Turning urban streets from infrastructures to living places Early research outcomes of a case study in Prato, Tuscany.

PROCEEDINGS OF

Urban Planning and Architectural Design for Sustainable Development (UPADSD) – 6th Edition 2021

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Urban Planning and Architectural Design for Sustainable Development

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Preface

As many countries around the globe continue their struggle with the Covid-19 pandemic, the world can now see how a single occurrence could tip the scales and influence almost every aspect of our lives, leaving a mark on our cities that will echo for generations. Early research on its effects in cities mainly concerns four themes including environmental quality, socio-economic impacts, transportation, and urban design as well as management and governance, all of which provide planners, practitioners, and policymakers with the best opportunity to contribute to creating more resilient and sustainable cities.

That being said, with this challenge comes a positive secondary impact as it sparks debate, the introduction of innovative solutions, and an improved response to current and future crises. Therefore, it has become vital that new approaches to city planning are introduced to achieve a more resilient and sustainable use of public spaces in the future.

One of the key measures in combating Covid-19 in the past was a complete restriction on the use of public spaces. So how will we adjust to this new normal, and what will happen to those spaces? Questions like these and many others arose in the span of only two years that made us rethink our relationship with public spaces and our environment. A new holistic approach to city planning should be the center of focus in support of climate mitigation, better health, better water and waste management, a more resilient and inclusive Circular Economy, and an effective urban service provision.

This book is a collection of innovative research submitted to the 6th edition of the International Conference on Urban Planning & Architectural Design for Sustainable Development, as well as the 1st edition of the Circular Economy for Sustainable Development. It provides a brief glimpse into the measures that need to be taken to achieve sustainable urban planning and development in a post-COVID world as well as preserve and manage our cultural heritage, improve energy efficiency in buildings, and address issues of urban infrastructure.

Over the past two years, urban vulnerabilities and underlying patterns and effects of the pandemic have been the focus of research published. In this abstracts book, we showcase valuable insights of researchers across the globe who introduce urban models for a post-COVID future, investigate user behaviors towards public building designs and public transport systems and contribute to the development of pandemic-resilient urban development.

Acknowledgements

IEREK would like to express its appreciation to all the members of the staff, scientific committee, chairpersons, and editors for contributing to the tremendous growth of this institution and for making the 6th edition of the International conference on Urban Planning and Architectural Design for Sustainable Development and the 1st Edition of the Circular Economy for Sustainable Development International conferences a success.

IEREK would also like to thank the conference chairpersons, Professor Francesco Alberti and Professor Fabio Pollice, who are the core reason as to why this conference was transformed from a mere vision into real life success. This institution is greatly indebted to IEREK's advisor and Italian Alliance Director, Prof. Ferdinando Trapani. IEREK takes distinct pride in being an institution that amasses a highly qualified and competent team who restlessly worked for months to make this conference what it is today. As for the success of this conference, any step forward towards the ultimate goal of creating a well-rounded society was made possible by the highly reputable scientific committee that worked competently to prepare for and revise research papers. It would also like to give thanks to all the members of the Scientific Committee who made it their duty to help this institution spread knowledge to the masses.

WORD BY THE CONFERENCE CHAIRPERSON

For the second year in a row, IEREK Conference on Urban Planning and Architectural Design for Sustainable Development, organized with the scientific support of the Department of Architecture of the University of Florence, has migrated onto the web because of the Covid-19 pandemic.

A big debate has arisen worldwide on what will be the long-time consequences of this dramatic experience, which, differently from the last edition of the Conference, is often mentioned by the authors of the submitted papers as the current state of affairs.

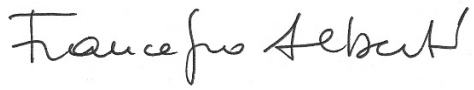
It is a widespread opinion that when we will have left the sanitary emergency behind, never will be the same. So, the question is: will we be better off?

