

## 11 LTP Targets and Trajectories

# 11a LTP2 Mandatory Indicators Pro-Forma

Core Indicator	Definitions	Year Type	Units		Year	Value		Actual and Trajectory Data													
Road Condition (% of network in need of further investigation)	(1) Principal Roads - BVPI223	Financial	%	Base Data	2005/06	4%	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Notes					
				Target Data	2010/11	5%	Trajectory	-	-	4	5	5	5	5							
	(2) Classified, non-principal, roads - BVPI224a	Financial	%	Base Data	2005/06	13%	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Notes					
				Target Data	2010/11	-	Trajectory	-	-	13						Target to be set in 2006/07					
	(3) Unclassified roads - BVPI224b	Financial	%	Base Data	2003/04	26.6%	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Notes					
				Target Data	2010/11	15%	Trajectory	26.6	18.3	14.24											
								1994-98	2003	2004	2005	2006	2007	2008	2009	2010	Notes				
Total killed and seriously injured casualties - BVPI99(x)	Calendar	Casualties		Base Data	1994-98	597	Actual	597	471	527								Notes			
								Target Data	2010	360	Trajectory	NA	527	485	447	409	393	376	360		
Child killed and seriously injured casualties - BVPI99(y)	Calendar	Casualties		Base Data	1994-98	48	Actual	1994-98	2003	2004	2005	2006	2007	2008	2009	2010	Notes				
				Target Data	2008-2010 average	26	Trajectory	48	33	32	35										
								Target Data	2008-2010 average	26	Trajectory	-	-	-	35	32	30	28	26	24	
Total slight casualties - BVPI99(z)	Calendar	Casualties		Base Data	1994-98	2,908	Actual	1994-98	2003	2004	2005	2006	2007	2008	2009	2010	Notes				
				Target Data	2010	3,000	Trajectory	2,908	2,965	2,869	2,907										
								Target Data	2010	3,000	Trajectory	NA	-	2,869	2,975	2,980	2,985	2,990	2,995	3,000	
Total local public transport patronage in target	Financial	Thousand passenger journeys		Base Data	2003/04	16,811	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Notes					
				Target Data	2010/11	22,500	Trajectory	16,811	17,306												
of which number of bus pass. journeys - BVPI102	Financial	Thousand passenger journeys		Base Data	2003/04	16,811	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Notes					
				Target Data	2010/11	22,500	Trajectory	16,811	17,306												
								Target Data	2010/11	22,500	Trajectory	16,811	17,052	17,160	17,566	19,685	20,912	21,822	22,550		
Satisfaction with local bus services-BVPI104	Financial	%		Base Data	2003/04	31.00	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Notes					
				Target Data	2009/10	60.00	Trajectory	31%	43%												
								Target Data	2009/10	60.00	Trajectory	-	-	44.4	44.8	45	52	56.3	60		
Footway condition - BVPI187 (% of the category 1, 1a and 2 footway network where structural maintenance should be considered.)	Financial	%		Base Data	2003/04	20.93	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Notes					
				Target Data	2010/11	19.2	Trajectory	20.93	23.85												
								Target Data	2010/11	19.2	Trajectory	-	-	-	19.85						
LPT1 - Access to areas of town centre activity	Financial	%		Base Data	2005/06	89.7%	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Notes					
				Target Data	2010/11	89.7%	Trajectory	-	-	89.7											
								Target Data	2010/11	89.7%	Trajectory	-	-	-	89.7	89.7	89.7	89.7	89.7		
LTP2 - Change in area wide road traffic mileage	Calendar	Million Tonnes CO <sub>2</sub>		Base Data	2003	1.657	Actual	2003	2004	2005	2006	2007	2008	2009	2010	Notes					
				Target Data	2010	1.747	Trajectory	1.657													
								Target Data	2010	1.747	Trajectory	1.657	1.673	1.688	1.696	1.709	1.722	1.734	1.747		
LTP3 - Cycling trips (annualised index)	Financial	Index, base 100		Base Data	2004/05	100	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Notes					
				Target Data	2010/11	110.6	Trajectory	-	100												
								Target Data	2010/11	110.6	Trajectory	-	-	100.6	102	104.6	106.6	108.7	110.6		

