

Thriving Cities:

**Integrated land use
& transport planning**

**Researched & written
by *Transport for
Quality of Life***

This report was commissioned by **pteg** and researched and written by Dr Ian Taylor and Dr Lynn Sloman of Transport for Quality of Life Ltd, www.transportforqualityoflife.com. It forms part of **pteg's** wider role in stimulating debate around broader policy issues of relevance to transport. We hope that it will help to generate ideas, discussion and feedback and therefore welcome any comments you may have on the points it raises. You can find our contact details on the back cover of this report.

pteg represents the six Passenger Transport Executives (PTEs) which between them serve more than eleven million people in Greater Manchester (TfGM), Merseyside (Merseytravel), South Yorkshire (SYPTe), Tyne and Wear (Nexus), the West Midlands (Centro) and West Yorkshire (Metro). Leicester and Nottingham City Councils, Strathclyde Partnership for Transport (SPT) and Transport for London (TfL) are associate members. The PTEs plan, procure, provide and promote public transport in some of Britain's largest city regions with the aim of providing integrated public transport networks accessible to all.



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Thriving cities

Integrated land use and transport planning

A report for *pteg* by Dr Ian Taylor and Dr Lynn Sloman, Transport for Quality of Life

01 Introduction

Cities are like human bodies. Their prosperity and liveability depends on their lifeblood of residents, workers, goods and materials being able to move about. So it is an obviously good idea for the process of developing and re-developing our towns and cities to start from insight into their transport infrastructure – a kind of ‘x-ray’ view that can see where their arterial structure is strong enough to support the increased travel demand of new development.

But the extent to which an understanding of the transport infrastructure has been the starting point for land use planning is strikingly limited. As a result, towns and cities have become clogged with vehicles making journeys that more sensible planning would either have avoided in the first place or enabled by sustainable modes of transport. The problem of over-dependence on motorised modes of transport has resulted not just in congestion, but in issues that extend from unpleasant street environments right up to global concerns about emissions, fuel availability and fuel affordability.

This report draws out the main strands emerging from what is now a large body of professional and academic analysis showing how much the functioning of towns and cities can be improved when transport is centralised in land use planning. It then describes case studies that illustrate the good outcomes of development where planning of transport and land use were well integrated, and bad outcomes where development proceeded irregardless. The report considers the extent to which current policies in the UK achieve integration between transport and land use planning, and concludes by highlighting changes in the policy framework that could be introduced to guarantee that future development of our towns and cities progressively moves towards more sustainable transport patterns.

Achieving sustainable patterns of transport would enable towns and cities to function better and feel better to their occupants. Just as importantly, this is essential to support sustained economic growth. It is notable that none of the recommended policy measures appear particularly difficult, but through better integrating transport infrastructure within the planning of development, these measures could pre-empt situations that are almost impossible to remedy retrospectively.

“Land use planning is critical to transport”

Local Transport White Paper (2011)

02 The changing UK policy context

The relationship between central government and local planning authorities is undergoing fundamental change, including reform of the way in which the planning system at local level takes regard of national planning guidance provided by central government.

The Local Transport White Paper (2011) recognised the importance of integration of land use planning and transport:

‘Land use planning is critical to transport. Where places (e.g. shops, work and other services) are located in relation to where people live is a significant factor in determining how much people need or want to travel. It is vital that sustainable transport is a central consideration from the early stages of local planning – for example whenever new houses or retail areas are being developed.’¹

This White Paper must, however, be viewed in the broader context of Government plans for a National Planning Policy Framework (NPPF), intended to supersede all pre-existing planning guidance, including that which has endeavoured to ensure that the planning process is integrated with transport.² This framework *‘will set broad economic, environmental and social priorities and how they relate to each other’*, a very different approach to the detail contained in the suite of planning guidance documents built up over preceding decades.³

Planning Policy Guidance 13: did it work?

Hitherto, the Government’s official guidance on how the planning system should deal with transport has centred on Planning Policy and Guidance 13: Transport (PPG 13)⁴, which in its present form dates from 2001. This document summarises its purpose as integrating planning and transport to obtain a sustainable system:

‘Planning Policy Guidance 13’s objectives are to integrate planning and transport at the national, regional, strategic and local level and to promote more sustainable transport choices both for carrying people and for moving freight.’

The document goes on to establish the important influence on transport of various aspects of land use planning (which are discussed further later in this report):

‘By shaping the pattern of development and by influencing the location, scale, density, design and mix of land uses, planning can help to reduce the need to travel, reduce the length of journeys and make it safer and easier for people to access jobs, shopping, leisure facilities and services by public transport, walking and cycling. Consistent application of these planning policies will help to reduce some of the need for car journeys (by reducing the physical separation of key land uses) and enable people to make sustainable transport choices.’

The remainder of PPG 13 develops these principles into detailed guidance that, taken overall, amounts to very good practice. The thrust of its approach

The lesson for reform of the planning system is that PPG 13 contains much that is worth retaining

is well-represented in many local transport and planning documents, and it has succeeded in incorporating good practice into many developments. Nevertheless, it is fair to ask the question whether PPG 13 has had the traction needed to ensure that development is sustainable from a transport perspective. Taken overall, the picture is mixed. During the lifetime of PPG 13 a considerable amount of new development has been built in locations that can never be anything other than car-dependent, built to designs that militate against non-car modesⁱ.

This has resulted from a combination of factors. When it comes to the most important major schemes, the reality for some local authorities has been a reluctance to insist on conditions that they think might deter developers who offer economic regeneration. In other cases where planning officials and elected representatives have approved plans for obviously car-dependent development it seems they could not envision what the alternative might look like, or failed to appreciate the accumulated evidence of the collateral damage that a car-dependent society brings in the shape of congestion, environmental degradation and social ill health.

The lesson for reform of the planning system is that PPG 13 contains much that is worth retaining, but also that for this good guidance to work it must be incorporated in a powerful policy framework that cannot be ignored.

The future: can we do better?

The National Planning Policy Framework has the potential to determine the shape of our towns and cities for many years to come. At present the gulf between best and worst practice is immense, ranging from developments hardly accessible except by vehicle, with unattractive noisy congested streets, through to vibrant developments mixing shops, houses and workplaces with fine public transport combined with a pleasant environment for walking and cycling. The policies of the NPPF should aim to raise the UK to international standards of best practice. For that to happen, the policies of the NPPF will need to be backed up by processes that give them traction in the real world.

The remainder of this report will consider:

- the evidence for the benefits of integrating transport and land use planning
- examples of the impact of both good and bad practice
- steps required to make sure that the NPPF and other planning policies achieve the aims expressed in the Local Transport White Paper

ⁱIt might also be noted that PPG 13 has tended to be eroded rather than strengthened. For example, the last amendment, in January 2011, introduced two changes that undermine sustainable transport – removal of an instruction to set maximum residential parking standards and removal of an instruction to use parking revenues for sustainable transport schemes.

03 The evidence for benefits of integrating land use and transport planning

A considerable body of professional and academic research analyses the interaction between land use planning and transport. In broad overview, the evidence leads to one compelling conclusion: where sustainability of transport is an integral consideration in the land use planning process, non-car modes of travel become dominant, but where development proceeds without due regard to transport considerations then car dependence is the outcome.

This section draws out some of the most relevant findings and examples from the research literature.

