

# Royal Borough of Kingston Local Implementation Plan

## Environmental Report

### Introduction

1. Strategic Environmental Assessment (SEA) is a process to ensure that significant environmental effect arising from plans and programmes is considered from the earliest stage of Plan development. Individual projects above a minimum size threshold have been subject to Environmental Impact Assessment for several years but there has been criticism that such assessment takes place too late and ignores the cumulative impact of smaller schemes. The EU has therefore accepted the need for assessment of environmental impacts from the outset when strategies and plans are being devised. The legislation came into force in the UK in July 2004 and the Local Implementation Plan (LIP) for the Mayor's Transport Strategy is the first Council plan to require SEA.
2. Environmental effects need to be identified, assessed, mitigated, communicated to decision-makers, monitored and opportunities for public involvement need to be provided. This report provides the opportunity for the public to see how the assessment has been done for the Borough's transport plan and what it has concluded. During its preparation four statutory environmental consultees, the Environment Agency, English Nature, the Countryside Agency and English Heritage were invited to offer their views. The Environment Agency took up that offer, submitting a useful checklist of issues they felt the LIP should cover.

### Identifying environmental effects

3. The starting point for an assessment of environmental effects of the LIP is to define our current environmental position; more precisely to establish our environmental baseline and how that would develop independently of the LIP. We can then compare the expected impacts of the Local Implementation Plan in terms of absolute change from the baseline and in terms of divergence from the business as usual scenario. However it must be understood that transport activity has seriously harmful impacts on a range of environmental topics. Where the harm will be reduced by the LIP proposals this is deemed a 'positive' impact. Since environmental improvement is one of the underlying objectives of the LIP, positive impacts will heavily outnumber any negative impacts of the Plan. The SEA process has been used during LIP development to date to maximise those positives and keep the negatives within reasonable limits through mitigation measures.
4. An interesting issue arises where the LIP strategy includes continuation of past practice in some specific area that does generate substantial environmental impact. It could be argued that the proposed strategy will have no impact on the business as usual scenario so the environmental effects need not be considered.

The Council feels this would go against the spirit of SEA and takes the view that a conscious choice to continue past practice within the new strategy should be assessed for its environmental effect per se, not the change in environmental effect. The scope of the SEA was designed to concentrate attention on significant effects, so some of the topics that were initially considered do not feature in the assessment section of the environmental report. The starting list of topics considered included:

- Bio-diversity including flora and fauna
- Population
- Human health
- Soil
- Water
- Air
- Climatic factors
- Material assets
- Cultural heritage, including archaeological and architectural heritage
- Landscape
- And the interrelationship between these factors.

5. The LIP does not propose large-scale construction projects that require demolition of buildings or use of Metropolitan Open Land or conservation sites. Minimal land take by new transport infrastructure is assumed and steadily tightening air quality and noise emission standards will reduce the impact of individual vehicles. On this basis, making more efficient use of existing assets and keeping traffic levels broadly level in the Borough, as a whole, will have a neutral or slightly positive impact on the Borough's soil, water, cultural heritage and landscape. To the extent that the LIP can reduce traffic levels, additional benefits will be enjoyed. There will be intensified attention to reducing contamination of watercourses and soil from transport activities e.g. spraying, salting, surface run-off. The LIP will contain policy objectives to manage and maintain the Borough transport network in a manner that favours biodiversity e.g. green corridors along road verges and associated boundaries such as rail lines and watercourses. It will accord with existing UDP policies on trees and biodiversity that aim to protect what we have and enhance wherever possible (policies BE9 and STR7a).
6. As no negative effects and at most modest positive effects are foreseen for the four topics discussed in paragraph 5 the Environmental Report will now concentrate on the topics where significant effects can be contemplated. These are biodiversity, air, climatic factors, human health (under which casualties, noise and obesity are dealt with), material assets and streetscape issues. It will also address the interrelationship between these factors. In general it is not practical to quantitatively forecast environmental variables in the absence of the LIP and contrast that with a LIP based forecast. This can in most cases only be done in qualitative terms.

## Environmental Baselines, Problems and Opportunities

7. For each of the 'significant effect' topics the report records the main problems applying to the Borough, identifying the role of transport in these and any situation where the LIP strategy could worsen the effects. All available baseline data quantifying the current state of affairs is then provided and opportunities to improve matters through the transport strategy proposed in the LIP are discussed.

### Biodiversity

#### Problems

8. Reconciling the transport and access needs of a resident population exceeding 150,000 with bio-diversity objectives inevitably involves finding a solution that keeps impacts within certain bounds. Zero impact is not an option while mankind survives on this planet. Zero biodiversity loss in future is a Community Plan target but can only realistically be seen as zero net loss, achieved through mitigation to ensure that any loss at a site is, as a minimum, matched by equivalent biodiversity gain elsewhere.
9. There are two main categories of impact, those arising from transport infrastructure and those from use of vehicles. Roads and railways tend to form linear barriers to wildlife moving across them. For all such species this can lead to isolation in pockets of habitat too small to permit a healthy population and a reduction in overall population viability. Any new road or car park construction further reduces the non-built up proportion of the Borough, chipping away at existing habitat. The emphasis on reusing brownfield sites means that new access roads and parking space does not normally result in losing pristine habitat. 100% of residential development in the last two years has been built on brownfield sites. The Council is aware that some brownfield sites support locally important habitats and species especially invertebrates, reptiles, and birds and anything that predates on these. This will be a consideration in development control decisions on such sites. In all cases a baseline ecological assessment will be undertaken using rigorous survey methods.
10. Transport infrastructure is largely a historical legacy that cannot be removed. Land take from additional infrastructure will be modest in future because, even if the Council wished to build significant new roads it would be faced with probably insuperable constraints arising from the existing built environment and protected open space. Rail line construction faces similar constraints, though on some rail corridors widening could be envisaged. The main form of landtake will be small scale and piecemeal, often resulting from efforts to encourage sustainable transport. The local effects on biodiversity can be negative even though, at Borough level, positive impacts are derived. For example a bridge for cyclists over the Hogsmill at Elmbridge meadow was constructed on a nature reserve with important water vole habitat thus affecting an area managed for this species. Roadside grass-verges may be partly or fully converted to accommodate cycle paths. Where verges are bounded by hedges, trees or semi natural habitats these can act as corridors for plant movement; they encourage flora attracting insects such as bees and can provide foraging for seed eating birds. They maximise the land's ability to provide water storage capacity, helping alleviate local flooding.

