ROAD SAFETY, A DRIVING FORCE FOR URBAN DEVELOPMENT?

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SUMMARY

The developments in urban models, the layout techniques, the values behind them and practices had evolved at different periods of urban thought. These developments are viewed here from the angle of road safety concerns, which may appear as a driving force for decisions, arguments or sometimes alibis.

As soon as motorised vehicles appeared in urban areas, the engineers in charge of road networks implemented systems to adapt the layout. At the same time, the literature on town planning took up lack of safety as one of the unbearable evils of the future, contributing to found the functionalist view of urban development. In the 70s, while American engineering constituted a reference for many European countries, a reaction appeared in Holland with the "woonerf" idea, which was to deeply affect layout practices. At the time, many experiences laid the groundwork for a technical doctrine of "traffic calming". Today, concerns for eco-mobility try to “bring together” such diverse objectives as urban quality, the development of “soft” modes of transportation, accessibility and mobility, not to forget safety. Planning systems have thus been implemented so that, over the long term, negotiated management of increasingly sprawling urban areas will be adopted.

1. INTRODUCTION

The 19th century saw the introduction of motorised transportation in cities. Ildefonso Cerda [1] was one of the first to analyse the importance of this new situation, which was to shake up “urban” design to use the term he created. In 1867 he wrote, "Comparing the past and the present, I understood that the application of steam as a driving force marked for humanity the end of one era and the beginning of another and that at this moment we are living a veritable transition period." (p. 72). This shake-up notably had the consequence of bringing to light what were the essential characteristics of the city. "All things considered, urban life is made up of two essential elements which cover all functions and all acts of life. Man rests, man moves: that is all." (p. 149).

The importance of travel networks in the city thus quickly became obvious and explicit. The effectiveness of motorised transportation, notably its speed, became an essential objective for urban development. The consequence, of course, is an explosion of urban sprawl that continues to be observed.

We are interested here in one of the negative consequences of the effectiveness of motorised travel, which is the risk run by other occupants of public spaces with the presence of larger vehicles travelling at higher speeds. We shall use this point of view to demonstrate how tools have been developed with a view to improving safety, and notably how network models have been designed to include this objective and the principles underlying their formal logic. These technical systems, designed for a large part for safety reasons, are then reused and implemented for other objectives upon which layout decisions are made. Today, the layout experts have many concerns, sometimes differing

from one country to another, and what we call the “state of the art” is often an aggregation of technical principles.

This is therefore a rereading of the history of urbanism since the end of the 19th century, seeking the safety concerns that have strongly affected its development, taking a look at some important dates and quoting just a few, highly representative authors.

It is also interesting to show that safety principles are often the result of transfers of more fundamental results from ergonomics, psychology, physiology, biomechanics, town planning, etc. and may lead to sometimes radically different conclusions.

2. LAYOUT TOOLS

2.1. The construction of technical tools

When motorised vehicles appeared, it was firstly urgent to develop them to improve design safety and to reduce their aggressiveness toward the environment. The type of motorisation of public transportation and its forms have been discussed from the point of view of their effectiveness but also from the point of view of the risks they cause to their neighbours. This second aspect was decisive in the choices made when it was a question of integrating them into existing cities [2]. The automobile, on the other hand, was able to adapt its design to the dynamic solicitations imposed by its constant increase in speed [3].

City design was also modified, as it had to adapt to these new types of constraints [4]. It was no longer a question of allowing slow travellers to move between built-up spaces, but rather to include structured networks in the space that were increasingly to mark urban forms [5].

