CLUSTER ACCESSIBILITÀ AMBIENTALE

a cura di / edited by
Dario Trabucco, Elena Giacomello, Martina Belmonte

MOBILITÀ VERTICALE PER L'ACCESSIBILITÀ

VERTICAL MOBILITY FOR ACCESSIBILITY

Oltre il Quadrato e la X

SITdA
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Università Iuav
di Venezia

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Oltre il Quadrato e la X

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INDICE TABLE OF CONTENTS

10 **PREMESSA** INTRODUCTION
Maria Teresa Lucarelli

12 **MOBILITÀ VERTICALE PER L'ACCESSIBILITÀ**
VERTICAL MOBILITY FOR ACCESSIBILITY
Dario Trabucco

16 What a Specialised VT Consultant can bring to a Project
Il contributo di un consulente di trasporto verticale nella progettazione
Stella Uberti

24 Gli ascensori urbani di Valparaíso tra riqualificazione urbana e valorizzazione del patrimonio culturale
The Urban Elevators of Valparaíso between Urban Redevelopment and Enhancement of Cultural Heritage
Alessandro Greco, Jaime Migone Rettig, Giorgio Pecoraro

32 Vertical Mobility: a multi-faceted Tool for enhancing Architectural Heritage
Mobilità verticale: uno strumento polivalente per la valorizzazione del patrimonio architettonico
Maria Luisa Germanà, Juan José Pons Izquierdo, Renzo Lecardane, Ferdinando Trapani

40 La macchina ascensore come elemento ordinatore ed espressivo del progetto di architettura
The Elevator Machine as an Element to order and express the Architectural Design
Massimiliano Condotta

48 Vertical Travel. L'accessibilità multisensoriale degli ambienti di transizione verticale nei percorsi di visita museali
Vertical Travel. The Multi-sensory Accessibility of Vertical Transition Environments in Museum Itineraries
Christina Conti, Mickeal Milocco Borlini, Giovanni Tubaro

56 Accessibilità e sostenibilità nel futuro dei borghi storici italiani: il caso Peccioli
Accessibility and Sustainability in the Future of Italian Historic Villages: the Peccioli Case
Carlo Ferrari

62 L'accessibilità nelle strutture alberghiere: il Resort Pollina
Accessibility in Hotel Facilities: the Pollina Resort
Alessandro Roversi

66 Accessibilità ambientale: due piattaforme elevatrici per percorrere il fianco del lago di Como
Environmental Accessibility: Two Lifting Platforms to travel the Side of the Lake of Como
Marco Baldelli

70 Elementi di comunicazione verticale: dalla prima industrializzazione all'attualità
Vertical Communication Elements: from the First Industrialization to Current Events
Raffaella Lione, Fabio Minutoli

76 Accessibilità all'ambiente costruito secondo i principi del Design for All: la norma prEN 17210
Accessibility in the Built Environment according to the Principles of Design for All: the prEN 17210 Standard
Elena Giacomello, Martina Belmonte, Dario Trabucco

82 Pinacoteca Nazionale di Bologna: un nuovo ascensore per l'utenza ampliata
National Art Gallery of Bologna: a new Elevator for the Extended User
Daniele Pavan, Caterina Poggioli

86 Impianto Aiguille du Midi sul massiccio del Monte Bianco
Aiguille du Midi plant on the Mont Blanc massif
Carlo Ferrari

90 Dialogue with the Jetty. Development of a new public space at the foot of the jet d'eau
Dialogo con il molo. Sviluppo di un nuovo spazio pubblico ai piedi del jet d'eau
Barbara Tirone

94 Ascensori per l'accessibilità nell'edilizia storica e monumentale: il Duomo di Milano
Lifts for Accessibility in Historic and Monumental Buildings: the Duomo di Milano
Alessandro Roversi

98 Universal Design for All per l'architettura Verticale
Universal Design for All for Vertical Architecture
Deanna Dalla Serra, Maria Paola Gatti

104 Verso l'accessibilità multidirezionale: gli ascensori ropeless
Towards the Multidirectional Accessibility: the Ropeless Elevators
Martina Belmonte, Dario Trabucco, Elena Giacomello

110 L'accessibilità dei collegamenti orizzontali e verticali. Uno strumento di valutazione per la progettazione inclusiva
The accessibility of Horizontal and Vertical Connections. An Assessment Tool for Inclusive Design
Valentina Giacometti