Core Indicator	Definitions	Year Type	Units		Year	Value	Actual and Trajectory Data										Notes	
							2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11				
LTP4 - Mode share of journeys to school	Share of journeys by car (including vans, taxis), excluding car share journeys	Financial	%	Base Data			Actual	-	-	-	-	-	-	-	-	Target for this indicator to be set following receipt of base data from government in 2006/07.		
				Target Data	2010/11		Trajectory	-	-	-	-	-	-	-				
	percentage of which Car						Actual	-	-	-	-	-	-	-				
	percentage of which Car Share						Actual	-	-	-	-	-	-	-				
	percentage of which Public Transport						Actual	-	-	-	-	-	-	-				
	percentage of which Walking						Actual	-	-	-	-	-	-	-				
	percentage of which Cycling						Actual	-	-	-	-	-	-	-				
LTP5 - Bus punctuality indicator	% of buses starting route on time	Financial	%	Base Data	2005/06	-	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Baseline to be set in 2006/07 from survey, operator and RTBI data. Work will refine / set targets.		
				Target Data	2010/11	90%	Trajectory	-	-	-				90%				
	% of buses on time at intermediate turning points	Financial	%	Base Data	2005/06	-	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11			
				Target Data	2010/11	90%	Trajectory	-	-	-				90%				
	% of buses on time at non-timing points	Financial	%	Base Data	2005/06	-	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11			
				Target Data	2010/11	Improve	Trajectory	-	-	-	Improve	Improve	Improve	Improve	Improve			
	Average excess waiting time on frequent service routes	Financial	Minutes	Base Data	2005/06	-	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11			
				Target Data	2010/11	Improve	Trajectory	-	-	-	Improve	Improve	Improve	Improve	Improve			
	LTP6 - Changes in peak period traffic flows to urban centres	Cambridge	Financial	Vehicle numbers	Base Data	2005/06	8,689	Actual	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10		2010/11	Notes
					Target Data	2010/11	8,700	Trajectory	-	-	8,689							
LTP8 - An air quality target related to traffic (Nitrogen Dioxide levels in Cambridge Core Area LEZ)	Parker Street	Calendar	µg/m³	Base Data	2005	51	Actual	2003	2004	2005	2006	2007	2008	2009	2010	Notes		
				Target Data	2010	41.5	Trajectory	53	49	51								
	Gonville Place	Calendar	µg/m³	Base Data	2005	48	Actual	2003	2004	2005	2006	2007	2008	2009	2010			
				Target Data	2010	39	Trajectory	-	-	-	49.1	47.2	45.3	43.4	41.5			
	Regent Street	Calendar	µg/m³	Base Data	2005	43	Actual	2003	2004	2005	2006	2007	2008	2009	2010			
				Target Data	2010	37	Trajectory	-	-	-	46.2	44.4	42.6	40.8	39			

# 11b Trajectory analysis

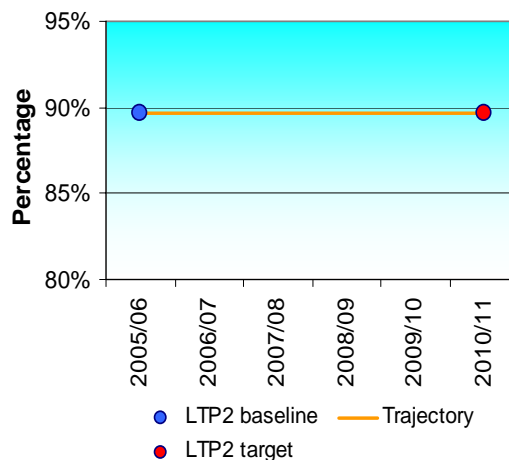
The following tables detail the analysis that has been undertaken to derive the targets and trajectories in this LTP. There are several indicators where we have yet to set targets or fully develop trajectories. These are:

Indicator		Status
AQ3a, AQ4a, AQ5a (LTP8)	Nitrogen Dioxide levels in Huntingdon, St Neots and Wisbech	Targets to be set following agreement of Air quality action plans by Huntingdonshire District Council for Huntingdon and St Neots, and by Fenland District Council for Wisbech.
AQ3b, AQ4b, AQ5b	Proxy indicators for transport impact on air quality in Huntingdon, St Neots and Wisbech	
CON4a, b (LTP4)	Mode share of journeys to school	Target and trajectories to be set upon receipt of baseline information from government in 2006/07.
CON5a, b, c (LTP5)	Bus punctuality	Targets set. Trajectory not yet set due to the lack of sufficiently robust baseline data. Trajectory to be developed in 2006/07, on the basis of detailed survey work, and information from Real Time Bus Information systems that are currently being implemented in Cambridge.
RS2	Wet skid resistance (SCRIM)	Due to problems processing 2005 SCRIM data in early 2006 we have not been able to set a robust target and trajectory for this indicator at the time of submission of the full LTP. We will therefore set a target for this indicator during 2006/07 and aim to include detailed information on the target and trajectory in the LTP1 Delivery Report.
AM1 (BV224a)	Condition of non-principal roads	Target and trajectory to be set in 2006/07, as per government requirements

## Accessibility indicators

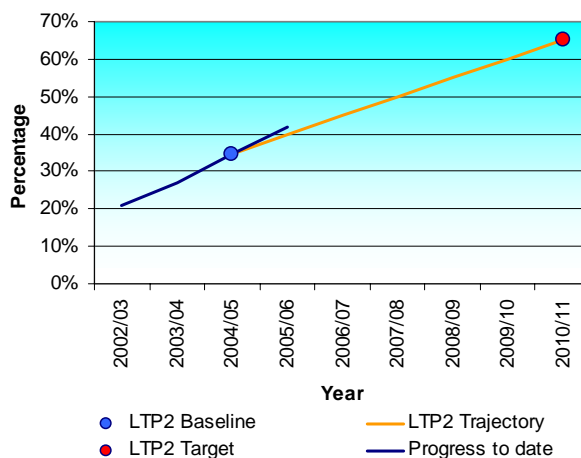
### ACC1 Accessibility of areas of town centre activity

1. Target							
		Baseline	Baseline Year	LTP Target	Target Date		
ACC1: No less than 89.7% of households to be within 1 hour of an area of town centre activity in the morning peak hour as measured by Accession in 2010/11.		89.7%	2005/06	89.7%	2010/11		
2. Trajectory							
2006/07	2007/08	2008/09	2009/10	2010/11			
89.7%	89.7%	89.7%	89.7%	89.7%			
3. Introduction							
This is a strategic countywide accessibility indicator as we have not at this stage set any indicators for our action plan areas. This is because it is unclear at the moment what interventions and measures are capable of being monitored quantitatively, and importantly, in a meaningful way. Any further indicators that are set as the action plans develop will be reported on in the 2008 progress report							
4. General Principles							
Journey time is not the only factor in determining accessibility to a service, however it is an element that can be measured relatively robustly using Accession. We have used a baseline year of 2005/06 rather 2004/05 because this was when most of the work on Accession took place, and it uses the most up to date bus timetabling information.							
5. External factors							
Due to the fact that commercial operators are responsible for the majority of bus services, we only have direct control over a small number of services. Any decision by commercial operators to cancel services can have a knock on impact on the council's revenue funding of bus services.							
7. Programme Areas / Schemes							
Schemes / Programme areas		Cost (£)	Progress towards target				
			2006/07	2007/08	2008/09	2009/10	2010/11
1	Accessibility action plans	£355,000	89.7%	89.7%	89.7%	89.7%	89.7%
8. Risk							
Risk		Impact		Probability		Max impact on indicator (%)	
1	Reduced revenue funding	Low – High		High		-10%	
2	Commercial operators withdrawing services leading to further pressures on passenger transport budgets	High		Medium		-10%	
9. Data issues							
The key way in which this will be monitored is through the use of the Government software Accession. To enable this to be done, the information that Accession uses will need to be kept up to date. This will require updating of all the bus timetabling information that is fed into Accession each time the figures are run.							
As with all Accession data, there is a need for qualitative assessment of the outputs from the modelling.							
At the current time, the use of Accession has not been rigorously assessed as to how meaningful it is as a tool for monitoring the impact of interventions, such as changes to the route of supported bus services. A key part of the monitoring and review of this indicator will therefore be the assessment of how useful a tool for measuring levels of accessibility it actually is.							
10. Assumptions							
It is assumed that revenue funding will not increase over the period							