The appearance of the automobile led to a feeling of fear that did not last. Speeds were temporarily limited to a few dozen km/h, which very quickly ceased to correspond to the real capacities of vehicles. Heavy traffic, which became congestion, and traffic hazards encouraged engineers and urban planners to find technical solutions to improve fluidity and comfort and to eliminate conflicts between users driving at different speeds. They notably made use of a range of pre-existent technical tools:

- Pedestrian streets, already set off by bollards to forbid chariots in Pompeii;
- Pavements, designed starting in the 18th century to protect ladies’ dresses, then widely used in Paris at the beginning of the 19th century at the urging of Abbé Dillon;
- Street lighting;
- The sides of the road used were defined before the appearance of the automobile ;
- Chicanes, bypasses and other terms already related to travel.

But the development of the automobile and the bicycle (slightly earlier) was to encourage innovations to respond to the emerging congestion and safety problems. In 1902, 10 km of roads were tarred in the Alpes Maritimes department of south-eastern France. Starting in 1922, dozens of streets were made one-way. After their invention in Cleveland in 1914, the first traffic lights were set up in France in 1933. Wide right-of-ways isolate fast-moving traffic from resident access with frontage roads. Large networks of bicycle paths were laid out in the industrial North of France, notably for the workers’ travel needs. In 1906, Eugène Hénard published a proposal for roundabout intersections to reduce conflicts in horse-drawn traffic. He proposed building underground carriageways and fly-over intersections.

2.2. Construction of new road objects

Motorisation generates great differences in speed among the various means of transport using the public space. The solution first entails separating slow vehicles – or their exclusion – and widening infrastructures, often to the detriment of pavements installed at the start of the 19th century. Design is refined by reserving specific places to vehicles depending on their speed: the fastest vehicles can be found in the middle of the road, pedestrians walk near the storefronts. The construction of a link between the three urban centres of Lille, Roubaix and Tourcoing stressed a tramway in addition to a road, a bridle path, a bicycle path and a walking space [6]. This can be seen in the topics developed at the first PIARC conferences dealing with congestion, ways of encouraging fluidity and the creation of new infrastructures [7]. Progressively, busy transport roads came to structure urban development. Thus, Soria y Mata was able to theorize on the “linear city” which adapts to public transportation routes and which began to be applied in Madrid.

These practical and theoretical evolutions have operational consequences, notably for the layout of public spaces where increasingly heterogeneous and increasingly fast traffic has to be dealt with. It was first a question of progressively constituting an initial layout “toolbox”, whose use quickly became generalized due to the rapid internationalisation of technical cultures, whether road techniques, signing, etc. Furthermore, "road sharing" – although the use of this term in French (“partage de la voie”) is recent – appears to be a very old treatment principle and a common-sense solution for treating streets. It implies separating pedestrians, cyclists, pubic transportation and automobile traffic (as well as horse-drawn traffic).

3. A FUNCTIONAL NETWORK CULTURE

While these physical and regulatory systems do not appear to have changed much since they appeared, at least in their principles, this is not the case of the layout culture on the level of a built-up area, which was to give rise to organizations of networks and treatment of public spaces that differ widely depending on the functions being stressed, the objectives sought and the degree of integration in the urban fabric.

3.1. Segregation of modes and functional hierarchy

Writings by urban planners were soon to integrate the presence of motorised transportation, trying to imagine what the city of tomorrow would look like. This was notably the case of Eugène Hénard in France. One of the most fervent advocates of the automobile was, of course, Le Corbusier, who wanted to have Paris crossed by “a main traffic throughway, 120-m wide, equipped with a raised carriageway for one-way traffic, without crossroads” [8] (p. 265).

The principles of segregating modes of transportation and the hierarchy of roads progressively became structured during the International Congresses of Modern Architecture. Thus, starting in 1924, Le Corbusier wrote, "Traffic can be categorized – better than anything else. Today, traffic is uncategorized, – dynamite thrown into the fire in the corridors of streets. Pedestrians are beaten to death. And with that, traffic no longer flows. The sacrifice of pedestrians is sterile" [8] (p. 160).