11. Where bonded gravel paths are constructed through green spaces to encourage walking some species will lose due to the fragmentation of habitat while others like reptiles and some invertebrates, and invertebrate feeders such as pied wagtail, may gain. If the paths are constructed for cyclists the habitat fragmentation is more significant, careful consideration will be given to the siting of such paths especially through ecologically sensitive areas. All replacement of natural ground by hard surfaces, including conversion of front gardens for parking will have an effect on water storage capacity and will increase storm water run off. In severe cases this leads to sewage polluting rivers, as in a recent episode locally where tens of thousands of fish were killed in the Thames. High water levels can also harm breeding birds such as grey wagtail and moorhen in streams and rivers when their nests are washed out following heavy summer rainfall. This becomes more serious where scheduled birds such as the kingfisher and other birds on the red list of conservation concern are affected.
12. Impacts on biodiversity from use of vehicles and the maintenance of infrastructure are substantial. Air quality is affected by vehicle emissions though rarely at levels sufficient to harm plants. Some vehicle emissions, notably nitrogen, can enrich soils; this would only tend to be a problem where an ecosystem was based on poor soil.<sup>1</sup> High ozone levels can also affect sensitive ecosystems. Wildlife can be affected; indicators such as butterflies demonstrate this on roads with high traffic flows. A sporadic but often more serious problem is contamination of watercourses and soil from surface run-off containing oil and fuel, heavy particulates, brake lining dust and heavy metals from catalytic converters. This all has a devastating effect on the fish population, and the aquatic plant life which supports invertebrate populations. Gulley pots have traps that collect silt and heavy pollutants but these will only help if they are cleaned out regularly. A second source is salt washed from roads after winter maintenance. Salt and grit sprayed beyond the carriageway can damage bio-diversity along verges or lead to salt tolerant species becoming established.
13. Grass and hedge cutting beside roads, cycle tracks, bridleways, rail corridors etc is damaging to some extent. Policy on alleyways and bridleways is to wait as long as possible, to the end of the breeding season to reduce impact on nesting birds. Roadside verges are cut one metre in. Spraying herbicides on weeds growing on or at the back edge of the highway is necessary to protect their roots breaking up the pavements and roads. The first spray of the year is on the back edge (up to fences walls etc), and applied from backpacks with care taken to prevent the chemicals reaching drains or watercourses. Two more 'contact' sprays per year, in April and July/August, use weak chemicals to kill visible weeds in gutters, on pavements and at the back edges. Local authorities only use glyphosate in public areas for health and safety reasons.
14. Noise from vehicles and road lighting schemes (this is more obvious when walkways and cycle paths are lit during the hours of darkness) disturbs some species while others appear to adapt successfully, especially resilient urban species. Roadkill can affect populations of mammals, reptiles and birds.

---

<sup>1</sup> Paras 3.39 to 3.42 and 5H.9 of the Mayor's Air Quality Strategy.

## Baseline

15. There are 1,260 hectares of protected open space in the Borough, 13 sites of importance for Nature Conservation at Grade 1 and 15 at Grade 2. There are also nine Local Nature Reserves (LNR) and one proposed LNR. These designations virtually preclude any transport-related development within their boundaries. They should also ensure minimisation of transport-related disturbance or pollution that could arise from a new development in surrounding areas. However existing infrastructure and its use (including intensified use) does pose a significant problem. Richmond Park adjoins the northern boundary of the Borough and is a Site of Special Scientific Interest (SSSI) and a National Nature Reserve. It is being managed in such a way as to reduce road traffic in the Park and this objective is compromised by traffic using Park roads during daylight hours that would otherwise be on RBK's roads. Given that the Council has resisted the Royal Parks Agencies proposals for gate closures and has sought to retain a through traffic facility the existing environmental impact on wildlife and biodiversity must be deemed negative.
16. The margins of railway lines are largely free of disturbance from people and often form valuable wildlife habitat. The railway lines running through the Borough are specifically identified as green corridor in the UDP. Between them they link Wimbledon to the green belt at Chessington and intersect with the Hogsmill Valley green chain.

## Opportunities

17. The LIP strategy entails a 'no net loss' approach to any new build or maintenance activity so that, if loss of trees or important habitat is unavoidable at a site, mitigation measures, including replacement, and new habitat schemes take place at another location. Where construction of car parking at new developments, or conversion of front gardens for parking is proposed, and the Council have powers to permit or refuse (restricted to conservation areas), the drainage implications will be a consideration and permeable designs will be favoured.
18. The Borough Policy Statement in chapter 3 includes "The Council will ensure that, during all types of highway maintenance, contractors and council officers use the latest techniques to reduce contamination of watercourses and soil and to manage and maintain the network in a manner that favours fauna and flora e.g. green corridors along road verges." The LIP should ensure that the Biodiversity Action Plan Partnership works with the highways grounds maintenance contractors to provide good practice guidance on managing highway verges with wildlife in mind.
19. The Council is experimenting with coated salt crystals that help neutralise the burning effect of salt sprayed on roads, yet retain the de-icing properties. Costs per tonne are about 45% higher but if the trial is successful winter maintenance strategy in the LIP will see full conversion to this type of salt. New designs of salter and gritter that began operating in 2004/05 use low throw spreaders so that more stays on the carriageway and less reaches verges or adjoining properties.

20. The LIP contains a target to reduce traffic levels in the Borough by 5% between 2001 and 2011. This could offer scope to reduce traffic impact in Richmond Park by making daylight hours use of RBK alternative routes more acceptable. Other aspects of the LIP will tend to reduce average traffic speeds, which in turn reduces noise and the probability that birds and mammals are killed on the roads.

## Air Quality

### Problems

21. London's air quality is the poorest in the UK and amongst the worst in Europe. Poor air quality is significant cause of ill health and early death in London. It is estimated that 1,600 deaths are brought forward and 1,500 breathing problem-related hospital admissions per year occur as a result of air pollution. The RBK population is 2% of London's so the RBK share of these totals can be estimated at 32 deaths brought forward each year and 30 hospital admissions.
22. The table below shows a fall in air emissions between 1999 and the projections for 2005. Substantial reductions are expected for all the noxious pollutants.

Table 1: RBK Air Pollution Emissions 1999 and Projected Emissions in 2005 (Tonnes)<sup>2</sup>

Year	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	VOCs	Benzene	Butadiene	Particulate Matter
1999	32.1	1,077	3,651	1,241	31.7	8.7	41.3
2005	9.6	807	1,773	1,023	15.9	3.0	29.9

23. 58 per cent of the nitrogen dioxide (NO<sub>2</sub>) and 68 per cent of fine particle (PM<sub>10</sub>) emissions in London are from road transport. These pollutants are of the greatest health concern, particularly for the most vulnerable – the very young, older people and those with heart and lung conditions. Air pollution is also detrimental to the built and natural environment. Reducing pollution from individual vehicles and reducing overall traffic levels is therefore the focus of the Mayor's Air Quality Strategy and is an objective of the Council's Local Implementation Plan.
24. In RBK the concentrations and forecast trend for six types of air pollutant have been assessed using modelling techniques and compared to permitted limits which apply from a variety of dates. In four cases modelling shows all limits will be met. In two cases the assessment forecast exceedences, of the permitted "annual average" for nitrogen dioxide and for the "24 hour mean" for small (PM<sub>10</sub>) particles at particular locations. The pollutants concerned, their limits and the relevant dates appear below.

