

SUSTAINABLE URBAN ROADS

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ABSTRACT

A detailed urban road study cannot prescind from the theme of recovery of its role as heart of urban life. This premise implies a subversion of the common trend to consider the road as a non-place designed for the mere car transit. This presumed car hegemony is the main cause of degradation in urban areas. The increase in vehicular flow and the related harmful phenomena (accidents, harmful emissions, noise, land consumption) cause the disappearance of "relational spaces", therefore a net decrease in volume and content of activities of which the road is the scenario. On the contrary, the road has to be a scenario for a wide range of high social context and calibre events; these presuppose that the road is also a stage for a wide range of voluntary and social activities. These activities pretend high standards of thermal, acoustic and visual comfort areas with accessibility, safety and aesthetic value necessary to persuade people to a more fruitful use of the road. It is fundamental, in the recovery of a road system strip, to provide a holistic approach, and at avoiding the use of standard solutions, taking each area as a unique and distinctive.

1. THE ROLE OF THE URBAN ROAD

1.1. Degradation of urban roads

Within a wide-ranging review aimed at establishing a new culture in the road project, we should note that this cannot hold a dominant role in the proposed urban prototype for a more equitable city, no more unrelated to the theme of "sustainability". This needs to be understood not only in terms of a more prudent use of resources, but in the most fruitful sense of osmosis between aesthetics, comfort, climate, social cohesion and the necessity to promote a prosperous urban life. Thence, it is important to opt for a new way of thinking which tends to transform the urban fabric in a fruitful centre of community life. It is fundamental to overcome the harmful idea that considers the road as a mere "traffic channel" and a poor practice used to transform the urban empty spaces in urban service areas, echo of a "self-centred" culture which is focused on a pervasive use of the car and a peremptory pretence to conform the urban fabric too [12].

There are three adverse results that prove this phenomenon. Soil consumption, as the waste of large areas for the transit or parking of vehicles, the result of a marked increase in the transport demand is maybe the most harmful phenomenon for the social cohesion, being the bearer of acute erosion and disappearance processes of "relational spaces" such as to deprive the route of its successful role of agora, a centre of large-scale social events, and exacerbate the harmful phenomena of exclusion of certain social classes and users. The pretence to heal the erosion of community life by gathering uses and events in large containers, not only promotes a more extensive use of the car, intensifying the soil use, but it also excludes from the fact of taking part to such events, those whose "use" is prevented. Still, the vast tendency to a little cautious conduct, exacerbated by a marked habit to consider the route as a mere car stronghold, promotes the "common" idea to intend the road as a precluded place from feeble users. Therefore, not only he sees

frustrated his natural vocation to live the road as a full social life centre but also he sees his freedom of movement as damaged and its exclusion as heightened. One cause of the sense of danger issued from the road is the high number of accidents observed in urban areas, where pedestrians are often involved and not infrequently with fatal results.

ISTAT data help us to see how in 2007, 176.897 collisions, i.e 76.6% of the total have occurred in urban areas, causing the death of 2269 people (44.2%) and 238,712 injured (73.3%). It is also necessary to underline that among these, 627 pedestrians have died, among whom numerous children, including 730 between 10 and 13 years old and 1099 of 10 years old. Therefore, children and older people are more often exposed categories to adverse outcomes of a non-regulated promiscuity between cars and pedestrians [10]. Nor we can overlook how the extent of such adverse outcomes arising from the exclusive use of the car do not only concern the route. In that regard, there are other offensive phenomena that damage the "quality of life" such as noise and emissions of harmful gases and dust; studied conducted by WHO in 13 Italian urban areas allow us to note that dust and ash suspended in the urban air dome, where the rate exceeds of 20 ug/m³, provoke 11.6% of deaths due to cancer, 19.8% due to strokes and 3.3% due to ictus [13]. Nor we have to overlook the harmful outcomes from the marked increase in acoustic stress. In Europe, it has been estimated that 26% of people are exposed to a sound load greater than 65 db Leq; this acute and pervasive phenomenon causes acute and marked sleep disorders, such as to disturb the mood, exacerbate a state of "annoyance" and stress and sometimes promote the violence.

Nevertheless, these adverse phenomena not only violate city life, but they are often extended to the private sphere also damaging house life. For example, the increase of noise and harmful emissions is afoot of a deep activities decline at "gardens in front of the houses" and sometimes in some areas of the residence, often provoking, in worst case scenario, the relinquishment. This exodus having as result the rupture of social ties, causes and exacerbates the erosion of the social fabric and the agony of a now weary sense of community.