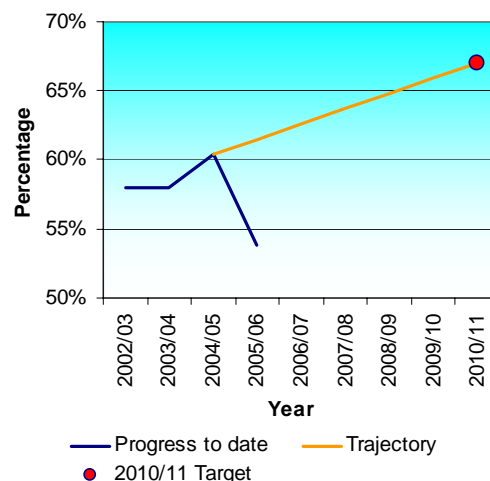
## ACC2 (BV165) Pedestrian Crossing Facilities

1. Target							
		Baseline	Baseline Year	LTP Target	Target Date		
<b>ACC2 (BV165):</b> More than 65% of crossings to have facilities for disabled people meeting the standards set by BV165 by 2010/11.		34.6%	2004/05	65%	2010/11		
2. Trajectory							
2006/07	2007/08	2008/09	2009/10	2010/11			
45%	50%	55%	60%	65%			
3. Introduction							
This indicator monitors the provision of tactile paving, the provision of audible alarms or tactile rotating cones and the provision of dropped kerbs. Since a change to the methodology in 2002/03, we have continued to make steady progress towards our target.							
4. General Principles							
Steady progress has been made towards this target in recent years, however there remain some complicated junctions which do not currently meet the standards for BV165 which could affect our ability to meet the target as they may require additional funds to be brought up to standard.							
5. External factors							
Climate change will have an affect on the condition of the network, with drier, hotter summers and wetter winters causing increased deterioration and damage to our network typical signs being subsidence, heave and 'fatting up' from high temperatures. This could lead to increased competition from other areas of the maintenance budget, with funds potentially being diverted to deal with the effects of a hot summer or particularly wet winter.							
6. Milestones							
N/a							
7. Programme Areas / Schemes							
Schemes / Programme areas		Cost (£000s)	Progress towards targets				
			2006/07	2007/08	2008/09	2009/10	2010/11
1	Pedestrian Crossings programme	150	45%	50%	55%	60%	65%
8. Risk							
Risk	Impact	Probability	Impact on growth				
1	Lack of identified funding as part of Government maintenance block allocation, and competition with other maintenance areas for the limited funds available	Low-medium	Low	Could affect the number of crossings that are upgraded, particularly at the more complicated locations.			
2	Complicated junctions that incorporate crossings that do not currently meet standards set by BV165 may require a scale of works out of proportion to the benefits achieved, or that reflects the usage or potential usage of the facilities	Medium	Medium	Could affect the number of crossings that are brought up to standard			
9. Data issues							
Data is collected annually as part of the Annual Infrastructure Survey							
10. Assumptions							
Progress will continue at a similar rate as in previous years							