<sup>2</sup> Source GLA, reported in South London Sub-Region Databank

Table 2: Air quality permitted limits in 2004/05

Nitrogen Dioxide	200 µg/m <sup>3</sup>	1 hour mean (not exceeded more than 18 times per annum)	31 Dec 2005
	40 µg/m <sup>3</sup>	Annual mean	31 Dec 2004
Particles PM <sub>10</sub>	50 µg/m <sup>3</sup>	24 hour mean (not exceeded more than 35 times p.a.)	31 Dec 2004
	40 µg/m <sup>3</sup>	Annual mean	31 Dec 2004

Tighter standards for particles will be required by the end of 2010 as follows:-

Table 3: Air quality permitted limits for 2010

Particles PM <sub>10</sub>	50 µg/m <sup>3</sup>	24 hour mean (not exceeded more than 10 times per annum)	31 Dec 2010
	23 µg/m <sup>3</sup>	Annual mean	31 Dec 2010

25. Specific areas in RBK which exceed the AQS objective include major roads across the borough and parts of roads including:
- A3 (Kingston by pass)
  - A307 (Richmond Road, Kingston Hall Road/ Wheatfield Way/ Clarence St)
  - AA238 (Coombe Road/ Coombe Lane West/ Cambridge Road)
  - A308 (Wood Street/ Kingston Street/ Kingston Road/ Cromwell Road/ Queen Elizabeth Road/ London Road/ Kingston Hill)
  - A240 (Ewell Road/ Broadway/ Kingston Road/ Kingston Vale)
  - A243 (Hook Road)
  - A2043 (Kingston Road/ Malden Road)
26. A further Stage 4 assessment has been undertaken together with an updated screening assessment [USA].<sup>3</sup> The revised modelling predictions confirm the earlier findings that the annual mean nitrogen dioxide and daily mean PM<sub>10</sub> objectives will be exceeded in some areas of the borough. This vindicates the earlier decision to declare the whole Borough as an Air Quality Management Area (AQMA) since local solutions such as diverting traffic where there are exceedences could be impractical, or only serve to move the problem elsewhere. Whilst some fine particles (PM10) may be imported from outside the Borough, and other local sources contribute to some degree, the principal particulate source in the Borough is from road vehicles exhaust emissions. The stage 4 assessment confirms the importance of road traffic to NO<sub>x</sub> levels and, based on the median result at the locations investigated, 21% of the total contribution is derived from background sources of NO<sub>x</sub> and 79% from road transport.

<sup>3</sup> In accordance with section 84(1) of the Environment Act 1995

## Baseline

27. Across London sites there has been a fall of around 33% in the  $\text{NO}_x$  concentration over the period November 1996 to November 2003. This is the result of reduced  $\text{NO}_x$  emissions due to technological changes in the vehicle fleet. The overall fall in  $\text{NO}_2$  concentrations does not match those of  $\text{NO}_x$ ; it shows little change over the period, falling by 6%. For RBK the 2003 concentrations and the trend since 1998 are shown for both  $\text{NO}_2$  and  $\text{PM}_{10}$  in the following charts. For  $\text{NO}_2$  21 ppb equates to  $40 \mu\text{g}/\text{m}^3$ . For  $\text{PM}_{10}$  the limits should not be exceeded on more than 35 days per year.

Figure 1:  $\text{NO}_x$  levels in Royal Borough of Kingston (A3 site)

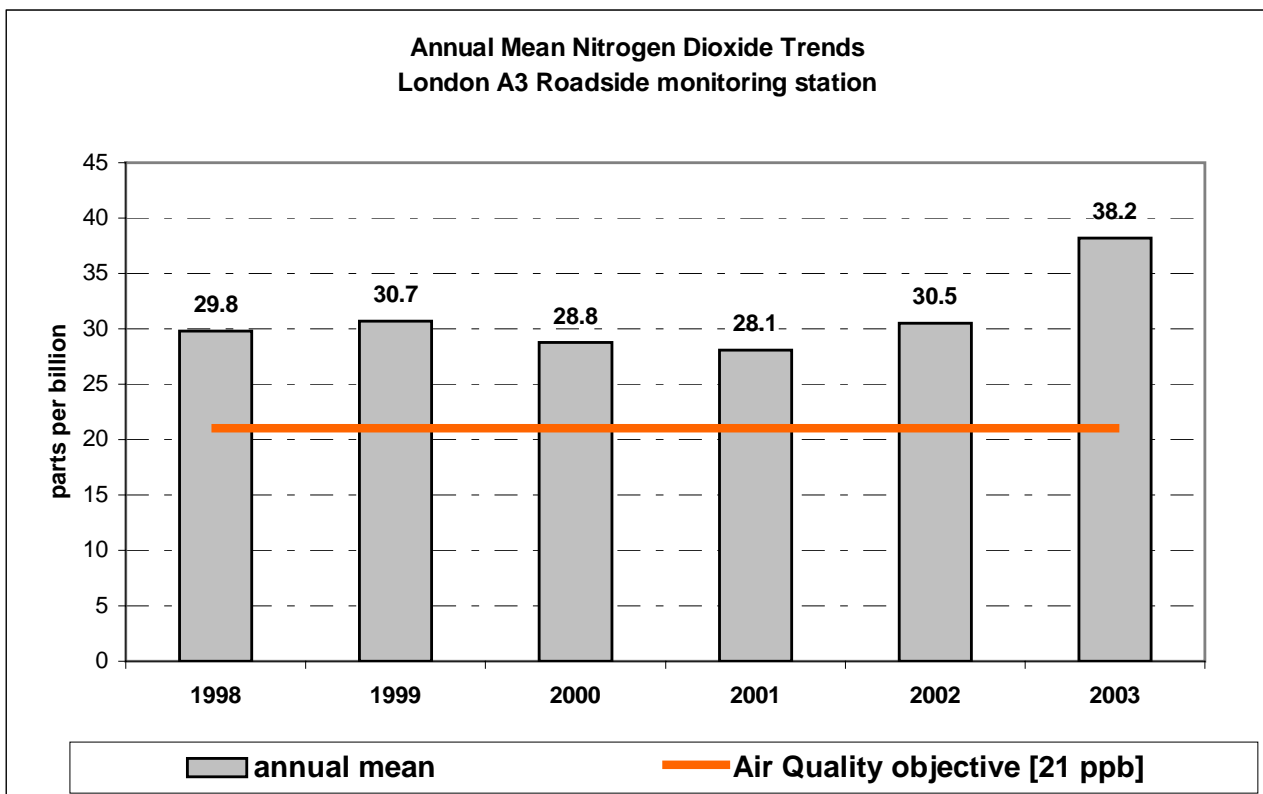
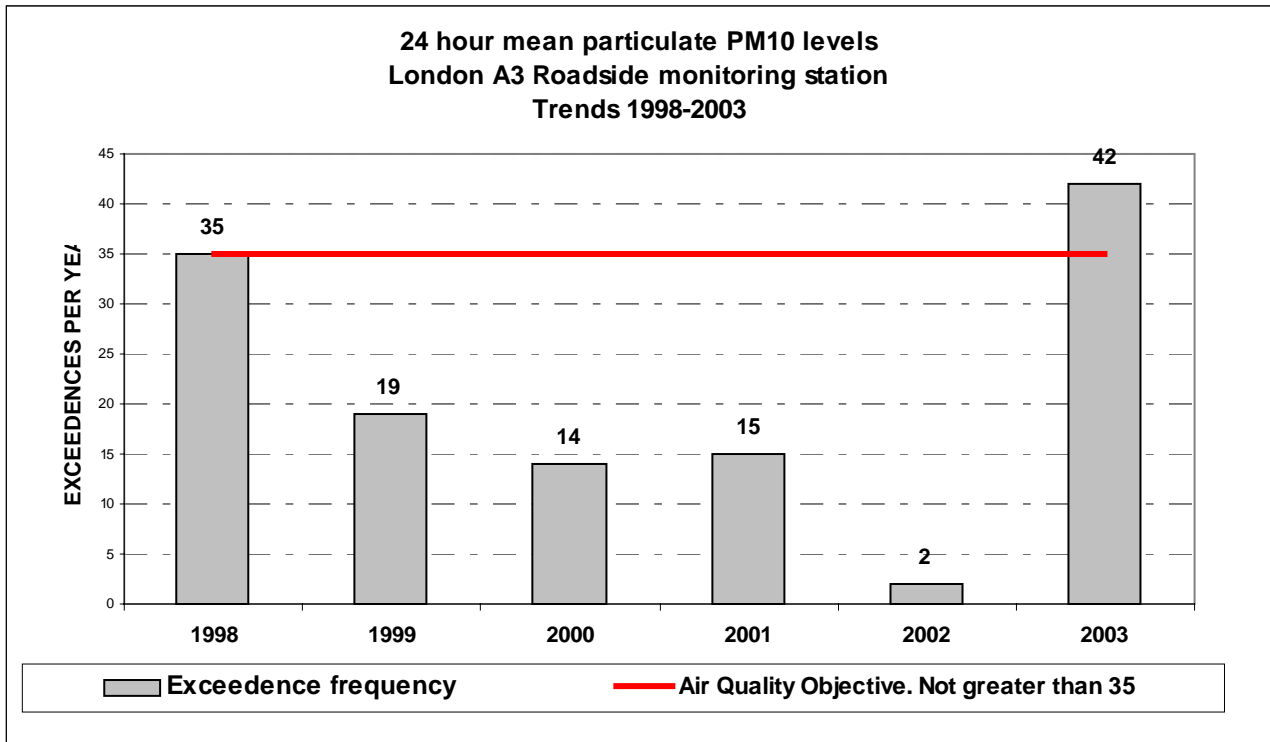