He theorized on the integration of different modes of transportation into the urban project through a hierarchy of networks. Thus, in the Charter of Athens [9], he called for three types of roads: "The first useful measure would be, in congested trunk roads, to radically separate the fate of pedestrians and that of mechanised vehicles. The second, to give

lorries their own traffic bed. The third, for primary routes, envisage through roads that are independent of the regular roads designed for light traffic only" (Article 60).

Later on, these ideas were taken on by the committee specialists headed by Colin Buchanan and created by the Ministry of Transport in Great Britain in 1961 to study the problems posed by the development of the automobile in modern society. These were illustrated in a report [10] with the example of a hospital where traffic is a major element: "patients arrive at the reception, are moved to wards, then perhaps to operating theatres and back to wards. Doctors, consultants, sisters and nurses go their rounds. Food, books, letters, medicines and appliances of many kinds have to be distributed. A good deal of this includes wheeled-traffic. The principle on which it is all contrived is the creation of areas of environment (wards, operating theatres, consulting rooms, laboratories, kitchens, libraries, etc.) which are served by a corridor system for the primary distribution of traffic. This is not to say no movement takes place within the areas of environment, since even in a hospital ward there is a drift of movement up and down that ward, but it is strictly controlled so that the environment does not suffer."

This principle can be applied to a city. A primary network ensures transit and travel between neighbourhoods, a secondary network ensures distribution, while in the "areas of environment" – urban rooms – only local traffic should be encountered. Such a system implies a design of these "areas of environment" in relation to the nature of usages and the rate of motorisation. When demand becomes too high, networks with differentiated levels may be necessary.

Segregating modes, hierarchy of networks and protecting areas of environment are all responses to the safety problems posed by the cohabitation between vehicles in fast traffic and urban activities.

3.2. Toward a safe town planning

At the same time, in Sweden, academics in Göteborg tried to streamline safe urbanism. The 1968 SCAFT guide listed the principles laid down by this reflection:

- Reduce traffic through the localisation of activities and the use of space;
- Separate vehicle, cyclist and pedestrian modes to eliminate conflicts;
- Differentiate the network by functions and characteristics, ensure transit outside the town centre and residential areas;
- Differentiate the various traffic flows so that each flow is as homogenous as possible;
- Clarify, simplify and homogenise road design to facilitate decision-making;
- Design a “forgiving” environment to reduce the seriousness of accidents.

These principles help to clarify the use of networks, notably by separating the different functions: transit, arterial travel, residential, etc. Urban spaces are designed using a grid structured in six functional categories. Its application thus influences urban growth in many European countries [11]. Many projects are presented as exemplary, such as the design of the new town of Stevenage. This design leads to good results from a safety point of view. The OECD report on "safety in residential areas" [12] lists evaluations of the application of these principles in Great Britain (new towns) and Germany (new urban growth areas).

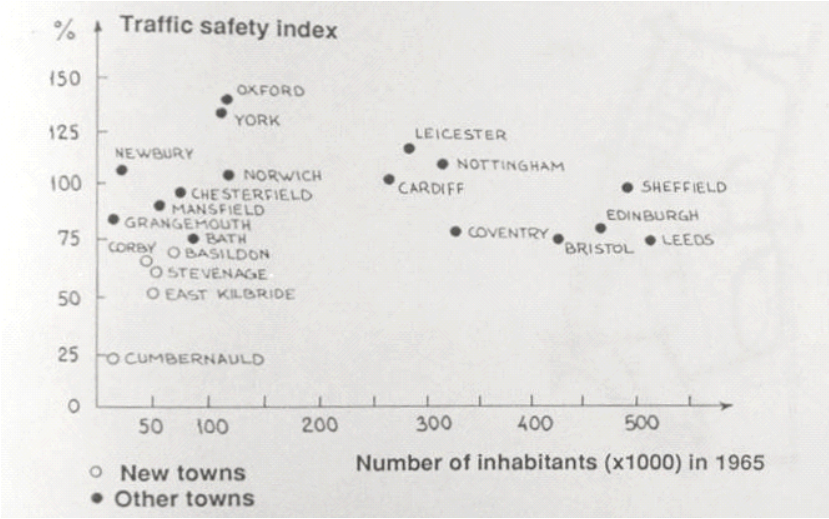

Figure 1 – Size and Safety Index for old and new towns in Great Britain (the safety index is the number of accidents in relation to the population and an average national index in urban areas) [12]

