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Soft Mobility and Pedestrian Networks in Urban Areas[1]

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ABSTRACT

By referring to the wider strategies set up, starting from the middle of the Nineties, by the European cities to promote a sustainable urban mobility and to the more recent concept of soft mobility, which generally includes pedestrian and cycling mobility, this contribution focuses on pedestrian mobility in urban areas, outlining criteria and methods for planning and designing networks of urban public open spaces, such as roads and squares, devoted to an exclusive or prevailing pedestrian use. First of all, the paper analyzes the multiple roles played by roads and squares within the cities: "axes" supporting different mobility flows, including the pedestrian ones, and in the meanwhile urban places in which different activities (commercial activities, meeting, and so on) take place. Grounding on that, the main reasons driving toward an organization of such spaces as urban networks have been outlined. Then, some guidelines and methodological elements, both for planning pedestrian networks and designing their elements taking into account the correspondence between foreseen uses and spatial features of each element, have been provided. Furthermore, the links between the pedestrian networks and the main junctions of other urban mobility networks, as well as between the first ones and the urban contexts have been stressed. Suggested guidelines and methodological elements have been applied and tested both on historical and suburban areas of the city of Naples; nevertheless they represent only a first step towards the setting up of a method for pedestrian networks planning and design in urban areas.

Sustainability and pedestrian mobility

The improvement of the pedestrian and cycling mobility, especially in urban areas, is a key action to reduce the huge environmental costs of the motorized transport which is still today the main transport mode for urban and regional travels.

This action constitutes a segment, even though remarkable, of wider strategies targeted to promote sustainable mobility, especially in urban areas.

By the mid Nineties, the Aalborg Charter (1994), signed by many European cities to promote a sustainable urban development, singled out, among the key principles for re-directing urban development, the improvement of sustainable mobility, especially walking, cycling and public transport, and assigning priority to environmentally friendly means of transport. Starting from the end of the Nineties, many initiatives took place in Europe with the aim of opposing to the spread of the cars favoring a sustainable urban mobility, through policies aimed at innovating modes and means of urban transport, strengthening public transport, especially rail transport, and encouraging walking and cycling (Galderisi 2007).

In 2004, during the Fourth European Conference on Sustainable Cities, the Aalborg Commitments have been approved. Among the strategic commitments of European local governments, the followings are identified:

– the reduction of the need for private motorized transport and the improvement of effective and accessible alternatives;
– the increase of the amount of travels through public transport, walking or cycling;
– the spreading of low-carbon emission vehicles;
– the development of integrated and sustainable urban mobility plans;
– the reduction of the impacts of the transport sector on the environment and the public health.

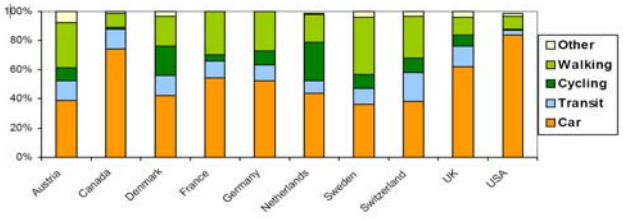
All the mentioned documents underline therefore that, beginning from the second half the Nineties, the need of steering urban mobility toward sustainability had been progressively established in Europe, assigning centrality to the pedestrian and cycling mobility, increasingly identified as key components of the so-called "soft mobility", which imply the exclusive use of the human physical capacity (Ministère des transports, Ministère des Travaux Publics, Ministère de l'Intérieur et de l'Aménagement du territoire 2008).

