

Oxford City Council : Transport Implications of the LDF Core Strategy

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Introduction

This commentary has been prepared at the invitation of City Council officers to inform the Council's LDF. It focuses on the Council's proposals for housing and employment growth for the City as a whole and in relation to identified strategic sites, both of which have significant implications for travel and traffic.

The work undertaken follows the lines of an agreed proposal dated 8 December 2008. Following discussion with officers an initial draft was updated to take account of the proposed changes to the Submitted Core Strategy published in April 2009

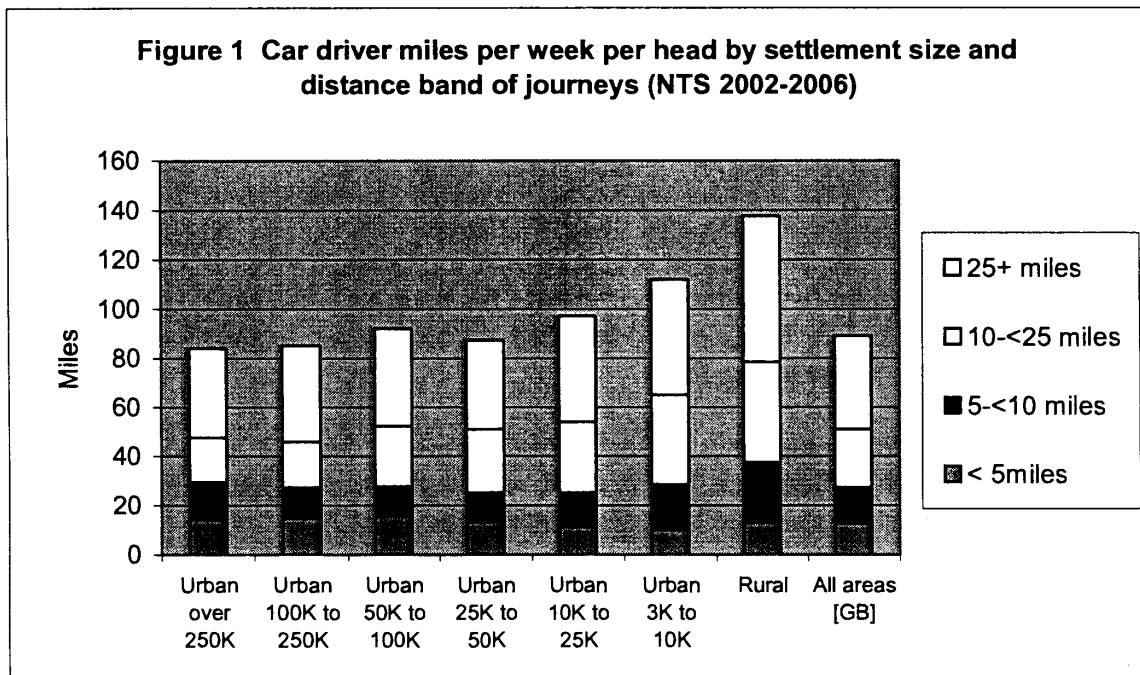
The commentary is organised in four main sections:

- 1 Reviews some general research evidence about the relationship between the location of development and the resulting volume of travel generated, especially by car.
- 2 Complements this with the results of previous research undertaken at Oxford Brookes University on this relationship specifically in the context of new residential developments in Oxfordshire
- 3 Reports the evidence of new work using the 2001 Census on commuting behaviour to and from Oxford City and nearby towns where major expansion has occurred in recent decades¹
- 4 Applies this evidence to the City Council's Core Strategy proposals and to the main transport-related arguments which have been put forward for and against them.

1 General evidence on development location and travel

Evidence on the inter-relationships between land use, transport infrastructure and travel behaviour and their implications for planning policy was reviewed in a Government-commissioned report in 1993². This was used to inform PPG13 published in 1994. The PPG's principal objectives were to 'reduce the need to travel' and to ensure that 'opportunities were available for a choice of modes other than the car'. These objectives and much of the substance of policy guidance are retained in the revised version prevailing today³.

The PPG promotes development in and around urban areas drawing on evidence from the National Travel Survey (NTS) that per capita travel and the proportion of travel by car declines with increasing settlement size and density. However the relationship is not linear and of particular significance for planning in shire counties is the higher rates of car use which take place in settlements smaller than 25-50k (see Figure 1 for the latest available data).



Research undertaken on a body of NTS data from the period 1988-2002 has generated important additional insights⁴:

- i) whilst some of the variation in travel behaviour between settlement categories is due to socio-economic differences in their populations, controlling for this statistically indicates that nationally adults living in rural settlements (below 3k) travel 17 miles further a week as car drivers than those in the next settlement category (3-25k) who in turn travel 16 miles further than those in the 25-50k category. Successive steps continue for settlement categories above 50k but on a smaller scale.
- ii) about two thirds of the additional car mileage undertaken in the smaller settlement categories is attributable to greater distance travelled and only a third to greater use of the car. Furthermore, as can be seen in Figure 1 virtually all the additional car travel is associated with journeys of more than 5 miles. The pattern of inter-urban travel (ie travel beyond the home settlement) is therefore of particular significance in such cases

The same research project also examined data from the 2001 Census to identify features relating solely to commuting journeys. This demonstrated even more pronounced differences between residents in the settlement size categories. Journey to work distance by car amongst residents of rural settlements under 3k (averaging 8.3 miles) is more than twice the figure for the largest freestanding towns (over 250k) with a fairly even gradient for the settlement sizes in between. However the differences between settlement categories viewed in terms of *workplace* location are much less. This is because the largest urban areas have an excess of jobs over workers and draw their workers from wider catchment areas. It is also because, except for modern developments in principal centres, little demand restraint operates on private, non-residential parking. .

