

THE STRUCTURING OF SUSTAINABLE SETTLEMENTS: URBAN DESIGN AND MOVEMENT

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1.0 INTRODUCTION

The Scottish Executive has recently published a new Planning Advice note PAN 76: New Residential Streets, prepared by a team led by WSP. This paper builds from this work to examine the importance of new approaches to the design of settlements and their potential impact on patterns of movement. It also examines the linkages between new design approaches and other aspects of Scottish Executive policy on sustainable development. This paper examines the following:

- The travel challenges currently facing settlements in Scotland including relevant trends
- Emerging policy guidance that is encouraging new approaches
- The nature of settlement, why we move and why we are moving more
- How has the structuring of our settlements occurred over history
- The evolution of highways design guidance and how this has led to a dominance of the motor vehicle in recent residential developments
- The concept of the walkable neighbourhood – how can we design traditional urban places where most daily needs are met by walking rather than by having to use the car
- How we can start to design more pedestrian and human scale places – examples from Poundbury, Dorset - where a truly mixed use settlement has led to lower vehicle trips and the creation of a legible place
- The use of design codes in the delivery of sustainable communities

2.0 TRAVEL CHALLENGES AND RELEVANT TRENDS

There are many challenges currently facing Scotland. This STAR Conference has itself been organised as a response to many of these challenges which include economic growth, changes in social trends and increasing car ownership and usage. In this section of the paper we will briefly highlight some of these challenges where they potentially impact on the design of expanded or new settlements.

2.1 The Scale of Housing Growth

The demographics of Scotland are changing in complex and diverse ways. Parts of Scotland, particularly more peripheral areas but also some major urban areas are experiencing static or declining overall population levels whilst other areas, particularly in the south east of Scotland are experiencing major growth. Even in areas experiencing more static or declining population levels there are still major trends towards smaller household sizes which are still resulting in overall growth of housing numbers. In Scotland as a whole, over 24,000 new dwellings were completed, a level of development that has been broadly similar for over a decade.

Growth has been particularly evident in the Edinburgh, Lothian's and Fife areas and reflected in the strategic housing allocations for these areas. By illustration, the Edinburgh and Lothian's Structure Plan for the period up to 2015 indicates that land for over 18,000 additional dwellings should be provided for, over and above existing housing sites.

This high level of overall growth in dwellings but particularly the scale of growth in certain areas, particularly in the Central belt, is an issue of considerable importance in relation to urban design and movement because, on the one hand, it provides very significant opportunities to consider the urban design of extensions to existing settlements and new settlements in new ways but equally, if we get this design wrong, the impact on travel patterns could be very significant. This combination of both challenge and opportunity is starting to be recognised in emerging national and local guidance on the nature of this new settlement as we will discuss later in this paper.

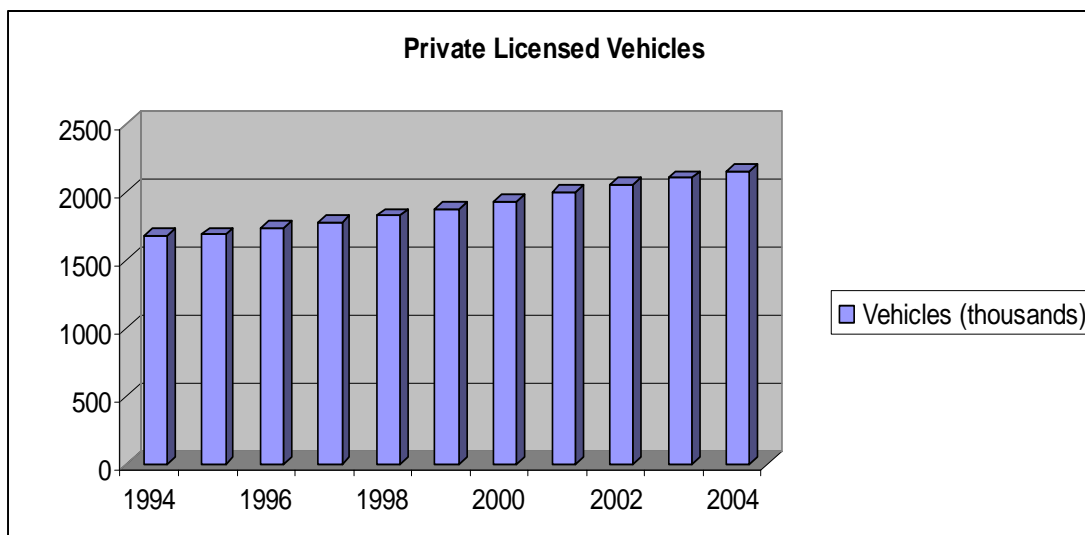
Even in those areas experiencing slower growth there is considerable scope for more imaginative approaches to settlement design. This is vital as many of these areas are still experiencing many of the other travel challenges detailed below such as increasing car usage and declining levels of walking and public transport use.