1.2. Multi-functionality of urban fabric

It is fundamental to heal the erosion of the social fabric, make a comprehensive urban recovery of the tissue which aims at restoring the lost part of a scenario in which "passers-by walk on the sidewalks, children play on the front door, someone is sitting on a bench or on a step ... two people exchange greetings, others stop to have a chat. " However, to convert the road in the centre of a wide variety of phenomena, it is right to raise the issue of "environmental value" of a site according to the law and as purpose of a work of its recovery. Only a place that is bearer of a sharp and keen sense of comfort can promote a wide number of large-scale events, exhorting people to halt. Long-term stops are an opportunity to observe the urban landscape, people who pass through it, an opportunity to hear the sounds that pervade it [16].

Such acts are an afoot of positive outcomes because they are a starting point for more advanced contacts such as the conversation, an opportunity to take part, even as spectators, to the urban life. In this regard, it is worth noting as an alive place full of events can lead to a much wider emotional range compared to the urban views more imbued with an often empty poetics that aims at arousing astonishment. However, this statement, exhorts to note the importance that a more sensible and comprehensive approach to the road theme has got in promoting the social life of an urban area. This fact is true when the propensity to take part in urban life is a "latent desire", "whose scope cannot be

determined a priori, but that emerges only when there is a vast range of areas with an acute sense of comfort and aesthetic harmony.

Yet, this desire is the source of a large and vast phenomenon of osmosis between events and episodes. Thus, even a low value episode may be due to a spontaneous and strong desire to take part to it, an idea for a global emotional activity. This phenomenon allows us to assert that life among houses, that is the sum of various events and uses of which a urban strip is scenario, is a "self-strengthening" process. This datum exhorts to note how the study of a piece of the urban fabric should encourage the vocation to take part in various events of which it is the centre. It must be ensure the user to observe what happens in the site under consideration, or rather gathering episodes and events, creating consistent extension dense areas, with the human sensory apparatus elements contained and the weight they hold in standardizing the emotional depth of a contact.

For this purpose it is appropriate to lead rigorous examination of the alleged number of users, thus creating areas where it is not difficult or uncomfortable to move or halt, but not so large areas to cause the phenomena of dispersion, which would militate against the natural growth of social processes. Again, it is fundamental to note that a site poor in events evokes and issues, not just a sensation of a sad and colourless place, but also a sense of danger, result of a broad phenomenon in which empty areas, devoid of the spontaneous control work carried out by people used to stop there, become the scene of criminal events. Furthermore, in order to promote an extensive mutual exchange among people, it is important not only to increase the number, but also the duration of stops and various events of which the area is scenario.

In this sense, it is right to transform the urban fabric in a landscape open to a wide variety of uses, planning measures that encourage the user to carry out a broad range of activities. In this sense, to transform an area in a veritable scenario of urban life exhorts to ponder principles and ideas borrowed from a severe examination of the needs that come from common acts such as walking, standing, sitting, observing, talking and listening. If we think about the act of "observing", we note how a fundamental rule consists in inferring the extension of an area through an evaluation of the number of alleged members, thus using as first idea, the limited emotional extent of the visual system and the strong causal link between the emotional range of a contact and the changing of perception due to the changing of distances.

The proposal to use as limit of the social visual field is consistent with this statement, considered by Hall as evocative of the field within which important contacts can grow and whose emotional range is supposed to be not more than 100m, that is the visual organ range value for which it is possible to discern a form or an event. Still, it can be interesting to unify two visual fields, each as source of a peculiar form of contact. An area can be 100 m deep and 25 m wide, a value that evokes a clearer perception, and therefore an afoot of a more fruitful and deeper contact. In addition, it is important to avoid net order differentials not to make difficult the full vision of the site and provide that it is possible for the user to enjoy a wide variety of views and that no obstacle is placed along the line of sight.

Nor we can be exempt from determining that the site "level of enlightenment" is high and uniform, in order to avoid that at night, its vocation to be a scenario open to a wide variety of uses id damaged and do not preventing a full and wide vision of the area and people in order to heighten a feeling of a safe place. Provide seats and rest stops along the borders of an area is still a standard to be observed carefully to satisfy a latent and strong willingness to participate, even as mere urban life observer. Being able to stop at a border

of an area allows the user to observe the context and evokes a sense of shelter and known as border effect, outcome and echo of the sense of being less exposed, that comes from a more limited extension of the "personal territory" to be protected, extended only to the frontal arc. Even the propensity to stay in these areas is an echo of a latent desire to observe events and rituals of which the site is scenario but at the same time to remain strangers to them, to erect a sort of limes between the himself and other people. Extra care should be to provide shaded areas not exposed to sunlight or violent weather events.