A recent review of evidence on the relationship between settlement characteristics and travel behaviour more generally has identified further influential factors including location, urban design and attitudinal attributes⁵. These do not invalidate the observed overall relationships

with settlement size and density noted above but they will influence the way in which variations arise between one place and another within a particular category and between individuals or households within a particular place. This highlights the importance of moving beyond general observations to identify and interpret local land use-transport characteristics where understanding is needed to inform a particular planning exercise.

2 Evidence from research in Oxfordshire

Research undertaken at Oxford Brookes University during the 1990s sought to establish the relative merits of new residential development on the edge of Oxford compared with similar development at smaller freestanding towns in the county from the perspective of minimising car travel. As well as illuminating features relevant to spatial planning in the county the local evidence also helped develop understanding of the variability of behaviour between superficially similar places – thus complementing the work using national data sources referred to above. The results reported here are drawn from household interview surveys on newly built estates funded as part of ESRC research⁶, supplemented by further surveys on established estates in the same towns. Both were then reviewed in the context of travel behaviour within the county more generally⁷. Although the results are now over a decade old the structural determinants and their relationship to one another has not altered fundamentally in the period since and it is unlikely that individual figures will have altered by more than one or two percentage points. (Evidence of recent trends drawing on the 2001 Census is given in the following section).

Overall, in terms of trips made ‘regularly’ (ie to the same place for the same purpose at least once a week) there is little difference in the *number* of trips per adult but the proportion of car-borne trips from newly-built estates is higher. In addition residents of newly-built estates engage in longer journeys (almost wholly in connection with commuting). After controlling for differences in socio-economic composition it is estimated that adults on new estates generate about 25% extra car mileage per head compared with adults in established (modern) housing areas in the same town⁸.

Although this difference may be expected to reduce over time as new communities mature its scale should be sufficient to caution against using evidence from the Census (ie derived from *existing* residents) as the basis of predicting travel behaviour amongst residents of new developments. The higher car mileage associated with new estates can be seen as a step-change manifestation of a longer term process in travel behaviour generally and in the Outer South-East in particular of weakening local links between homes and workplaces and greater participation in longer-distance commuting.

Details are given in Table 1 below of commuting characteristics on the surveyed estates in Oxford and the three ‘country towns’ of Central Oxfordshire which have undergone planned expansion (Bicester, Didcot and Witney). Note that the figures do not represent a complete cross-section of the working population on these estates. Households were deliberately selected according to their composition and housing characteristics so that the *places* could be compared on a like basis. In particular - reflecting planning policy at the time – the estates were largely devoid of social housing and the special features likely to attach to this tenure group are therefore not represented in the results.

It should also be emphasised that the surveys in Oxford were conducted in estates on the edge of the built-up area with almost direct access on to the Ring Road and thence the national

road network. Residents of more recent developments on brown-field land within the city could be expected to have even shorter average journeys to work and a lower proportion of car driver trips and this has been confirmed in subsequent research⁹.

Table 1 : Commuting behaviour amongst residents of established and new estates in Oxford and the country towns (P Headicar 2000⁷)

	Percentage with workplaces*:				Journey to work**		
	in home settlement	in Oxford City	in rest of Oxon	outside Oxon	Avg trip distance (miles) all modes	% trips car driver	Car driver miles per worker
<i>Established estates</i>							
Oxford (New Marston)	76%		16%	8%	6.3	56%	3.4
Bicester	45%	18%	22%	15%	12.3	67%	10.1
Didcot	32%	10%	43%	15%	10.7	73%	8.2
Witney	45%	20%	32%	4%	8.3	66%	6.1
<i>New estates</i>							
Oxford (Botley)	66%		21%	13%	11.4	64%	8.5
Bicester	26%	23%	20%	31%	17.6	88%	16.3
Didcot	24%	12%	35%	29%	14.9	74%	8.4
Witney	26%	28%	33%	13%	15.5	80%	13.7

* 'home settlement' includes working at home. Note that the new estate at Botley is classed as being on the edge of the built-up area of Oxford although it lies outside the city's administrative boundary

** of those with a fixed workplace who travelled to work; ie *excluding* those working at home

As a whole these figures illustrate the general points made earlier that new estates are associated with a lower proportion of workplaces in residents' home settlement, a higher proportion outside Oxfordshire and greater use of cars for the work journey. With the exception of the special case of Didcot¹⁰ work trips by car on the new estates are up by between 8%-21% (least in Oxford and most in Bicester) and work trip lengths up by between 39%-87% (including Didcot) – these together contributing to the much higher car driver miles per worker.

In comparing the different locations Oxford is characterised by a much high proportion of commuting journeys within the home settlement (76% compared with an average of 41% for the country towns amongst residents of established estates and 66% compared with 25% amongst residents of new estates). Its car driver mileage per worker is only 42% of the country town average amongst established estates and 22% of the average amongst the new estates.

Bicester and Didcot have a higher percentage travelling to workplaces outside Oxfordshire compared with Oxford and Witney. This reflects their greater accessibility to the large pool of workplaces in London and the Outer Metropolitan Area which is fostered by the presence of the M40 motorway near Bicester and the high-speed rail services at Didcot.

