



Paternoster Retrospective
How Much Prosperity can London Take?
The Use of Our Streets
Traffic Calming for Livable Streets
London Transport Assessment Studies
Haringey Urban Design Action Team

UDQ 35

JUNE 1990

£2.00

**URBAN
DESIGN
QUARTERLY**

TRAFFIC CALMING FOR LIVABLE STREETS

ENGINEERING STANDARDS OR CREATIVE DESIGN?

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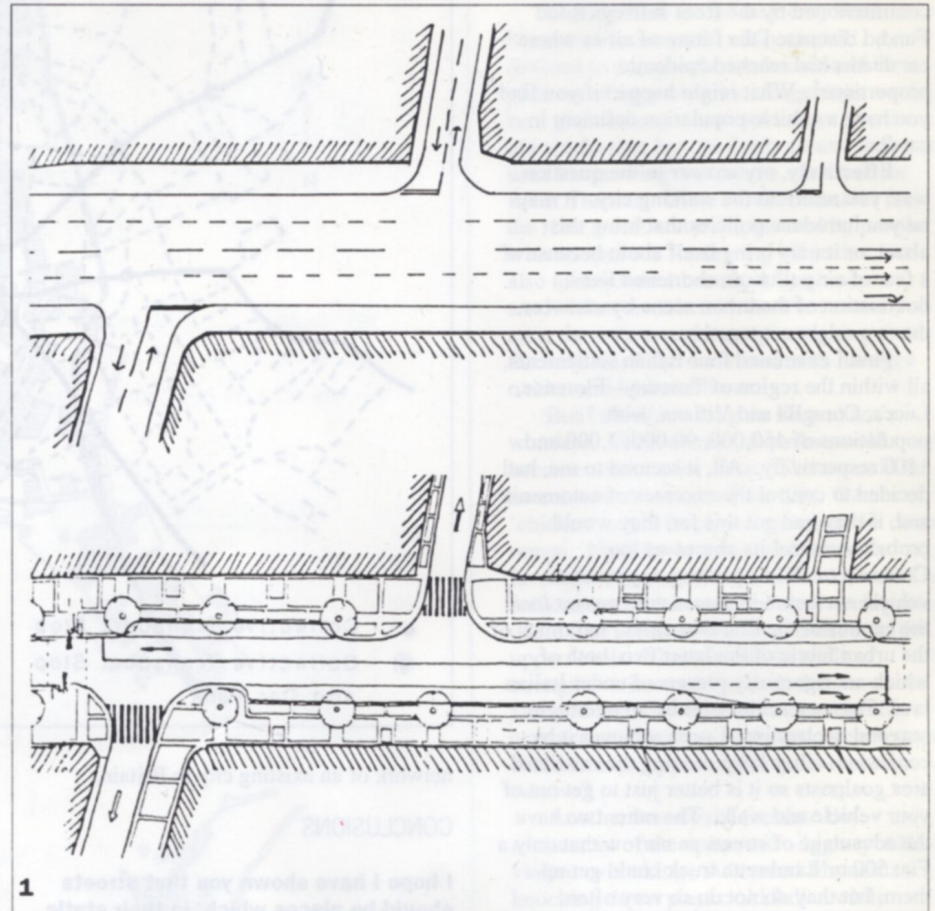
Creative design of public urban space has been hijacked by the rigid and insensitive imposition of traffic engineering standards. In striving to achieve uniform standards of road layout, materials, signs and street furniture, traffic space has become increasingly divorced from urban architecture and civic design. Such an approach may be justified on safety grounds when designing segregated transport systems like railways and motorways, but most urban streets perform multiple functions and their design should also be multi-faceted. Such a holistic approach to street design has been developing in several European countries linked with techniques commonly referred to as "traffic calming".

In theory, the design of public spaces should follow the procedure:

FUNCTION -- OBJECTIVES -- DESIGN

The definition of street function, however, has narrowed to that of the passage of traffic and the parking of vehicles. While effort and expense may often be given to the design of individual buildings and facades, the surfaces and spaces between them are ignored from every viewpoint except traffic. The creation of an attractive environment in which to carry out other legitimate activities such as strolling, looking, chatting, listening, window gazing, pram pushing, playing and learning has been compromised by the demands of the twentieth century 'space invaders' - motor vehicles. Verges and gardens are converted to parking, footways are narrowed to fit in another traffic lane, corners of buildings are cut off to meet sight-line requirements, metal guard rails create pens for pedestrians, a forest of poles support signs, signals, and street lights, and the ground is patterned with white and yellow paint in the style of "traffique grotesque". What chance does architecture have behind this all pervasive clutter?