This is a relevant step toward a sustainable urban development: pedestrian mobility, although representing a remarkable part of urban mobility, has never been considered, indeed, as a transport

mode with autonomous dignity. Grounding on an approach to urban mobility mainly developed into the filed of transportations studies, pedestrian travels have been neglected for a long time or considered as spontaneous movements which do not require specific plans or design rules: for long time, walking has not been interpreted as one of the transport modes, perhaps because it doesn't involve the use of vehicles or because it represents the basic mean of movement. However, walking is the most vital mean of transport, the one on which all the activities of a community depend. On the other hand, the relevance of walking into the transportation system of any city was already recognized in the Sixties by the Buchanan Report (Ministry of Transport 1963). The lack of consideration of pedestrian movements is also evident in traditional surveys related to the subdivision for transport modes of the whole of urban travels. In these surveys, in fact, the only travels generally considered are those exclusively made on foot, by cycle, by public transport or by car: short or connecting different transport modes travels – which are generally made on foot – are generally neglected (Litman 2006).

Moreover, the close dependency of soft mobility on the ways of organization of the urban spaces clearly emerges comparing data related to the diffusion of walking or cycling in European and American cities. European cities are characterized by historical fabrics built up before the spread of the car, by high residential density and by the presence of many heterogeneous activities, while American cities, often built up according to a car-based transport model, are largely characterized by low residential densities and by mono-functional urban areas.

At the end of the Fifties, indeed, Lewis Mumford invited to reorganize the city centers for the pedestrian movement: a careful quantitative analysis showed the inefficiency of the private transport in comparison with both the public and the pedestrian transport, asking for assigning to pedestrian travels a key role in the wider urban transport system. "But to bring the pedestrian back into the picture, one must treat him with the respect and honor we now accord only to the automobile." Mumford stressed the need to revitalize the pedestrian movement, rethinking the overall organization of the city: "(...) if we are to make walking attractive, we must not limit provide trees and wide pavements and benches, beds of flowers and outdoor cafés (...): we must also scrap the monotonous uniformities of American zoning practice, which turns vast areas, too spread out for pedestrian movements, into single-district zones, for commerce, industry, or residential purposes. (...) Where urban facilities are compact, walking still delights the American. Nothing would do more to give life back to our blighted urban cores than to re-instate the pedestrian, in malls and pleasances designed to make circulation a delight. And what an opportunity for architecture!" (Mumford 1956). It seems clear, therefore, that encouraging the urban pedestrian mobility requires not only the recognition of the pedestrian travels as primary mode of transport inside the city but, above all, the reorganization of urban places that, both in the historical town and in the peripherical areas, are devoted to an exclusively or prevailing pedestrian use: particularly, streets and squares. These latter, in fact, although not exclusively devoted to pedestrians, represent the key places for pedestrian travels, even the short ones, inside the city. It is clear, in fact, that while the exclusive pedestrian use is the distinctive factor of the green urban open spaces (parks, gardens), the public open spaces such as streets and squares, also when they was built-up for pedestrians as in the case of historical towns and characterized by the presence of activities strictly connected to such use (commercial activities, touristic activities, etc.), are currently mainly characterized by a mixed use pedestrian-vehicle or, more generally, by the coexistence of different transport modes, including the pedestrian one. Very often, however, mixed uses often clash each other: the coexistence of cars and pedestrians has become, with the increasing growth, since the last century, of the car flows, more and more difficult, although the conflict among pedestrians and vehicles was already present in ancient Rome: for example, the first restrictions to the passage of vehicles inside the city were imposed by the Lex Julia Municipalis in 45 a. C. that prohibited the movement of wagons within the city from the dawn to the sunset, except for the transport of materials for public works or resulting from public demolition (Hass-Klau 1990). Despite the growing conflict among transport modes not always compatible one with each other, streets and squares still play multiple roles within the city: such spaces, in fact, not only represent places which support different types of travels but they are also required to partially satisfy the whole urban demand for leisure and social aggregation. As very well described by Gehl (2003), in fact, these spaces are the main support to different types of activities that the author distinguishes in necessary, optional and social.



The graph shows the high heterogeneity in the distribution of urban travels by mode of transport among European and not European countries. In particular, it is possible to note that the "walking" has very little relevance in countries such as the United States and Canada, where the cities had a car oriented development.