The surveys also investigated where residents of the country towns had lived previously and which places they had considered as possible places for moving to. In both contexts the results indicate a remarkably weak connection with Oxford City as far as the housing market is concerned (Table 2). However these results can be interpreted as 'self-fulfilling', given the differential in house prices between Oxford and the country towns. Whatever 'preferences'

people living in the country towns might ideally have had when moving the fact that they did not in the main come from Oxford nor explicitly considered it as a possible place to move to suggests that housing in the city was known not to fulfil their needs or to be beyond their affordability. The results also confirmed that residents of new estates were less likely to have lived previously in the same town and that residents of Bicester and Didcot were more likely to have considered home locations outside Oxfordshire (ie in line with their workplace locations).

Table 2 Where residents of country towns had lived prior to their house move and the places considered as possible home locations* (P Headicar 2000⁷)

	Where lived previously		Places considered for moving to	
	Established estate	New estate	Established estate	New estate
Home town**	46%	27%	63%	47%
Oxford City	5%	7%	3%	3%
Rest of Oxfordshire	27%	28%	28%	37%
<i>Outside Oxfordshire:</i>				
Metropolitan ***	8%	18%	4%	7%
Elsewhere	15%	21%	2%	7%

* Up to three possible places or areas were recorded; the figures here show the proportion of all responses

** 'Home town' is the town residents had moved to and were living in when surveyed

*** 'Metropolitan' is Greater London plus the sector of the Outer Metropolitan Area between it and Oxfordshire

3 Travel to Work evidence from the 2001 Census

Evidence from the 2001 Census provides more general (and more recent) confirmation of the local features reported in the previous section. The travel data is confined to the journey to work but, as the Oxfordshire research identified, this is in fact the journey purpose which is most important in differentiating between home locations in terms of the amount of car travel generated. The Census data can also be used to examine the characteristics of work travel *to* various places (ie from the workplace end) which can inform decisions about suitable locations for employment development. This additional dimension will be reported after first reviewing the Census evidence on home-based travel.

Travel to work from residential areas

An analysis has been undertaken using ward level statistics of travel to work by residents of Oxford and of the 'country towns' of Bicester, Didcot and Witney. These towns have been the main locations of new residential development in Central Oxfordshire in recent decades and, as a group, represent the main strategic alternative to further development in or adjacent to Oxford City¹¹.

The analysis within Oxford City has been subdivided into four sectors :

- i. Oxford Central and West (including Jericho and Osney)
- ii. Oxford North
- iii. Oxford East (the Marston, Headington and Wood Farm areas)
- iv. Oxford South-East (Cowley, Littlemore and Abingdon Road).

In this commentary, in order to provide a fair basis of comparison with the country towns, the data for Oxford Central and West have been excluded. This is because this area has features which are to some extent a product of the unique nature of the city's central area – notably links with employment in the University and a high proportion of people working at or from home. (If these people were included they would depress the overall travel figures for the City and give an unreasonably low representation of travel from the suburban parts of the city where most new housing development is likely to take place.)

The differences in travel behaviour can best be understood by considering two main parameters

- i) the location of workplaces, here subdivided into 'at home' (ie no work journey), home town, rest of Oxfordshire and outside Oxfordshire - and hence the average work journey distance
- ii) the mode of travel, here subdivided into car driver and other - and hence the proportion of work travel represented by car movements

These two factors are related in that the opportunities for commuting by the various modes vary generally with distance from home and specifically with the links available between particular home and workplaces.

These factors are brought together into the statistic of average car driver distance per worker which is considered the best single indicator for comparison purposes. The relevant figures are shown in Table 3.

Table 3
Workplace and car driver mode share for residents of Oxford City and the Country Towns (2001 Census¹)

Workplace	Oxford City (exc Centre & West)		Country towns ¹² (Bicester, Didcot & Witney)	
	% of workers	% Car driver	% of workers	% Car driver
At home	9	0	9	0
Home town	68	33	38	48
Other Oxon	17	77	41	80
<i>Of which: Oxford City</i>			13	70
<i>Rest of Oxon</i>			28	85
Outside Oxon	7	65	12	79
ALL		39		60
Avg work journey distance (km)*	9.3		14.7	
Avg car driver work jny (km)	13.2		18.1	
Avg car driver km per worker*	5.2		10.9	

*includes zero for people working at home

Key points to note are that:

- A much greater proportion of workers living in Oxford City travel to a workplace in their home town (68% compared with 38%)

- For these 'home-town' journeys the car is used only two-thirds as much in Oxford City (for 33% rather than 48% of journeys)
- For journeys to the rest of Oxfordshire and beyond modes other than the car are used more by workers living in Oxford. This can be attributed to lower car ownership in the city coupled with its better regional connectivity by public transport.
- The average distance of journeys to work from the country towns (14.7km is much higher than from Oxford City (9.3 km) and also than the national average (11.0 km, excluding people working from home)
- The proportion of journeys to work made as car driver from the country towns is also much higher (60% compared with 39%)

This combination of longer average commuting distance and higher car mode share means that the average car driver distance per worker for people living in the country towns is more than twice that of Oxford City (10.9 km compared with 5.2 km).

Commuting to workplaces

It was noted previously that nationally there is much less variation in trip length and mode share of work trips when viewed from the workplace end. A principal reason for this is the wider catchments characteristic of places of employment in the main urban areas and the lack of restraint applying to use of cars for the work journey at their more suburban locations. Oxford exhibits both of these features.

The evidence of commuting to workplaces is presented in Table 4. In this case Central Oxford is included as an additional category for comparison purposes.