It is also fundamental to conduct a strict and exact study about pieces of furniture, pondering how they can fulfil a support role, or as "benchmarks" to guide, or, in some cases, as secondary seats. In this regard, it must be noted how spontaneous is the tendency, when you are in foreign place, to stop in front of a pieces of furniture along its border. Above all, Gehl notes how it can be important to place the seats in some specific parts of the site marked by border elements, in a way not to enact a sense of rupture, and harbinger of a great variety of wide and pleasant views.

Moreover, the meticulous installation of seats has a considerable influence in promoting and facilitating the conversation. For this purpose, it is considered fundamental to ponder that seats are placed in such a way that does not make it difficult to observe the interlocutor. In case of front seats, so as not to impede the maturation of spontaneous exchange between two people, it is dutiful not to overlook the importance and the social value of distance. A caution to be observed may therefore consist in placing arched and corner seats, in order to encourage people to talk and allow those who alternatively wish to sit by themselves.

However, to create an appropriate scenario to exhort people to converse, it is essential that they can hear without effort, in other words, it is important to relieve the acoustic stress, thus suggesting an agreeable sound scenario that allows not only to hear a voice, but also the sound of water and wind, a music. Those sounds that evoke a calm sense of quiet. Furthermore, the most common and harbinger act of the larger number of outcomes is to walk. It may be a mere and necessary act, as a desire to entertain, or an opportunity to explore and learn. Walking requires a vast network of routes and areas to stop, harbingers of a deep sense of comfort. Among the rules to ponder, a crucial one requires to infer the transverse extent of a route from the assumed number of users, by placing a capacity limit that does not exceed 10-15 pedestrians per minute per square meter. This rule compliance is deemed to avoid adverse outcomes coming from the hint of empty and sad spaces that emanates from wide and sparse areas and the no less harmful results caused by the "congestion" of routes, forcing pedestrians into two opposite directions, makes contact between people more difficult and the use of the space less spontaneous [16].

Besides, the extension of a route should not be excessive, both as a real and perceived value. In this case, it is considered appropriate to provide sinuous routes, such as to evoke a wide but not tortuous variety of views, in other words, not to be perceived as strenuous. In addition, providing interruptions and demarcation lines with larger areas in which the user can stop, not only makes the route less demanding, but it is also an opportunity to heighten the expressive power of the work and the emotional flow that results from the discovery of the route, an echo of the interplay between the sense of quiet evoked by a narrower road and a more acute pathos and astonishment that comes from a wider area that offers more extensive views. In case of study or recovery of a large urban void, it is a good practice to design paths along the borders in order to give it a well-known

and pleasant sense of shelter. It is also fundamental to ponder measures aimed at overcoming any order differentials, in order to alleviate the sense of interruption that they emanate. The study of sinuous ramps and promenades is a prudent measure in order not to make difficult the use of an area, and heighten its sense of cohesion and unity to promote the discovery in a very slow, as well as harbinger way of a deeper emotional experience. No less crucial is the choice of materials, aimed at creating a non-disconnected parterre or suitable not to make walking difficult or dangerous.

2. REQUIREMENTS OF THE URBAN SPACE

2.1. Safety

This broad premise is fundamental to establish the norms that a city must fulfil. It must be safe and should be persuasive in evoking such a dowry. An area full of episodes is thought to be such a scenario. No less, the adverse outcomes are a phenomenon that have to be pondered carefully, as known, result of a pervasive tendency to drive with no prudence, so as to make the road scenery of a not well adapted scenario for a fertile urban life.

In this regard, it is worthwhile to enumerate some of the data exposed by Gehl, borrowed from experienced test in Australia, which allow to see how, in routes covered by a large number of vehicles, 85% of children not older than 6 years old move taking an adult by the hand [16]. Another important issue is the 'accessibility, condensed in the theorem for which the user with limited physical capacities should be considered as an average user in order to ascertain that there is no part of the site precluded to him. It is therefore fundamental that a careful recovery of the urban fabric is not exempt from predicting that areas and pedestrian routes are safe and continuous, with no interruptions or obstacles that can make difficult the full use of the urban fabric.