Figure 2: PM10 levels in Royal Borough of Kingston (A3 site)



The 2003 PM10 level jumped after a declining trend and was almost certainly inflated by nearby road works. However 2003 was a bad year for air quality as the Nitrogen Dioxide chart shows. Results from other London sites confirm that pollution for 2003 was worse than other years at most sites as a result of the heatwave and photochemical episodes during the year.<sup>4</sup> 2004 results should revert to trend. Provisional 2004 results for annual mean NO<sub>2</sub> (µgm<sup>-3</sup>) and daily mean PM<sub>10</sub> exceeding 50 µgm<sup>-3</sup> at the A3 site suggest this occurred. They are shown with earlier years for comparison.

**NO<sub>2</sub>**

1999	2000	2001	2002	2003	2004
59.0	55.4	53.0	58.0	72.6	63.0

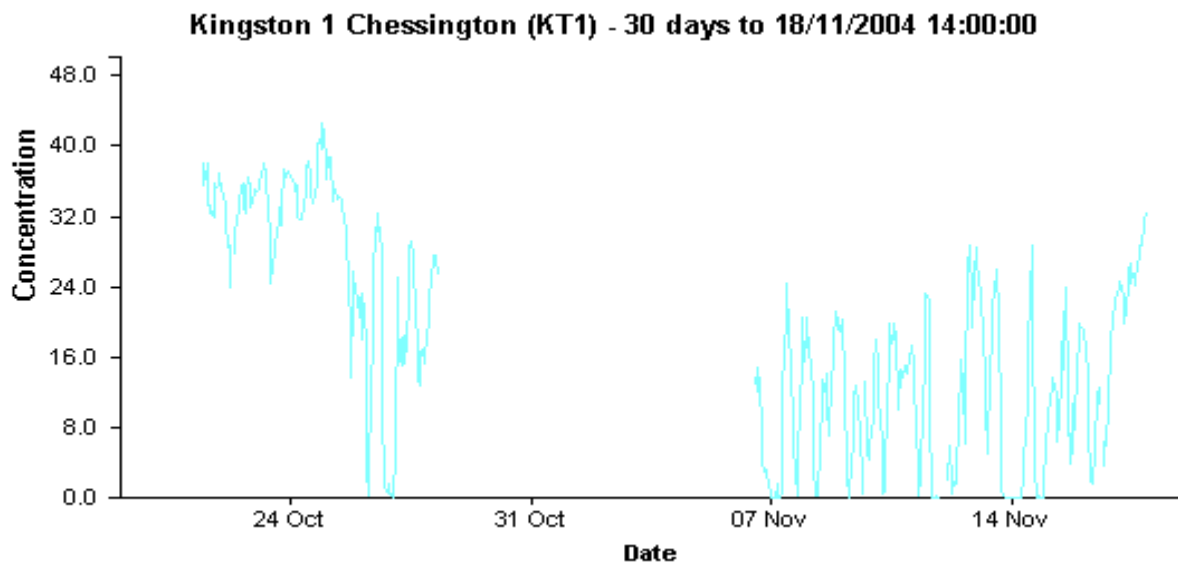
**PM<sub>10</sub>**

1999	2000	2001	2002	2003	2004
21	16	15	3	43	14

<sup>4</sup> Stage 4 assessment, page 14

28. A further pollutant with health implications is ozone. Because this is a secondary pollutant, generally created by chemical reactions among other pollutants and oxygen in the air there are no exceedence limits the Council must meet. However there is a provisional EU limit value that a daily (8 hour mean) maximum figure of  $100 \mu\text{g}/\text{m}^3$  should not be exceeded more than 10 times per year. There is baseline data from a monitoring site in Chessington. An example of the output is shown in the chart below and current readings are accessible via [www.londonair.org.uk](http://www.londonair.org.uk) Ozone is normally highest in rural areas so this suburban site should detect higher readings than the average across the Borough.