4. SAFETY IN THE TREATMENT OF PUBLIC SPACES

4.1. The context in the 1970s

The dominant technical culture of this period produced closely sized infrastructures which were the results of the strict application of models produced by travel dynamics, which led to relatively constraining design standards. This sizing is also the result of the integration of ergonomic considerations from psychology which tried to facilitate crossings by reducing the complexity of the task. It appears to be useful to break down intersections, allowing the successive meeting of each flow or turning movement, including by spreading out this weaving in space. Even if these designs often appear outdated to us today, it is nonetheless true that they were based on obvious road safety considerations.

In cities, it is generally accepted that the automobile must be able to easily access dense centres and that new neighbourhoods are being structured around segregated or ranked networks. While projects based on these approaches are taken as examples in new towns, in older fabrics they are often hard to implement. It is not practical to categorise networks into 6 categories and it is not realistic to separate all flows of vulnerable users. Projects mainly deal with town centres where pedestrian business streets are designed in a context of competition with supermarkets setting up in outlying areas. Traffic plans are both tools for access and for moderating traffic in major centres.

For a lack of a more critical view of the place and role of the automobile in cities, this retistic hierarchical view of the road traffic system leads to creating infrastructures that encourage this mode of travel, even though it consumes more space than others. The application of such principles in old towns is not without damage to the existing fabric and is done to the detriment of neighbouring populations. Often, derogations to road standards are granted and sharp bends on fast, major infrastructures become, despite speed limits and overabundant signing, black spots that are hard to fix.

4.2. The Dutch experience

In the anti-authoritarian context following 1968, urban planners such as Joost Vahl, and residents of the Netherlands decided to oppose urban policies that were excessively focused on automobile travel and multifunctional zoning to design a new environment. The

middle of the1970s saw the appearance of the "woonerf" ("pedestrian priority area") idea which, by encouraging the integration of road users, provides an alternative solution to the specialisation of space. Local roads in Holland are usually constituted of a layer of bricks laid on a bed of sand. It is therefore necessary to remove the bricks regularly to replace the whole. It is easy to undertake experiments with new layouts of public spaces, experiments with new urban forms based on the co-production of public spaces with the neighbours who want to have in front of them a tree or flowers, a bench, a sandbox, a parking space, etc. This is how innovation was possible, giving rise to the concept of "pedestrian priority area" which ensures low-speed cohabitation among all users of local roads. It wasn't until 1977 that innovative regulations ratified this idea of "pedestrian priority area" in the Netherlands, giving priority to pedestrians over motorised vehicles and adopting specific signing.

Without dwelling on this anecdotic aspect of the birth of this mode of layout for public space, we should recognise the originality of this idea of integration, replacing that of segregation. Woonerf has given rise to a new technical design for integrating various modes of travel and functions of public space. Physical systems can reduce vehicle speeds allowing such cohabitation. From a safety point of view, the visibility of different users is stressed, and the foreseeability of possible encounters in this space is brought into play. It is no longer a question of designing streets exclusively as travel spaces, but rather as a territory owned by several actors who are not all on the same route and whose presence does not follow a single pattern.