The space demanded by the car and other vehicles has eroded space for pedestrians and



for amenity. The car is a great waster of space, and much urban space is wasted on it. Buildings can no longer define the shape and scale of public space. The concept of "urban rooms" and "corridors", in which floor and walls are designed together, and bridged with nature's own ceiling - the every changing sky - is still applied in pedestrian areas, but rarely in other places. Elsewhere urbanity is in retreat. Urban space is dictated and defined by traffic and highway standards for parking, access roads, kerb radii, turning circles, stop lines, lane widths, refuges, crossings, and so on. Yet even if the presence of motor vehicles is accepted, the space provided for vehicles is often excessive and inefficiently used.

It is time for local authorities to embark on a programme of "space reclamation" in urban streets, to bring them back to life. There is enormous potential for converting carriageway space to more profitable, and more attractive use. First, however, we have to abandon the outworn notion that our traffic problems have to be tolerated only in the short term, until that glorious day when adequate capacity will be provided, and no longer will there be any traffic jams or car park queues. We all know now that this day will never arrive. More road capacity simply reproduces the same problems on a larger

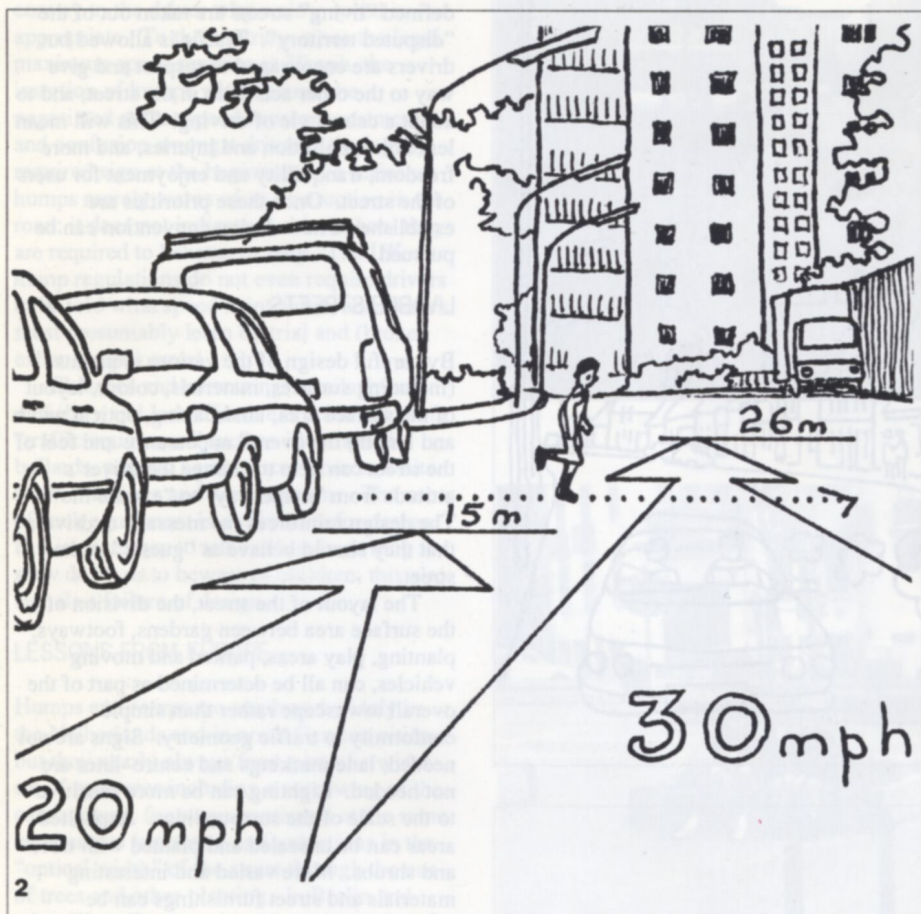
scale.

There is a lot of surplus carriageway space which provides neither traffic capacity nor space for other activities or amenity. Traffic capacity is determined by key junctions in the road network, not by the width of the streets that run between them so, except at these key junctions, single file traffic in each direction is often sufficient. This happens anyway, even when streets are marked out with two lanes in each direction, because kerbside space is occupied by vehicles parked or loading.

Space is taken up not just by the volume but also the speed of traffic. The faster the traffic, the more space must be provided to allow its safe passage. The more space that is provided, the greater the encouragement to speeding. In urban areas, the blanket 30mph speed limit has led to a uniform approach to street design and does not allow priority to be given to non-traffic activities. In streets with a residential function 30mph is too fast. Speeds of 20mph or lower are not only safer but also require less vehicle space. On main roads too, carriageways can be reduced in size provided speed is not the priority. Once it is accepted that priority should be given to living rather than traffic, to pedestrians rather than drivers, a whole range of possibilities open up for making streets more livable and

Figure 1 to left. Surplus carriageway can be reclaimed to bring streets back to life.