2.2. Aesthetic value

An additional and often cited parameter is the compositional and aesthetics harmony of an area. It is dutiful to note that a site, if bearer of a quiet and erudite compositional vocabulary, persuades the user to pause and to "recognize" in it, thus evoking and promoting a sense of identity and belonging. This theorem calls to note that, first of all, the proposal of a strong and coherent poetics is essential in order to restore a new and strong sense of place. But, at the same time, the road, when filled and permeated with a cultured vocabulary, leading to a severe ratio, can give a kind of cohesion and order to the urban fabric. The road should be not only an area to be used but also an opportunity of union and cohesion in the broad sense, a sign aimed at protecting cultural, historical and aesthetic values of a site, borrowing from them a peculiar noble and austere poetics, by curing where the sense of place is more acute and obvious, where that poetry is cautious and frugal and vice versa, stronger and marked, or rather, such that a more extensive and erudite vocabulary is shown off where the anomie of the site exhorts the route to evoke to itself the duty of giving cohesion and order to the context. This duty seems to be fundamental within the contemporary urbs, that is the "generic city", eroded by the voracious expansion of prosaic Junkspace, evoked by Koolhaas, pervaded by a greedy rule, that is the abstention by the perpetual change of the urban fabric and an adhesion to an arid utilitas and unwilling to follow any kind of compositional nature [11].

Nor this theorem has to be an excuse for a vacuous narcissism. A severe and acute poetics can enumerate a wide and opulent variety of formal results, such as tones and notes of an opera excerpt and can evoke a strict and erudite order, even by enumerating an austere and frugal vocabulary in which "venustas" is not the result of a decorum

exempted from any duty, but it comes from a rigorous examination, filled with a soft poetic inspiration of various opera excerpts [1]. Those authors previously cited still agree on the theory that an acute poetics can be borrowed from a thoughtful use of a "fractal plot," as norm and organizing principle of the urban landscape at different scales. A new and acute poetics should therefore evoke a dense urban fabric, intersected by sinuous paths, crowned with porous borders, carved by ruptures and interruptions that promote a fruitful interplay among different parts of the urban fabric. It is not difficult to suppose that the recovery of a vast "organized complexity" restores a sense of real and pleasant man's habitat. Furthermore, a fractal plot is suitable not only for an atavistic memory, but also for the profound nature of human being.

It is supposed that the human way of thinking, supported by a dense network connections comes from the fact of being part of a fractal universe. Nevertheless, this theorem exhorts to note how much importance is held by the context in disrupting the structure of our mind. The melancholy poverty of the contemporary urban landscape can have broad and adverse outcomes not only due to the opaque emotional anemia of which it is the cause, but also eroding the connection between man and context, thus enacting a comprehensive and clear interruption between them and damaging man's vocation to establish extensive connections, if deprived of a source, the fractal plot of its habitat, from which he derives the ratio of his thought. An empty and poor place makes human mind poorer and arid.

Moreover, in order to heighten the cohesion between man and urbs, it is fundamental to infer the form from the human scale, from which the urban landscape composition could be borrowed. Finally, observing that the value of an urban area plays a preponderant role in making it the centre of a fertile urban life, it is not difficult to presume that a strong and clear cohesion between composition of an area and human scale, changing the view that a user ponders on the "quality of the context" may increase a desired and strong vocation to live the urban fabric.

2.3. Visual and acoustic comfort

Furthermore, creating areas harbingers of a high of wellness, a great importance is held by acoustic comfort. In this regard, we note how it is necessary that background noise should not exceed of 40-50 db, in order to allow people not only to talk but also to hear sounds or softer tones of a voice. The study of acoustic comfort presumes a severe examination of the connection among auditory system, human being, acoustic environment and social fabric [5].

The wide demand for safe sites, permeated by an acute sense of aesthetic value exhorts to accomplish a strict examination of visual comfort. This topic assumes a coherent study of the place with the outcome of a rigorous examination of the natural light source. If a congruous and uniform brightness, between 100 and 1000 Klux is necessary to promote a comprehensive perception of the place, it is fundamental to ponder carefully that the place is not exposed to harmful glare effects. These are deemed caused by a visual field characterized by exaggerated brightness levels or by sharp light contrasts [6].

2.4. Environmental Comfort

However, it is a severe examination of the broad theme of environmental comfort, more specifically, the vocation of a place to preserve a pleasant and healthy climate scenario that holds significant importance. There are many needs to be evaluated. For example, in Northern Europe, a preponderant need concerns to repair the user from wind or heavy weather conditions. In southern Europe, it is very important to foresee measures aimed at repairing people from the great solar contribution and to ease the radiant exchange of

heat. The importance that climate has in varying scope and duration of use and events of which a site is centre is proved by some Scandinavian studies. These show a net and marked increase in summer the number of people that use to stand outside of 200%. This phenomenon results in a significant increase in voluntary and social activities. Moreover, the use of an area changes both because of the season and activities done. For example, in southern Europe during the winter, people prefer areas exposed to the sun but sheltered from the wind, and vice versa, during the summer, they prefer to stay in shady and ventilate areas.

