



# PhD in INGEGNERIA GESTIONALE / MANAGEMENT ENGINEERING - 39th cycle

## PARTENARIATO PNRR Research Field: SUSTAINABLE LOGISTICS SOLUTIONS FOR FOOD URBAN DISTRIBUTION

| Monthly net income of PhDscholarship (max 36 months)   |
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| <b>€ 1450.0</b>  |
| In case of a change of the welfare rates during the three-year period, the amount could be modified. |

| Context of the research activity                                      |   |
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| <p><b>Motivation and objectives of the research in this field</b></p> | <p>On the one hand, urban logistics is gaining growing attention in both the academic and managerial contexts, since the flow of goods transported within the cities is constantly increasing. This trend is even more significant if considering the food sector, with different types of food products moving in urban areas, starting from supermarkets, dark stores, restaurants and shops.</p> <p>On the other hand, the awareness and attention towards environmental sustainability goals (in addition to the more traditional efficiency and effectiveness objectives) is being shared by both scholars and managers. As a matter of fact, the products delivered in the cities generate logistics flows, which have to be carefully managed also due to their environmental implications.</p> <p>Traditional logistics solutions (e.g., tours performed by means of diesel vans) - despite being diffused among the players operating in the field - are emerging as not very efficient, effective and sustainable options to accomplish urban food deliveries. Conversely, innovative solutions, including refrigerated parcel lockers, alternative vehicles (e.g., cargo bikes), as well as the introduction of digital solutions (e.g., platforms as virtual markets for local agricultural products) should be identified and investigated, due to the potential benefits they may imply in terms of emissions.</p> <p>While the academic literature shows some attempts to address such innovative solutions, the state-of-the-art is still at early stages, and much room for research remains</p> |



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|  | <p>in this respect. Based on these premises, the goal of the PhD is twofold. On the one hand, identifying, analysing and classifying the main innovative logistics solutions for distributing food products in urban environments. On the other hand, after having selected the most promising ones, quantitatively estimating the environmental impact that the implementation of these solution entails if compared to more traditional deliveries (by means of the development and application of quantitative models). The scholarship is funded by a PNRR grant (ONFOODS - Research and innovation network on food and nutrition Sustainability, Safety and Security - Partenariato Esteso Tema 10 -"Modelli per un'alimentazione sostenibile").</p>   |
| <p><b>Methods and techniques that will be developed and used to carry out the research</b></p> | <p>Different methods will be applied during the PhD research.</p> <p>First, a reviewing of scientific literature, as well as the analysis of grey and white literature. Moreover, the candidate will search for cases (with technological providers and/or logistics service providers and/or companies operating in the food industry) to analyse sustainable innovative logistics solutions already implemented (or that could be implemented in the future) in urban areas (in Italy and abroad). Primary data coming from the interaction with companies will be enriched with information from secondary sources (as an example, companies' websites, industry reports). Once the information are collected, the main sustainable solutions will be first classified and analysed. Focusing on the most promising ones, their impact will be evaluated by means of quantitative assessment models (e.g., by means of analytical models, simulation, ...). The candidate will thus model the implementation of some innovative logistics solutions to improve the environmental sustainability in urban food distribution. Both economic and environmental perspective should be considered, in order to assure the applicability in real contexts of the proposed solutions. Guidelines for the implementation of the innovative sustainable solutions will be derived from the evidences of the research project.</p> |
| <p><b>Educational objectives</b></p>   | <p>The main educational objectives of the research project</p>  |



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|   | <p>are:</p> <p>1 - to develop the capability to analyze complex systems, with reference to the distribution process in the food industry, with a special attention toward urban contexts;</p> <p>2 - to build the capacity to develop models to compare (from an environmental and an economic perspective) different logistics solutions in the food industry, using both qualitative and quantitative methodologies;</p> <p>3 - to become able to interact with public and private stakeholders revolving around the city for research purposes and policy definitions. The candidate will then develop advanced competence and research skills according to the objectives of the project.</p> <p>The candidate will also learn methods and tools to design and conduct a research project, following the appropriate methodologies for data collection and analysis, and to present and publish results in both scientific and practitioners' contexts (e.g., scientific conferences, academic journals, practitioner conferences).</p> |
| <p><b>Job opportunities</b></p>                 | <p>The main opportunities for a PhD graduate in this research area are:</p> <ul style="list-style-type: none"> <li>- Academic career in the field of Logistics;</li> <li>- Career in logistics operators;</li> <li>- Career in food companies and retailers;</li> <li>- Career in Advisory;</li> <li>- Career in Public sector agencies, international organizations and authorities working on the policy design for sustainable innovation / sustainable logistics / sustainable mobility in cities.</li> </ul>   |
| <p><b>Composition of the research group</b></p> | <p>2 Full Professors<br/>6 Associated Professors<br/>3 Assistant Professors<br/>6 PhD Students</p>  |
| <p><b>Name of the research directors</b></p>    | <p>Tumino, Mangiaracina, Siragusa, Seghezzi</p>   |

| <b>Contacts</b> |                                |
|-----------------|--------------------------------|
|                 | <p>angela.tumino@polimi.it</p> |

| <b>Additional support - Financial aid per PhD student per year (gross amount)</b> |
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| Housing - Foreign Students                                     | -- |
| Housing - Out-of-town residents (more than 80Km out of Milano) | -- |

| Scholarship Increase for a period abroad |         |
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| Amount monthly                           | 725.0 € |
| By number of months                      | 6       |

**Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information**

The PhD candidate will have the opportunity to attend courses and seminars on management engineering, research methodologies and skills, sustainable innovation and food sustainability at Politecnico di Milano. He/she will be supervised by the research director through frequent meetings, and will receive feedbacks on his/her intermediate results during regular meetings with the Doctorate board. He/she will have the opportunity to attend scientific conferences. The candidate will be eventually involved in some teaching and communication activities, which are seen as a major opportunity to practice with dissemination of research results. He/she will be offered a desk near the office of the research directors and other PhD candidates, to facilitate also informal interaction.