4.3. Traffic calming experiments in Europe

This new type of design, known generically under the term "traffic calming", was the subject of many experiments in various countries, notably in Northern Europe, in the 1980s. These experiments were especially focused on town centres or residential neighbourhoods. On the other hand, experience in France in the same period mainly focused on major trunk roads, through roads in urban areas and city approach roads. Safety objectives are increasingly obvious and the problems to be solved more complex. The objective of the "Safer city, accident-free neighbourhoods" programme, launched under the aegis of the Interministerial Committee for Cities, was to improve the safety and quality of urban life through quality layout. This was notably the opportunity to renew layout modes in public spaces, bringing together the procedures of engineers, urban planners and landscape architects [13]. This operation was positive overall in terms of safety. The risk of accidents was reduced by 60 % in the areas treated; average speeds and especially excessive speeds were also reduced [14].

Comparing all of the European experiences, reliable conclusions have been drawn as to their effectiveness [15] [16]. There is a large body of literature on the subject. Many authors have shown the effectiveness of such measures from the point of view of the drop in the number and seriousness of accidents, but also the reduction of speed and noise, the decrease in through traffic in residential areas, the satisfaction of neighbours, petrol consumption and the increase in the value of buildings (real estate value and business revenue). Many results were reported upon at the Congresses in Paris [17] and Copenhagen [18]; partially reproduced in Accident Analysis and Prevention [19].

4.4. Traffic and speed calming in travel policy

At this stage of reflection, it appears that the ideas of segregation and hierarchy provide a consistent traffic design, while the integration of different modes and different uses make possible the effective treatment of public spaces. These two different levels of dealing with road safety are, in theory, joined. But in practice, many situations are complex to analyse,

notably in older urban fabrics. Certain experiences show that it is possible to improve safety throughout an entire area by combining two types of actions:

- Redistributing traffic in the network;
- Locally improving road treatment.

In 1988, the Transport Research Laboratory [20] undertook such an experiment on 5 urban areas measuring 7 km² each. £250,000 were invested and accident risks dropped by 10 to 15 %. Other countries undertook this type of experiment to retreat entire areas [21] [22].

Approaching the question from a more global level requires an overall view of how the city operates and of the objectives that we want to stress. Safety concerns, as well as questions of town planning and the development of social relations and life, ecology and economic quality can lead to choices that stress public transportation, two-wheelers or automobiles, especially in town centres and business and industrial areas. These choices condition how traffic networks are structured and how urban travel is organized. Roads can be defined by their different functions [23]. Their treatment can follow different logics which, according to the PIARC technical committee on roads in urban environments, can lead to the definition of 6 major categories of road objects:

- Roads for motorised traffic,
- Roads for all traffic – separation of travel modes,
- Roads for all traffic – mixed travel modes,
- Roads reserved to public transportation,
- Roads reserved to cyclists,
- Pedestrian areas.

4.5. Layout principles

The safety considerations that underlie the principles of segregation, hierarchy and integration are essentially different. On the one hand, there is the question of simplifying the driving task by reducing the encounters among flows and uses and, on the other, there is the question of directing the diversity of urban practices to make them predictable and visible in order to deal with this at suitable speeds. In practice, these principles operate jointly, often applied to different urban spaces. But more and more, layout results in the aggregation of principles that were initially simple but which practice and the complexity of situations have made it necessary to combine for improved adaptation.

Other principles have thus appeared in the technical literature: the sharing or space, strongly stressed in France, automobile traffic calming in cities and speed modulation in many countries.

Street readability, in various forms, is a notion derived from current notions of cognitive sciences. The works of Eleonore Rosch [24] have notably shown that the construction of mental categories is not strictly the result of the application of necessary and sufficient conditions, but is mainly the result of phenomena of adaptation to the environment in which an activity is undertaken. These theoretical viewpoints correspond to the empirical results of Jan Rasmussen [25], pointed out in other safety fields. The representation of a situation is constructed overall by a holistic approach that is used to categorise it into a generic category, which does not make it easier to interpret cues which do not fit together. These incongruities demonstrate the importance of the context in interpreting a particular cue. Much research in cognitive sciences today looks into this type of phenomenon, combining them with the analysis of activity. Driving is therefore a field that has been

largely explored from this point of view. Some work has looked into special situations which can be foreseen in a given environment [26] [27]. A readable road would be one which lets users foresee as early as possible the types of interactions with other users that they might encounter.