Figure 3: Ozone levels in Royal Borough of Kingston (Chessington site)



### User friendly measures of local air quality

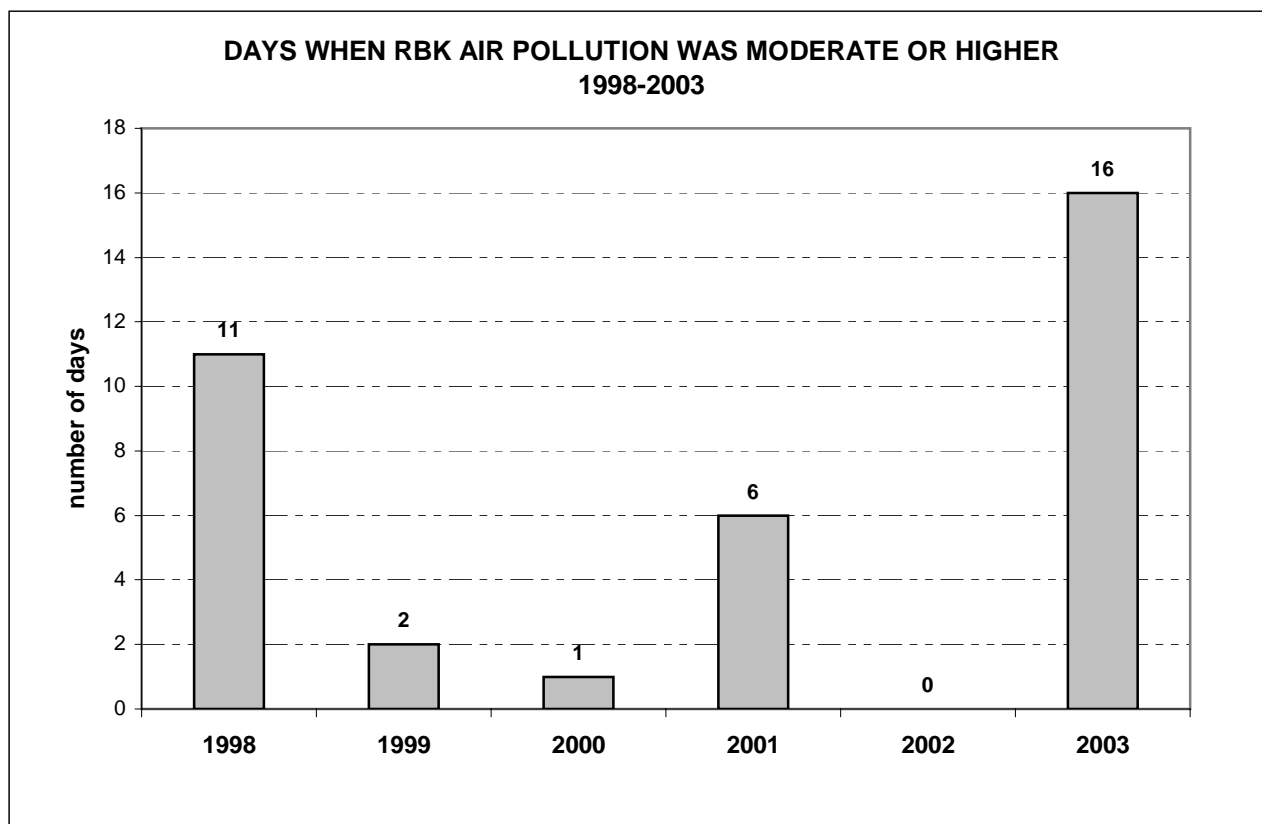
29. A general assessment of forecast daily air quality, region by region, on a ten-point index is produced by the Met Office. The Kingston one is available on the following web site <http://www.bbc.co.uk/weather/5day.shtml?id=2327>

#### Key to the Index

1 – 3 (Low)	Effects are unlikely to be noticed, even by those sensitive to air pollution
4 – 5 (Moderate)	Sensitive people may notice mild effects but are unlikely to need action
6 – 7 (High)	Sensitive people may notice significant effects and may need action to reduce or avoid them (for example by spending less time outdoors).
8 – 10 (Very High)	Effects are as for high, but symptoms may be worse, or may effect more people

The following chart shows the numbers of days per year moderate or high categories applied to the Royal Borough of Kingston.

Figure 4: Composite Air Quality Assessment for RBK



## Opportunities

30. Stage 4 assessment of air quality allowed different traffic level scenarios to be tested alongside a 'reduced emissions from technology improvement' scenario. In the following tables the outcomes are compared site by site in comparison to the base forecast for 2005. The 'no growth' scenario means no growth overall compared to the 2001 traffic level while the 'reduced traffic' means 5% decline in absolute levels of car use compared to 2001.

The outcomes for the reduced emissions and traffic reduction scenario were that fewer locations were predicted to exceed the Air Quality Strategy (AQS) objective than the base case scenario. Each scenario's effect is shown in isolation and this indicates that technology has more influence than traffic levels. As one would expect, the scenario with reduced traffic was more favourable than no growth and generally delivered 4% to 8% reductions against the base case. While all three scenarios reduce concentrations across the borough, none do so sufficiently to ensure that there are no areas that exceed the objectives.

Table 4: Predicted 2005 concentrations ( $\mu\text{g m}^{-3}$ ) of  $\text{NO}_x$  at the identified locations

Site number	Location	Base	Reduced emissions	No growth	Reduced traffic
1	Fairfield North Kingston (A307)	190.1	161.0	185.9	180.7
2	London Road Kingston (A308)	203.8	170.4	198.5	191.8
3	Wheatfield Way Kingston (A307)	130.4	110.9	127.6	124.1
4	Richmond Road (A307)	106.7	90.7	104.3	101.3
5	Cromwell Road (A308)	146.5	125.6	143.6	139.9
6	Kingston Hall Road (A307)	116.1	99.1	113.7	110.7
7	Nr. Tolworth Junction (A3)	150.5	121.5	146.1	140.5
8	Hook Road (A243)	154.3	125.5	149.9	144.3
9	North of Malden Junction (A3)	122.5	102.1	119.2	115.1

Table 5 Predicted 2005 daily mean  $\text{PM}_{10}$  objective at the identified locations

Site number	Location	Base	Reduced emissions	No growth	Reduced traffic
1	Fairfield North Kingston (A307)	63.0	53.0	61.0	58.4
2	London Road Kingston (A308)	91.4	74.3	87.5	82.8
3	Wheatfield Way Kingston (A307)	44.7	40.0	43.7	42.4
4	Richmond Road (A307)	41.6	37.5	40.7	39.6
5	Cromwell Road (A308)	42.8	38.8	41.9	40.8
6	Kingston Hall Road (A307)	38.9	36.0	38.2	37.3
7	Nr. Tolworth Junction (A3)	66.5	56.9	64.0	61.0
8	Hook Road (A243)	55.9	49.3	54.1	51.9
9	North of Malden Junction (A3)	41.6	38.3	40.7	39.6

31. The improved air quality derived from traffic reduction is one of several justifications for the LIP strategy on modal shift. The Council will increase efforts to promote modal switch away from inappropriate car use (especially on short journeys) and work to encourage cleaner vehicles using electricity or fuels such as LPG. A common misconception is that the air inside a car is cleaner than the air a pedestrian or cyclist breathes. Studies have shown that this is quite wrong. The Council needs to increase awareness of this fact and will include it in publicity encouraging people to walk and cycle more.
32. Large cuts in emissions from HGVs and buses will be an important factor in improving air quality. The Borough will benefit from the proposed London low emission zone that will prevent HGVs that do not meet the most modern emissions standards from entering London. This should come into force in 2007 and the Council includes a contribution to the LEZ enforcement task within the air quality LIP policy statement. The 8,000 vehicle London bus fleet is the cleanest fleet in the UK, with 90% meeting Euro II or III standards, compared with 78% in 2002. 79% of the fleet is fitted with particulate traps compared with 39% in 2002. TfL are responsible for this impressive progress and the Council supports their policies and intend to increase public awareness of the facts.