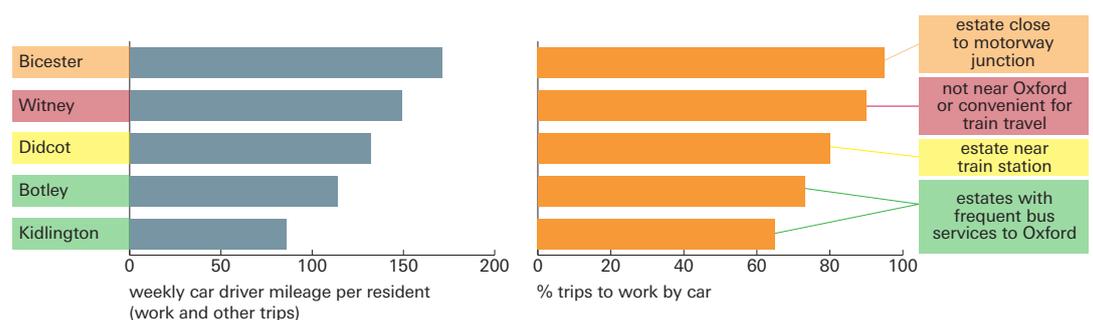
We can identify eight key factors that determine the car dependence of new developments:

- Overall location of development
- Density of development
- Local facilities and jobs
- Street layout and design
- Public transport quality and proximity
- Car parking
- Restraint to car movements
- 'Smart' travel measures secured through the planning system

The first and most fundamental choice is the **overall location** of a development in relation to urban centres and transport corridors. Studies confirm the common-sense expectation that travel habits are strongly influenced by the type of transport corridor that is closest, and that developments situated adjacent to or within the nearest conurbation have lower car use.

A comparison of residential development around Oxford, showed that new housing located near a motorway junction had higher car use than estates with good bus or train links⁵ (see Figure 1). Subsequent work⁶ showed that all of these estates outside of Oxford have in fact generated higher car use than a new estate built on brownfield land within Oxford itself (53% of trips were by car for the infill estate, compared with an average of 82% for the estates outside the town).

Figure 1: Effect of housing location on car use

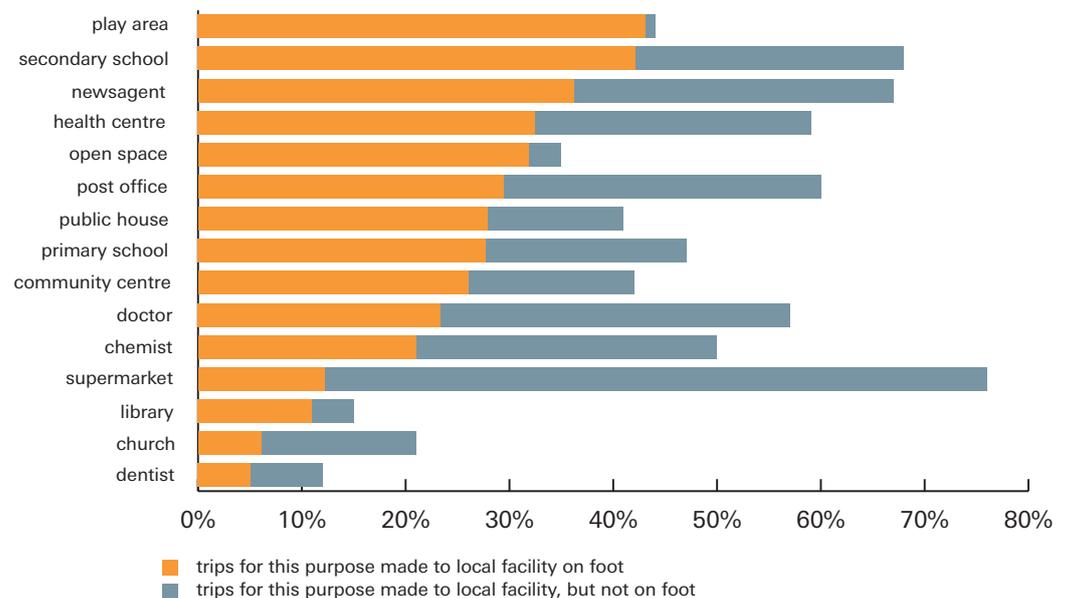


Once location has been determined, the character of a development depends critically upon the development density. Many studies, at all scales from city-wide down to the level of a single neighbourhood, show that development at higher density results in lower car use. All sorts of other aspects of land use (as discussed below) are determined by **density** levels. So, for example, low densities cannot support shops within walking distance, road layout becomes uninteresting and over-extended for walking or cycling, and the catchment area for public transport is too thinly populated for services to be viable.

There is a critical density threshold above which high frequency rapid transit services become financially viable. Although influenced by local context, this can be set roughly at 100 dwellings per hectare⁷. This is, for example, approximately the development density of the Vauban estate on the outskirts of Freiburg that has been able to sustain an extension to the tram line (see case study later in this paper). A second threshold of significance is the density at which excellent public transport will capture a majority of commuter journeys. A study of every rail station in San Francisco shows this tipping point at around 200 dwellings per hectare⁸. Although British circumstances differ in important respects, it is notable that this approximately corresponds to the minimum guideline density in *The London Plan* for development of locations with excellent public transport access⁹. This guidance derives from a process to map out public transport accessibility levels (PTAL) and represents an example of good practice in integrating transport and land use planning.

Masterplanning can influence travel behaviour by provision of **local facilities and jobs** - mixing together living accommodation, shops, services and jobs, so that the need for travel is reduced. Where local facilities, such as a health centre or supermarket are available as part of a housing development, research¹⁰ shows that they capture a large proportion of the trips residents make to those types of destination (see Figure 2). These facilities also provide jobs within easy reach of local residents.

Figure 2: Trips captured by local facilities



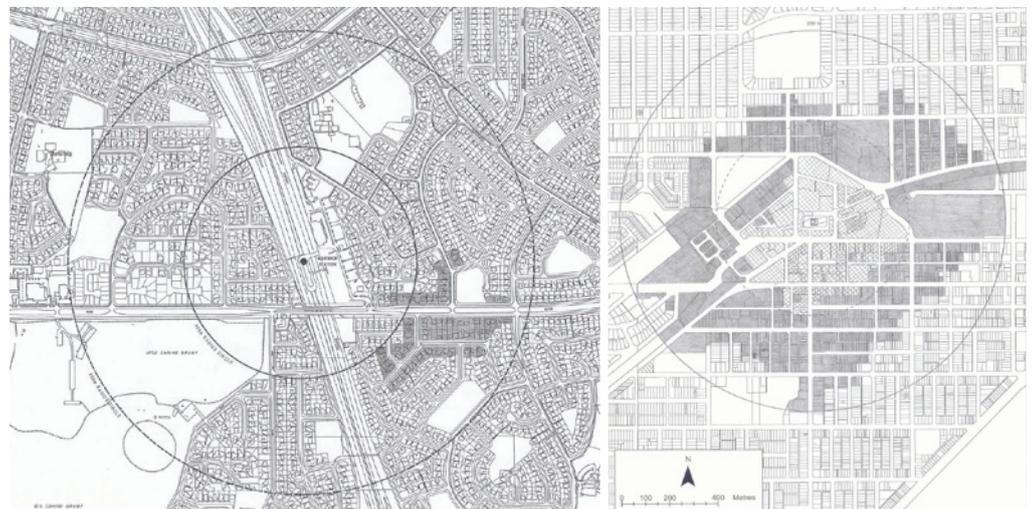
Source: adapted from Winter et al 1995

There are, however, types of employment that should only be incorporated into new developments at a central hub of the regional transport network. These are organisations with large numbers of employees or highly skilled specialists that can only be drawn from across a large catchment. So, for example¹¹, 75% of the employees of businesses at the centre of the public transport network in Washington DC arrive by public transport, but for businesses in the city suburbs only 10% of workers arrive by public transport, even when a station is close by.