5. URBAN NETWORK MODELS TODAY

Transcription of these principles in space, to become operational, entails network models. It should be observed that any design and operation of surface traffic networks is based on a ranked model and this is the case whatever the city or country in question. This model is generally explained in the form of maps which are ways of showing this organisation.

These models can differ formally from one country to another. Even if it is, of course, difficult to take an exhaustive census of this, an in-depth analysis of practices makes it possible to pinpoint several major types of organisation stressing one or another of the aforementioned technical principles.

5.1. The Buchanan model and the Dutch transport plan

The most classical model, developed by Buchanan, was adopted by many designers. The road system is usually broken down into primary, secondary and tertiary systems. The tertiary road system is included in areas of environment which can be treated as "30-km/h zones". Such a model can be found, for example, in the Dutch design [28].

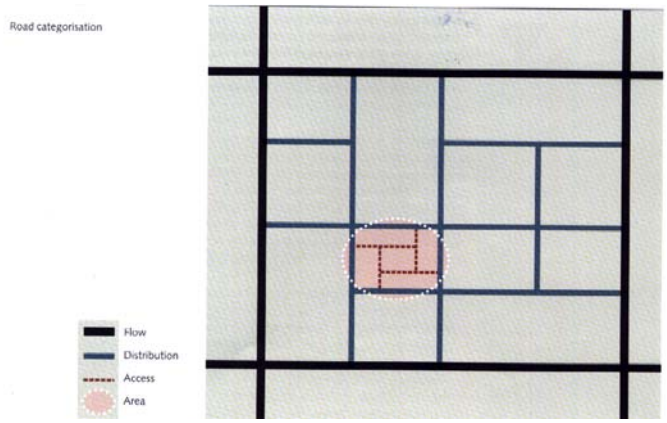

Figure 2 - Categorisation of urban roads in Holland
(Ministry of Transport, Public Works and Water Management, 1996)

The concept of "sustainable safety" [29] [30] calls for road systems that are designed for a specific function. The design of road systems should be mono-functional. Vehicles should have the same speeds, directions and masses for fast or medium-speed lanes. Roads should be readable. The environment should be tolerant so as to reduce the seriousness of injuries and it should include limitations for the driver’s reduced condition. The design can be clarified, making usage and behaviour foreseeable. It tends toward a standardisation of roads, markings, systems for controlling traffic and speeds so as to induce a suitable behaviour "naturally".

5.2. The Danish model

In Danish technical documents, it is recommended that the entire city should be treated using just 2 types of roads: traffic roads and local roads. The first category is used for through traffic and travel between urban areas, the second is used for local traffic.

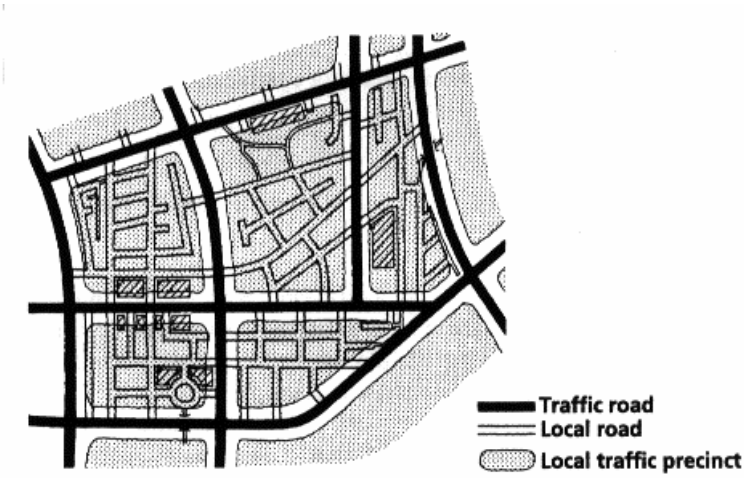

Figure 3 – Danish road network model [31]

The difference with the Buchanan model is not just theoretical and has important practical consequences. Indeed, according to such a plan, "30 km/h zones" cover much larger surfaces than in the previous case, notably including neighbourhood distribution roads which sometimes correspond to wide right-of-ways. Some French cities have begun to adopt this point of view.