2.2 The Density of Recent Development

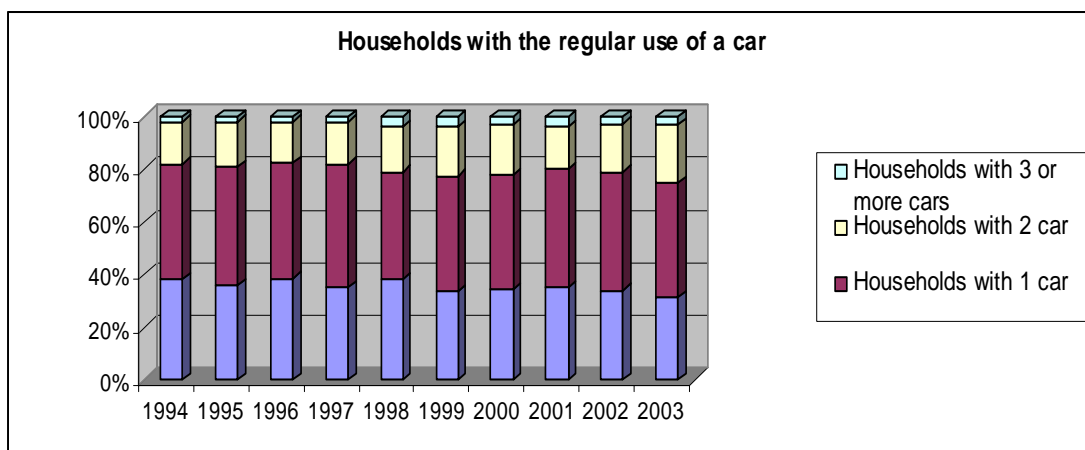
One of the concerns underlying the move to more innovative approaches to the design of new and expanded settlements and particularly road layouts has been the relatively low density of a very high proportion of new development away from city centre high density flatted development. There have, it is true, been some well known examples of high density regeneration schemes such as the Waterfront in Edinburgh and the Gorbals area in Glasgow but away from these much of the development taking place has been low density in nature even on many brown field sites. Whilst this may be a clear market response to the demand for family type accommodation, the relatively high proportion of land given over to road space within many developments has exacerbated this issue, with impacts on the amount of land take and also on movement issues such as average walking distance to local services. We will expand on this issue later in this paper.

2.2 Increasing Car ownership and usage

Clearly one of the greatest challenges facing Scotland as with the rest of the UK is the increasing level of car usage. Car ownership levels are continuing to increase as shown in the following graphs with marked increases in the overall numbers of licensed vehicles but also significant increases in the number of households with 2 or more cars.