The first ones are those that take place every day without taking into account weather conditions or quality of the surrounding environment, such as to go to school, to go shopping, to wait for a bus, etc.
The second ones can be instead favored or promoted by the place features, since these optional activities are freely chosen, such as walking or sunbathing.
The third group of activities refers to those activities essentially addressed to social aggregation in public spaces, such as playing, meeting, chatting etc., but also the whole of passive contacts among people like to simply look each other.
It is quite evident that the quality and the attractiveness of public open spaces largely depend on the interlacement and the combination of these different activities: according to Gehl (2203), life among buildings is not only characterized by pedestrian flows but it includes the entire spectrum of the mentioned activities. Public open spaces are, therefore, certainly devoted to mobility but, above all, they represent urban places characterized by multiple uses, from walking to meeting and shopping; moreover, they can usefully contribute to promote social relationships but also, on the opposite, to increase the sense of insecurity and exclusion in the city.
In relation to the multiple roles played by these spaces in urban areas, it is clear that in order to promote soft mobility and, more specifically, pedestrian mobility, there is the need to look at them not only as channels supporting different types of travels, including the pedestrian ones but, above all, as urban places, included in specific urban contexts, and devoted to support a plurality of activities.
Until today, in fact, the numerous interventions of pedestrianisation on individual streets or squares have had heterogeneous results, depending on the different starting conditions. In many cases, their implementation was not capable to trigger a process of effective improvement of pedestrian travels in the urban area. Moreover, pedestrian spaces are often interested by uses scarcely respondent to or coherent with the primary purposes (Gabellini and Bonfantini 2005).
Grounding on these considerations, in the following paragraphs methodological guidelines for singling out networks of urban open spaces devoted to the pedestrian mobility – focusing on the reasons that favor their organization as a network – will be provided. Moreover, some guidelines driving the "project of use" of each element of pedestrian networks in order to achieve a better coexistence among the different activities that public open spaces have to support and to improve, in the meanwhile, the congruence between foreseen uses and spatial features of each element, will be presented.

From planning to design urban pedestrian networks

The need for organizing public open spaces as a network is at present widely shared, at least in reference to particular categories of open spaces such as green areas that, although located in urban areas, are primarily characterized as natural areas.
In relation to the latter areas, indeed, it is largely recognized in scientific literature that the resilience of natural systems essentially depends on the "continuity" of the individual natural areas; therefore, these areas have to be not isolated or marginalized but linked one to each other through green (natural or artificial) corridors, creating a green or ecological network. Of course, when public open spaces devoted to a prevailing pedestrian use, such as streets and squares, are concerned the continuity among these spaces is not strictly required: in these cases, indeed, the network is not indispensable for the survival of its components even though "continuity" can be certainly useful to enhance the effectiveness of each element.
However, it is worth mentioning that, since the Nineties, the traditional concept of ecological network, specifically related to the links among natural areas, has been significantly widened.
Gambino (2003) highlighted, for instance, that both in the Italian and in the European context, it is difficult to identify networks only devoted to purely biological functions, since the density of cultural, social and economic relationships that have historically shaped the territory, affecting its ecological dynamics. Hence, broader and comprehensive concepts have increasingly spread as that one of "environmental network", reminding of the multifunctional character of such networks.
Therefore, the concept of environmental network with multiple features and uses seems to anticipate an holistic approach to public urban open spaces – which have also driven some quite recent experiences of land use planning, such as that ones of Rome and Bergamo – aimed at including both green open spaces and urban open spaces, such as streets and squares. Grounding on this approach, to each element of the network, in according to their specific features and locations, an active role in the improvement of the quality of the urban environment can be assigned. Thus, according to the principles affirmed by the Aalborg Charter, the urban open spaces devoted to a prevailing pedestrian use will ensure a more suitable answer to the demand for places devoted to leisure and social aggregation, increasing the quality of urban life and reducing the demand for social activities in natural areas. Therefore, the organization as a network of urban open spaces can ensure not only a more balanced distribution of the opportunities for pedestrian movement within the city, but also a more spread quality both of urban and natural environment. Finally, it has to be

considered that, also in this case, the isolation of pedestrian spaces will likely produce an excessive load of use on some parts of city or on single roads or squares, reducing their efficiency and attractiveness.