5.3. The 30-km/h city model

It may thus be legitimate to think of limiting speed to 30 km/h throughout the city. If some people envisage such a decision, it seems that this model is reserved to smaller towns. In Belgium, the town centres of Hasselt and Mons have been transformed in this way. Consequently, demands for reducing speeds are no longer limited to streets with little traffic but also cover larger roads. Treatment thus makes it possible to reduce speeds and, on the other hand, to integrate these infrastructures into their urban environment.

Thus we can see a desire to expand 30-km/h zone-type designs further. Since the pedestrian streets of the 1960s, convergent ideas of a "car free city", "30 km/h city", "generalised 30-km/h zone" or even the Swedish "vision zero" have appeared.

Sweden envisages a new strategy for road safety action based on “vision zero". It is based on one objective: "In the long run, no one will be killed or seriously injured within this road transport system. In order to achieve this vision, the designers of the system are always ultimately responsible for the design, operations and use of the road transport system and are thereby responsible for the level of safety within the entire system." 30 km/h remains the reference speed for vehicles beyond which the risk of a vulnerable user’s being seriously injured in an accident exceeds 50 %. …"Based on the Vision Zero strategy of action, vehicle speeds shall not exceed 30km/h where mixed traffic is foreseen or planned. Consequently, there should only be higher speeds on roads or streets where there is no pedestrian or bicycle traffic or where the different types of traffic have been separated…. Pedestrian and cycle traffic can be considered to be sufficiently separated from vehicle traffic only where there are grade-separated passages for crossing the roadway" [32]. Implementing such a vision is thus based on a fine analyse of the locations of conflict between vulnerable users and motorised traffic. Strict application in urban areas should lead to a wide expansion of areas limited to 30 km/h [33].

6. CONCLUSION: WHAT IS THE OUTLOOK FOR EUROPE?

6.1. Eco-mobility and the appropriation of safety techniques

Reflections on road systems today stress a ranked view of infrastructures. Such a viewpoint integrates into the mesh of networks roads that carry heavy traffic, more protected areas laid out according to traffic-calming principles that have now been tested, recognised and diffused. These layout principles have thus spread to many countries in Europe. If these systems were initially designed for safety, however, their current use is much more widespread.

Awareness of the environmental nuisances caused by automobile traffic – whether pollution, noise or the cluttering of urban public spaces – has produced new awareness of the need to reduce the number of private vehicles and their speed in cities. These current environmental concerns have led some to speak of neo-hygienism in urban design. Eco-mobility is expanding, mainly with the use of bicycles, but also walking (Great Britain, Switzerland, etc.), the design of urban vehicles and the development of public transportation, notably tramways, etc. These objectives have found their way into various legal texts covering the construction and layout of public spaces. This can be seen in France in the law on air (LAURE – 1996) initiating new ways of fighting against nuisances, the obligation for cycling layouts and planning for urban travel and, more recently, in the solidarity and urban renewal law (SRU – 2000) which modifies provisions for urban travel plans (PDUs – *Plans de Déplacements Urbains*), notably adding safety to their objectives.

Other countries have implemented similar procedures for planning urban travel on the local level. In Italy, *Piani urbani del traffico* (PUT) and, in England, *Local Transport Plans* (LTP) are equivalents to the French PDU. Their objectives mainly aim at reducing the growth in automobiles in cities with a view to sustainable development and protection of the environment. Safety is clearly cited as one of the objectives of these plans. Despite some national specificities, the technical options adopted lead to actions which often seem quite similar to those of the PDU.