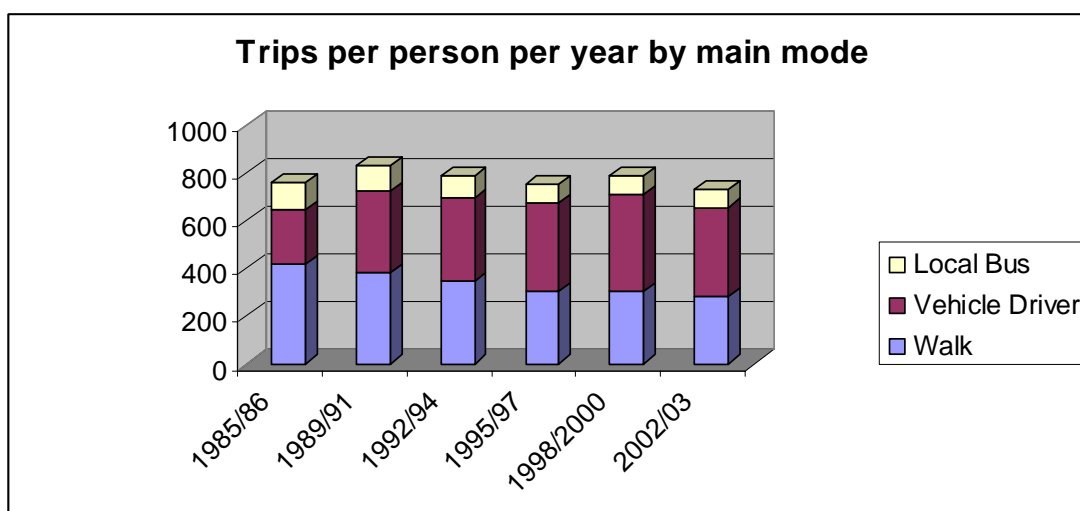
Source - Table S1 - Scottish Transport Statistics (2005 Edition)



Source - Table 1.17 - Scottish Transport Statistics (2005 Edition)

This is of particular importance in relation to the design of new and expanded settlements for two key reasons. Firstly, there is evidence that once households gain access to more cars, the level of more sustainable travel by that household, by walking and public transport, not surprisingly, declines. Secondly, the higher ownership of vehicles, even if they were not being used more, poses major problems in terms of parking provision and the dominance of the car in the urban fabric.

Increasing car ownership itself, as has been seen in other parts of Europe such as Germany and some of the Scandinavian countries, does not have to automatically lead to corresponding increases in car usage but this is not the overall trend in Scotland where, as the graph below illustrates, car usage has also been increasing with reducing levels of walking and public transport use. Later in this talk we will explore whether different approaches to urban design in these countries could have had any influence on these trends.



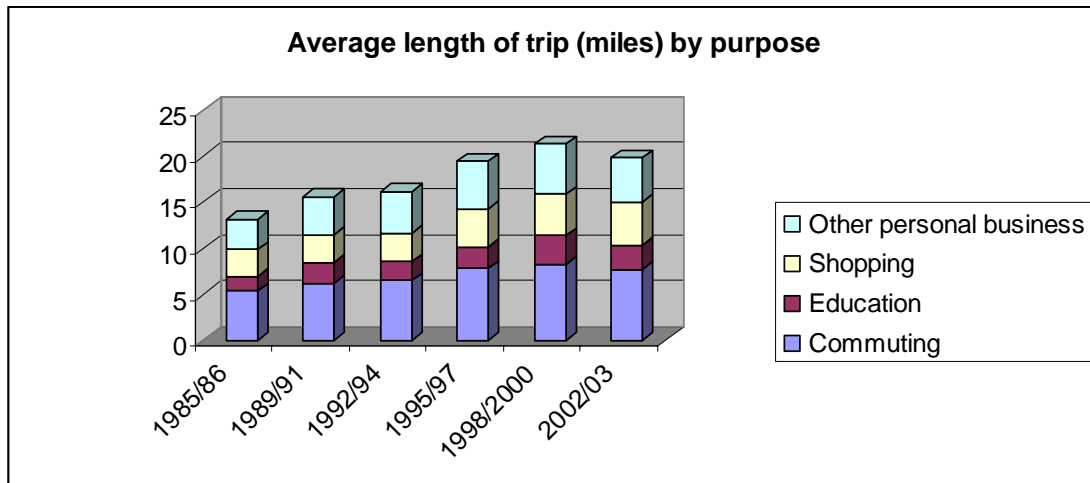
Source - Table 12.1 - Scottish Transport Statistics (2005 Edition)

2.3 Reducing proportion of walking and public transport trips

The graph above, as well as highlighting increasing car usage, highlights a significant reduction in walking levels per person since the 1980's. Overall levels of public transport usage have also been declining although this masks much more complex modal and local trends with overall increases in rail usage and some evidence that bus usage trends in some major urban areas are now being reversed.