Street layout and design strongly influences how people make their daily journeys. Travel by non-car modes is highest in pleasant 'liveable' streets with low levels of traffic, trees, interesting features, attractive shop-fronts and convenient direct lines of access to facilities like public transport.

A study in Perth, Australia¹², graphically illustrates how street layout can facilitate or militate against access to the local railway station (see Figure 3). The theoretical pedestrian catchment area of two stations is shown on the maps as a circular 800m 'ped-shed' representing easy walking distance - if people could walk as the crow flies. In reality, only the houses shaded black are actually within 800m walking. Where the street layout allows direct access most of the houses are within an easy walk. But where there is an unconnected 'impermeable' street layout, reaching the station from most houses entails a detour going the long way round, a highly unattractive option for pedestrians.

Figure 3: Homes walking distance from stations



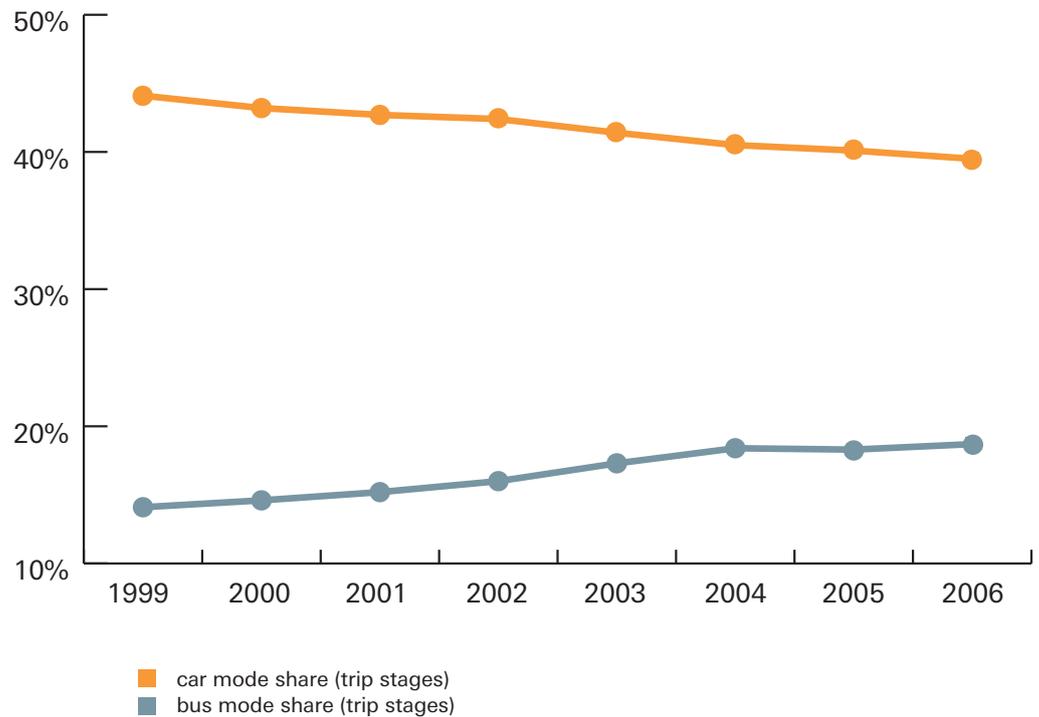
Warwick Rail Station, Pedshed

Subiaco Rail Station, Pedshed

Source: Curtis 2006

The impact of public transport on travel behaviour has been much studied. Viewed at a city-wide scale, it is clear that cities that invest strongly in **public transport** succeed in shifting trips from cars to public transport. High investment in London's bus network from the late 1990s resulted in a rising percentage of trips captured by bus and a corresponding fall in the percentage of trips made by car¹³ (see Figure 4).

Figure 4: Bus versus Car mode share in London



Source: London Travel Report 2007

At a more local scale, it is clear that both the distance to public transport and its quality have major impacts on travel patterns. A study¹⁴ of every station in Californian cities with quarter-hourly services or better found that residents within ½ mile (i.e. easy walking distance) are five times more likely to commute by train than the same city's average resident. Extending this research¹⁵ to all 3000 American rapid-transit stations found that households within this ½-mile radius own fewer cars than households living outside them (0.9 cars per household as compared with 1.6) and that many fewer residents commute by car (54% c.f. 83%).

There is also evidence that the type of public transport infrastructure is an important influence on travel behaviour. Some new rapid transit rail systems have attracted many more users than would be predicted by standard modelling of similar service frequency, travel speed and fares for buses. As a result, certain models add in a 'bias constant' representing acceptance of extra journey time by train users¹⁶. The usual explanation is that fixed-way systems have higher visibility and status, better waiting and travelling environments, and relative immunity to traffic congestion. In fact, taking cities worldwide, it is only those where rail-based systems dominate that the overall operating speed of public transport is faster than travelling by car¹⁷. These sorts of factors have resulted in a world-wide pattern of lower car use and higher public transport use in cities that have rail services as part of their public transport system, with, for example, American cities with rail systems showing public transport use 400% higher than those with entirely bus-based systems¹⁸.

Provision of public transport will not, of itself, guarantee that travel patterns are sustainable. The other aspects of land-use planning discussed here all play in powerfully upon the modes of transport people choose. It is, for example, quite possible, indeed all too common, to choose the right location for a new development, for example centred on a station with a good train service, but to build it in such a way that the majority of trips will be made by car. One of the most glaring interactions between public transport and land-use planning in this respect is provision of **parking**. If a station is designed on a 'parkway' model (i.e. park-and-ride), then it tends to be surrounded by acres of tarmac with major roads and heavy traffic, creating a poor environment for pedestrian or cycle access and also consuming valuable space near the station that is the best place for shops, offices, or high-density residential development.

Both the quantity and the price of parking are important determinants of travel patterns. Copenhagen adopted a long-term policy for its city centre to remove 3% of parking capacity every year and to avoid building any extra roads. This strategy has been critical in enabling Copenhagen to achieve zero traffic growth in the old city over a fifteen year period¹⁹. Cities across Canada have been shown to display a marked inverse correlation between availability of parking in central areas and commuting by public transport²⁰. Pricing of parking has also been shown to have a powerful effect. One study²¹ found that car commuting to businesses with free parking was 50% greater than car commuting to businesses that charge their staff for parking.

Consideration of how land use planning treats parking provision is complementary to the more general question of **restraint to car movements**. A trans-European project²² to integrate transport and land use planning put the issue bluntly:

'Land-use and transport policies are only successful with respect to criteria essential for sustainable urban transport (reduction of travel distances and travel time and reduction of share of car travel) if they make car travel less attractive (i.e. more expensive or slower).'

In practice this actually means making sure that other modes of travel are more attractive than the car.