Furthermore, it is fundamental to foresee and create a wide variety of areas characterized by peculiar climate scenarios, both in order to satisfy a wider range of desires and to encourage a more opulent and vast variety of events; in this regard, it is important to note that each activity, altering the metabolic cycle, changes the sense of comfort perceived by the user and therefore it varies his expectations. Within a recovery or study of a piece of the urban fabric, it is a duty to operate a strict examination of the phenomena that rule the climate scenario in order to infer all measures to remedy and mitigate any harmful phenomena of user's comfort.

The local climate scenario comes from a large interplay between far-reaching climatic phenomena in other words the radiant contribution, humidity and winds, and acute local disturbance phenomena, results of peculiar characteristics of the material and physical site in question. For example, in urban field, there is a large and clear thermal anomaly known as urban heat island (UHI). This phenomenon led to a marked difference in temperature between the urban dome and the rural context. The average value of this range is 3 ° C, although in some cases it may reach 10 ° C; phenomena that rule the climate scenario of a urban fabric strip are:

- increased long-wave radiation emitted by suspended dust;
- increased range of solar radiation collected and accumulated caused by the peculiar texture of the urban fabric, increase of exposed area and copious processes of reflection;
- net decrease of accumulated heat in the atmosphere, caused by the dense nature of the urban fabric;
- marked increase of accumulated heat from the components of the urban fabric, caused by their high heat capacity;
- limited scale of evapo-transpirative processes. This phenomenon is caused by a lack of green areas and the constant expansion of impermeable soils;
- net decrease in convective heat dispersions, caused by a marked propensity of the urban fabric to obstruct air flows;
- anthropogenic nature of heat emission.

The rough and changing nature of urban fabric texture has caused a wide variety of climate scenarios evoked by a net change of temperature ranges, humidity and wind. For example, the dense or sparse nature of the urban fabric has a considerable influence in changing the value of the view factor between prospects and the sky view factor (SVF), evocative, in percentage terms, of the sky portion extension seen from a given point. These parameters, in addition to the albedo of materials, are preponderant in relieving or exacerbating accumulation or mutual reflection phenomena of the radiant flow between opposite volumes. An issue to ponder carefully concerns evocative parameters of voids shape, or urban canyons such as: H (vertical extension of the volumes that mark off the void), W (transverse extent of urban fabric strip in question), L (its depth). According to the relation between H / W and L / H as well as the density of the urban plot enacted by the

parameter j (connection between built-up areas and total area), it is possible to make an examination of the scale of phenomena that disturb the climate scenario of the site in question [3]. However, a strict examination of the phenomena that change the climate of an area does not allow to ascertain if it is deemed by a user with a desirable sense of comfort. In this regard, it is important to note that a person is exposed to a generous thermal exchange process with the context. In particular, intakes of detected energy such as metabolic energy (Met), outcome both of made activities and type of clothing, the terrestrial and solar radiation (respectively R_s and R_t), vice versa, the emitted flux is the result of losses by convection (Conv), evaporation (Evap) (and perspiration) and long-wave radiation (R_e) emitted by the epidermis. This phenomenon can be expressed by the heat balance equation:

$$B_t \text{ (heat balance)} = R_s + R_t + \text{Met} - \text{Evap} - \text{Conv} - R_e;$$

Nevertheless, a strict examination cannot be exempted to balance the user's spontaneous tendency to change his behaviour because of climate change, nor evocative parameters of biological and physiological conditions (sex, age, health status, inheritance ...), sociological (education, family, fashion, food) and psychological, nor the importance held by the activity done. Furthermore, the climate area in question can change the view of each user, because of his deep and latent expectations. Among numerous indices proposed (ASV, PMV, BT), PET (physiological equivalent temperature) is considered to be accurate in pondering factors that come from the individual behaviour. For this purpose, two equations are provided combined with a strict evaluation of the heat balance, that using body temperature as datum, allow to evaluate the extent of heat flow that radiates from the core of the body to the epidermis and that is absorbed by clothing.

