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Supervisor Expression of Interest
MSCA-IF Marie Sklodowska Curie Action-Individual Fellowship 2020

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Department Name: Research topic: (https://www.polimi.it/en/scientific-research/research-at-the-politecnico/departments/)	Department of Architecture, Built environment and Construction engineering
MSCA-IF Research Area Panels	☐ CHE_Chemistry ☐ ECO_Economic Sciences **X ENG_Information Science and Engineering** ☐ ENV_Environmental and Geosciences ☐ LIF_Life Sciences ☐ MAT_Mathematics ☐ PHY_Physics ☐ SOC_Social Sciences and Humanities
Politecnico di Milano Areas:	☐ Cultural Heritage **X Smart Cities** ☐ Territorial Fragilities ☐ Health ☐ Industry 4.0
Brief description of the Department and Research Group (including URL if applicable):	**Description of the Department** The Department of Architecture, Built environment and Construction engineering is a scientific and cultural project based on extensive research and teaching experience on planning, design, production and management, in the field of architecture and civil engineering. The Department aims at facing present challenges for an overall improvement of territorial assets, urban development, and of the built environment. The Department brings together a multi-disciplinary team of researchers and professors, fully expressing the "polytechnic spirit" in teaching and research, an approach leading to a timely scientific and technical response to the complex problems posed by

	the transformation of the built environment, concerning both new interventions and redevelopment projects. **Research Group** The main and longest-term interests are in the field of planned maintenance and facility management (constructions and infrastructures), developing researches in the areas of: - Smart Urban Maintenance (facility management services for urban assets and networks, organization of information); - Organizational models for building and urban facility management; - Big Data and IoT (internet of things) for the management of built assets at the urban scale; - Sensor-based inventory for knowledge management of built assets (sensing technologies, data collection and processing procedures, etc.); - Information systems and IoT Platform for Real Estate management; - BIM (Building Information Modelling) application in operations and maintenance phase of the building process; - Data-driven decision making for the enhancement of Real Estate management; - Building maintenance manuals and programs (structure, application procedures, organization of information, data bases); - Tasks, competences, skills and training for maintenance managers and facility managers.

Brief project description: **(max 1 page)**	The topic of the Smart City is today at the center of plentiful debates on the international, European and national scales, also for the potential impact of innovation of urban services in the overall performance of cities. Literature and virtuous cases of Smart Cities at European level envisage scenarios of optimization and innovation of traditional urban services based on the application of Information and Communication Technologies (ICTs), in particular the Internet of Things (IoT) and Big Data management. Indeed, the application of ICT innovations into the urban management field allows to optimize existing services and outline new ones, based on the key concepts of: real-time monitoring, information sharing and urban symbiosis. Such ICT-based services could potentially be

	able to redefine the demand for infrastructure and physical assets. Although the interest by Public Administrations, Urban Planners and Urban Facility Managers in the transformation of cities in Smart Cites continues to grow, this transformation process seems to be still at an experimental stage and poorly supported by consolidated reference methods and shared cognitive tools. Hence, the current city management scenario is characterized by some still open issues related to the integration of urban management and enabling technologies regarding for example: - new features of urban services and innovative methods of information management; - new qualitative and quantitative tools to measure and monitor over time the level of endowment and maturity of smart urban services; - risk related to ICT adoption within the urban management in terms, for instance, of data reliability and security. Starting from the hypothesis that there is a close relationship and connection between Smart City services, infrastructures and Urban Facility Management (UFM) services (the quality and efficiency of Smart City services depends on the good conditions of the urban infrastructures guaranteed by the good performance of UFM services), the project aims at: • how to develop, involving different stakeholders (urban planners, urban facility managers, citizens, public administrations, etc.), new possible typologies of ICT-based services related to the City domains (e.g. mobility, energy, waste, buildings, governance)? • how to develop methods of risk analysis and management for the proposed innovative service, related to the adoption of enabling technologies? How to support public administrations and stakeholders in the identification and management of the risks associated with this technological innovation and to take the necessary mitigation measures? • how to propose a set of indicators able to measure the presence and the maturity of smart urban services? How to define strategic guidelines useful for assessing the influence of smart services on the demand/use of physical infrastructure by citizens?