Table 4

Residence and car driver mode share of work journeys to Central Oxford, non-central Oxford and the Country Towns (2001 Census¹)

Residence	Oxford Central and West		Oxford Non-central (North, East and South-East)		Country towns (Bicester, Didcot & Witney)	
	% of workers	% Car driver	% of workers	% Car driver	% of workers	% Car driver
Home town	49	18	54	38	58	38
Other Oxon	45		40		34	
<i>Of which: Oxford City</i>					4	80
<i>Other towns in Central Oxon*</i>	19	50	17	80		
<i>Rest of Oxon</i>	26	56	23	82	30	83
Outside Oxon	6	70	6	89	9	90
ALL		37		59		63
Avg work jny distance** (km)	11.7		11.9		10.7	
Avg car driver work jny (km)	16.9		15.8		14.6	
Avg car driver km per worker**	6.3		9.3		9.2	

*Kidlington, Bicester, Didcot, Abingdon and Witney

**includes zero for people working at home

Key points to note are that:

- ‘Central Oxford’ draws its workers almost equally from within the city and from the rest of Oxfordshire (49% and 45%) with only 6% from outside the county. Outside the centre a greater proportion (54%) are drawn from within the city
- The country towns draw almost 60% of their workers from within the home town, even though the numerical catchment this represents is much smaller than Oxford City.
- In commuting terms there is a strong imbalance in the relationship between Oxford City and the other main towns in Central Oxfordshire, even though their total populations are of similar size. About 1 in 6 jobs in Oxford are taken by workers from the other towns whereas only about 1 in 25 jobs in these towns are taken by workers from Oxford.
- The average commuting distance of people travelling to workplaces in ‘Central Oxford’ is slightly longer than to the country towns (11.7 km as against 10.7km). However their car mode share is much lower (37% compared with 63%). The net effect is that the average car driver distance per head of people working in Central Oxford is a third less (6.3km compared with 9.2km).
- Workers travelling the longest distances (ie from outside Oxfordshire) are three times more likely to travel by modes other than the car if travelling to Central Oxford
- There is very little difference between the travel behaviour of people commuting to workplaces in Oxford outside the city centre and to the country towns. Workplaces in the country towns are associated with a slightly shorter average trip length but a slightly higher car driver mode share.

4 Commentary on the City Council’s Core Strategy

This section comments on the transport implications of the Core Strategy and in particular the proposed location of strategic development in and adjacent to Oxford City. It is presented under the following four headings:

- i Aims of the strategy
- ii Future traffic growth and its implications
- iii Strategic residential developments
- iv Strategic employment developments

The main purpose of the commentary is to apply and interpret the evidence quoted in the previous sections. Within the confines of this exercise it is not possible to comment authoritatively on the transport implications of the Core Strategy drawing on *all* sources of evidence including the detailed traffic modelling work which the City and County Councils have commissioned. However areas of concern for which as yet there appears to be insufficient explanation or justification are highlighted.

In summary as far as residential development is concerned the detailed evidence reported previously provides unequivocal support for the objectives of the Core Strategy and

demonstrates the local validity of the general principles contained in PPG13 and other guidance documents.

The arguments surrounding employment development however are less clear-cut. They depend *inter alia* on

- The location of the development within the City
- The nature of the jobs provided in the development
- The alternatives, both within and outside the city, against which the proposals are to be compared
- The assumptions made about transport investment and demand management accompanying the proposals.

i) Aims of the strategy

The importance of linking new development with appropriate transport infrastructure so as to promote accessibility and protect the environment is registered in the Vision and Objectives (Section 2) of the Strategy. Consistent with this – and following Government guidance in PPG13 – ‘reducing the need to travel’ is identified as one of the three key planks of the spatial strategy (3.1)¹³.

“A strategic objective of the spatial strategy is to ensure that new developments are in accessible locations so as to minimise overall travel demand”

In the text which follows (3.2) the contribution of this to reducing carbon emissions is emphasised. The means of delivering it is explained in terms of a policy of a hierarchy of centres within the city, applying a sequential approach to developments according to their population catchments whilst taking account of the opportunities and constraints faced by each centre.

Good accessibility is clearly a desirable objective in terms of providing opportunities to employment and other services and is also a necessary condition to prevent longer distance journeys being made because of the lack of alternatives. However the Strategy – like PPG13 itself – does not give sufficient acknowledgement of the fact that good accessibility does not translate automatically into less travel demand. Particularly at a strategic level and in relation to commuting journeys whether any reduction actually materialises will also depend on the opportunities and constraints created by prevailing housing and job markets and by the degree of choice exercised by individuals within these markets. It should be emphasised that nationally the vast majority of motorised travel (about 95%) and associated CO₂ emissions derives from journeys longer than 5 miles. In this context it is the implications of development proposals for travel to and from the city, rather than within it, which are most significant.

A similar proviso surrounds a further dimension of the accessibility objective, namely to reduce the need to travel *by car*. Although good accessibility by other modes is a necessary condition for reducing car travel (ie through modal shift) it is not sufficient by itself to deliver this. People’s actual choice of travel mode will be influenced by the *relative* attractiveness of the car and for most journeys it is clearly seen as the preferred option, notwithstanding efforts by transport authorities to improve the alternatives. Unsurprisingly car ownership – because of its effect on individuals’ car availability – is in fact the most important influence on levels

of car use. Hence, rather than merely seeking to influence mode choice for particular trips, this points to the importance of policies influencing the location, design and management of development (together with transport demand management) in promoting conditions where lower levels of household car ownership are a practicable – indeed attractive – option.

ii) Future traffic growth and its implications

The Core Strategy quotes the ONS population projection for the city increasing from 151,000 in 2007 to 176,000 in 2026. The SE Plan proposes provision for 12,000 additional dwellings in the city (including the South Oxford SDA) which implies an additional 14,640 economically active persons¹⁴. If the ratio of resident workforce to jobs prevailing in the city in 2001 were maintained (1.44) this would mean an increase of 21,060 jobs. In fact the Strategy anticipates some improvement (ie lessening) of the worker/jobs ratio during the Plan period although this could be offset if it transpires that the SDA includes a significant employment element.