These trends are clearly of major concern not only from a transport and environmental perspective but also from a health perspective and this is reflected in a number of the other papers being presented at this STAR conference.

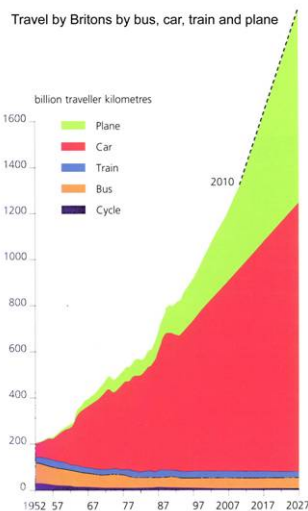
There are many behavioural and other reasons underlying these trends in but one important one that is potentially a cause and an effect is the increasing length of journey people are making for a range of journey purposes including commuting but also education, shopping and personal business. This is illustrated in the following graph.



Source - Table 12.6 - Scottish Transport Statistics (2005 Edition)

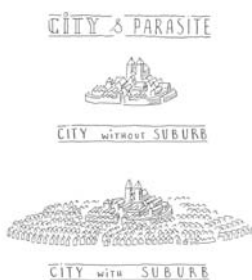
In designing expanded or new settlements a key aim should be to reduce this trend by both reducing the physical distance to local services (e.g. through the planning in of local shops and primary schools as a key element in the masterplanning approach) but to also, through sensitive urban design, make the use of walking, cycling and public transport more attractive.

3.0 Why we are moving more and the nature of settlement



As a nation we are all moving more. It has become easier to do so and we have more disposable income to devote to it. The most significant growth has taken place by car and plane and this trend is forecast to continue.

Over the last century or so though the amount of time that we spend travelling to and from the workplace, to schools and for leisure has grown at a much reduced rate in comparison to the distance that we now travel.



This additional travel is predominantly as a result of the way in which we have developed our settlements. In the diagrams here by Leon Krier the city without suburb is based on a walkable neighbourhood and the ability to access many of one's daily needs by foot. As the city grows the suburb has been the default development model for the last half a century or so and this, by its nature, promotes movement by the car. The suburb without



the city (as we see in many parts of the US and on the periphery of some of our towns in the UK) is completely unsustainable.



Krier argues that the only way in which we can grow is by duplication of the city model.

Leon Krier

4.0 The Evolution of Highways Design Guidance



Hanoi, Vietnam

The streets of modern day Hanoi present to the visitor a scene of complete chaos. Pedestrians, cyclists, scooters (some with trees on the back), cars, people selling their wares, people cooking their wares all inhabit the highway. Many road safety auditors might at first sight instantly condemn this place although on closer inspection everything is moving at about 5mph and because everyone is looking out for everyone else and missing them the place seems to work. There are very few rules – the success of the place relies on it being busy and slow speed. The standard comment to tourists is to walk very slowly across the street – if you run then drivers will not have time to avoid you and you will get hit!

The development of our streets (the glue that hold any community together) over time has been shaped by many influences. After the great fire of London in 1666 street widths were set in relation to the prevention of the spread of fire and later, with the advent of better drainage and requirements for daylight street dimensions they were again stipulated further.

As vehicles have become more commonplace in streets then they too have had an impact – many of the principal streets in Edinburgh for example are based on the turning requirements of a six horse carriage.

Over the last half of the twentieth century the dominance of the motor vehicle has got progressively worse; in the US fire trucks are often the controlling factor for street design with them having to be able to perform U-turns in many streets – a hangover from the very first fire trucks



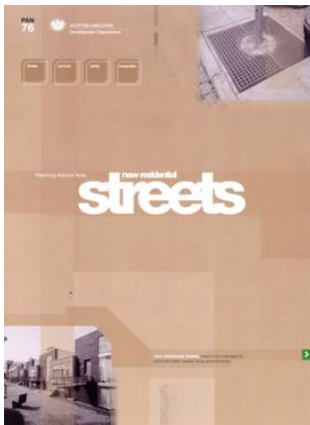
Refuse vehicle, Bologna

which used their reverse gear to pump the water and hence could not reverse! In the UK it is often the refuse vehicle that stipulates residential street dimensions – yet this vehicle only uses these streets once a week and why don't we have smaller or articulated refuse lorries so that we can have tighter streets that encourage lower vehicle speeds for the rest of the time?