120 Misurare l'accessibilità degli ambienti sanitari. Il caso dell'azienda sanitaria universitaria le Scotte di Siena
Measure the Accessibility of Healthcare Environments. The Case of the University Health Board Le Scotte of Siena
Luca Marzi

128 Otis e Alba: la prima sedia a rotelle che interagisce con gli ascensori
Otis & Alba: the first wheel chair interacting with the elevators
Fabrizio Vimercati

132 Il riconoscimento biometrico come password di accesso all'edificio
Biometric Recognition as a Password to access the Building
Michele Suria

136 Comportamento sismico degli ascensori
Seismic Behavior of the Elevators
Pasquale Pipino, Paolo Dubini, Simone Peloso, Filippo Dacarro

Vertical Mobility: a multi-faceted Tool for enhancing Architectural Heritage

Mobilità verticale: uno strumento polivalente per la valorizzazione del patrimonio architettonico

Vertical mobility plays a key role in the accessibility of architectural heritage: an extraneous requisite, but indispensable for enhancing the built heritage in an inclusive way. In this framework, in the light of their multiple technological features, mechanical devices will be discussed, taking into account the interaction with the users (individuals and community). Urban and architectural design in the historical context is very often confronted with vertical mobility, in the relationships between fragmented spaces and the perceptive processes of the user. The mechanical devices can be read at the same time as technological products and as iconic moments of the narrative sequence of different urban areas. A focus will be placed on the social relevance of vertical mobility, with reference to the theme of the healthy city. The paper will report several results from an interdisciplinary research opportunity, stemming from MOVE AGED, a project funded by Interreg Espana-Portugal EU Program, specifically devoted to the specific needs of elderly people in the historical parts of urban settlements.

The paper proposes architectural heritage as a thought-provoking, trans-disciplinary application field. In fact, the user's experience and technological innovation have become indispensable terms of reference in the activities of knowing, conserving and enhancing; over the last decades topics such as social inclusion, participation processes and community involvement have entered the domain of architectural heritage.

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From sloping paths to vertical mobility: not only a geometrical transformation

Vertical mobility may refer to the private or public dimension, as well as indoor or outdoor places. Instead of considering this peculiar kind of mobility on a case-by-case basis, when only surmounting a height difference becomes necessary, vertical mobility should be seen within a systemic framework. This could contribute to considering – on the one hand – the built environment properly and – on the other hand – the users and their varied needs.

The need to surmount differences in levels within the built environment, both on the building and on the urban scale, has been a keenly felt issue ever since antiquity. Extremely varied, minor or important examples testify to the fact that the most common traditional solution was to create sloping paths by adding steps, ramps and curbs.

An intense relationship links this kind of solution and the user. Regarding the design phase, the well-known formula (2 risers + 1 tread = 63-65 cm) deriving from François Blondel's Cours d'Architecture (Paris 1675) and today globally applied by designers in order to guarantee safe steps, derives from the ergonomic dimension of the stride length of the average user. Regarding the utilization, this relationship is even more intense: the physical effort, depending on the slope, is only the most obvious aspect of a wider multisensorial experience, in which positive aspects (diversification of points of view and perspectives in Le Corbusier's idea of promenade architecturale) coexist with negative aspects (risk of slipping and falling). Lighting conditions, both daylight or artificial light, have a significant influence on the experience of negotiating a sloping path or a flight of steps, as well as weather conditions, building materials, finishes of structures and the state of maintenance and conservation.

The need for swifter and more undemanding paths has led towards vertical solutions for overcoming height differences within the built environment, by resorting to mechanical devices. From the archetypical systems of ropes and the animal- or man-powered windlass (Fig. 01), to the contemporary machine-powered systems, the same tendency to exclude the human experience is most noticeable in the passage from the slope to the vertical path. Generally speaking, in vertical mobility, the users are almost passively transported from point A to B, without considering potential consequences of this passage, not only on the areas traversed, but also on the users themselves.

In order to change this tendency, there is a need to include the user's experience, in terms of both analysis and design of vertical mobility, with specific attention to the presence of mechanical systems, rather than only to the geometrical configuration of the path. These systems, like any other artefact, have multiple features, clearly referable to three interdependent components (hardware, software, and brainware) embedded in a specific technology support network (Zeleny, 2009). In light of this consideration, devices such as elevators, escalators, platform lifts, and mechanical ramps, are not just physically structured mechanisms, but have the potential of interacting with individuals and communities, changing their lives and increasing their well-being. At the same time, these mechanisms interact with the anthropic context, strongly influencing the conditions for using the built environment, without considering the dimensional and morphological impact.