## Energy Use, Climatic Factors and Carbon Dioxide (CO<sub>2</sub>) Emissions

### Problems

33. Total energy consumption in London has been growing consistently during the last 40 years and transport is a major consumer. The Mayor's strategies for sustainable development and the environment set guidelines for the positive environmental impact sought from transport strategies. For example: *'the Energy Strategy sets a target for a 20% reduction in CO<sub>2</sub> emissions from 1990 levels by 2010.* This is a target related to emissions from all sources but in principle the Borough will aim to ensure the LIP contributes a fair share of the reduction i.e. that transport CO<sub>2</sub> emissions decline 20% by 2010. This requires a radical break from the national trend in which the UK's CO<sub>2</sub> emissions have, by 2002, fallen 10% since 1990, but within that the transport sector's emissions increased by 47%.
34. The role of transport is actually worse than these figures show because they exclude air travel other than take off and landing. Air travel has grown much faster than surface travel in the last two decades. Aviation accounts for just over 3.5% of total global CO<sub>2</sub> emissions but this could reach 15% by 2050 if growth is allowed to continue unchecked.
35. A recently recognised factor affecting global warming is that poor air quality has helped restrain the rise in temperatures. As improved air quality takes effect warming trends will become more severe, accentuating what is already the most serious long term problem facing the world. Although scientific opinion is virtually unanimous and many people are attempting to modify their lifestyles, western societies in general are still in denial about the problem. The necessary changes to use of energy in the course of personal transport have hardly begun.

### Baseline

36. Figures from the GLA indicate that total CO<sub>2</sub> emissions are expected to increase 13% in RBK between 1999 and 2005, reaching 479,000 tonnes a year. The Mayor wishes London to make a contribution to meeting the UK target of reducing CO<sub>2</sub> emissions by 20% below 1990 levels, by the year 2010. Motorised transport is responsible for about 20 per cent of all carbon dioxide emissions in London. For transport-related CO<sub>2</sub> emissions, road traffic accounts for 65%, rail and Underground for 25%, and aviation (landing and take off-cycles of domestic flights) for the remaining 10%. On those percentages, road traffic contributes 13% of carbon dioxide emissions in this Borough, though the proportion is likely to be slightly higher since the Borough lacks any Underground network and is more dependent on road traffic than average.
37. In RBK the main impact of climate change will be via flooding and the Council has Environment Agency maps showing those parts of the Borough vulnerable to a one in a hundred year flood. Large areas of housing in Kingston beside the Thames and Hogsmill Rivers feature.

## Opportunities

38. The LIP provides an opportunity to make a conscious choice about cutting energy use in the course of transport. Improved fuel efficiency of cars and, to a lesser extent, goods vehicles remains elusive because each advance tends to be matched by negative trends like increased use of 4 by 4 vehicles, air conditioning and other luxuries which make vehicles heavier. At the local level the Council has little opportunity to alter fuel efficiency so must seek a reduction in traffic levels in order to bring down CO2 emissions. It can and will improve fuel efficiency in its own small fleet of vehicles and the larger fleets of contractor's vehicles.
39. There is an opportunity to promote conversion to energy efficient lighting and other energy saving devices in public transport facilities, roadside lighting, and general street furniture. Solar panels could be installed in the roofs and south facing walls of Council car parks and in south facing noise barriers.

## Human health (casualties, noise and obesity)

### Casualties

#### Problems

40. The problems of most concern are casualty rates per mile among children and other vulnerable road users (VRUs) and the rise in absolute numbers of motorcycle casualties. While car design has increasingly protected occupants there has been insufficient attention to impacts on those struck by vehicles. In this respect the growth of 4 by 4 or SUV vehicles is a problem. They are generally 'less safe' for other road users and VRUs, in terms of restricted vision for their drivers (making collisions more likely) and the consequence of an impact. The LIP has specific and ambitious casualty reduction targets that benefit health very directly. As well as casualties averted there is a wider circle of benefits since all KSI casualties have consequences for families and friends.

#### Baseline

41. Full baseline data appears in the road safety chapter of the LIP. However data and targets for killed or seriously injured are shown here in table 6.

Table 6: Casualty Reduction Targets and progress as at 31 December 2003

Category	1994-1998 Annual Average Casualties	Number of Casualties in 2003	% reduction by 2003	% reduction required by 2010 from the 1994-1998 average	RBK target number of casualties in 2010
<b>Killed or seriously injured casualties</b>					
All	124	85	32%	40%	74
Pedestrians	32	25	22%	40%	19
Pedal cyclists	14	8	43%	40%	8
Powered two wheelers	22	19	14%	40%	13
Children	13.4	10	25%	50%	6

## Opportunities

42. The road safety chapter details a strategy to use the pattern of casualties and our current position relative to the constituent parts of the national road safety targets, to set priorities for our road safety activity. A particular priority in coming years is to work with all the Borough's schools to ensure reviews of safety in their surrounding area are completed by 2008. The review results will help determine the local safety scheme and Safer Routes to School programmes, identifying where school related safety measures are necessary. Results will feed directly into the programmes of 20-mph zones, speed cameras and speed indicating devices (SIDS), pedestrian/cycle crossings and education and training work proposed within the LIP.

## Noise

### Problems

43. For many people noise and vibration can annoy, disrupt communication and disturb sleep. Noise may also contribute to inequalities in health since higher levels of traffic noise are more likely to be experienced by socially deprived groups in areas affected by busy roads. The 1999/2000 National Noise Attitude Survey carried out by the Building Research Establishment found that 35 per cent of respondents in outer London reported being at least 'moderately' bothered by road traffic noise compared with 22 per cent in the UK as a whole. While few residents of the Borough complain to the Council about general road noise it is assumed that the 35 per cent figure noted above will be a good estimate for the Borough.

### Baseline

44. The following link to a DEFRA road traffic noise map of London allows residents to see what level of traffic-generated noise applies to their streets.  
[www.noisemapping.org](http://www.noisemapping.org)

## Opportunities

45. The noise map will help the Council identify areas where noise reduction through quiet, micro asphalt/thin road surfacing or mitigation through use of barriers is required. It also provides an evidence base for potential complaints and claims for double or triple glazing costs. By reducing both traffic speeds and volumes there should be a positive impact on noise, and on the ability to use the public street space to allow for greater community cohesion – as shown in the classic San Francisco study looking at the relationship between traffic levels and social interaction. Both these aspects have been shown to interact with health.
46. An EU Environmental Noise Directive (2002/49/EC) will be transposed into UK law in the coming year or so and will help resolve where responsibility for tackling noise lies.

## Obesity

### Problems

47. Rising levels of obesity and diabetes are in part connected to transport trends. There is increased reliance on door to door car travel compared to walking and cycling. Obesity is increasingly visible among children and diabetes rates are rising among obese adults.

### Baselines

48. Obesity and diabetes within the Borough are likely to be increasing on a par with national trends.

### Opportunities

49. School Travel Plans offer the means to reverse recent trends and get more children walking and cycling to their schools or using public transport that includes a walk at one or both ends of the trip. The Local Implementation Plan will ensure that every school that could benefit from a formal travel plan will have one in place by the end of the decade. Workplace and other green travel plans, along with a raft of initiatives to make public transport, walking and cycling a more popular option will be beneficial in terms of obesity among all age groups. However transport choices are only one aspect of obesity and LIP measures may only be able to slow the upward trend rather than reverse it.