The only possible answer is: it just depends on us, as well as for all other emergencies about the planet's and its inhabitants' health and survival that have been temporarily obscured by the pandemic: global warming, pollution, soil consumption and depletion, exploitation of natural resources above their thresholds for reproduction, reduction of biodiversity. Without forgetting that such environmental emergencies go hand in hand with the social and economic sustainability ones called into question by the seventeen SDGs of the United Nation Agenda 2030.

It just depends on us - where "us" stands both for members of the human race and specifically for researchers, professionals and educators in the fields concerning the human habitat: urban planner and designers, architects, engineers, landscape designer, agronomists, etc.

The papers presented at this edition of the UPADSD Conference are a significant testament to how disciplinary research is already able to provide advanced analysis tools and innovative design approaches to address the challenges we face.

The hope is therefore that the Covid-19 pandemic can be soon left behind and remembered as a painful but decisive turning point in the collective awareness and assumption of responsibility, so that research lines and concepts such as those presented in this anthology can germinate and grow worldwide.



Professor Francesco Alberti
Professor at the Department of Architecture (DiDA),
University of Florence, Florence Italy.

Word from the Chairman of the Board of IEREK

First, I would like to state that it is my honor to be launching this joint conference on the vital themes of Urban Planning for Architectural Design and Sustainable Development (UPADSD) 6th edition and Circular Economy for Sustainable Development (CESD) 1st edition of its kind.

Second, I would like to praise IEREK's efforts in establishing this successful event. IEREK- International Experts for Research Enrichment and Knowledge Exchange - is an institution that began pursuing its goal of reaching excellence in the research field in 2013, and since then has been linking scholars from around the world and providing them with a platform that would advance all their innovative efforts. All the while achieving IEREK's main goal of building international relationships with prestigious universities and institutes worldwide, spreading knowledge, and enhancing research around the world, through collaborating with trustworthy partners who share its same vision.

With this undertaking, IEREK hopes to present the world with a conference that positively contributes to its field and paves the way for scholars to combine their ideas for the greater purpose of discovering new and innovative solutions to today's issues, along with the aid of our scientific committee of distinguished professors and researchers from a range of established universities from around the globe.

Finally, I hope that the conference succeeds in delivering its message to the world of professionals in the various concerned disciplines to inspire that their work be made a reality. I also welcome all audiences, from undergraduate to postgraduate students, and all who could benefit the most from this conference. I look forward to seeing you all and to collaborating on this prosperous experience.

Mourad S. Amer

Architect, B5c, DSc, MSc, PhD

IEREK CEO

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Part IV
Reimaging Cities, Territories and Landscapes

Turning urban streets from infrastructures to living places
Early research outcomes of a case study in Prato, Tuscany

Gabriele Paolinelli[1], Lorenza Fortuna[2]

[1]Associate Professor, Department of Architecture, University of Florence
[2]Phd Student, Research Fellow, Department of Architecture, University of Florence

Abstract

During the second half of the Twentieth Century heavy phenomena of infrastructural development have affected urban landscapes. With regard to the streets, hosting the growing fluidity and speed of motor vehicles fluxes has been a priority for most designers. Nowadays there are multiple driving forces towards a transition that could accomodate different uses within the streets, primarily the cultural, social and economic exchanges that streets could enable in the past and have progressively lost.

By the spreading practice called “shared street” most signage and traffic lights can be removed to host a self-regulated and spontaneous circulation of all users and vehicles. This paradigm is being discussed with regard to its potential in strengthening urban landscape identity, ensuring accessibility, redefining uses and practices within the street, reducing injuries and misbehaviours, offering real and perceived safety to all users.

“Back to the street” is an ongoing research by design dealing with strategies of integration of different kinds of urban streetscapes. Which design features are needed to encourage a change in attitude, speed, hierarchy for street users? How can these features positively affect urban landscapes in general and streets liveability primarily?

We propose the case study of San Paolo street in Prato (Tuscany) presenting a set of quality requirements for street design such as plants integration, water drainage, comfortable paths for both cyclists and pedestrians.