Figure 2. In streets with a residential function, 30 miles per hour is too fast - 30 mph has a fatal flaw.



more attractive. Such a reversal of priorities occurred in the Netherlands in the mid-1970s and has now been followed in Denmark, West Germany and other north European countries.

How do we proceed? It is first necessary to agree on the functions appropriate to different urban spaces, and where traffic conflicts with living, priorities must be determined.

TRAFFIC TERRITORY

The volume, speed and behaviour of traffic are variables that can be controlled or influenced through design and other means. The agreed traffic territory consists of motorways and perhaps other roads with no frontage development, where traffic and engineering standards can be justified to provide for safety, capacity and speed (though there is little agreement on how fast above 50mph such roads should be designed for). Surface materials, signs, lighting and landscape all need to be designed for road users travelling through the space behind a windshield at 70 feet per second or faster.

PEDESTRIAN TERRITORY

At the other end of the scale there is also

much agreement that vehicles are inappropriate in pedestrian shopping streets, footways and parks, and that speed should be "designed out" of mews courts, culs-de-sac and similar "pedestrian priority" spaces. Here, spaces can be arranged in scale with people, buildings and plants. Materials can be chosen and signs can be designed to be appreciated and read at close distance, and at walking speed.

Early efforts to counteract traffic domination of residential areas relied on the physical segregation of pedestrians and vehicles, for example the "Radburn" layout. In the early 1970s the Dutch recognised that full segregation was impossible even if it were desirable, and so developed the "Woonerf" where all road users have equal priority within a shared space. More than 7,500 streets in Dutch towns and cities have been converted to "Woonerven". The Woonerf has been a great success and popular with most people, but in the development of a general policy for "living areas" it is now seen to be too costly and too drastic for universal application. Nevertheless, shared spaces are still appropriate where the costs of street reconstruction can be justified, and depending on the mix of pedestrians and vehicles.

In between the purely vehicle and purely pedestrian environments lies the disputed territory where space is parcelled out between vehicles and street activities. This disputed territory accounts for the great majority of urban public space and in a substantial proportion of this, traffic has currently got the upper hand.

A SPEED STRATEGY

There are many variations and possibilities in deciding on the functional priorities of streets, but several countries have adopted a simple classification of urban streets into "traffic" streets and "living" streets. This classification is used to develop a strategy for speed management, and also for design. In provided for vulnerable road users (pedestrians and cyclists) and priority can also be given to public transport. In such streets it is not necessary to have continuous priority for traffic over other functions. For example, in shopping areas through traffic can relent and expect to travel more slowly, to give way to pedestrians and to vehicles seeking access to frontage premises. Slower speeds can be encouraged by using narrower carriageways, tightening corners, keeping bus stops in the main running lane and other measures. A 10 metre four-lane carriageway has almost the same traffic capacity as a 13 metre carriageway, and at 8 metres capacity drops by only 5-10% but a third of the space is saved. In narrow streets, more imaginative design is necessary, but on the other hand the savings in space are more valuable.

There are merits of safety and readability in having standardised signs and markings in "traffic streets", but there is nevertheless plenty of scope for improving design and reducing clutter. Where priority is shared with shopping and other activities, a more comprehensive approach to the design of the street is required. For example different surface materials can convey different functions in an attractive way, and bollards can be more attractive than railings.

To bring residential streets or "living areas" back to life vehicle speeds can be reduced to a maximum of 20mph, not just by a change in the legal limit, but by physical redesign of the streets themselves. Traffic is a lot less threatening at 20mph, and at that speed it is easier to persuade drivers to be tolerant and accepting of vulnerable road users. If speeds are limited to 20mph, casualty reductions of 40-50% may be expected. A pedestrian hit by a car at 20mph has a 90% chance of survival, but a pedestrian hit by a car at 30mph as a 90% chance of being killed. At steady driving speeds of 20mph, exhaust emissions and fuel consumption are reduced, and noise reductions are equivalent to halving the volume of traffic.

At 20mph or less most of the trappings of traffic - lane markings, signs, barriers, refuges, tall lamp standards - can be dispensed with. The space can become part of the townscape, rather than just a tentacle of the traffic network. The street can be converted to convey to the driver that a slow,



calm and tolerant style of driving is appropriate.

A change to 20mph maximum speed allows space to be designed for pedestrians, cyclists and amenity. Residents' parking is usually accepted except where demand exceeds the space available. Essentially, the defined "living" streets are taken out of the "disputed territory". Traffic is allowed but drivers are encouraged to respect and give way to the other activities in the street, and to adopt a calm style of driving. This will mean less noise, pollution and injuries, and more freedom, tranquillity and enjoyment for users of the street. Once these priorities are established a new design convention can be pursued.