Pedestrian networks may largely contribute to the requalification of urban areas; nevertheless, to pursue this aim, the plan of such networks should be framed in the wider strategies of evolution/ transformation of the whole cities in which they are included. For example, in the historical city the implementation of a pedestrian network can represent a key action within a wider strategy of requalification, addressed to improve tourism too, of the urban area. Likewise, in the central urban areas, characterized by the presence of relevant urban facilities (universities, hospitals, leisure facilities, etc.), this implementation can support strategies aimed at increasing the accessibility to the urban activities reducing, at the same time, the car flows. In peripherical or decayed urban contexts, pedestrian networks – meant as a key component of a wider regeneration strategies aimed at recovering the building stock and at integrating new relevant urban activities to ensure its revitalization – can provide new places for social aggregation, often completely lacking, contributing to the pursuing of wider social aims. Once clarified the reasons that lead to favor the organization as a network of urban open spaces mainly devoted to a prevailing pedestrian use and the role that, in different urban contexts, such networks can play, there is the need for explaining that, in reference to these spaces, the concept of network has an high degree of abstraction. Unlike ecological networks, which require physical connections among their elements, pedestrian networks can be continuous and totally based on pedestrian travels, or multi-modal, characterized by small pedestrian networks developed over different areas of the city, linked one to each other through public transports. The latter is clearly the most widespread model of network, mainly in large urban areas, where it is hard to ensure the continuity of the pedestrian network both for the travel distances and for the difficulty to create large car-free areas. Thus, urban pedestrian network are often characterized as systems of local networks, devoted to an exclusive or prevailing pedestrian use, linked through rail transport.

Summing up, urban pedestrian network can be shaped both as a network of public open spaces devoted to an exclusive or prevailing pedestrian use extended to the whole city and linked to the urban or regional ecological network, or as a web of local networks, developed over more or less extended partition of a city, linked through public transports. However, the opportunities for defining and implementing "unitarily" pedestrian networks extended to the whole city are not very frequent, also due to the difficulties generally related to the implementation of such networks (car-free roads and squares, widespread interventions of street furniture, etc.). More frequently, pedestrian networks are implemented through an incremental approach, that is through the progressive implementation of local networks or, sometimes, also of individual pedestrianizations. In many cases, the realization of new railway stations represents the starting point for promoting local pedestrian networks. In designing networks of open spaces devoted to a prevailing pedestrian use, time plays, therefore, a relevant role. Generally, in medium or small sized cities, the whole urban network can be designed and the single interventions can be carried out over the time according to the project.

On the opposite, in the big cities, the starting point for the pedestrian network development is generally represented by single interventions, due to specific needs or opportunities, which are subsequently expanded and linked through public transport. Finally, some guidelines addressed to identify pedestrian networks and to design their elements can be provided. In relation to the heterogeneous activities that such networks have to support, the choice of their elements and of the "level" of pedestrianisation (exclusively pedestrian or mixed) of each element depends, first of all, on the features of the urban context in which these elements are included. The demand not only for mobility but also for the many optional and social activities that, according to Gehl (2003), pedestrian networks can support depends, indeed, on the localization and on the features of their urban context which they belong to (historical city or periphery), on the characteristics of the population, on the existing activities, on the physical peculiarities of the urban area and of the elements of the network. Moreover, it is useful to take into account the likely transformations of the urban area at stake, issuing from the future scenarios outlined by urban planning tools according to a given temporal span.