As the design for separate flows cannot fulfill all quality features in San Paolo street, mostly due to its varying width, we assume the “shared street” can replace it for enhancing collective life within the streets while promoting the local sustainable mobility. The research is investigating two options: sharing the street in the narrow stretches or along its whole length. A preliminary comparison is proposed to discuss the earlier outcomes of research.

Keywords

*Landscape design; Urban streets; Shared streets; Accessibility; Liveability**Introduction**intorduction*

The widespread distribution of cars as prevailing private means of transport since '50s have entailed significant transformation to landscapes, and mostly to cities. These changes primarily concerned the streets, as places addressed to vehicles transit, but have consequently concerned several aspects of the urban life. Habits have changed with modes of transport, for example reallocating commercial, working and leisure activities outside the settlements (Bohigas, 2007; Capuano, 2020).

As Sylvia Crowe (1960) had foreseen, the need for a faster transit has radically changed the way people use streets, thus resulting in the loss of many advantages for the social, cultural and economic exchange, and so in the contradiction of cities' primary function: to be a place in which to live. So, while cities' dynamics have being deeply analyzed by architects, urbanists, economists and sociologists, some authors started to focus their interest on streets as crucial elements of collective urban identity. Despite many differences among perspectives and key issues, starting from the '60s a debate is fostered on the relational, multiscalar and multifunctional role of public spaces and particularly of streets. While Lynch (1960) underlies the importance of legibility and identity of space, relating to memory and orientation trough streetscapes, Cullen (1961) and Alexander (1977) read the streets as coherent sequences of frames. At the same time, Appleyard and Lintell (1972) analyze the consequences of traffic increase on outdoor activities and Gehl (1971) starts its still ongoing studies on the social dimension of urban streets focusing on uses in relation to their morphological, material and functional qualities. A new way of interpreting urban streets gradually emerges, looking at people's emotional and sensory experiences as quality features for changing urban landscapes in search for a new spontaneous and awakening social process, where streets take on a metaphoric and cognitive meaning (Rykwert, 1982).

Nowadays, after around seventy years of cars moving through cities, problems of conflicts, injuries, pollution and places' identity have considerably increased, depleting the liveability of urban open spaces, peoples' health and social equity (Illich, 1981). Growing traffic flows and the suggestion of speed as a major means of freedom

have reshaped our proximity (Smets, 2007) and detached our bodies from the ground (Pavia, 2020). As the lanes increase in number and width and the spread of parking areas have become new parameters for cities' transformation, the liveable space within the streets has been significantly reduced. The expansion and densification of cities' infrastructures and the combustion of fossil fuels is also causing a severe quality decline for air, water and soil, affecting not only the ecological functioning of natural systems, but also indirectly the quality of life for humans (EEA, 2017).

The awareness of need for a change in attitude is widely shared among the scientific community and the public authorities, and most cities around the world are moving towards a new understanding of urban mobility systems. Contemporary visions are emerging where pedestrians and cyclists have priority over motor vehicles and public open spaces are designed to host a wide range of activities and convey a sense of place and wellbeing. Sustainable mobility is being included in city planning theory and practice as a multilayered strategy for citizens' health: it reduces air pollution, produces enhancement of people's lifestyle, promotes physical activity, helps social interactions and little economies. Walking is an inherent activity trough which humans learn and discover since their early appearance in the world. It is also a medium for connecting with objects and other people. Furthermore cycling enables a freedom of movement and an impromptu use of space that no other means of transport can offer except one's feet.

As in urban streets the vehicles' average speed equals the bicycles', exceeding by only 2 km/h pedestrians' during traffic congestion hours (Fiorillo et al., 2018), cycling even turns out as the most efficient means of transport in the urban realm.

The plan for pedestrian and cycle mobility deals more with the research on places' identity than with the infrastructural arrangement for slow transit fluxes (Furtlehner, Licka, 2019). Therefore sustainable mobility can become a playful practice, an active experience where the physical space can take on a symbolic meaning and strengthen the awareness and joy of belonging to the urban community (Panzini, 2020).