Due to the fact that vertical mobility is one of the key tools of accessibility, the efficiency of these devices should be a priority in managing the built environment; accessibility is not merely a quantitative requisite, but it becomes an ethical theme and its importance includes many qualitative features.

Vertical mobility acquires specific meanings and features within architectural heritage: the whole built environment characterized by specific conspicuous historical, archaeological, artistic, scientific, social or technical interest (CoE 1985). Vertical mobility improves accessibili-

Fig.01 The Greek monasteries of "Metéora", built on the summits of rock formations average 300 mt in height, offer an archetypical example of mechanical vertical mobility: "before the 1920s ascending the rock columns involved the perilous enterprise of climbing ladders or being hauled up by ropes and nets" (https://www.britannica.com/topic/Meteora). Av. at http://www.monastiria.gr/meteores-monastere-de-barlaam/?lang=fr.

ty, both within single historical buildings and within the open spaces of historical settlements. Gaining access in a safer and more comfortable way is certainly a prerequisite for the sustainable use of architectural heritage, the social and economic dimensions of which go further than simply overcoming physical or cultural limitations and regard different kinds of user. On the one hand, vertical mobility improves the quality of life of residents and local communities and facilitates social inclusion; on the other hand, it can encourage cultural tourism and bolster the local economy. In any case, vertical mobility takes on a particular importance when considering the ageing population (as will be outlined below).

Many constraints arise as a consequence of the intrinsic inaccessibility of the ancient built heritage, and the need for conservation poses cultural challenges, as well as those of design and technique. The wide range of examples of insertion of devices for vertical mobility in ancient contexts can be divided into two broad categories, united by their objective, technical and material extraneousness from historical pre-existences: on the one hand mimetic solutions, which tend to minimize their aesthetic impact by trying not to be too visible; on the other hand, emphatic solutions, which accentuate differences by exhibiting high-tech forms.

Vertical urban mobility as a social issue

Regardless of other notable advantages, the implementation of mechanical infrastructures that help to maintain the differences in elevation within cities is a matter of great social importance. As can be read in the Granada Declaration for Accessible Cities (2013) "[…] The protagonist of the city will always be the pedestrian and universal accessibility the fundamental principle for its design" (Cañavate & Fernández-Bermejo, 2016).

From this premise, it is clear that vertical urban mobility infrastructures facilitate the life of the citizen, by ensuring less arduous pedestrian (and cyclist) mobility in areas with steep slopes. But, in a very special way, the mechanical aids favor population groups with mobility difficulties (elderly people, permanent or temporary physically handicapped, pregnant women, etc.).

Fig.02 Monitoring movement of citizens and surveying users of the vertical mobility devices within the MOVE AGED Project. *M. Serrano*

These elements, which have witnessed a rapid development in recent decades, are widely used by the population, who see them as an invaluable aid in getting around easily in their local urban environment. In Spain, for instance, more than 400 complete infrastructure items (some of them composed of several individual elements) have been developed in the last two decades (Toda, 2015).

The Project MOVE AGED (Ser mayor y vivir en un barrio con barreras topográficas en España y Portugal. Las infraestructuras de movilidad urbana vertical como elementos integradores e inclusivos para los ancianos), funded by the Fundación General CSIC, the Centro Internacional sobre el Envejecimiento and the European Regional Development Fund, is focusing on this issue (http://arcg.is/15iuTu). The Project is seeking to discover the impact of the development of vertical urban mobility infrastructures on the lives of local people, the elderly or those with mobility problems, living in neighborhoods with topographic difficulties in Spain and Portugal, and often in historical cities.

The study was developed through a brief survey conducted in some of these infrastructures, located in three Spanish cities: Pamplona, San Sebastián and Vitoria. In total, the fieldwork covered fourteen different places (eight elevators, four ramps, an escalator and a mixed infrastructure), over three working days between the months of December 2018 and May 2019. In this study, 713 surveys were conducted on people over 65 years of age and 11,634 citizen movements were monitored (Fig. 02).

According to the results, the elderly users make up more than a quarter of total, a higher percentage than that of the population present in these cities. It can be observed that the profile of the users is evenly matched as regards gender. However, there is an inverse relationship between age and the use: a higher number of years corresponds to lower number of trips.