It is, we would suggest this dominance of highways guidance along with an over supply of guidance and the planning policy of zoning different uses that has led to poor quality settlements and unsustainable places over the last 50 or so years.

Things are being tackled in a more creative manner though through emerging advice and guidance at the UK, Scottish and local levels and practical applications of these approaches in the design of new and expanded communities. In the next section we examine recent Scottish guidance before looking at three examples of larger scale sustainable developments in the UK that help illustrate many of the relevant concepts (section 6).

5.0 Emerging Scottish Advice and Guidance



PAN76 New Residential Streets

There is a wealth of new policy guidance and research emerging in Scotland that is relevant to urban design and movement and the structuring of sustainable settlements. Whilst this paper concentrates on the national level guidance emerging from the Scottish executive, it is encouraging that a number of local authorities are now taking a proactive approach to this exciting and dynamic agenda through the production of new design standards, area planning statements and specific advice on such issues as home zones.

The guidance emerging from the Scottish Executive has, in the past come from an number of different starting points, some from an urban design based approaches and some from more of a transportation and land use perspective but what is encouraging is how this guidance is now adopting a more holistic approach and engaging stakeholders from developers to transportation planners, urban designers to engineers.



Crown Street

PAN 76 New Residential Streets illustrates this trend particularly well, being a joint publication by the Development Department and the Enterprise, Transport and Lifelong Learning Department. Prepared by a team led by WSP in association with EDAW and Phil Jones Associates, the PAN followed on from Designing Places and has strong links with PAN 67 Housing Quality. Equally though, as we will explore it fits in well with other emerging transport and land use policy guidance, in particular SPP17 Planning for Transport and PAN 75.

PAN 76 New Residential Streets took up the challenge of changing approaches towards street design in new development away from one over dominated by technical and engineering requirements (important as these are) to a more imaginative approach aiming to produce higher quality, more attractive and safe residential areas. The advice put forward reflected a fairly widespread desire for change following extensive consultation with developers, local authorities and other consultants. Moreover, a key component of the PAN is a number of case studies of emerging good practice in various parts of Scotland.

The PAN encourages those involved in developing new residential streets to create places that are distinctive, safe and pleasant, welcoming, adaptable and resource efficient but also, and perhaps most importantly in the context of this paper, places that are easy to get to, and around by all modes of travel. The emphasis is one of connecting well with existing streets, walking and cycling networks and allowing for links into future areas of development. By making streets feel safer, for example using creative layouts to minimise speeds naturally and maximising natural surveillance from buildings and passing traffic, walking, cycling and the use of public transport should become more attractive.

The PAN provides advice on street design under the following three key headings:



- Context - issues of local character, built form and links to surrounding areas;
- Identity - street character types, street furniture, materials and signage;
- Connection - for example promoting well-connected networks and discouraging closed

culs-de-sac, making routes easily legible and designing to promote low vehicle speeds and good access for bus services.



As well as providing advice on road layout and related issues for new developments, the PAN also covers process issues, recognising that an integrated and consistent approach from planners and engineers and indeed developers and their teams is vital if the principles of good design are to be realised in the completed development. Linked to this was a recommendation for a revised approach to the Road Construction Consent Process following additional research commissioned by the Executive undertaken by a team also led by WSP which highlighted how the existing process was sometimes resulting in a dilution of design as plans moved through the RCC process.

PAN 76 New Residential Streets is about making new settlements vibrant and attractive places to live but it does this within a context that puts renewed emphasis on easy and safe movement by all modes and not just for the car. This aim of supporting design that should promote more sustainable patterns of movement is well exemplified by the case studies within the PAN. Innovative approaches to settlement design in locations such as Ardler in Dundee or the Drum in Bo'ness or the Gorbals in Glasgow aim to make walking and cycling more attractive options and to open up access to public transport. This is in marked contrast to many examples of recent development which have tended to over concentrate on the needs of the car to the detriment of other road users. Often this has been unintentional but based on historic and often inflexible roads design guidance with its routes in an era where the challenges highlighted in previous sections were much less apparent.