3. THE PROJECT OF THE ROAD SCENARIO

3.1. Introduction

Postulates that transpire from such a wide premise exhort to note how the acute range within an urban area of its principal characteristics, exhort to withdraw from a vacuous pretence to state standards, and, vice versa, convince to opt for the proposal of a method that aims at evoking ideas to ponder, while maturing proposals aimed at recovering a wide piece of urban fabric. This work, however, where its purpose is to transform the route in appropriate scenario of fertile urban life, but also as sign aimed at protecting, or sometimes evoking a distinct genius loci, such as to cure the erosion of a desirable sense of social cohesion, cannot be exonerated by a strict context examination. The theorem, consistent with this topic, that the role to give to a specific arc of the road network, more specifically its due and consistent forms, whose prediction allows to borrow proposals aimed at promoting an urban landscape, it must come from an examination of cultural, historical, economic, social, compositional, environmental, values of the context. Or rather, it is a duty to withdraw from a practice aimed at inferring the role of a road from an evaluation of transport demand, preferring a rigorous examination of the transport offer, that is the vehicular load a road can tolerate, according to its peculiar nature. It should be noted as the axiom that permeates this phase is to deprive cars of superfluous space and give it back to pedestrians [14].

3.2. Study of the Route and Traffic calming

It is known that in a poor and low-quality scenario voluntary or social activities are very rare. On the other hand, the urban fabric should persuade the user to move on foot, stop, sit, watch the urban landscape, talk and listen to the sounds of life that flourishes. For this

purpose, an issue to ponder carefully is the study of precautions designed to make the road safe and persuasive in evoking this dowry.

First of all, it is therefore necessary the proposal of cautions aimed at exhorting the driver to proceed carefully. For this purpose, a great importance is held by a learned and detailed study of the road network, aware of the strong relationship between shape of the route and driver behaviour, in this sense, it has been noted that:

- longitudinality, where exaggerated, promotes a net and harmful increase of the speed; so, it is therefore fundamental to foresee any rupture of extended "lines of horizontal convergence" and opt for sinuous paths;
- vehicular wide-lanes promote speed;
- a road environment such as to suggest its role as centre of a wide variety of uses, exhorts the driver to behave more cautiously;
- promoting a full and comprehensive view of critical points or nodes, allows the driver to see any danger in time.

It is also considered very useful a broad-weighted use of traffic calming measures, in areas in which speed or the extent of traffic flow are not deemed appropriate to the role of the road, where it is centre and source of a wider list of uses. Moreover, a prudent use of measures to calm traffic should be the result of a recovery policy of the road network extended to large strips of urban fabric, to avoid that the positive outcomes over a network are rendered vain by a marked increase in vehicular flows and adverse outcomes, on contiguous paths and excluded from a strict recovery operation. As known a judicious use of such measures, having as clear outcome a marked decrease in speed of vehicular flow rate and the number of critical points, and exhorting an increase in "concentration of the driver, caused by net interruptions in development of the course, promotes a strong decrease in number of collisions [7].

The study of traffic calming measures, however, is important not only to evoke a safe urban setting but also to retrieve spaces that are now occupied by cars, to which give a new value and purpose, in which it is possible to include a study of the green areas, materials and pieces of furniture.

Nor it is possible to abstain from noticing how these elements are themselves a net and strong sign, and can therefore be raised as word of an erudite poetics, such as to suggest a clear and strong genius loci. In addition, we should mention the equally large and positive outcomes arising in the recovery of a healthy and pleasant urban landscape.

A judicious use of traffic calming measures, exhorts the driver to conduct in a more cautious way and helps to bring down the range of traffic flow, promotes a marked decrease in volume of dust and gases emitted by cars, and a strong reduction of the acoustic load. In this regard, some European studies note that a decrease in speed from 50 to 30 km / h is harbinger of a strong decline of background noise up to 5-6 dBA. These results, however, need a severe Traffic calming measures study which promotes not only contained but also constant speeds. For example, a large pause between two elements, allows in the part between them, an increase of speed, causing "successive accelerations and decelerations," whose outcome is a net increase in noise and emissions.

Moreover, a less acute sense of danger, emanating from the route and from the recovery of some parts of it, is an opportunity to create a wide and extensive network of routes and "oasis" for the rest of pedestrians, in order to promote the "pedestrian mobility" and exacerbate autonomy of children and older people. In this sense, and furthermore

encouraging a wider use of the route, a prudent use of these measures is proposed as an opportunity to remedy the harmful phenomena of exclusion and evoking a more prosperous and equitable urban setting.

3.3. Materials

Another issue to ponder, within an extensive recovery project of the urban landscape is a careful selection of materials, taking into consideration the importance they have in upsetting the flow of radiant exchange, and therefore the climate scenario, of an urban void. Generally, urban roads are exposed to an extensive use of hot-mix wearing courses. This material is characterized by a limited albedo and a marked propensity to keep the radiation and emanate heat, causing harmful temperature increases in volumes of air close to the ground. For this purpose, it is fundamental to choose materials with low propensity to undergo acute increases in temperature, such as to exaggerate heat emissions. Qualities of a material that provides an extensive use in urban areas are:

- high albedo, in order to heighten short-wave reflections and avoid any energy excess to cause a marked increase in temperature;
- high infrared emissivity in order to heighten heat emissions and prevent a harmful increase in temperature;
- high thermal capacity and contained diffusivity, qualities of a material that absorbs, in a broad span of time, the significant contribution to which it is exposed, not revealing any strong increase in temperature, and emitting heat only during warmer night hours.