One useful concept is 'filtered permeability', where direct access is deliberately restricted for private motor vehicles, but maximised for walking, cycling and public transport:

*'In cities such as Freiburg, Groningen and Zwolle the principle of filtered permeability is acknowledged as a key element in their success in restraining car use and promoting alternatives. Through traffic is channelled onto a limited network of main roads. Suburban developments are often designed as giant culs de sac for cars, while short cuts provide a far more permeable network for the sustainable modes. People use these modes – particularly cycling – because of the time and convenience advantage compared to travelling by car.'*²³

The benefits of this kind of approach have been quantified in Holland²⁴ by a study that compared areas with different accessibility by car. 'Low car accessibility' was defined as at least one minute's drive to reach the nearest main road; presence of a 30 km/hr zone; traffic calming measures; and a pedestrian priority area (a 'woonerf' – known as a home zone in the UK). The number of car trips was over 40% less in these areas than areas of high car access but with similar density and land use mix.

Travel plans have been shown to achieve 15-20% reduction in car commuting trips, and in some cases much higher

The final respect in which the planning system can influence travel patterns is through a requirement for developers to implement **'smart' travel behaviour change measures**. These comprise a combination of generally small-scale physical interventions, such as cycle parking facilities or cycle lanes, combined with improved public transport services backed up by information and marketing campaigns. Many workplace travel plans have come into being due to Section 106 agreements implemented as part of planning permission for business premises. Such plans have been shown to achieve 15-20% reduction in car commuting trips, and in some cases much higher²⁵. Travel plans for schools have shown similarly impressive results. The newest area of endeavour is residential travel planning schemes put in place through collaboration between planning authorities and developers. Little data is available yet on the impact of residential travel plans on car use, but the potential to influence travel behaviour when people move house is known to be large. For example, one study²⁶ found that 28% of people moving house changed their mode of travel to work, rising to 45% for those changing workplace at the same time.

The professional and academic literature that this section has treated in overview reveals that planning decisions about land use can determine our travel patterns at a deeper level than the infrastructure and the technologies that we tend to think of as 'transport'. As a consequence the benefits to be gained from integrating those land use planning decisions with transport planning decisions are also potentially deep and wide-ranging.

04 Case studies: lessons learnt

Case study 1: Planning for car-reduced living, Vauban, Freiburg

Vauban is a new development on the edge of the German city of Freiburg, about 3km from the city centre. The building work started in 2000 and the final phase was completed in 2006, with housing for 5000 residents and work premises that employ 600 people. The development covers 38 hectares of land that used to be occupied by barracks, with net development densities in the range 90-100 dwellings per hectare.

Vauban was planned from the outset to be a leading example of sustainability, not just for transport, but also for overall energy use and other aspects. The innovative way the development handled parking provision has been closely studied.

The land use plan ensured that local facilities and local jobs are within easy reach by walking or cycling, through implementing the idea of 'a district of short distances', including a school, nursery schools, a shopping centre, a farmers' market, a food co-op, recreation areas and businesses.

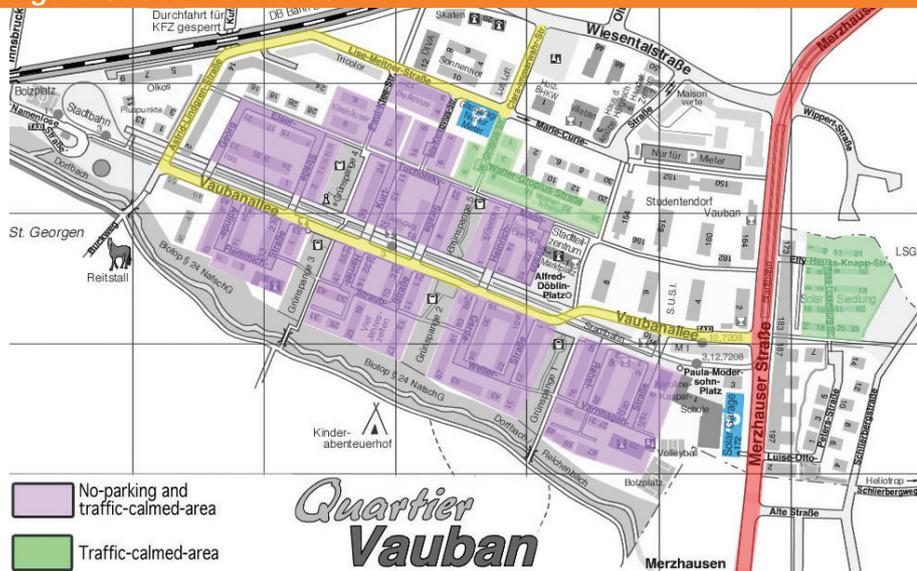
People - friendly streets in Vauban, Freiburg



Photocredit: Steve Melia

The design and layout of the development has aimed to create pleasant spaces and streets that are attractive to pedestrians and cyclists. The speed limit on the district's main road is 30 km/h, and in the residential area cars should not drive faster than walking speed (5 km/h), observing 'home zone' rules whereby vehicles are expected to give way to pedestrians.

Figure 5: Quartier Vauban



Credit: eRich Lutz

From the time that construction started public transport was provided by a frequent bus service, replaced by a tram service by the time the development was built out. The tram runs along the spine of the development, Vaubanallee, with a peak hour service to Freiburg town centre every five minutes. 32% of residents have a public transport season ticket²⁷. This may reflect the legacy of measures to encourage sustainable travel behaviour enacted during the earliest stages of development – a local car club was set up and members received a free one-year pass on local public transport and a one-year 50% discount on trains.

From the outset the development set out to influence car use, with an aim of *'car usage reduction in the city district with a noticeably higher quality of life... not a small, car-free enclave, but rather reducing the use of cars in the entire district to everybody's benefit.'*²⁸ Rules on car parking were a core part of the strategy to achieve this.

Vauban has been described as a 'car-reduced' development, rather than 'car-free'. For large parts of the residential area, the development plan for Vauban prohibits the building of parking space on private property (see lilac area on map, Figure 5). Residents can choose to own cars and can drop off and pick up at their homes, but they must park their cars in communal multi-storey car parks at the edge of the development, for which they pay a one-off purchase charge based on the construction costs and a monthly charge to cover ongoing maintenance²⁹. Households without cars are not subject to these charges and therefore do not in any way subsidise the cost of parking provision for car owners. All residents nevertheless have access to a local car club when they require a car. The overall result is that, compared with most other places, the cost of a vehicle is more obvious in Vauban, and using it is somewhat less convenient.

The result of the car-parking strategy has been studied by comparing Vauban with an otherwise similar development on the other side of Freiburg (Rieselfeld, with 10,000 residents)³⁰. Car ownership levels in Vauban are dramatically lower (44% less, at 150 cars per thousand residents vs 270 per thousand).

As would be expected, the travel habits of non-car-owning Vauban householders show markedly less car use than households with cars (see table).