PAN 76, as well as building from Scottish Executive design based publications such as *Designing Places*, sits well alongside a suite of new transportation related policy and guidance documents recently produced by the Scottish Executive. A core document is the new SPP17: Planning for Transport which whilst approaching

travel issues from a slightly different starting point, that of promoting better integrating land use, economic development, environmental issues and transport planning has a number of similar objectives. This includes improving access to public transport and enabling people to easily access local services by walking and cycling through attention to internal road layout and external connections.

6.0 Sustainable Urban Extensions

6.1 Upton, Northampton



Walkable neighbourhood
(Urban Task Force)

The expansion to the west of Northampton, a town of 200,000 people is being undertaken on land in the control of English Partnerships. The principles for new development in this area have been based on the concept of the 'walkable neighbourhood' – a centre focused on a 5 minute walk (about a 400 metre radius) with a connected network of streets designed more around the pedestrian than the car. The concept allows for many of one's daily needs to be met in the centre of the walkable neighbourhood, such as primary schools, shops, places of business etc. the concept is not new and many historic villages from around the world (where walking was the primary mode of getting around) unsurprisingly follow this pattern.



Upton, Northampton
(EDAW, EP)

The first phase of 1100 dwellings utilises the walkable neighbourhood with a school and the potential for shops at the centre of the site. It is based on a connected grid of streets that does not follow the traditional hierarchical rules – here almost any street type can be connected to another for example mews street (shared surface street) to main street (distributor road). There are no requirements for maximum dwellings on a particular street type as everything is connected. As noted by one of the local authority highway engineers 'it would be almost impossible to computer model this network because it is a real place!'

The development also makes use of the adjacent A45 road by addressing this busy thoroughfare of around 45,000 vehicles per day rather than turning its back on it. On this busy road proposals have been implemented to 'humanise' the traffic and to create an urban boulevard. This has involved de-



A45 Urban Boulevard – under construction

trunking the road from the Highways Agency, developing a strategy to reduce the speed limit from 60mph to 30mph over time and to build shops, offices and residential premises. The urban boulevard allows for a high volume of traffic whilst creating an environment that pedestrians feel comfortable to walk and be in.

6.2 Poundbury, Dorchester



Poundbury Masterplan showing mix of uses (Leon Krier)

The market town of Dorchester in Dorset (population 15,000) like many places in the UK has had for many years a demand for growth. Historically this had always taken place in a rather piecemeal fashion with sites being developed in accordance with planning rounds and with the planning system only looking maybe five years into the future at a time.

In 1988 land owned by the Duchy of Cornwall at Poundbury was identified for development and The Prince of Wales with masterplanner Leon Krier set out a long term 30 year vision for how this could be developed and provide a sustainable mixed use extension of 6,000 people to the town. The plan has been realised and the development is now well underway.



Poundbury Phase 1 (Leon Krier)

Phase 1 of Poundbury is based on a walkable neighbourhood, the plan relates well to the existing community and at the centre of both existing and new communities are shops, offices, a community hall and a pub. The residential car parking takes place mainly in rear courtyards and the design of the parking makes it difficult to get your car out and hence easier to walk to the centre for your daily needs. Research undertaken by Oxford Brooks in 2003 found that 22% of residents' disposable income is spent within the development.

The streets are laid out by the buildings forming spaces through which vehicles travel; sightlines are reduced and restricted in many places. The adjacent picture shows a mews court sightline blocked by a building colonnade. There have been



Main street, Poundbury



Residential and commercial properties sit side by side

no reported accidents in since development began over ten years ago.

The Poundbury concept allows for a mix of uses with shops, offices, factories, schools and other community facilities. The philosophy has been to mix these totally with residential accommodation and many factories sit directly next to houses – the trick has been to make sure that the factories go in first then whoever buys the adjacent dwellings knows exactly what they are getting. Residential and commercial uses actually make very good neighbours - they look after each other when one is away – the factories are busy during the day when people are out and people are at home in the evenings and at weekends when the factories are closed. At the start of 2006 there were 650 people working in Poundbury and 1000 living there; research undertaken by Oxford Brooks University has found that 25% of those working in Poundbury are doing so by sustainable travel methods – walking, cycling or working from home.