The development proposals in the Core Strategy contribute to, but are not the main factor in a very substantial deterioration in traffic and related environmental conditions forecast for the highway network of Central Oxfordshire¹⁵. The principal factors are increases in car ownership and use arising generally from other socio-economic factors and from increases in population and employment outside the Oxford area which result in growth of traffic into or through it. These exogenous factors plus committed development in Oxford City in the period to 2007-2026 (assumed to be 2297 houses and 4,900 jobs) are forecast to result in a 42% increase in trips on the network during the a.m. peak hour, a 51% increase in vehicle distance and an 80% increase in travel time, with average speeds falling from 62 to 52 kph. The new development anticipated in the Core Strategy under a high growth assumption (including the South Oxford SDA) is assumed to represent a further 10,396 houses and 9,850 jobs. The forecast effect of these is for the number of trips to increase by 49% (on the same 2007 base), vehicle distance by 55% and travel time by 91%, with average speeds falling to 50.5 kph.

Mitigation measures beyond the transport investments already anticipated by the County Council may enable this traffic increase or its effects to be lessened. However any increase of this order (and equivalent increases at other times) implies an appreciable deterioration in urban quality and significant economic, social and local environmental disbenefits.

Of itself this scenario does not invalidate the planned scale of development in Oxford (which, as indicated, is a relatively minor factor and which in overall terms is set by the SE Plan in any case). However it does challenge the City Council to demonstrate that its LDF is sound in that all possible measures are being pursued (in collaboration with the County Council as transport authority) to minimise adverse consequences. This applies not only to the specifics of the strategic development proposals (considered below) but to the management of highway and parking space, to complementary investment and the promotion of alternative modes..

In general the transport projects referred to in the Core Strategy (5.1) are concerned mainly with Access to Oxford from outside the city and with movements to and within the city centre¹⁶. Neither these nor the measures for ‘supporting city-wide movement’ listed in Policy CS15 will have a significant impact on traffic volumes within the city more generally. Indeed it is unlikely that any combination of measures of the kind pursued in Oxford over the last three decades could avert a general worsening of conditions. It follows that the ‘step-

change' in population, employment and forecast traffic levels anticipated in Central Oxfordshire deserves to be accompanied by a step-change in transport management methods.

The following are the kinds of initiative which would be appropriate to this more pro-active stance (coupled with the improvements already identified):

- Workplace parking levy and/or congestion charge (coupled with a review of public parking charges) with revenues 'ring-fenced' to other transport improvements including support of workplace travel plans in existing developments
- Reduced parking standards in new housing development coupled with residential travel plans incorporating controlled parking, car clubs, car share and personalised travel planning
- Progressive extension of controlled parking areas amongst established development and tightened regulation of household car ownership within them coupled with the promotion of alternatives through residential travel plans

It is notable that, in line with the Panel's recommendation, proposed policy T3 in the SE Plan encourages consideration of road user charging in regional hubs (Oxford being one). The County Council in its observations on the CS made no comment on this or the reference to charging in the text. Rather it registered concerns about the projected increase in traffic within the city and said that it 'will need to work with the City Council to bring forward a comprehensive mitigation strategy for the development proposed'¹⁷. The City Council for its part registers in the CS text its support for the further development or investigation of a range of long term measures. However no such strategy has yet been published, even in illustrative form. Since its restraint elements will inevitably be controversial and difficult to implement it follows that there are as yet no grounds for assuming that measures will in practice be forthcoming on the scale needed to prevent the projected deterioration in conditions.

Strategic residential developments

The general arguments derived from national evidence in favour of concentrating residential development within or as extensions of larger settlements are amplified in Oxford's case by a number of particularly favourable local factors. These include:

- The large number (and large surplus relative to the number of resident workers) of jobs within the city, resulting in a high level of 'self-containment'
- The significance of Oxford as a sub-regional centre and hence the presence of many high-order facilities (eg in relation to specialised retail, health, education, leisure etc). This too implies a high level of self-containment for these types of activity
- The combination of a relatively dense urban form, a strong demand-management regime towards car use (principally applied to the central area, but also through residents' parking schemes), an unusually high standard of local bus services, and a well-established culture of cycling. These are contributory factors to the relatively low levels of car ownership in the city which in turn underlies the unusually high use of modes other than a car for a town of its size.

- The high level of regional and sub-regional connectivity by public transport modes available to residents of the city

None of these advantages are available to possible alternative locations for strategic residential development within Central Oxfordshire. The overwhelming superiority of Oxford in this respect is demonstrated by the evidence of average car commuting distance per worker, both among established residents and in residents of new developments.

Oxford's advantages apply almost irrespective of where (within or adjacent to the city) new residential development is located. However for these advantages to be realised in practice it is axiomatic that the conditions which currently prevail generally in the city should as far as possible be replicated in the new developments. This includes such features as

- Encouragement of low levels of household car ownership (eg through limited provision and management of residential parking and the promotion of car club and car share schemes)
- Good access to bus services and high levels of service
- Good access to local facilities
- Design and management which favours walking and cycling
- Good bus access to the city centre, to other strategic employment locations and – where practicable - to other points of interchange with the city's inter-urban public transport services

These comments apply particularly to the South Oxford SDA and other locations on the edge of the city which otherwise are at a relative accessibility disadvantage.