Among the new materials defined suitable to alleviate the radiant load of urban site, it is important to mention those which disperse not-kept radiant contribution in the form of thermal emissions. Among them, we can mention:

- Phase Change Materials or PCM. These materials are characterized by a marked tendency to accumulate heat, an outcome of the appeal extended to materials nanocapsule such as paraffin that absorbs collected solar radiation and converts it into the latent heat required to change the state from solid to liquid.
- Thermochromic materials, characterized by the tendency to change colour and therefore the albedo, thanks to the context temperature by conforming to it their absorbing power.

Nevertheless, it is also important to underline that materials used to wear the mantle of a road must follow strict requirements of mechanical nature, because they have to withstand to acute and widespread erosion and wear. For this purpose, it is appropriate the use of new materials known as cool asphaltic materials, which include the use of Portland cement as binder: these materials are suitable to placate temperature increase of the site in question, by promoting reflection phenomena of solar radiation, heat loss at night and increase of evaporative properties of wearing courses.

Moreover, a careful choice of materials has to be made carefully in coining a new and erudite compositional vocabulary, in other words in coining or evoking a net sense of place. The change of parterre colour or texture, denotes a strong and witty rhetoric, but at the same time it proposes a code aimed at understanding a full role comprehension for each parts of the area.

3.4. Green

Furthermore, it is not less crucial to provide a detailed study of the green. This statement exhorts to withdraw from the vacuous use to consider it as a mere decoration to ponder an extended use as component aimed at protecting the areas designed for pedestrian stops from the sun, characterizing critical points, separating parts of the route, capturing noise, dust and gases emitted from cars and evoking a strong link between urban and rural areas, between man and nature [15]. Therefore, duties to which green may fulfil are:

3.4.1 *Aesthetic Function*

The green should be part of the compositional vocabulary that permeates an urban void, in order to evoke a soft and tenuous link between separate pieces of the urban fabric and to bridge the gap between this and the rural context. This meaning of green exhorts to ponder standards of shapes proportion, volumes, materials, notes and chromatic tones, to set out a full cohesion with cultural and compositional values of the site, without neglecting to add to the poetic inspiration, a strict examination of the physiology of tree species.

3.4.2 *Social and therapeutic function*

A brief contact with the green of no more than 4-6 minutes allows to calm and soothe instincts such as fear and anger, as such contact is harbinger of a significant decrease in blood pressure and muscle tension.

3.4.3 *Playful- recreation function.*

A punctual and accurate study of the green is also necessary to persuade the user to perceive an area as appropriate scenario of events and episodes of high social and emotional.

3.4.4 *Acoustic and visual insulation*

Curtains made of hedges and shrubs allow to measure and contain the spread and the intensity of noise. These cause the reflection and diffraction of the sound wave and they also absorb a part, then dispersed in the form of thermal energy. The result of this phenomenon is a strong decrease in sound pressure, sometimes amounting to 8 db. Furthermore, a careful study of trees curtains is an important measure in order to contain harmful phenomena of glare and reflection.

3.4.5 *Reduction of the rate of suspended harmful substances*

It is estimated that one hectare of forest can absorb the annual emissions of CO₂ of a car that covers a distance of 80,000 km each day and at the same time it can produce oxygen for 40 people. The green changes and purifies the air from dust, such as PM₁₀ and PM_{2,5}, and from ashes suspended in the atmosphere. It is important to note how some essences often used for decorative purposes can pick and accumulate, per cubic meter of foliage, lead and other compounds contained in 6 m³ of air;

3.4.6 *Temperature controller effect.*

A large and extensive use of green has a high importance in promoting a pleasant and mild climate scenario; noting that the normally copious radiant contribution from a specimen, only a limited part (20%) is transferred as sensible heat by convection and long wave emission and a much larger part is reflected or transformed into latent heat helpful to promote numerous evapo-transpirative phenomena, it is allowed to presume that vegetation does not contribute to exacerbate the radiant load on the site. In that regard, it is important to note that the temperature difference between air and surface foliage is quite

limited and not up to 2 ° C. In addition, preserving borders and parterres of an urban void from the copious and dutiful summer solar gain, curtains of trees avoid exaggerated increases in temperature, result of the marked tendency of mineral materials to keep and accumulate radiations received and harbingers of harmful emissions of heat. Vice versa, during the winter, when it is hoped that the site is exposed to the sun, some deciduous species by changing the texture of their foliage, give a more substantial radiant contribution. Moreover, the wide evapo-transpirative processes, picking heat from air and soil, promote a marked decrease in temperature. In this regard, we note that the extent of this contribution is assumed to be 2454 MJ per kg of water.