## ACC3 (BV178) Accessibility of footpaths

1. Target					
<b>ACC1 (BV178):</b> More than 67% of footpaths and other rights of way to be easy to use by members of the public by 2010/11.		Baseline	Baseline Year	LTP Target	Target Date
		60.4%	2004/05	67%	2010/11
2. Trajectory					
2006/07	2007/08	2008/09	2009/10	2010/11	
62.6%	63.7%	64.8%	65.9%	67%	
3. Introduction					
This indicator is designed to measure performance related to two highway authority duties: - to sign public rights of way on leaving metalled roads and such ways fit or purpose. The standard sampling methodology provides for historical comparisons to be made within an authority and contemporary ones between authorities.					
4. General Principles					
1. This indicator is measured by two random sample surveys making up 5% of the length of the public rights of way network in Cambridgeshire each year.					
2. The Rights of Way Improvement Plan (ROWIP), which is included as Appendix 13 of the LTP, seeks to address the area requiring significant attention (including non-reinstated paths) that would otherwise not be possible with existing resources. As a bidding and policy document the ROWIP seeks to address some of the funding and implementation constraints. In the meantime, our continued programme of works should, as a minimum, maintain the current quantity and quality of access.					



## 5. External factors

1. Prioritisation under low capital and revenue budgets and staffing has meant some parishes have been given a low priority status. Only significant issues are responded to if reported from these areas. Funding to reduce the number of these parishes would increase performance under this indicator.
2. Over one third of Cambridgeshire's Local Councils (2005/6) have opted to take an active part in maintaining the network through Parish Paths Partnerships. This grant scheme is funded by all the District Councils. Their ability to support this valuable and locally empowering partnership work has a direct impact on performance.
3. Agricultural policy adjusts the type and timing of farming operations. Performance will be reduced where Government Policy negatively affects compliance with the Highways Act duties for reinstatement of cross-field paths and retention of access tracks coincident with public rights of way, unless these impacts are balanced by additional resources for enforcement. New funding arrangements may help as they take account of landholders' duties regarding public rights of way. However, the reporting and following up of infringements will take staff time.
4. Development including new settlements, new public open space, new and 'improved' roads, and the Cambridgeshire Guided Busway all have the potential to reduce performance where public rights of way are not treated correctly. Staff time will be taken up trying to achieve this due to the technicalities of public rights of way and the large numbers of interested parties. Where extinguishment is used to address a concern, the extent of the network will be reduced; though performance would, of course, increase.
5. Climate change is, at least anecdotally, boosting vegetation growth reducing the efficacy of the minimal twice a year cutting contracts still further. A cumulative funding increase will be required to counter the resultant reduction in performance.
6. The Definitive Map and Statement consolidation project; and adjustments through claims, diversions, creations and extinguishments in the meantime; will effect performance for better (where routes can be more clearly defined) or worse (where walked routes are discovered to not be Definitive).

## 6. Milestones

Are set in Annual Service Plans.

## 7. Programme Areas / Schemes

Schemes / Programme areas		Cost (£000s)	Impact on indicator				
			2006/07	2007/08	2008/09	2009/10	2010/11
1	New footpaths / rural pedestrian improvements / PROW	1,320	✓	✓	✓	✓	✓
2	Rights of Way maintenance	715	✓	✓	✓	✓	✓

## 8. Risk

Risk	Impact	Probability	Max impact on indicator (%)
1 Not obtaining the staff or budgetary resources required	High	High	2% per year

## 9. Data issues

1. The reported baseline percentage (60.4%) is within the range of statistical variation around our 2004 target of 62% that this method of measurement allows. However, the indicator was reported as being 'Not on track' because it was recognised that further progress was needed.
2. An assessment by Cambridgeshire County Council's Research Group of the range of statistical variation that will be seen on the survey of Rights of Way in the county undertaken using the specified methodology for BV178 indicated that variation in a range +/- 7 percentage points could be seen. In this context, the value of the indicator for assessing short term changes in the condition of the network is questionable.
3. It has been discovered that a non-record gets treated as a fail by the standard methodology spreadsheet. This may occur for example where there is no bridge on a path so a pass or fail record has not been entered. Therefore from the second half of 2005, passes have been registered instead.