The frequency of use of infrastructure is considerable, since almost two thirds of respondents use it daily and 22.9% at least once a week. The main use is for shopping and other errands and the opinion regarding the infrastructure is very favorable: 97% of respondents

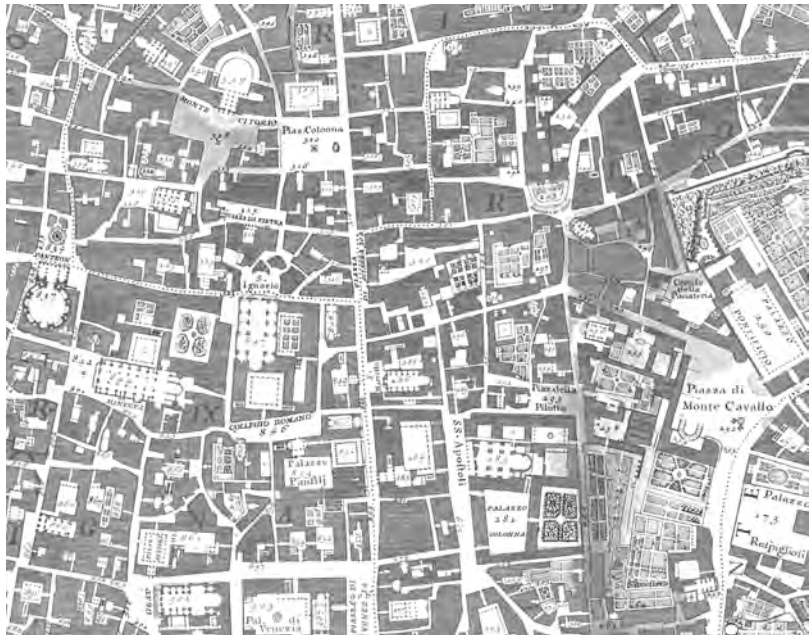

Fig.03 Extract from the Plan of Rome by Gianbattista Nolli (1748), av. at http://www.romaeterna.org/urbs/forma/nolli.html?fbclid=IwAR3RHTjzg64ZaTYmEy-7CqL8MozgmnOrmM_O712E-KgFbvjw-k9YoaxYeP8.

state that the infrastructure allows them to do things that they could not do before, or, at least, facilitates them.

The high frequency of use by the elderly and the great value they attach to vertical urban mobility infrastructure underlines the important role it plays with regard to quality of life and in the actual physical well-being.

Sequences of spaces and experiences of mobility in the historical city

A sequence of spaces is here understood as a method for organizing the built environment according to the arrangement of a series of buildings or open spaces, considered and defined by morphological, perceptive and sensorial features. In this sense, the sequence requires the coordinated employment of light, materials, and surfaces as design tools.

The sequence of spaces affects the user's experience during his mobility, as a consequence of the variations one can perceive in the specific characteristics of the areas traversed, both physically and emotionally. The spatial experience, according to Bruno Zevi, extends from architecture to the city, through streets, squares, alleys and wherever Man, operating in the voids, has shaped enclosed spaces (Zevi, 1948). The idea of the continuity of voids, defined by the full volumes of architecture, was already graphically explicit in the seminal map of Rome published in 1748 by Gianbattista Nolli. The inverse reading of static space highlights emptiness as the first element for investigation, in which, for example, the Pantheon itself, represented in its recognizable plan, becomes an open urban space available for a range of spatial and temporal experiences, whilst still belonging within the city (Fig. 03).

Following this theoretical thread, in more recent times, Steven Holl has developed the hypothesis of the transformation of the static and physical dimension of space through the experience of movement of the body, which feeds the points of view in an indeterminate flow of perspectives in a very compressed period of time (Holl, 2000).

Fig.04 Escalator installed in the 1980s inside the ancient Rocca Paolina in Perugia. *Gianni Careddu (https://commons.wikimedia.org/wiki/File:Perugia,_Rocca_Paolina_(18).jpg)*

According to Juhani Pallasma the multisensorial experiences, when in sequence, lead to a fusion of the qualities of space, matter and proportions (Pallasma, 2005), so as to generate a "polyphony of senses" (Bachelard, 1957). Walking while thinking, an image we have inherited from the agora of ancient Greece (Solnit, 2001), is an experience that can be relived through a stroll along anchored paths. The reference is now to the unanchored urban proménade of the flaneur by Walter Benjamin (Benjamin, 1982), regarding the subsequent involvement of direct experience, which allows us to rediscover a new lexicon dictated by discovery (Burckhardt, 1997) and the opportunity to lose ourselves (Augè, 2009).