Table 1: Comparison of travel habits amongst Vauban residents

| Type of trip | car-owning households | non-car-owning households |
|------------------|-----------------------|---------------------------|
| 'bulk' shopping | 73% by car | 6% by car |
| 'daily' shopping | 10% by car | 0% by car |
| leisure | 28% by car | 2% by car |
| commuting | 61% by bicycle | 91% by bicycle |

Source: Nobis 2003

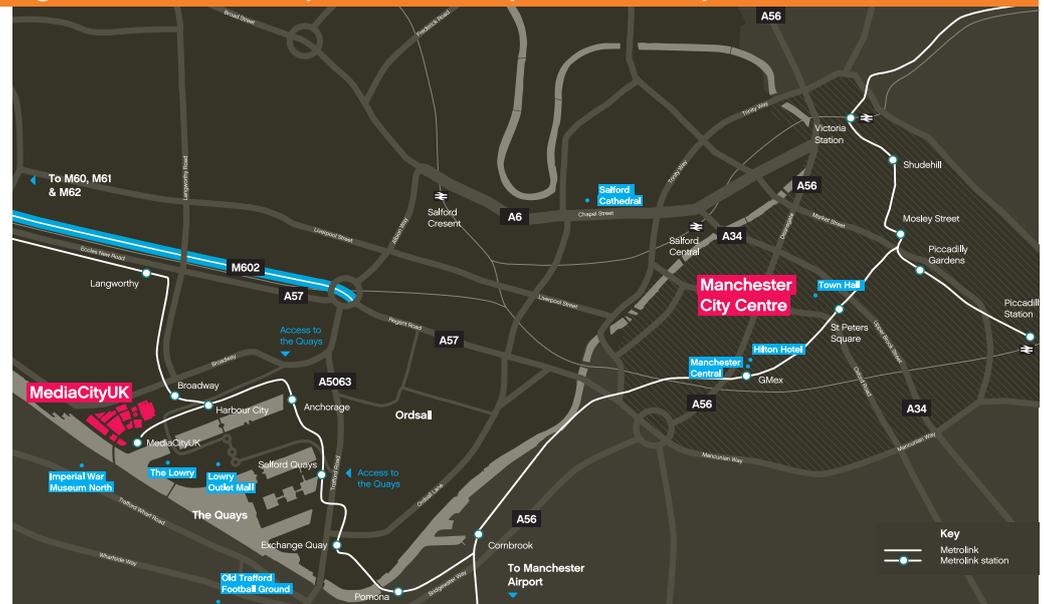
The overall picture of travel in Vauban is highly sustainable. Car mode share is only 16% of all trips, significantly below the average for Freiburg as a whole³¹. Public transport accounts for 19% of trips. Walking and cycling capture an impressive 64% of trips.

Case Study 2: Integrating new public transport infrastructure with major urban renewal, 'Media City', Salford Quays, Manchester

Salford Quays is 5km west of the centre of the city of Manchester on its ship canal to the sea. The quays closed as dockyards in 1982 and became one of the largest urban regeneration projects in the UK. The site is presently occupied by over 750 companies employing 22,000 people and has become home to 7300 people. Its visitor attractions draw 4 million visits per year.

Major development is continuing, branded as the 'Media City' project, the focus of this case study. This has entailed major enhancement of the tram and bus network and illustrates what can be achieved where the developer and planning authority work closely from the outset with the body responsible for public transport, in this case Transport for Greater Manchester (TfGM), the Passenger Transport Executive (PTE).

Figure 6: Location map of 'Media City' Salford Quays



Credit: MediaCityUK

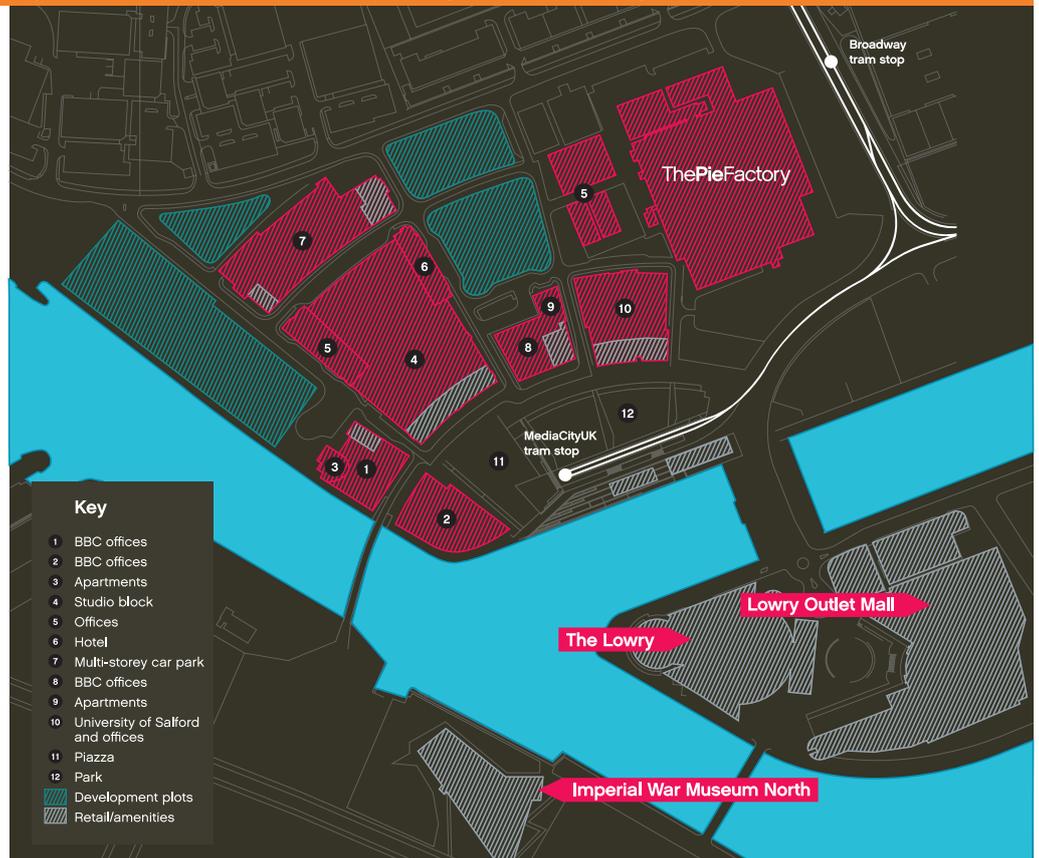
Media City, a development covering 80 hectares, will add a further 5000 jobs by the end of 2011, rising to 23,000 by 2023. The land use for phase one includes offices, retail, leisure, a hotel and a further 4000 residential units, situated across the broad waters of old Dock 9 and the ship canal from the existing development of the Lowry Theatre, the Imperial War Museum and the Lowry Outlet Mall.

A tram line (Metrolink) from Manchester city centre has served the broader Salford Quays area since 1999. It was evident, however, from the earliest planning stages, that the Media City development would lead to overloading of the system. Following negotiation with TfGM, £25 million has been invested by the developer and the regional development agency to build a new spur from the existing tram line to a new station and to add four new trams to the fleet. As a result the frequency of tram services will be doubled to run from Media City station to the city centre every 6 minutes, with a journey time of 12 minutes. The line also enables connections to residential areas across Manchester.

As a whole, the Metrolink tram network operates without public subsidy, with revenue risk being borne by TfGM, and with fare surpluses used to cover borrowings for further investments in the system.