Policies CS14 and 15 provide a framework within which the above features can be sought although inevitably their achievement in practice depends on negotiations with developers, trade-offs with other objectives and complementary action by transport authorities and operators.

Strategic employment development

As noted earlier there is generally little difference between workplace locations in urban areas of various sizes as far as average work trip length is concerned. At first sight the figures for travel to workplaces in Central Oxfordshire appear to reflect this general phenomenon. (Table 4 showed that average work trip lengths in to workplaces in the country towns are in fact a little less than to workplaces in Oxford City). However the mix of employment types in the two categories of settlement are markedly different. Other towns in Central Oxfordshire have a relatively low proportion of jobs in knowledge intensive industries and in public administration, education and health, implying less specialised/ lower income employment. These places are therefore more associated with workers who can expect to exercise less 'choice' (and hence engage in shorter-distance journeys, all other things being equal). Conversely Oxford is likely to have a higher representation of these more specialised types which would be associated with longer average trip lengths. In other words if one were to compare work trip lengths *by employment category* then the trip lengths of people in more specialised forms of employment in Oxford would almost certainly be shorter.

As far as commuting by non-car modes is concerned the general evidence is that this is somewhat higher for workplaces in larger towns but only pronounced in Inner London and the centres of the other main conurbations. However by virtue of the unusually well-developed demand management regime in Central Oxford workplaces in this part of the city exhibit a higher non-car mode share than is normal for a town of its size. Unfortunately this feature is not replicated in suburban parts of the city, despite the relatively good public transport accessibility in many places. This suggests that, in this respect, the city is currently 'under-performing' and that there is scope to raise the non-car share in these places by adopting a more pro-active demand management regime of the kind referred to earlier.

Outside Oxford much of the recent growth in knowledge based industries has occurred not in towns but at freestanding locations in the south of the county such as Harwell, Milton and Culham. Our analysis has not examined travel to these places but they are almost certainly characterised by relatively long average commuting distances and a high car mode share. Furthermore whilst action may be taken to improve non-car choices at these locations they are inherently handicapped by being poorly situated in related to the main public transport network and by being relatively remote from the county's main concentration of population in and around Oxford City.

The Core Strategy proposes a 'managed growth' approach to economic development seeking overall provision in line with the findings of an Employment Land Study¹⁸. This is distributed between a main allocation of previously safeguarded land at Peartree on the north-western edge of the city ('Northern Gateway'), employment growth in the City and district centres and protection/further development of existing employment sites, mainly on the south-eastern fringe of the city. The latter include the Oxford Business and Oxford Science Parks which, together with established employment in their vicinity, means that the proposed South Oxford SDA is well served by local employment opportunities. The CS refers to the possibility of further employment land being allocated as part of the SDA (3.4) but this option is not recommended since the area is relatively distant from most of Oxford's residential population (as well as Botley and Kidlington) and is also poorly located in terms of accessibility by public transport from other towns in Central Oxfordshire.

The previously approved West End Area Action Plan includes limited provision for additional employment (800 jobs to 2026) as part of its vision for a regenerated mixed use quarter of the city centre. Its policies include continued application of stringent demand management policies taking advantage of the exceptional accessibility of the location. However it is may be questioned whether the wider transport implications of the limited employment provision have been sufficiently recognised (since the Plan was considered in advance of the city's Core Strategy) given that the corollary is the much greater provision now proposed at Northern Gateway (estimated 3,150-3,750 jobs) in a much less sustainable location. In particular it is arguable whether the fullest possible recognition has been given to the guidance in PPG13¹⁹ that local authorities should seek to make maximum use of the most accessible sites such as those in town centres and others which are close to major transport interchanges, given that such opportunities are scarce. The West End offers incomparable sub-regional and regional accessibility by virtue of its proximity to Oxford Rail Station, Gloucester Green Coach Station and the position of the city centre as a nodal point in the city and county's bus network. This advantage is reflected in the evidence of current commuting behaviour reported earlier.

The Northern Gateway proposal takes advantage of one of the few large developable sites within the city, much of which (as a consequence of its proximity to the elevated A34 and other main roads) is not suited to residential development. The site abuts the northern residential area of the city (and hence would offer valuable additional local job opportunities) and is on a major bus corridor from the city centre. It is well-placed to serve towns such as Witney, Woodstock, Kidlington and Bicester in a northern arc of Central Oxfordshire – closer than the city centre and much more accessible than the employment concentrations in the east and south-east of the city. By virtue of its focal position near the junction of a number of radial roads entering the city it has (or could have given relatively minor alteration of routes) direct and frequent bus services from these towns.

However there are a number of major transport disadvantages associated with the site. In policy terms it contravenes Government guidance that major generators of travel demand should be focused in city, town and district centres and near to major public transport interchanges²⁰. No evidence is presented that all such opportunities have been exhausted as far as the core area of Central Oxfordshire is concerned (ie including places such as Botley/North Hinksey which are just outside the city's administrative boundary). In particular it seems surprising that policy CS9 should propose land at Summertown (the designated district centre for the northern sector of Oxford) as a contingency site for residential rather than employment development. (If allocated for employment it might be compensated for by a greater residential component at Peartree instead.)