Since the main Buchanan's work "Traffic in Towns" (MoT, 1963) brought to light the need to face the problem of cars in cities many contributions have been given both in the scientific discourse and in the professional practice on this issue. The design for sustainable mobility has become relevant, trying to figure out which quality features are needed to encourage walking and cycling and enhance places' identity in cities while reducing the danger produced by vehicles. Different approaches have emerged to accommodate by design all functions required to streets in this perspective. Among others "woonerfs", term first coined in 1965 by Niek de Boer, refer to residential areas where vehicles conform to pedestrians and cyclists rules, "complete streets" emphasize the need for a comprehensive design for users of all abilities and with all kind of transport. Besides, in Mark Francis theory (2016) "democratic streets" deal much more with the concept of collective use and social equity, and "shared streets", as promoted by Hans Monderman, concern the removal of signage for a self-regulated sharing of space among all users and vehicles.

An insight of this last approach is provided to better understand its implication in landscape design.

Discussion and open conclusions

The two options show different solutions that could both contribute to improve the urban landscape in terms of accessibility, micro-climate, hydrology, identity; ultimately enhancing resilience, well-being and sustainability. With regard to the early outcomes above mentioned we propose some general arguments:

In option 1, the presence of an actual vehicular lane, should not allow cars to exceed 30 km/h, due to the often changing spatial configuration that alternate the shared and the separated fluxes layout. However we could consider that the streetscape itself can suggest such a behavior without imposing restrictions. In fact the succession of different levels acts as a speed bump. So we can assume that the two options don't show any differences in terms of vehicles speed.

Option 1 results in frequent changes in landscape scenery and use, that could cause disorientation in users. However, this could positively affect a less fragmented street, producing interesting differences within a more homogeneous landscape.

Flows separation in option 1 requires more space for transit, depriving the street of many other uses and components, including parking lots, permeable soil and vegetation features. This sometimes can prevent the landscape from achieving a widespread adequate quality level. Furthermore the citizens' frequent claim for parking lots could generate opposition to such kind of transformation, even if it could represent an opportunity for reallocating them elsewhere away from the streets, for example inside buildings.

Options 2 allows a general and better integration among all street components that generate a widespread landscape quality. Since we assume it is better to avoid a sectoral and partial approach to design in order to

achieve an higher efficacy for the project, we would recommend option 2 for via San Paolo and in general for streets which show similar spatial and functional features. Nevertheless, as the “shared street” layout can't be implemented in the whole city's network of roads, it could be useful to evaluate hybrid solution such in option 1 to trigger a transformative process where different solutions can fit the diversity and hierarchy of the streets in the urban landscapes.

In conclusion it is worth looking deeper into the shared street layout to better understand its potential in enhancing urban landscapes, promoting the integration of different uses and components of road networks, encouraging people to come “back to the street”. In fact, as it results in this design experiment, the shared street can be a solution to provide much more space for non-transit activities, to generate places where to grow proximity relations among citizens, and this is mostly valid in narrow streets. In order to develop a transition towards a more sustainable urban environment it is necessary to overturn the current paradigm where motorized transit influences and often undermines people's freedom of movement. For enhancing sustainable mobility streets should be more attractive and pleasant, and vegetation plays an important role in this strategy. As the above mentioned results show, the shared street layout often allows the presence of a wider vegetal system within the streets, even where the ordinary layout reveals a lack of space. Planting trees along the road network is notably important for the connectivity and the ecological efficacy of the urban vegetal system, which can positively affect not only the beauty, health and micro-climate conditions of the city, but also the environmental quality at wider scales. However while for these reasons the shared street seems to be a proper transformation for some kind of urban streets, a few critical issues must be still widely discussed, such as the real and perceived safety for visually impaired people and the need for notifying a change in mobility rules from one place to another, which could be a driver for users' disorientation and confusion. As the shared street precondition is the absence of rules and the informal self management of people's activities, we argue it is the landscape, as designers conceive it, that should address this critical issues, conveying a sense of place where people are induced to behave in a respectful and safe way and share their public space without conflicts.

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