Despite these improvements it was seen that residents in the north and west of the Salford district would not be able to reach the employment opportunities at Salford Quays except by car. TfGM worked with Salford City Council to establish the cost-benefit case for new bus services. Even with straitened economic circumstances locally and withdrawal of UK government funding for such services, the bus service has been deemed to be so important for connectivity in the area that funding of £380,000 has been agreed from Salford City Council, TfGM and Salford University. This figure will provide a subsidy over 5 years, after which the service is forecast to become fully commercial. The service will operate with four new hybrid diesel electric vehicles at a 10 minute frequency, with a reduced frequency in the evenings and on Sundays.

Figure 7: Site Plan of 'Media City' Salford Quays



Credit: MediaCityUK

Attractive environments for non-car travel, Salford Quays



Salford Quays provides some attractive environments within the various developments for non-car travel. Access to the area as a whole includes a traffic free route for walkers and cyclists along the Bridgewater canal towpath from Manchester passing close to the south of the area, linked by two new pedestrian bridges over the Manchester ship canal. In the other direction the canal towpath diverges to provide links to residential areas. Three hundred cycle racks are to be provided around the Quays area.

The local planning authority attached a condition to the Media City development that it could only go ahead after agreement on a scheme to achieve 45% of trips by non-car modes. The planning condition set up a group to oversee achievement of the modal split target, including TfGM.

This case study shows the crucial role that the Passenger Transport Executive can play in securing good public transport to a development. By UK standards of sustainable transport the Media City development scores highly. However, any PTE is constrained to operate within the local and regional ambitions that set the strategic context for land-use planning, and it is evident in this case that sights could have been set higher. For a development of this centrality with such good public transport it would have been normal in many European cities to seek to achieve a majority of trips by non-car modes. The modal split target for Media City was arrived at by analysing trips to existing development in the area and projecting the same travel behaviour to the new development. It therefore does not represent any improvement on the status quo, which is car-dominated, albeit not overwhelmingly. Media City includes a new 2000 space multi-storey car park and it is notable that the 'getting there' information from one of the largest employers moving to the site, the BBC, starts by boasting that they will have '11 million people within an hour's drive, the motorway network on the doorstep...' ³². This would have been a more sustainable development if the land-use planning processes and authorities had drawn upon the expertise of the PTE at the highest strategic level to help set and achieve a more ambitious vision for sustainable transport that, at the least, sought to make car journeys a minority of trips.

Case Study 3: Good and bad for buses in Halewood and Speke, Liverpool

Passenger Transport Executives advise how to integrate transport into planned developments at all scales. The preceding case study in Manchester considered opportunities and problems arising for TfGM at the scale of one of the largest developments in the UK. This case study considers the other end of the size spectrum. It contrasts two comparatively small developments in Liverpool in order to illustrate how detailed timely input at the most local level can make the difference between attractive public transport and public transport that, in practice, is unusable.

The good example is Ravenscourt local shopping facility in Halewood, a suburb on the southeastern outskirts of Liverpool. This is a redevelopment of a local shopping centre originally built during the 1960s vogue for concrete modernism, as the area expanded in the wake of Ford's car plant coming to the area. The shopping centre subsequently became run-down and has been partially demolished. It is surrounded by residential areas.

The tender from the local council for the redevelopment, comprising new retail development and a new health centre, was won by a developer who had worked in consultation with Merseytravel (Merseyside PTE) in the past. As a result of this existing relationship of trust the advice of Merseytravel was sought from the outset.

The existing shopping centre included a bus facility that was not an attractive place to wait for a bus as a passenger, or for drivers to wait with their buses. This arose from the design, which was nothing more than a space where buses could turn around and wait to make their return journey – a large open area of bare tarmac consisting of two bus stops and several bus layover stands. The physical unattractiveness was combined with a location tucked round the back away from the main activities of the shopping centre. The area became plagued by antisocial behaviour problems, particularly in evenings, so both passengers and drivers were subject to intimidation.

The result of the dialogue between Merseytravel and the developer is a development layout that better integrates the bus facilities into the new shopping centre. A new section of highway cuts through the centre of the new shopping area in an 'L' shape with a new separate access so that buses can enter at one end and exit alongside the shopping centre car park at the other. This not only brings the bus stops closer to the shops but also helps to remove the feeling of isolation in the evenings, as some of the shops, such as takeaway food outlets, will be open until late at night. Additional benefits are that much less noise from bus engines will carry to the nearby residential properties and that Merseytravel's maintenance costs (vandalism repairs) are expected to fall. Access on foot or by bicycle to the shops and medical centre will also be more pleasant when the development opens later this year.

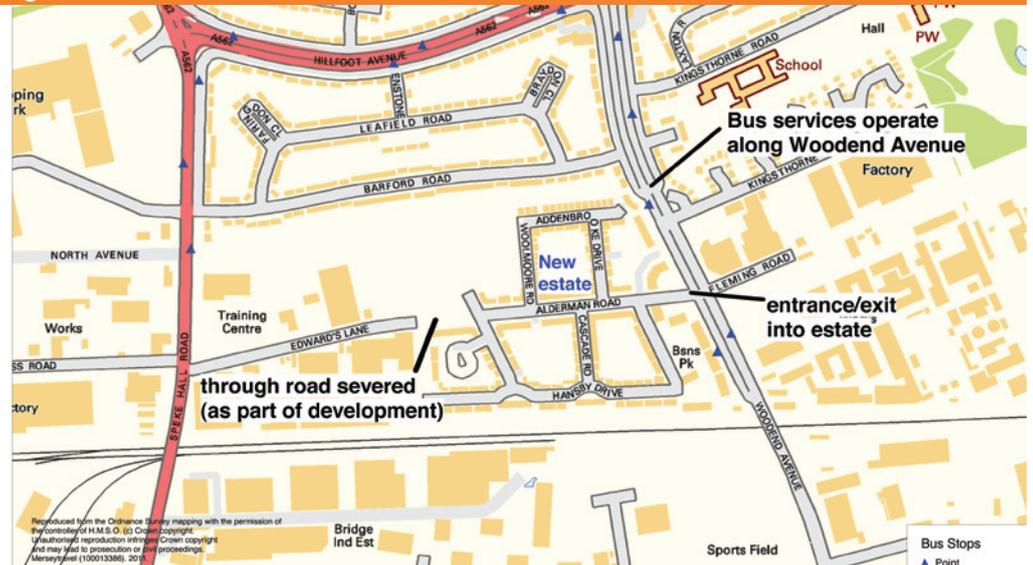
Merseytravel are of the view that the transport outcomes for the new development are probably as good as could have been achieved. They are nevertheless aware of their dependence on goodwill from the developer. Because PTEs lack the weight of statutory planning consultees, the developer would probably have had sufficient leverage to push through the development

in a much less satisfactory form. The following example is a case where this happened. Edwards Lane, Speke, is a suburban housing development of 300 houses on former brownfield industrial land in south Liverpool, built in 2003. During the planning process Merseytravel requested that provision be made for a bus route through the development. This could easily have been created and would have been served by slight modification to the route of an existing bus service.

Although the developer in question had won awards in local authorities elsewhere for sustainability and good public transport provision, in this case the developer pushed for, and received planning permission without any provision for public transport. It is relevant that this occurred at a time when planning authorities in less prosperous areas were particularly worried that too many demands would make developers take their money elsewhere. The award-winning developments were built in authorities that were more economically buoyant and made more demands of developers.