Furthermore, the role played by each potential element of the network within the whole urban mobility system, has to be considered in relation both to the current situation and to the development scenarios provided by the urban mobility planning tools. The elements of the network will be therefore singled out and designed taking into account the congruence between the present and future role of these elements in the urban mobility system and the current and future demand for different uses arising from the urban context. Moreover, the role of each element of the pedestrian network will also depend both on the features of the element itself (slope, size, etc.), and on the potential impact that a change in the current role might have on the whole system of urban mobility. Once all the elements of the network have been identified and the multiple uses (pedestrian and car flows, heterogeneous activities etc.) that each element have to support have been defined, a "project of use" for each element can be outlined. Such a project

will be addressed to manage the different practices of movement and rest, often clashing each other or not immediately compatible, that in a synchronic or diachronic way run over the spaces and to which an answer in terms of spatial organization, choice of adequate building materials and so on has to be provided (Gabellini 2001). Therefore, the project of use of each element of the network will depend on the demand for different uses arising from the context, on the physical features of the element at stake and on the relationships that each element has with all the others. In the meanwhile, the project of use will influence the physical features of each element: such features have to be defined grounding on the congruence between them and the multiple uses that each element has to support.

Summing up, promoting soft mobility in urban areas requires first of all a spatial and functional reorganization of urban spaces devoted to the pedestrian mobility: restrictions to car flows in some urban areas, indeed, do not automatically favor pedestrian mobility. On the opposite, criteria, methods and techniques to define or to recovery the attractiveness of the pedestrian spaces are required, promoting different practices of use of such spaces and designing them as urban places as well as "channels" supporting heterogeneous, also vehicular, flows.

Guidelines for pedestrian networks planning

According to the criteria for planning and designing pedestrian networks outlined in the previous paragraph, first of all, the general plan of the pedestrian network and the detailed project of its elements require different types of surveys developed at least at two different scales: surveys at urban scale aimed at defining the scheme of the whole network, that is the elements of the network and their main roles; surveys at local scale aimed at defining the functional organization and the spatial features of each element of the network. In the first group of surveys, present and planned features of the city have to be taken into account in order to bring out existing and future demand not only for mobility, but also for places for leisure and/or for social aggregation. Analyses focused on the functional and social role of the urban area and on the features of existing and potential users are therefore useful. The role of the urban area at stake can be defined according both to its history (development and role of the area over time) and to its functional features, determined for instance by the presence of relevant urban activities or of historical buildings attracting large amount of tourists, or of tertiary and commercial activities, etc. These surveys provide first items for the singling out of the network, supporting the definition of the main aims that the network itself is planned for.

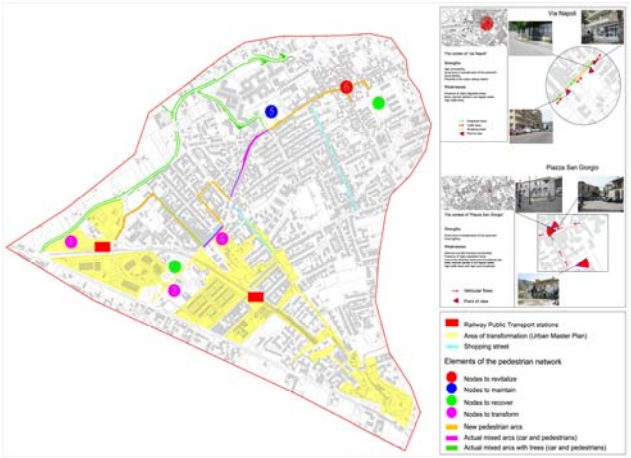
As noted above, indeed, pedestrian networks are generally framed in wider requalification strategies of urban areas, addressed to different aims according to the different features of the area at stake. For instance, the aims will significantly differ if the network is part of a historical core of a large metropolitan area or of a medium or small sized town, or, again, in a new suburb or in a consolidated peripherical settlement.

These type of surveys provide planners also with an essential support for planning the whole network. For example, the knowledge of the historical growth of the urban area can drive planners to steer the pedestrian network plan toward the recovery of a lost historical memory or identity. The knowledge of the functional role of the urban context can suggest to counterbalance or, on the opposite, to emphasize the current role through the implementation of the network, promoting, for instance, the revitalization of commercial activities or improving the accessibility to the existing activities. As mentioned above, the development scenarios of the urban area, with reference both to the ongoing transformation processes and to the forecasts of land use planning tools, have to be taken into account.