Being located outside a designated centre the City Council's currently approved parking policy would imply that much more generous parking standards are applicable to the Northern Gateway site²¹. (It is possible the AAP could propose some variation of this and Policy CS6 now makes explicit reference to incorporating a "balanced package of transport mitigation measures"). Notwithstanding the promotion of alternative modes envisaged in the Framework Travel Plan²² the absence of restraint levels comparable with those in established centres would mean that in practice a majority of trips generated by the 3000+ workers – and a large majority of their travel – would be by car. The propensity of a peripheral development such as this to provoke car use is exacerbated by virtue of its position next to the Oxford Northern Ring Road and junctions with the A34, A40 and A44. Such a location on the strategic road network means that an unusually high proportion of longer distance car trips is likely to be generated.

The immediate consequences of the proposal in worsening already congested traffic conditions in the vicinity have been commented on by both the County Council and the Highways Agency¹⁷. The fact that it would take particular advantage (ie reduce the effectiveness) of scarce public highway investment planned as part of the Access to Oxford package to serve the city and sub-region more generally is a particularly serious criticism.

The highway authorities have indicated that, as per standard practice, they would expect the consequences of 'residual' traffic generated by the development to be mitigated through works funded by the developer. Even if this proves affordable it is undesirable for more general traffic and environmental reasons that significant additional car mileage is facilitated in this way. It needs to be emphasised that whilst the CS intentions for securing attractive accessibility by non-car modes to the site are laudable these forms of travel are at an inherent and pronounced disadvantage relative to the car at such a location.

There are two further observations to be made about the Northern Gateway proposal

- i) its implications for the existing Peartree Park and Ride site
- ii) its relationship to railway development proposals on the Oxford-Bicester line ('East West Route')

The presence of the Park and Ride site within the proposed Northern Gateway AAP poses both problems and opportunities. Such a large volume of free parking effectively invalidates any attempt to limit parking spaces amongst development in the vicinity. (Difficulties of this kind have been reported in connection with people working in the North Hinksey area using the Seacourt P&R site). Arguably the Peartree P&R also militates against a cohesive layout of new development in the area east of the A44 linked with the existing Lakeside residential area. However development in this area could provide the opportunity

- a) to move the P&R site to within the A40/A44 enclave which is more 'cut off' and subject to higher noise and pollution levels, thus releasing a valuable tract of developable land and/or
- b) to replace it with a remote site in the A40 (Witney) corridor (with developer funding from the vacated site contributing to both this and associated bus priority measures along the corridor)

Under either of these scenarios the P&R bus service would continue to provide a fast link to the Northern Gateway from the city centre and Summertown (South Parade).

The eastern boundary of the Northern Gateway is defined by the Oxford-Bicester rail line. Whilst plans for the development of this line as part of the longer-distance East-West Route continue to be worked on by a consortium of local authorities Chiltern Railways has announced its intention to upgrade the Oxford-Bicester section as part of a new half-hourly service to London Marylebone via High Wycombe with an intermediate station at Water Eaton. This station will serve a wide residential catchment on the northern side of Oxford. It will also provide access to employment in the Kidlington and North Oxford areas from a wide sub-region, with the possibility of future extension to Milton Keynes.

By comparison with road-based services rail offers a faster and more reliable option which is more attractive to people who might otherwise drive. However to capitalise on this (as far as in commuters are concerned) the convenience of the final journey stage from a station is critical. Ideally, as with Oxford's West End, destinations should be within a short walking distance. In overall planning terms any strategy for the northern fringe of Oxford which includes both a major employment development and a new station should attempt to bring the two together at the same location. The current separation of the Northern Gateway and Water Eaton proposals is clearly sub-optimal in this respect. (Even if a bus service were operated to connect the two it would have the effect of adding 20-30 minutes to overall journey times). Since both proposals are only at the initial planning stages it would seem reasonable to expect that the options of co-location were examined, viz either

- a) development of the intermediate station at Peartree rather than Water Eaton, or
- b) employment development at Water Eaton rather than Peartree (possibly incorporating partial or wholesale relocation of the existing P&R site in the manner suggested above for Peartree)

Set against the current proposal for Northern Gateway there would seem to be two kinds of alternative, both of which are likely to deliver a much more satisfactory transport outcome. (The exact content of these suggestions is necessarily illustrative)

Alternative A

- Greatly reduce the proposed employment development at Peartree, possibly confining it to the relocation of emergency services for which a special case can be made
- Explore the scope for its contribution to employment requirements being met instead at a combination of other locations within the wider Oxford built-up area where a more stringent demand management regime could be applied within the existing policy framework, eg Summertown, Botley/North Hinksey and Water Eaton. (Such a distribution would also help address the Highways Agency's concerns about the over-concentration of generated traffic on to a single A34 junction)
- Consider development of the area east of the A44 for predominantly residential development, coupled with the relocation of the present P&R site

Alternative B

- In partnership with the highway authorities and other transport agencies reconceptualise the Northern Gateway proposal as a truly sustainable public transport-led development, incorporating a demand management regime comparable with established centres within the city and capitalising on the unique opportunities presented by its location
- Examine the practicability and relative merits of siting the proposed intermediate station on the Oxford-Bicester rail line at Peartree rather than Water Eaton
- Utilise developer funding for transport improvements in the area not to increase capacity for general traffic but manage traffic queues and provide for congestion-free routes for bus/coach and emergency services. [This assumes no workplace or road user charging measures are brought forward as part of a general transport management strategy for Central Oxfordshire]
- Relocate the Peartree Park and Ride car park at one or more locations within the A40 (Witney) corridor coupled with the introduction of bus priority measures [subject to the same charging proviso] and a dedicated express bus service to/from the city centre which also serves the Northern Gateway site

5 Conclusion

In summary this assessment concludes that the new developments proposed in the CS are consistent with its strategic objective that they should be in accessible locations, to minimise overall travel demand. However, in the context of traffic projections for the city as a whole, no overall demand management strategy has yet been identified which is practicable and politically supported which would be sufficient to make possible realisation of the City Council's vision for an improved quality of life and public realm.