The result is a semi-gated development, isolated from public transport routes which pass by on surrounding arterial roads. Residents who could have been within 100–200m of a bus stop in fact have to walk 600m because they are separated from the bus route by a brick wall, and a cul-de-sac prevents buses from serving the estate itself. It has become an estate that depends on use of cars. As a fairly compact infill development this need not have been the case.

Figure 8: Edwards Lane Plan



Case Study 4: Sustainable transport for a whole new suburb in Stockholm

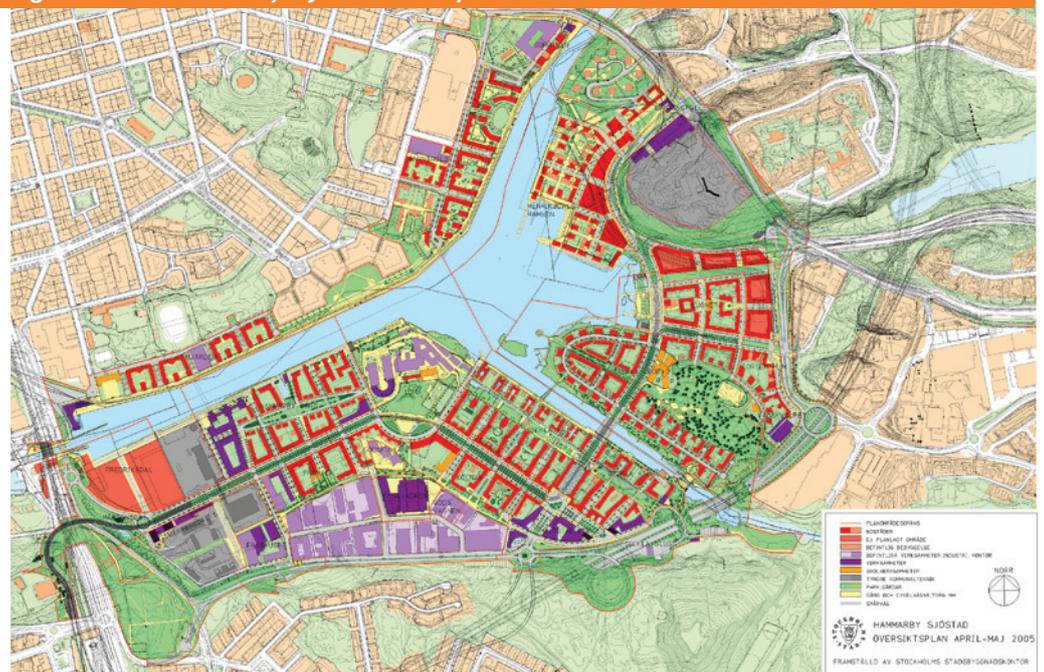
The new development of Hammarby Sjostad is the biggest development project in Stockholm. Today it houses 17,000 residents, and when complete in 2017 it will be home to 24,000 people and workplace for 5000. Its travel patterns are already being monitored and they show that something highly unusual is happening. Car ownership per household *decreased* from 66% in 2005 to 62% in 2007. By 2010 the development was within 1% of achieving its target for 80% of trips to be by non-car modes³³. So how is this being achieved?

Hammarby Sjostad is about 3km from the city centre on a 160 hectare brownfield industrial site, for which the present plans were drawn up after the site failed in a bid for the 2004 Olympics. The site boundary incorporates a further 40 hectares of waterways. From the outset the city set the target that the development should have just half of the overall environmental impact of an average 1990 development. The transport goal was for *'fast, attractive public transport, combined with carpool and beautiful cycle paths, in order to reduce private car usage'*³⁴.

Public transport serves the development in most conceivable forms. Ferries run year round, every ten minutes from early morning to midnight. A tram line runs through the whole length of the development along a central avenue. Several bus lines connect the development with other important destinations. A car club serves the development with 37 cars and now has 500 individual members (6% of households) plus 100 corporate members.

Hammarby Sjostad is designed to be fairly high density (115 residential units per net hectare) but nevertheless to incorporate a good proportion of green space (30 hectares). The street layout and the mix of land uses is designed to make the streets attractive to pedestrians and cyclists, with traffic and services concentrated along the central avenue. The design is described

Figure 9: Hammarby Sjostad site plan



Credit: Stockholm City Planning Department

as a combination of *'inner city street dimensions, block sizes, building heights, density and functionality mix...with...openness, waterfront views, parks and sunlight.'*³⁵ Offices and industry occupy 30% of the land area and 100 restaurants and retail units are interspersed with the residential areas. There are three schools for 1600 pupils in total, plus 10 'pre-schools' for 1300 children (catering for ages one and upwards!). One intriguing anomaly is that car parking provision is arguably rather high for a self-proclaimed environmental development, at 0.7 places per dwelling (on-street plus garaged), although still low by British standards.

The latest modal split figures for Hammarby Sjostad show that it is matching up to expectations: 52% of trips are made on public transport, 27% on foot or by bike, with car journeys accounting for just 21%. These figures are all the more striking for the fact that the development is situated close to the Southern Link urban motorway, completed in 2004 after a decade of debate finally concluded that it should go ahead, but be largely put into tunnel.

The development process for Hammarby Sjostad was led by the City of Stockholm, who determined the overall vision for the development and then ran a masterplanning process that involved some 20 firms of architects.³⁶

The wider context for the Hammarby Sjostad development is a long-standing policy of public transport centred development in Stockholm, for which the benefits were becoming clear even before this latest project. Population density has increased in the central city, the inner city and the outer suburbs.

New housing has been built as 'urban villages' around the high quality rail system, both in the inner city and in new outer suburbs.

One study has noted that *'These new developments are all dense, mixed use areas with a careful eye for the kind of design characteristics found in the old inner city of Stockholm. They have been popular as places to live and work'.* Over the decade studied, car use in Stockholm fell 5% (4867 to 4638 miles per year per person) whilst public transport use increased 14% (from 304 to 348 trips per year per person).³⁷

Mixed-use waterfront development in Hammarby Sjostad



Credit: Stockholm City Planning Department

It will be necessary to create a virtuous circle development design that encourages public transport also encourages walking and cycling

05 The concept of public transport centred development

A large step towards integration of land use planning with transport planning would be accomplished simply by recognising that the process of development should be centred on public transport. To achieve a society-wide move towards sustainable travel patterns it will be essential to make better use of better public transport for medium and long journeys. But it will also be necessary to create a virtuous circle where development design that encourages public transport also encourages the most sustainable of all modes of travel for shorter journeys – walking and cycling. This mutually complementary approach is possible because what is good for public transport use can also be good for walking and cycling: all public transport journeys also involve shorter trips to and from public transport, for which development design can encourage access on foot or by bike. These principles of development design will also encourage use of these sustainable modes for trips to local destinations within the development or close by.

So the concept of public transport centred development³⁸ does literally mean that public transport should physically lie at the heart of developments, but it must also include considerations about how the public transport interacts with the development and about the quality of the public transport provision. *The Masterplanning Checklist for Sustainable Transport in New Developments*, developed for the Campaign for Better Transport, lays out criteria that public transport centred development should meet in order to create sustainable travel patterns, based on an extensive survey of the evidence in academic and professional literature:

- **Public transport centred development:** all new developments should centre on high quality public transport that provides rapid connection to the nearest major centre of employment and major urban facilities. Housing developments that are too small to justify new high quality public transport connections should only be built where the existing public transport infrastructure is already strong.
- **Dedicated public transport routeways for large developments:** for a scale of development where thousands of new homes are intended, the development should be served by segregated public transport routeways that guarantee reliable services unaffected by traffic congestion, that can therefore be competitive on journey time with private motor vehicles, and that are highly visible to potential users (and to potential investors in housing or businesses). This means segregated busways, tramways or railways.
- **800m maximum distance from residences to the main public transport hub:** this distance defines a 10-minute walk 'ped shed' around a major public transport hub that is appropriate for development. Services for local links, such as buses, should be closer - 400m maximum.