The surveys related to the users allow planners to single out different categories that, in relation to their different needs and expectations, lay down heterogeneous, sometimes conflicting, mobility demands. In many cases, not only the population living in the urban area at stake but even daily or temporary users – due to the presence of relevant urban activities or of tourist attractions – have to be taken into account.

Therefore, the structure of residents and the different typologies of not-resident users have to be investigated. In particular, it is useful to distinguish the amount of daily users, spending a remarkable part of the day in the area working or studying, from that one of temporary or occasional users, such as tourists. These surveys can be carried out through indirect and qualitative evaluations, based for example on the level of attractiveness of the existing activities or, in other cases, through quantitative assessments: the number of users of existing activities can be generally measured, although approximately.

Finally, the surveys related to the urban area in which the pedestrian network has to be developed have to highlight the current and future levels of accessibility of the area and, in particular, the existing or potential linkages between the pedestrian network and other mobility networks, such as railway stations, parking areas, etc. In order to define the role of the elements of the pedestrian network within the wider network of urban mobility, the elements which have already been totally or partially devote to a pedestrian use (squares and pedestrian roads, car free areas, etc.) have to be identified.



The identification of the scheme of the network is based on the assessment of the congruence among the role, current or potential, of the element and the demands of use, actual or potential, arising from the context. The image shows the scheme of pedestrian network developed for the Pianura district in the western periphery of Naples.

These elements represent the current supply of spaces for pedestrian mobility. All the others have to be classified taking into account their current role (primary roads, neighborhood roads, etc.), their future one, according to the forecasts of the mobility plans, and their physical features (size, slopes, etc.).

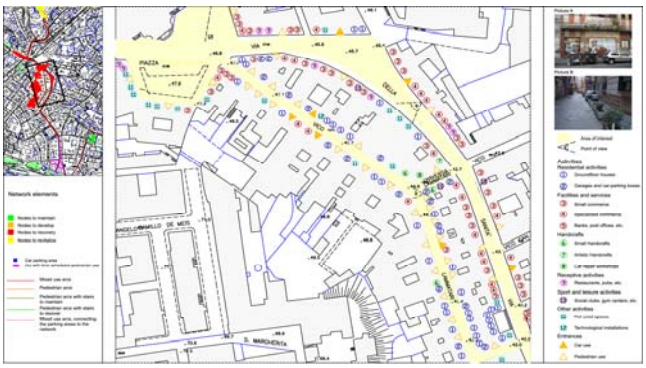
Then, once defined the current and future features of the urban area and the role of each element of the pedestrian network, the scheme of the network itself can be worked out basing on the assessment of the congruence between the role, current or future, of its elements and the demands of use, current or future, arising from the urban context. Since pedestrian networks represent one of the multiple urban equipments, the sizing and the design of these facilities can be effectively carried out only on the basis of criteria aimed at assessing the correspondence of the available facilities, or in other words of all the roads and squares, to the heterogeneous demands of use to which these elements are required to answer. In particular, the inclusion or the exclusion of each element (road or square) as component of the pedestrian network has to be defined following criteria essentially referred to the features of the urban area, to the typology of the element itself and to its role in the urban mobility network: generally primary roads, roads characterized by a high slope, etc. have to be excluded, at least from a total pedestrianisation. Moreover, it will be possible to define some criteria for selecting, among all the elements that could be part of the pedestrian network, those exhibiting a stronger "propensity" to a total or partial pedestrianisation. For instance, such criteria should be referred to the features of the urban context as the presence of commercial activities, traditional or “typical” handicraft activities, relevant historical buildings, etc. Finally, according to the correspondence, evaluated with respect to current and future conditions, between the role of the elements and the demand for their usage arising from the urban context, the different elements to be included in the network and the design objectives to be achieved for each of them, will be identified. In some cases, in fact (for instance existing roads or pedestrian squares in historical urban contexts), the congruence among the role of the elements and the demands for usage arising from the context is already verified; therefore, such elements will be included in the network and the design objectives will be conservation and maintenance. In other cases, some elements could be part of the pedestrian network, even though a lack of correspondence between their current role and the demands for their usage arising from the context might be identified (for instance pedestrian roads or squares in peripherical urban areas where the demand of use is at present very low): for such elements interventions addressing a revitalization through the location of attractive urban activities along the road should be defined. Again, the opposite could even happen, in that a high demand for pedestrian usage, due to the presence of relevant urban activities or touristic destinations, should concern elements currently showing a strategic functional role in the urban mobility network. In these cases, it is possible to decide whether to change the functional role of the considered road or to shift the demand of use toward other roads.

