retail trade, 78% of internet users shopping online, creating huge stream of cargo. Customers expect courier companies to deliver this stream of goods in the most comfortable and possibly quickest way directly to their hands.

Most of the courier companies are the international organizations committed to implementing the Sustainable Development Goals by applying the concepts of sustainable logistics, corporate social responsibility, and the circular economy. The implementation of these goals is achieved through managing the process of technological and organizational change within the company at all levels of the organizational structure.

The presentation will introduce the daily practice of operation in urban logistics and last mile delivery solutions in Poland, as well as the strategic directions for the industry's development, with an emphasis on implementing sustainable logistics solutions.

The first part of the presentation will focus on building a sustainable supply chain by implementing environmentally neutral delivery methods and solutions, developing IT tools, and creating a delivery network that supports the reduction of logistics operations and pollution emission.

The second part will focus on the process of implementing electric delivery vehicles into regional fleets operating in cities. The process of managing this change will be discussed from an organizational perspective – redefining the rules for cooperation with subcontractors and changing the structure of operational departments; from an administrative perspective – the obligation to meet legal requirements related to electromobility; and from an infrastructural perspective – the need to build and operate charging stations, adapt IT systems, and select the technical parameters of the vehicle fleet to fit the local delivery network.



## Francesco Russo

Francesco Russo, since 1999, is full professor in transportation with the Dipartimento di ingegneria dell'Informazione, delle Infrastrutture e dell'Energia Sostenibile, Mediterranean University of Reggio Calabria, Italy, where he lectures Transportation and Logistics Systems and Sustainable Mobility. He is the author of more than 300 papers. He is listed in Stanford-Elsevier List of World's Top 2% Scientists.

His research interests include methods and models for the analysis and design of freight and passenger transport systems at urban and extra-urban scales, the development and implementation of ITS, and the analysis of emergency issues and evacuation of urban systems, as well as the analysis of the risk in the transport system.

He has been and is principal investigator for many national and international research projects. He is Editorial Board Member of several international journals and member of international scientific advisory and steering committee.

### *Abstract*

Today, local administrations are faced with the presence of greater constraints in terms of the use of space and time. At the same time, large amount of data is available to fleet managers that can be used for controlling their fleets. This presentation is set in the context defined by sustainable city logistics, and information and communication technologies (ICTs), to formalize the three themes of the smart city (transport, ICTs and energy savings) in a single problem. Following this, the main purpose of the study is to propose a unified formulation of the basic problem of fleets, i.e., the traveling salesman problem, which explicitly includes the use of emerging information and communication technologies (e-ICTs). The contribution proposes methods and models for updating choice and utility in relation to path costs in urban delivery.

This research explores the opportunity to extend the path cost formation with a within-day and day-to-day learning process, including the specification of the attributes provided by e-ICTs. The research answers to queries coming from operators and collectivities to improve city liveability and sustainability. It includes both economic sustainability for companies/enterprises and environmental sustainability for local administrations (and collectivities). Besides contributing to reduce the times and kms travelled by commercial vehicles, as well as the interference of freight vehicles with other traffic components, it also contributes to road accident reduction (social sustainability).

The proposed model moves within the two approaches of the literature: it is an inter-period dynamic model with the probability expressed within the discrete choice theory; furthermore, it is a sequential dynamic model with the probability dependent on the previous choices. The contribution presents an example of application of the model, developing a transition matrix.