## Material assets

### Problem

50. Transport infrastructure is a material asset that each generation inherits from the previous one, modifies and passes on to the next. Sustainability principles require that this generation should not subsidise its lifestyle by passing the costs to subsequent ones. The condition of some road and rail assets in the Borough is inadequate and a backlog of maintenance exists.
51. Resource consumption can be seen as an aspect of material assets. Construction and maintenance of infrastructure and the operation of vehicles frequently relies on non-renewable resources. Oil consumption is in effect covered by the earlier discussion on global warming but for other materials recycling is a way to reduce the problem.

### Baseline

52. As part of a five-year asset management plan the Council will complete a full inventory of its transport assets and their condition. Most details are already known and are summarised in the LIP, but some gaps remain to be filled.

## Opportunities

53. The asset management plan provides the means to identify condition deficiencies and a programme of investment to bring the assets to a serviceable and safe standard. Visual appearance is one aspect and the Council will aim for a steady improvement along with prompt graffiti removal.
54. The Council will aim to use, or ensure contractors use, recycled material whenever possible in the course of construction and maintenance work. The Council will continue to run a surrendered vehicle scheme so that these can be recycled and the problem of abandoned vehicles reduced. Details are available on [www.alg.gov.uk/scrap-it/](http://www.alg.gov.uk/scrap-it/) or on the Royal Borough of Kingston website.

## Streetscape issues

### Problems

55. Street clutter is a prime concern of heritage and conservation groups and inevitably transport related signing and installations make up much of the street furniture. Measures to reduce crime and increase a sense of security are an important element of the LIP strategy but can have secondary environmental impacts that should be considered, e.g. intrusive CCTV columns and cameras.
56. Certain traffic calming measures are not an attractive addition to the streetscape, but are one of the most effective methods of casualty reduction – with a record of between 50 and 60% reduction in casualty numbers in treated areas.

### Baseline

57. An audit of the Boroughs street furniture is in progress

### Opportunities

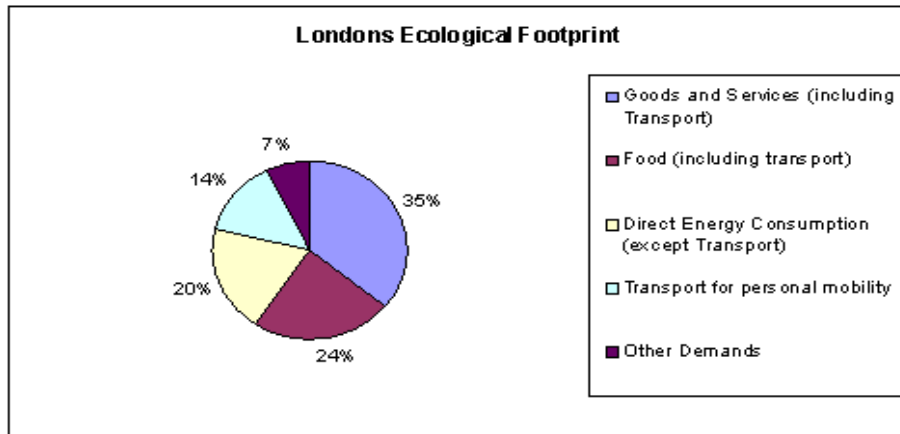
58. Once completed the audit will allow removal of redundant and duplicate signing and installations. It is possible to select designs for traffic calming measures that are less unattractive and, in the case of home zones, positively enhance the appearance of a street. This involves significant cost.

## The interrelationship between environmental factors

### Ecological Foot-printing

59. The Borough's Environment Strategic Partnership Group (ESPG) supports a technique called 'ecological foot-printing' to establish the impact of Kingston residents on the planet. An 'ecological footprint' is the area of land and water required to provide all the energy, water, food and other materials that we consume.

One study of London's ecological footprint<sup>5</sup> has shown that the average UK footprint is 6.3gha (global hectares) per person, compared to the global 'earthshare' (i.e. if everyone on the planet had an equal footprint) of 2.18 gha. Londoners are even more profligate at 6.6gha (3 times the present earthshare). To be on track to attain a sustainable lifestyle by 2050, each Londoner's ecological footprint needs to reach a milestone 35% lower by 2020. Footprinting is a new and developing way of measuring impacts and has yet to establish settled conventions so results will be broad brush. The proportion of overall impact derived from transport has ranged from 10% in a study of Berlin to 30% in a study of Guernsey. A more recent London study<sup>6</sup> suggests the average Londoner has a 5.8 gha footprint with a 14% figure for 'transport for personal mobility'.



60. A Liverpool study found a 17% contribution. After adding an allowance for freight transport, and for the fact that RBK as an outer London Borough is more car-dependent than the London average, it is likely that transport contributes at least 20% of the RBK footprint. It is therefore incumbent on the Council to follow a LIP strategy that will cut the transport contribution and play some part in bringing down the overall impact of Kingston residents on the planet.
61. The London study attributed nearly a third of the transport footprint to building and maintaining road infrastructure. Use of recycled or secondary aggregates whenever possible for new build and maintenance work on local roads, cycleways, footpaths, and public transport facilities is an obvious policy choice to help conserve resources.
62. Policies on traffic calming are another example of environmental interrelationships. These policies can potentially have air quality, noise and streetscape impacts that accompany the known casualty reduction benefits. There have been concerns that emissions per kilometre are higher at 20 mph than at 30 mph and this could worsen air quality. However national studies have shown that traffic calming has no real impact on air quality on a city wide basis, and whilst there may be "spikes" of increased noise adjacent to individual measures, this is generally offset by reductions in traffic flows. The Council will only install traffic calming measures whose noise impact has been assessed as acceptable and do not spoil the appearance of a street. Some additional cost is acceptable in pursuit of these designs.

<sup>5</sup> Best Foot Forward.

<sup>6</sup> The Footprint project, led by London Remade and London First. See [www.londonfootprint.com](http://www.londonfootprint.com)

## Environmental impact assessment

63. Criteria has been laid down in RBK's UDP (Res3a) to determine whether environmental impact assessment is required for a planning application; this will depend on not only the size of the development but also its location within the borough. This environmental impact assessment must address all relevant issues relating to the development.

## Alternative strategies and measures

64. The SEA process requires some consideration of alternatives to assess whether the best environmental options are being followed. Alternatives are limited to those which are realistic, and which have a real chance of delivering the policy objectives of the plan. This concept is not easy to apply to a complex strategy like the LIP that relies on combining a multitude of policies and measures into a coherent and complementary whole. Given that environmental considerations have been one of the driving forces of RBK's policies and programmes for many years, we do not believe that there are many credible alternatives that could deliver more benefit. However, this section will consider one particular option that has advocates and has attracted much interest, namely congestion charging.