Summing up, the surveys at urban scale allow to outline the scheme of the pedestrian network and to define, for each component, the objectives to be achieved in terms of conservation, recovery, revitalization, transformation. As mentioned above, the identification of the scheme of the network also requires a careful consideration of the potential links among pedestrian network and all the other transport networks (road, railway networks). In detail, the design of scheme of the network has to take into account the location of railway stations, bus stops, parking areas, etc. The presence of terminals and stops of other transport networks allows, in fact, pedestrians to access to the network and planners to outline multi-modal networks, or “networks of pedestrian networks”, located in different urban areas and linked through the public transport networks, mainly the railway ones. The pedestrian network will include roads and squares which might be pedestrian or characterized by a mixed use. Along the elements of the network exclusively devoted to a pedestrian use, access for residents, emergency transit, loading and unloading of goods have to be anyway allowed. Along the elements of the network devoted to a mixed use, the rules for an effective "coexistence" between cars and pedestrians have to be defined, such as low speed areas combined with protected pedestrian paths. Coexistence among pedestrians

and cars can also be interpreted in a "diachronic" way, providing areas totally pedestrian in some hours of the day or in some days of the week. Both roads and squares included in the pedestrian network can be further classified into primary, secondary, etc. The scheme of the network has to be also specified according to the different types of users which the elements of the network are devoted to. For example, in case of heterogeneous demands for usages (slow and fast pedestrian movements, car and pedestrian transit) by different types of users (tourists or users of urban facilities) along the some element, alternative and specifically targeted to a particular type of user pathways can be designed too.
Moreover, in case of elements of the network not accessible by all types of users, such as stairs, the identification of alternative and enjoyable by everybody paths or even, in absence of alternatives, connections through public transport, have to be defined.

Guidelines for designing the components of a pedestrian network

According to the plan of the whole pedestrian network, detailed surveys addressed to design each component of the network itself, have to be carried out. In detail, for each component, a “design by use”, meant as a tool for defining the best organization of the different demands of use, and to ensure the congruence among the different uses and spatial features of each element, has to be defined. To this aim, current uses and physical features of each element have to be investigated and the congruence among current demands of use and physical organization of each element has to be assessed in order to single out the required interventions.
Surveys related to the current uses should be addressed to provide a detailed knowledge, mainly based on the direct observations of places and of people’s behaviors, for example how places are adapted to the needs of different groups of users or which kind of activities users play in different times of the day. Moreover, these surveys will be aimed at pointing out all the existing activities along the elements of the network, with particular attention to that ones at the ground floors. Surveys will be, however, primarily addressed to identify historical and architectural features of the building stock and the state of maintenance of building facades, features of the paving, street furniture (benches bollards, lamps, etc.), with particular attention to their maintenance level as well as to the location and distribution of furniture. Such surveys, combined with the knowledge of the urban context and of the functional role played by the element in the urban mobility network, achieved through the first level analyses, will allow to specify the “design by use” of each element, or in other words to organize the different demands of use, the current and future ones, which might coexist in each element of the pedestrian network. Therefore, it will be possible, for each element of the network, to verify the congruence between the functional organization and the spatial features of the spaces, in order to highlight inconsistencies and problems to be faced. Such a phase is particularly important because it could also lead to a revision of the scheme of the whole network based on the first level surveys. The congruence assessment can be structured through matrixes and it can provide congruence judgments with reference to specific performance dimensions articulated in requirements which have to be achieved through the spatial organization of the network and the physical features of each element. The congruence judgments for each element of the pedestrian network can be both qualitative and quantitative and can lead, through aggregation and normalization procedures, to synthetic judgments for each performance dimension expressed through quality levels. There are numerous performance dimensions that can be considered in the congruence assessment. Among these, for instance, the attractiveness related not only the aesthetic quality of each element, but also as a result of different factors: from the historical and artistic value of the building facades to the presence of commercial or touristic activities at the ground floors. Among the performance dimensions a remarkable role is played by the accessibility, or the possibility to reach the element thanks to the closeness of stations, bus stops, parking areas. Moreover, the possibility for different typologies of users to easily use a space (usability) – which usually depend on the presence/absence of obstacles along the path, such as cars parked out of the parking spaces – and the presence of street furniture designed as barriers for pedestrian flows (flower pots, shop windows, etc.) have to be also considered. The scarce usability of a network element can be also related to the state of maintenance of paving and sidewalks.