Whilst the Strategy contains many elements designed to improve the scope for travel by means other than the car it does not pursue fully the measures needed to actually reduce car use. It follows that the potential to 'maximise Oxford's contribution to tackling the causes of climate change and minimise the use of non-renewable resources' remains to be realised.

The proposed employment-led Northern Gateway strategic development can be interpreted as contravening national policy guidance. Whilst the location has some particular advantages the amount of car travel which the development may be expected to generate has serious implications for traffic conditions in the immediate vicinity and for traffic flows, environmental conditions and carbon emissions more generally. To date no evidence has been supplied to demonstrate that all other options (taking account of opportunities within the wider built-up area of Oxford) would be even less satisfactory, ie sufficient to justify over-riding the objections noted.

Further work is recommended on this aspect of the strategy and suggestions have been put forward as to the directions these might take. Whilst the Northern Gateway proposal as currently envisaged undoubtedly presents a major transport problem it is possible that a more broadly-based examination of the issues it invokes could act as the catalyst to generating the step-change in transport thinking which Central Oxfordshire needs.

Notes and references

1. The work generating indicators from Census data has been undertaken by Stephen Brown, Research Associate at the Department of Planning, and is gratefully acknowledged.
2. *Reducing Transport Emissions Through Planning* Report by Ecotec Research and Consulting Ltd to the Departments of Environment and Transport HMSO 1993
3. *PPG13: Transport* Department of the Environment 1994 The extant version was revised in 2001 and included provision for Transport Assessments and Travel Plans. The guidance on parking standards is proposed to be removed in draft *PPS4 :Planning for Sustainable Economic Development* 2007. A more up-to-date expression of national policy in relation to housing development is contained in *PPS3 : Housing* 2006
4. *Impacts of land use planning policy on transport demand and congestion* Report by WSP Policy and Research for Department of Transport 2005
5. A comprehensive review of contemporary international literature in this field was included in the research project *Settlement Patterns and the Demand for Travel* led by Halcrow Group for the Commission for Integrated Transport in 2008.
6. *The Location of New Residential Development : Its Influence on Car-based Travel* by P Headicar and C Curtis in (ed) D Banister 'Transport and the Environment' E & FN Spon 1998
7. *The Exploding City Region : Should It, Can It, Be Reversed?* by P Headicar in (eds) K Williams et al 'Achieving Sustainable Urban Form' E & FN Spon 2000
8. *Same Place- Two Worlds?: A comparison of travel behaviour between households in established and new developments* by M Higgitt and P Headicar; Paper to Seminar D European Transport Conference, Cambridge PTRC 2000

- 9 *Brown-field Development and Reducing the Need to Travel : A Study of The Waterways, Oxford*
Stephen Brown MSc dissertation Oxford Brookes University 2004
- 10 Didcot is special case in that uniquely, for residents of the surveyed new estate, some of the longer distance commuting journeys are made by train utilising the frequent, high-speed services available from Didcot Parkway which lies within walking distance. This estate would seem particularly attractive to new residents for whom commuting by rail (mainly to Oxford, Reading and Central London) is a feasible option. In absolute numbers however these represent only a small segment. It follows that the figures for rail (and hence the overall car driver distance per worker) will be subject a large margin of error depending how many from this segment were included in our sample – this not being a dimension which was controlled for. The figures derived from the 2001 Census reported later are a much better indicator of commuting behaviour from the town more generally.
- 11 In addition to the three country towns the urban area of Wantage and Grove has been identified more recently as a location for major housing growth. In 2001 residents of this area generated greater car use for commuting than each of these towns. If the figures for the three wards concerned are added into those for the Country towns in Table 3 the average car mileage per worker is increased from 10.9km to 11.3km.
- 12 In these columns the figures are a weighted average of those of the individual towns based on the number of wards they contain (ie five in Bicester and Witney and four in Didcot). The figures calculated for the individual towns do however reflect the number of workers in individual wards. This simplifying assumption is sufficient to demonstrate the distinctive features of Oxford City and the country towns although if the actual total number of workers in each town were used to calculate the overall average the figures would be slightly different.
- 13 In this section the detailed references to the ‘Core Strategy’ are as presented in the ‘Proposed Changes to the Submission Core Strategy’ document published by the City Council in April 2009
- 14 *Background Paper B: Spatial Strategy* Appendix 1 ‘Estimated increase in Oxford’s workforce and employment’
- 15 Halcrow Group Ltd *Central Oxfordshire Transport Model Analysis: Oxford City LDF Testing Version 2* June 2009
- 16 *Background paper D(ii): Transport and Accessibility* Appendix 3 ‘Key transport schemes affecting Oxford’
- 17 Letter dated 15 October 2008 from Tamsin Atley on behalf of the County Council responding to consultation on the Proposed Submitted Version of the CS and a similar letter dated 16 October from Paul Robinson of the Highways Agency
- 18 Nathaniel Lichfield and Partners *Oxford Employment Land Study* 2006
- 19 ODPM *PPG13 Transport* 2001 para 21
- 20 *Ibid* para 20
- 21 Oxford City Council *Parking Standards TAs and TPs Supplementary Planning Document* February 2007. This specifies a general maximum of 1 space 35m² or 1 space per 2 staff for office development (B1a). However maximum provision in Transport District Areas is reduced to 25% of this and in the City Centre to operational requirements only.
- 22 Northern Gateway Framework Travel Plan 2008