## Congestion charging to reduce traffic further

65. In principle a congestion charging zone covering all or part of the Borough could be established provided it was supported by the Mayor of London. The £5 per day cordon charge in central London reduced all motorised traffic by 15% with a significantly larger drop in car traffic. A separate evaluation of a national congestion charging system undertaken for the Commission for Integrated Transport looked at charges per mile. It concluded that the optimal charge per mile in Outer London was 21 pence per mile and would apply from 7.00 a.m. to 7.00 p.m. Monday to Friday. This level of charging would cut traffic levels by 11.5%, congestion by 63% and lead to a 13.4% increase in average speeds. The study did not have a costed and proven method of collecting the charge; it simply worked on the assumption that GIS technology would make it possible to record mileage by each vehicle in each zone and charge accordingly.
66. Using price signals to influence motorist's choices and decisions is common practice, notably through parking charges. Two conditions are however pre-requisites – equity and a cost-effective means of collecting the charge. Both would be major challenges for a congestion charging zone in RBK. The process of deciding whether RBK residents should pay a lower charge than non-residents and if so what percentage discount would be divisive. Residents of those parts of the Borough of Richmond close to Kingston town centre would resist paying more to drive to or through the Borough than RBK residents paid. Motorists driving through the Borough on the A3 would also question the equity of charges. Within the timescale of the LIP it is improbable that GIS technology will be validated as a reliable and practical way to collect charges. Therefore the camera based enforcement system used in central London would be needed.

This is costly, for instance the annual running costs for such a system on the proposed western extension of the central London scheme equal the forecast revenue. Cameras would be required on every entry point to the Borough or a zone within the Borough. In practice this would direct attention to a more limited zone, probably based on Kingston town centre.

67. Pursuing congestion charging as a centrepiece of the LIP approach to traffic reduction would be a radical but high-risk approach. It would mean initially diverting some financial resources away from investment in public transport, walking and cycling facilities and from highway maintenance. If the scheme succeeded as a net revenue raiser it would become possible to make good and then exceed the investment expenditure. The risk is that a good deal of time money and effort would be spent on a scheme that foundered.

### Forecast effects of the alternative strategies

68. The baseline assumption without the LIP is that the overall environment remains much as it is with significant adverse impacts from road transport but little net change other than in falling road casualty numbers. With the strong sustainable transport approach of the LIP we assume improving air quality, a fall in noise, a safer environment for vulnerable road users, less impact on biodiversity, obesity benefits and improvements to streetscape. The congestion charging alternative within the strategy would reduce traffic levels and therefore environmental impacts more substantially if it was 100% successful and could be delivered fairly promptly.

### Reasons for selecting alternatives

69. The preferred strategy is the sustainable transport approach without congestion charging. The principal reason is that the number of risk elements associated with delivery of a congestion charging scheme in RBK make it almost certain that the scheme would be sub-optimal in its pricing, coverage, implementation date and therefore effect. The worst case scenario is that it would divert resources from other measures during development, then founder before the implementation stage.

### Proposed mitigation measures

70. There is a somewhat artificial distinction between trying to mitigate the negative environmental impacts of transport and trying to mitigate a negative impact that results from adopting the LIP rather than continuing past practice. For all topics assessed the net impact of adopting the LIP rather than continuing past practice is positive. Within the net effect there may well be negatives at specific sites outweighed by more substantial positives (area or Borough wide). For example it may be necessary to cut down some trees beside a highway to permit improved facilities for walking, cycling or public transport. The mitigation policy is as stated in paragraph 17. Much of the emphasis in the LIP on restraining transport demand, promoting modal switch and cutting traffic levels is a high level attempt to mitigate the overall negative environmental impact of transport.

## Monitoring the environmental effects of the Local Implementation Plan

71. The Council will report to the Mayor of London and TfL on transport related air quality progress through the Local Implementation Plan Annual Progress Report (APR). This APR document will be placed on the Council's web site. The Council will continue to report recorded pollution levels from monitoring carried out within the Borough in the UDP Annual Monitoring Report. That report also records the percentage of planning permissions on brownfield land and numbers and types of rare species in the Borough.
72. To fulfil its legal responsibilities in relation to the Local Air Quality Management regime the Council will produce an annual air quality report in accordance with LAQM guidance by the end of April 2005 before undertaking a further updating and screening assessment by the end of April 2006. The Council will publish air quality data on its web site and provide links to daily air quality information from monitoring carried out in Kingston and London. It will report annually to Council committees on progress against the Air Quality Action Plan targets.
73. Table 7 lists the indicators that are in place or under consideration as a means of measuring progress against the important Strategic Environmental Assessment objectives.

Table 7: SEA objectives and indicators

Objectives	Existing or Potential Indicators
<b>Population and Human Health</b>	
Reduce crime and fear of crime at transport interchanges.	Numbers or % of incidents of crime against the person at transport interchanges.
Improve road safety particularly for cyclists, pedestrians and motorcyclists	Number of killed or seriously injured on Borough roads.
Improve physical fitness, by encouraging walking and cycling particularly for short journeys.	% of journeys made on foot/cycling.
Improve accessibility of transport for all sections of the community to reach key services (especially health services).	
<b>Material Assets</b>	
Reduce impact of transport infrastructure on natural resources e.g. by using recycled aggregates in construction and maintenance.	% of recycled aggregates used in road maintenance projects.
Improve condition of pavements and transport infrastructure through regular maintenance.	BVPI 187 on footway condition
<b>Biodiversity, Landscape/Townscape</b>	
Protect and enhance greenbelt and open spaces.	Annual recording of numbers and types of rare species in the Borough
Reduce impact on rare species	Number of projects aimed at improving streetscape.
Enhance streetscape.	

<b>Objectives</b>	<b>Existing or Potential Indicators</b>
<b>Noise</b>	
Reduce negative effects of noise from transport infrastructure.	Traffic decreases next schools and hospitals (using ATC data). Number of noise complaints made in relation to traffic.
Increase use of 'quiet' modes; walking and cycling	Mode share for walking and cycling by RBK residents.
<b>Climatic Factors</b>	
Reduce vulnerability of transport infrastructure to effects of climate change (e.g. flooding risk). Reduce greenhouse gas emissions from transport sources. Reduce need to travel by private car.	% of journeys made by sustainable modes. Number of vehicle miles travelled in the Borough. Average new build density
<b>Air Quality</b>	
Reduce emissions from transport sources in AQMAs. Reduce emissions from transport sources.	Emissions data from roadside air quality monitoring stations. Traffic decreases in AQMAs.

## Consultation

74. As noted in the introduction, a scoping report was sent to the Countryside Agency, English Heritage, English Nature and the Environment Agency to comment on the scope and level of detail proposed for the Environmental Report. The scoping report was also sent to local organisations with an interest in the transport/environment area. As a result of feedback requesting more coverage of biodiversity that topic has been considered in full in the Report. The Council envisage that responses to this Report will help to refine the Final LIP and specifically the SEA statement, which accompanies the Final LIP.

Enquiries about this report should be addressed to:

Julian Jones  
Strategic Transport Planner  
RBK Planning and Development  
Room 203, Guildhall 2  
Kingston, KT1 1EU  
020-8547-4685

e-mail: [julian.jones@rbk.kingston.gov.uk](mailto:julian.jones@rbk.kingston.gov.uk)