The definition of the project of use of each element of the pedestrian network requires detailed surveys aimed at outlining, for each of them, the physical characteristics and the actual uses of each element, such as activities at the ground floor.

Again, among the performance dimensions, safety has to be carefully considered in that, along the different elements of the pedestrian network, any possible danger perceived by the user – which might depend on several factors, such as poor lighting, coexistence between cars and pedestrians, etc. – has to be taken into account and removed. Thus, the design by use and the performance analysis of each element will be targeted to specify the different uses, to define the spatial organization and, also, to guarantee the congruence among current and planned uses and spatial features of the elements of the network. In this phase, detailed actions aimed at promoting or discouraging ground floor activities, creating new attractions along the network, reorganizing car flows and parking areas, recovering building facades or historical heritage, integrating or reorganizing street furniture have to be defined. To support such a definition, matrixes showing for each element of the network the current performance levels, types of planned uses, performances to be achieved and actions to be implemented for their achievements, can be set up.

Conclusions

The criteria and the methodological elements outlined for the planning and designing pedestrian urban networks represent only a first step toward a new approach to the pedestrian use of urban areas. Despite a more and more diffused awareness of the need for promoting soft mobility, particularly pedestrian mobility, in cities, a shared toolkit of criteria, methods and techniques to support the definition of pedestrian networks, of their uses and of their spatial features is still not available. Very often the decisions about the pedestrianisation of roads, squares or also of large areas within the city, have been exclusively due to specific circumstances or opportunities, in absence of integrated plans aimed at driving pedestrianisation choices with reference to the wider strategies of evolution/transformation of the urban context and of the whole mobility network. This is due both to the lack of consideration of pedestrian travels as one of the mobility modes having equal dignity in comparison with the mechanized one, and to the double role that roads and squares play both as elements of the mobility network and urban places characterized by heterogeneous and often conflicting uses. The methodological guidelines come out from a theoretical and operative experience carried out within the Teaching Courses of Recovery and Development of Open Spaces held by the Authors at the Faculty of Engineering of Naples from 2003 to the 2006. In detail, according to the presented methodological guidelines, over these years the students have developed numerous project works, referred both to central and peripherical areas of the city of Naples, which allowed us to test and improve criteria and guidelines for planning and design pedestrian networks. Such criteria and guidelines do not represent, anyway, a consolidated and shared methodological framework, but only a first step toward their definition.

Notes

[1] Even though this paper is based on a common research work, the first, the second and the fifth paragraphs have been edited by Adriana Galderisi; the third and the fourth paragraphs have been edited by Andrea Ceudech.

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Images References

Graph at pg. 2: source Litman, 2010 www.vtpi.org/future.pdf; the maps have been edited by the students of the Course of Recovery and Development of Open Spaces.