6.3 Sherford New community



Sherford masterplan
(The Prince's Foundation)



Masterplan with walkable neighbourhoods shown



Main street, Sherford
(Chris Draper / Redtree)

This scheme for 5,500 dwellings and a mix of uses will create a defined edge to Plymouth along an existing valley and will connect the A38 and A379 roads with a new strategic link. In many developments this link would perhaps have been segregated from the new housing and other uses but at Sherford the traffic is being put to good use - a new busy mixed use high street is proposed that will carry up to 12,000 vehicles a day with shops, offices and residential accommodation.

The high street (arguably the first new high street to be built in England since World War II) will allow for parallel parking at the sides and chevron parking down the centre in order to generate as much activity and movement as possible. Exemplar high streets that have been analysed to design the new centre of Sherford have included Marlborough and Honiton. At Marlborough the parking is arranged in a similar fashion, at first sight the high street seems to present a scene of disarray with many movements by all modes and double (and even

treble parking) for deliveries and drop offs, yet the centre is vibrant and successful.

7.0 Mixed use and the connected street network

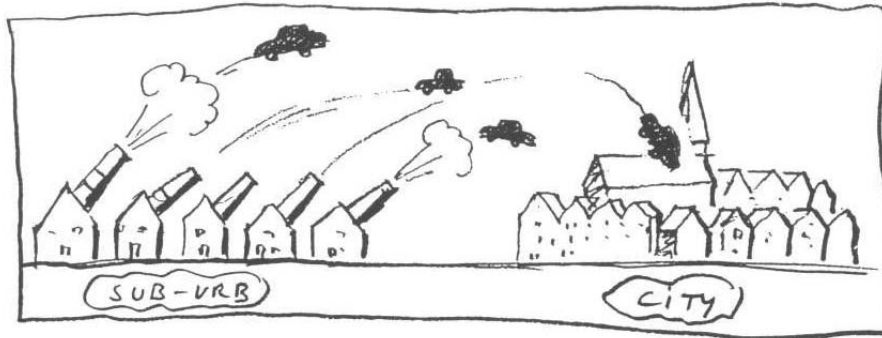
All of the three examples cited in this paper are based on connected networks of streets and a true mix of uses (not a zoned area where mixed use can take place). They are based on the human scale where buildings have a good relationship to the street and where the car is put below the pedestrian, the cyclist and the public transport user. In many respects they are based on traditional towns and places that have grown organically.

More research is now coming forward to support this model of development:

1. Dr Richard Jackson of the California State Public Health Authority has gathered data from the form of development that we live in and our health. The comparison between connected networks and highways engineered layouts (cul-de-sacs) has shown an increase in diabetes if you live in the latter and that on average you will be 6lb heavier if you do not live in a connected street network!
2. Space Syntax (London) have also looked at the relationship between walking and the environment that you live in. Their (unpublished) work has shown that people in UK New Towns walk 35% less than those in historic UK towns.

As Leon Krier suggests overleaf it is actually the nature of suburban development and a lack of mixed use that is the real problem in our towns and cities.

NOT THE CAR BUT THE SUBURBAN HOME IS THE DEADLY WEAPON



DAILY SUBURBAN MORTARFIRE AGAINST URBAN CENTERS

Leon Krier

8.0 Creating communities and community consultation

Finally some thoughts on building community and the requirements set out by the planning system for consulting existing communities.

Recently, in many schemes the process of keeping existing communities happy has led to the provision of green corridors or buffers between existing and proposed new communities. The Sherford scheme in section 6.3 allows for a 100m green strip in the south-west of the plan – this was provided in the masterplan at the wishes of the existing community and advice from planners that this would be looked on favourably in a planning application. The Poundbury and Upton schemes (to the credit of the planners and to not listening to the existing residents demands) butt up against existing communities.

As history has shown us all successful communities are homogeneous and do not have 'buffers' between subsequent development – what would Bath or York be like today if each generation allowed for a strip of land (that has little recreational or community purpose, and that someone has to maintain) between each stage of growth. We all need to be bold and to think long term – thirty years should be the standard masterplan vision for large scale developments and their surrounds!