But to achieve this goal of protecting the environment and reducing automobile use, the layouts available at the time (a period that can schematically be placed in the mid-1990s) were those which had been developed as a priority as a safety concern. This is the case of pedestrian priority areas, 30-km/h zones and the layout of large through roads, but also bicycle paths which gave rise to many experiments at the end of the 1970s. There is thus a “toolbox” whose effectiveness in terms of safety had already been measured experimentally and which has been implemented for concerns that are wider than those for which it was first designed.

Obviously, action on the urban environment is not taken in the sole aim of improving safety. Operations whose objective was to prevent accidents, especially on a large scale, have always considered other urban management objectives as having to be taken into account or integrated. The “Safer City, Accident-free Neighbourhoods” operations in France [13], the "Safer City Project" in Great Britain [34] [35] and OECD working groups [36] also deal with these questions. Thus, safety today must confront and explicitly work with a set of other values and its consideration depends on the relations between actors with different objectives.

6.2. The values defended

The values upon which public action is based are basically the same in all European countries. We must recognise, however, the contrasted priorities and effectiveness of the action undertaken in their name.

Everywhere, road safety is a priority of the State, which in many countries defines a policy to be applied on the local level. In Great Britain, it has long been the top value in layout actions, elsewhere it rather tends to be integrated – often too weakly – in more general processes. Urban layout has several faces. It is integrated into design standards for roads, improved by the correction of dysfunctional situations, promoted as a primary value in design leading to, among other things, a ranked organisation of the network (the English experiment in Gloucester, Sustainable Safety in Holland), it is sometimes an argument put forward to support the promotion of other objectives. Local technical services (with exceptions) justify the little interest they have in stressing road safety by the drop in the number of victims observed over nearly three decades and sometimes the priority given to the fight against road delinquency.

Protection of the environment is a strong objective of civil society, with some political parties being built on this concern. Today, it is an objective shared on the national and local levels. The promotion of eco-mobility takes on various forms. Bicycle use is defended by associations and is today relayed by the State in most European countries. Holland and Denmark have always defended this mode of travel, widespread in those countries. Walking is not much promoted in Europe, with British and Swiss policies being exemplary in this area.

Integration of the handicapped is an important issue in urban action. Thus, in Italy, associations play a very active role in urban layout. Elsewhere, this is considered more as being the result of the application of standards.

The isotropy of development plays a strong role in Belgium and Denmark: everyone must have the same chances and advantages wherever they live. This does not appear to be as strong in other countries.

The conservation of historic heritage plays a very important role in Italy. It is important in France and Germany and is taking on greater importance in Great Britain. Urban quality has been a driving force in layout in France, in a climate of competition between cities in order to improve their economic and tourist attractiveness. This can be seen on the finer level of layout in many countries, where populations are not satisfied with just the functionality of systems, but demand greater comfort and aesthetics. We should point out the growing importance of special urban events (festivals, sports, etc.) which must be included in design.

6.3. An island strategy

National policies are naturally sector-based. This means that special systems are implemented in favour of safety, the environment or the integration of the handicapped in cities. They are often under the authority of particularly ministries and are implemented by technical services with limited authority. Obviously, local action quickly exceeds the framework of sector-based actions, as it deals with a complex system within which individual and collective regulations are at work.

Looking at the processes at work and beyond the sector-based policies on display, urban planning appears to be the result of tension between two hardly compatible points of view.

On the one hand, economic development recognised as necessary appears to have consequences on the use of the automobile, which is increasing overall, on the other, there is a desire for a careful management of space resources and the fight against all dysfunctional situations related to mobility. This second aspect is the one that is strongly stressed by a large part of European urban societies, relayed by the media.

Even if the use of automobiles is increasing overall, traffic is being reduced in certain town centres. Is this a passing phenomenon related to the economic situation or a lasting reversal of the trend that will radically change the outlook for urban layout and notably for safety actions in cities?

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