LIVABLE STREETS

By careful design of the various elements (including surfaces, materials, colour, layout of the surface area, landscaping, optical width and length) the overall appearance and feel of the street can help to change the driver's attitude from "make way" to "excuse me". The design reinforces the message to drivers that they should behave as "guests" in the street.

The layout of the street, the division of the surface area between gardens, footways, planting, play areas, parked and moving vehicles, can all be determined as part of the overall townscape rather than simple conformity to traffic geometry. Signs are not needed, lane markings and centre-lines are not needed. Lighting can be more sensitive to the scale of the surroundings. Asphalted areas can be unsealed and planted with trees and shrubs. More varied and interesting materials and street furnishings can be employed.

With the focus of the design process shifted from traffic and highway engineering and urban design, architecture and landscape, the life of the street can begin to reassert itself. Children can cross the road to their friends free from the dangers of speeding cars, people can pause to chat, or simply to enjoy the scene, the weather or whatever. (There appears to be no word in the English language which conveys the passive enjoyment of the environment!). Life can develop in public spaces, and the design of public spaces in turn can develop without the oppressive influence of traffic rules. A new dialogue can open up on the design of urban streets.

THINGS IN THE STREET - NICE OR NAFF?

What things does the designer have to work with? The most important design elements are those that guarantee slow maximum speeds and a calm style of driving. A maximum speed of about 20mph must be ensured by physical means. Low traffic volumes are also desirable in "living" areas, but not always easily attainable, at least in the larger cities.

The basic techniques are becoming well known: changes in level and direction, carriageway narrowing, restrictions of



forward views. Unfortunately, in the UK unsightly examples of these features are becoming too well known, and well disliked. The standard speed hump or "sleeping policeman" laid out kerb to kerb certainly slows traffic at that point, but it does nothing to enhance the appearance of the street, or to convey to the driver **why** a slow speed is appropriate. To the contrary, since the legal maximum speed remains at 30mph, the insertion of humps which cannot be negotiated at that speed causes resentment and confusion amongst drivers. The legally required sign at the beginning of a series of humps merely warns of an obstruction in the road; it does not indicate to drivers how they are required to behave, or why. The UK hump regulations do not even require drivers to be told what speed is intended, and drivers must presumably learn by trial and (broken exhaust pipe) error!

Chicanes and narrowings similarly are unsightly and less effective if achieved using "traffic equipment" such as illuminated bollards, painted kerbs, arrow boards, white hatch markings and warning signs. The use of such equipment is a substitute for design. If it is necessary to tell a driver in writing to slow down or to beware of children, this also signals a failure of design.

LESSONS FROM EUROPE

Humps and ramps are employed widely in the Netherlands and in north German cities, but they nearly always form part of a wider set of measures including a narrowing of the carriageway, footways continued at the same level across junctions, and reductions in the "optical width" of the street through the use of trees and other planting. In Berlin and other West German cities, humps consist of raised rectangular sections of the carriageway ("speed tables") which require cars to slow, but which allow cycles and buses to pass unhindered. Chicanes are less easy to design in a satisfactory way and good and bad examples can be found in other countries. Some designers in West Germany no longer use chicanes, which they feel can spoil traditional townscape.

The most sophisticated traffic calming designs dispense with words, markings and signs, and colour is used only for aesthetic enhancement, not to meet some technical requirement. Particularly good examples of this approach can be found in Cologne (Nippes and Neustadt-Nord districts) and in Berlin (Moabit and Charlottenburg districts).

Progression towards a more integrated concept of design, which achieves multiple objectives of transport, access, safety, environment and amenity, is unlikely to be achieved without a multi-disciplinary approach. There are simply too many diverse and conflicting interests in an urban street to be reconciled from a single standpoint.

A major lesson learnt from traffic calming experience in Europe is that public involvement is essential. Transport proposals and plans often attract public attention from interest groups, but almost everyone takes an interest in their immediate locality. If



Figure 5 at top. Speed Tables used in Berlin.

Figure 6 below. Examples of traffic calming measures in Cologne.

contractors start digging up the street outside people's homes without those people having been party to the decision, the scheme will be in danger of being misunderstood and blocked by public opposition. More important, residents have a detailed understanding of the way in which the street works, and can therefore help to develop the best design. In the final analysis, it is the residents who have to live with the design.

ADVOCATE, INNOVATE, EVALUATE

Finally, the traffic calming approach is still relatively new, and as yet has hardly begun in the UK. There is therefore a need to encourage innovation amongst local authorities, and to set up

independent evaluations of various approaches and design techniques. There is an immediate need to assimilate the vast array of experience already gained by our European neighbours. The lesson contained in this paper is that traffic calming is effective and popular only if it is associated with the creation of a more attractive and (as John Roberts puts it) "user friendly" living environment. The need to learn is urgent, before large sums are spent creating inefficient and unattractive street designs, and before traffic calming becomes irreversibly associated with "giving people the Hump". ■