Recent studies led in Phoenix and Sacramento exhort to note that an increase of 25% of green areas has resulted in a decrease in consumption of air conditioning of 25 and 40%. In Italy, on average, an increase of 10% of green areas in urban centres is assumed to be harbinger of a decrease in temperature (2 ° C), in other words a decrease in consumptions from 8 to 11%. In order to foresee the result that an extensive use of green can have in regulating the scenario of a place, it is required to make an examination of the leaf foliage shape, from which it is possible to establish shape and extension of the shadow as well as size and posture.

3.5. Water

Water is a no less fruitful resource both as a word of a calm and erudite poetry and as a measure to heighten the user's comfort. A severe study of wet masses within an extensive recovery project of an urban place should therefore treat the role held by them as a sign of broad and rhetorical importance as measure aimed at containing temperature of air and radiant load on the site both by virtue of their high thermal inertia and as the abundant evaporative processes they promote. No less crucial is also the deep psychological and physical comfort that emanates from the sense of quiet calm evoked by the light sound of flowing water.

3.6. Urban Furniture

A cultured and timely study of furniture is crucial to persuade the user to stop to observe, listen, talk, meditate or enjoy a recreational and rest break, but at the same time to develop a new and erudite poetic; in this sense, the piece of furniture can be seen as a sculptural sign to heighten the vis-rhetoric and evocative of the piece. Furthermore, it is possible to ponder a judicious use of pieces of furniture, equipped with apparatus for the exploitation of alternative energy sources.

CONCLUSIONS

To sum up, where it is hoped that the road serves as a centre of a broad and rich urban life, a careful and pondered recovery project aims at:

- encouraging drivers to conduct in a more cautious and prudent way;
- creating continuous and safe pedestrian routes;
- creating spaces suitable for a wide range of activities;
- maintaining the environmental comfort of pedestrians areas, providing safeguards aimed at regulating micro-climate;
- thinking about the road sign as imbued with peculiar aesthetic values and therefore aimed at exacerbating or coining a net and primary sense of place.

An appropriate and consistent method with this statement and aware of the broad and wide variety of issues to ponder in order to create an urban space that leads to a strong sense of comfort and aesthetic appeal cannot be exempted from full a compliance to certain strict rules such as:

- the search for a holistic approach open to the contribution of several disciplines aimed at coordinating the several issues useful to give quality to a space;
- considering each area as unique and distinctive, developing consistent proposals with the environmental, social, historical and aesthetic necessities of the site in question;
- promoting the participation of future users in order to achieve a broad consensus on the proposal;
- do not neglect the three-dimensional character of the space, pondering carefully the perceptions of the same method that requires a rigorous examination of sections and volumes and of the area “space”.

A valid case to cite, at this regard, is the Woonerf. Even though this archetype must be reputed proper and peculiar of residential areas, it points out how the urban road can be a rich scenario of a wide variety of social events, and how a strict adherence to the proposed standards, of aesthetic quality, comfort, and road safety, can promote and create a pleasant place where pedestrian is prior and cars are considered guests. Vice versa, the Gran Via de les Corts Catalanes, in Barcelona, product of the creative estrus of Carmen Fiol and Andreu Arriola, is evidence and echo of a Poetics tended to avoid the sense of net fracture of the urban area which is supposed to be an inauspicious outcome of large boulevards, and to enounce a severe and suggestive use of green and materials to convert areas contiguous to the route in space open to a more vast and beneficial range of fertile uses. Nor it is vain to note how the 3.5 meters projection over the central carriageway, formed by the service roads, reduces noise and air pollution, and resolves the absence of sea-mountains relations. Furthermore, sound screens posed alongside the route protect pedestrian areas and urban fabric from the onerous noise produced by traffic, and can be considered a strong sculptural sign, able to give a more poetic and profound value to the place, while the walkways at the end of all the perpendicular streets reinforce a strong and secure relations between the two sides. It is not arduous to presume that this Work could be reputed apex of an appropriate and consistent method tended to restore the role, proper in the past of urban roads, as pleasant scenario of a fertile urban life, and as crucial part of urban fabric, able to evoke a secure and refined “ratio”, source of a strong and peculiar “genius loci”.

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CREDITS

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