

## **The Learning Loops in the Public Realm Project in South Verona: Air Quality and Noise Pollution Participatory Data Collection towards Co-Design, Planning and Construction of Mitigation Measures in Urban Areas**

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**Abstract :** Urban systems are places where the various actors involved interact and enter in conflict, in particular with reference to topics such as traffic congestion and security. But topics of discussion, and often clash because of their strong complexity, are air and noise pollution. For air pollution, the complexity stems from the fact that atmospheric pollution is due to many factors, but above all, the observation and measurement of the amount of pollution of a transparent, mobile and ethereal element like air is very difficult. Often the perceived condition of the inhabitants does not coincide with the real conditions, because it is conditioned - sometimes in positive ways other in negative ways - from many other factors such as the presence, or absence, of natural elements such as trees or rivers. These problems are seen with noise pollution as well, which is also less considered as an issue even if it's problematic just as much as air quality. Starting from these opposite positions, it is difficult to identify and implement valid, and at the same time shared, mitigation solutions for the problem of urban pollution (air and noise pollution). The LOOPER (Learning Loops in the Public Realm) project -described in this paper - wants to build and test a methodology and a platform for participatory co-design, planning, and construction process inside a learning loop process. Novelties in this approach are various; the most relevant are three. The first is that citizens participation starts since from the research of problems and air quality analysis through a participatory data collection, and that continues in all process steps (design and construction). The second is that the methodology is characterized by a learning loop process. It means that after the first cycle of (1) problems identification, (2) planning and definition of design solution and (3) construction and implementation of mitigation measures, the effectiveness of implemented solutions is measured and verified through a new participatory data collection campaign. In this way, it is possible to understand if the policies and design solution had a positive impact on the territory. As a result of the learning process produced by the first loop, it will be possible to improve the design of the mitigation measures and start the second loop with new and more effective measures. The third relevant aspect is that the citizens' participation is carried out via Urban Living Labs that involve all stakeholder of the city (citizens, public administrators, associations of all urban stakeholders,...) and that the Urban Living Labs last for all the cycling of the design, planning and construction process. The paper will describe in detail the LOOPER methodology and the technical solution adopted for the participatory data collection and design and construction phases.

**Keywords :** air quality, co-design, learning loops, noise pollution, urban living labs

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