A different way of comprehending the historical city is possible by focusing on the issue of urban accessibility in many Italian cities, where the issue remains largely unanswered. Excavation, sinking, engraving, super-elevation, are some of the design tools that can create new forms of access and redefine the morphological relationship in the spaces of the historical city. The reduced flexibility that marks historical centres must therefore be balanced with the recovery of the liveability and the implementation of measures aimed at guaranteeing conservation, accessibility and usability. For instance, the specific, peculiar and not replicable solutions proposed for the ascending path inside the Rocca Paolina in Perugia (1983), were based on a renewed encounter between cultural heritage and the local community, grafting new relationships between city and infrastructure (Fig. 04). In this case, the urgency to explore the need for mobility while protecting the cultural heritage enabled the project to become an example of the prominence of the landscape dimension.

Vertical mobility as an urban theme

In the fruition of the built heritage, understood as an opportunity for social innovation (Genovese, 2018), overcoming disparities of height is one of the most deeply felt problems for all of us and, in particular, for those with mobility difficulties (MIBAC, 2008). Therefore, one

of the aims of the policies for safeguarding and enhancing is to guarantee the feasibility of moving around on foot, as a basic right for all, by designing itineraries that do not discourage local people and elderly tourists with mobility problems and directing attention towards the functional, cultural, environmental and managerial aspects of mechanical systems. These systems should be safe and attractive, and combined with adequate public transport that renders the idea of moving about on foot favourable, would contribute to the conditions of health of the general public, reducing drastically non-communicable diseases (NCD). In historical cities, in particular, from the point of view of social management, overcoming the issue of disparities of elevation is mainly an issue for two categories of user: the elderly and the tourist. In Europe, the elderly people are becoming the principal visitors to historical cities. For example, in Italy, a study of 109 major cities showed that only 2.5% of the population actually lived in the historical centres, of whom 23 % were aged over 65 (Ancsa-Cresme, 2017). Generally, in Italy centralized urban services (health, higher education, law courts, etc.) are tending to move away from historical centres, which are being deserted by residents but, on the contrary, invaded by hordes of tourists: "The preservation of natural and cultural resources is another challenge the industry must overcome. Results show that the number of UNESCO cultural and natural sites, as well as intangible cultural heritage listings, keeps growing, indicating greater commitment to preserving some of the key attractions driving people to visit destinations" (WEF, 2019, 7). Apart from quantitative data, one needs to consider certain qualitative aspects of the ageing of the resident population in the areas of the ancient city; on the one hand the elderly may feel excluded from their own living area for reasons of physical accessibility and perceive the approach of mass tourism as a threat to their cultural identity. On the other hand, these same elderly people could be included in policies of sustainable tourism in a relational key as players to be actively involved in local story-telling (Richard & Marques, 2012).

The public and/or private design initiatives that utilize mechanical systems to surmount disparities of height can accomplish, with a single action, two integrated social objectives: to enable (chronically or temporarily) disadvantaged subjects to continue to enjoy all public and semi-public spaces that are part of architectural heritage (ranging from the landing in one's house to a square or urban park); to enable agencies devoted to citizens' healthcare to provide forms of preventive therapy based on physical mobility, rendering all public and semi-public spaces accessible. In accomplishing these aims, vertical mobility becomes a factor in urban enhancement, acting on individual and community regeneration and, at the same time, leading to the creation of social (inter-generational, if possible) networks, as a back-up for the entire architectural heritage. The mobility/accessibility strategies of chronically and/or temporarily disadvantaged subjects, residing in historical centres, and strategies for sustainable tourism, if accompanied by opportune campaigns for training and communication, may also become factors in mobilizing/re-activating the social capital in historical centres, collaborating in order to create equilibrium between residents and tourists, both of which are categories involved in the processes of safeguard and enhancement.

Conclusions

Vertical mobility in the architectural heritage, if seen to be applying a multi-scalar and trans-disciplinary approach, has important potential in improving conservation and overall enhancement.

There is a need for a cultural and strategic (and not merely technical) vision of mechanical systems, which may include relationships with the users, at individual and community level, with the urban fabric, and with the constraints that derive from historical identity.

These systems contribute significantly to a more complete and inclusive use of architectural heritage and are essential in terms of public health, also fostering mobility for the elderly and

disabled people with temporary or permanent difficulties. The positive consequences also include the added economic value that may result from cultural tourism.

Public and private stakeholders should be more involved in focusing on the issue of vertical mobility, in order to help guarantee efficient design and management solutions.

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