- **Direct high quality pedestrian and cycle links to public transport:** walkers and cyclists should be able to access public transport by routes that are as close to a straight line as possible and that are faster and more convenient than by car. The routes should be designed to offer an attractive and safe environment i.e. with trees and other planting, good lighting, passing local shops, cafes and other facilities.
- **Cycle storage at transport hubs:** cycle storage facilities should be large, under cover and prominently sited close to station entrances (as per good European practice).
- **Minimal car parking at transport hubs:** new developments should not centre on, or be planned in association with, park-and-ride style transport hubs.

Well-planned settlements avoid the need for unnecessary trips

06 Conclusions: achieving thriving cities through integration of transport and land use planning

The Local Transport White Paper, *Creating Growth, Cutting Carbon, Making Sustainable Local Transport Happen*³⁹, has set out the Government's ambitions for decarbonised growth:

'Our vision is for a transport system that is an engine for economic growth, but one that is greener and safer and improves quality of life in our communities.... By improving the links that help to move people and goods around, and by targeting investment in new projects that promote green growth, we can help to build the balanced, dynamic, low carbon economy that is essential to our future prosperity.'

Integration of transport in land use planning will be fundamental to achieving these ambitions. Well-planned settlements avoid the need for unnecessary trips - and carbon - in the first place, and lead to maximal use of low-carbon modes of travel such as public transport, walking and cycling.

This vision of a sustainable transport system implies a step-change improvement. Although this presents a challenge, it is commensurate with the major reform of the planning system that the Government has initiated in order to drive economic growth. For example, the National Planning Policy Framework (NPPF), that is due to replace all pre-existing planning guidance, offers an opportunity to embody principles that integrate land use and transport planning at the highest level.

We propose three golden rules that should be incorporated into emerging national planning policies, including the National Planning Policy Framework (NPPF), to ensure a step-change improvement.

Policy recommendations

01. All major development should be public transport centred

In addition to the literal meaning that development should be physically laid out around public transport, this concept should also be taken to mean that the whole approach to the development is centred on considerations about the quality of the public transport and, moreover, that development design is such that the majority of access to the public transport will be through walking and cycling.

02. All major development should aim to achieve a design where car journeys are a minority of mode share

This will require public transport links to the nearest major urban centre (and from the development 'catchment' in general) to be faster than car travel. This in turn implies, at the least, bus priority measures, but for the largest developments requires dedicated lanes or fixed-way public transport. It also requires that, within the development itself, access to and from public transport is fastest and most attractive by walking and cycling. The design of the development must also be such that it incorporates 'everyday' services and facilities that obviate the need for travel beyond the development for purposes that can be served locally.

03. Development should primarily occur as infill, or at least adjacent to, major centres

Unless developments are built within or adjacent to major regional centres of housing, employment, goods and services – centres which are also the hubs of their public transport networks – they will be dominated by trips made by car.

In addition to getting good *policies* in place, there is an obvious need to improve *processes* dramatically.

It is striking from the case studies of European best practice that local and regional authorities take an active lead on important development sites in a way that does not happen in the UK. Planning departments in Britain are proactive to the extent of developing a local plan that indicates zoning for different land uses, but thereafter normal practice is reactive in response to plans proposed by developers. In its review of sustainable developments across mainland Europe⁴⁰, the Homes and Communities Agency concluded that local and regional authorities played a vital proactive role drawing up broad principles, standards, design guidelines and infrastructural requirements, as well as specifying actual numbers for new houses and other land uses. The proactive approach continued as leadership of a masterplanning process, in Sweden termed 'active collaboration', with many teams of architects and planners competing.

Enterprise Zones require a masterplanning vision that integrates transport from the outset

We consider that British local authorities should be encouraged to develop a vision for highly sustainable developments on important sites, similar to European best practice, with thorough-going integration of land-use and transport. This approach should be in conjunction with Local Enterprise Partnerships, a joint leadership role that would align with the Duty to Cooperate established in the Localism Bill (2011). This approach would fit with the stated purposes of the NPPF to empower local planning authorities whilst liberating them from prescriptive policy detail. It would also fit with The Local Transport White Paper's outline of the necessary role of Local Enterprise Partnerships:

*'Local economies do not follow local authority boundaries...for instance a city or town may have a large travel to work area...Local Enterprise Partnerships...reflect natural economic units...We expect the Local Enterprise Partnerships to form a view on the strategic transport priorities which best support sustainable economic growth in their areas and to play a key role in implementing significant devolution of transport decision making to local areas.'*⁴¹

It is important that such an approach should also be adopted as part of the Government plans for 21 Enterprise Zones announced in the 2011 Budget statement, if their benefits are to be maximised. To function well and to enable sustained economic growth, Enterprise Zones require a masterplanning vision that integrates transport from the outset, with excellent public transport provision and layout of jobs and facilities that maximise non-vehicle movements of workers, residents and materials. In this instance sustained economic growth fits with environmentally sustainable growth. Although these zones are intended to strip away bureaucratic planning obstacles, they do in fact envisage a positive role for local authorities, who will proactively implement Local Development Order powers to create permitted development categories for the zone. There is a crucial role for local authorities in leading the creation of integrated transport and land use masterplans to ensure that Enterprise Zones work.

In devolving greater responsibilities to local authorities, national government also has a duty to establish processes that ensure local bodies with relevant expertise and experience are included in the planning process. It is therefore urgent to remedy the gaps in the present processes, which fail to guarantee that expertise regarding local and regional transport are thoroughly incorporated into land use planning. In particular, all bodies carrying responsibility for local transport should be statutory planning consultees.

Process recommendations

01. Local Authorities and Local Economic Partnerships should be encouraged to proactively draw up highly sustainable masterplans for development sites of key significance

Local planning authorities, together with Local Economic Partnerships, have potential to drive forwards much higher quality developments than are presently being built in the UK. However, for this to happen, it is critical that, whilst devolving greater powers, national government lays out overarching principles in national planning policies, including the NPPF, that make it clear that high standards for integration of transport and planning are expected everywhere.

The danger otherwise is that, as at present, developers will play local authorities one against another in a 'race to the bottom' to avoid properly planning for sustainable travel. It is notable that developments with excellent design for sustainable transport in Europe are highly popular and have achieved high levels of investment from developers and utility companies⁴².

02. Planning processes should universally include the bodies responsible for local transport

Outside the metropolitan areas, transport authorities already have statutory consultee status, but a glaring omission exists in metropolitan areas where, despite holding responsibility for many millions of passenger movements, Integrated Transport Authorities and Passenger Transport Executives are presently not statutory consultees.

The government has set in motion the biggest change in the planning system for decades, which could set the scene for decades to come.

This is the time to lay out a shared vision for the kind of towns and cities that we want to achieve: thriving settlements bustling with low carbon travel.

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