## 10. Assumptions

N/a

## 11. Additional Information

1. The Rights of Way Improvement Plan aims to direct resources to managing the most popular routes. It values usefulness, connectivity and social inclusion. This indicator will not reflect improved performance in those areas despite DfT, DoH, Defra, and other support for the policies and costings contained in such plans.

# Air Quality indicators

## AQ1 (LTP2) Carbon Dioxide emissions

### 1. Targets

**AQ1:** CO<sub>2</sub> equivalent emissions from road transport in Cambridgeshire to be no more than **1.747M tonnes** in 2010.

Baseline	Baseline Year	LTP Target	Target Date
1,657,201 tonnes CO <sub>2</sub> equivalent	2003	1,747,000 tonnes CO <sub>2</sub> equivalent	2010

### 2. Trajectory

2006	2007	2008	2009	2010
1.696M t	1.709M t	1.722M t	1.734M t	1.747M t

### 3. Introduction

The target for CO<sub>2</sub> emission is based on a modelling assessment of the vehicle fleets emissions, based on mileage on various classes of road across the county. The trajectory shows an upward trend. This is due to two main factors.

- The Growth Agenda
- Traffic on the Trunk Road / Motorway network.

The LTP programme includes packages of measures to reduce the need to travel by car, and provide alternatives to the private car. The Integration of land use and transport policy driven by Structure Plan, Local Plans / LDFs and RSS will help to achieve sustainable development in transport terms.

### 4. General Principles

- Vehicular mileage in 2003 base year is taken from the Department for Transport's National Road Traffic Survey.
- Growth in traffic to 2010 is based on TEMPRO Central forecasts for Cambridgeshire.
- Make up of vehicular fleet is based on Cambridgeshire data

### 5. External factors

Traffic on the Trunk Road network in Cambridgeshire accounts for around 52% of modelled CO<sub>2</sub> equivalent emissions of Greenhouse gases. Growth in traffic on the trunk road network is beyond the control of the county council, particularly in the context of the national importance of the A1 / A1(M), A11, M11 and A14. We will continue to work with the Highways Agency on the development of initiatives to reduce CO<sub>2</sub> emissions, however, this alone will not be sufficient to reduce the level of CO<sub>2</sub> emissions. Their will be opportunity as part of our Transport Innovation Fund study may identify opportunities where we can work together to address this issue.

### 6. Milestones

Opening of Cambridgeshire Guided Busway.

### 7. Programme Areas / Schemes

Schemes / Programme areas	Impact on indicator				
	2006/07	2007/08	2008/09	2009/10	2010/11
1 Mode share of vehicles in Cambridge drop from 87.3% to 78%, factored from Indicator CON6b. <b>See assumptions below.</b>	-7,509 tonnes	-10,100 tonnes	-12,735 tonnes	-15,413 tonnes	-18,135 tonnes
2 Mode share of vehicles in Market Towns drop from 78.1% to 76.1%, factored from Indicator CON7. <b>See assumptions below.</b>					

### 8. Risk

Risk	Impact	Probability
1 Higher than expected growth of traffic on the trunk road network	High	Medium
2 Insufficient LTP funding.	Low	High

### 9. Data issues

The data is based on best estimates using known factors, using a methodology derived by Cambridgeshire County Council's Environment Division. This methodology is very similar to a method derived by DEFRA (DEFRA baseline – 1,918,000 tonnes), although the two give different figures. As the primary value of the indicator is in the trend information that is provided, the methodology is considered robust, although further work will be undertaken to allow comprehension of the reasons for the difference in baseline.

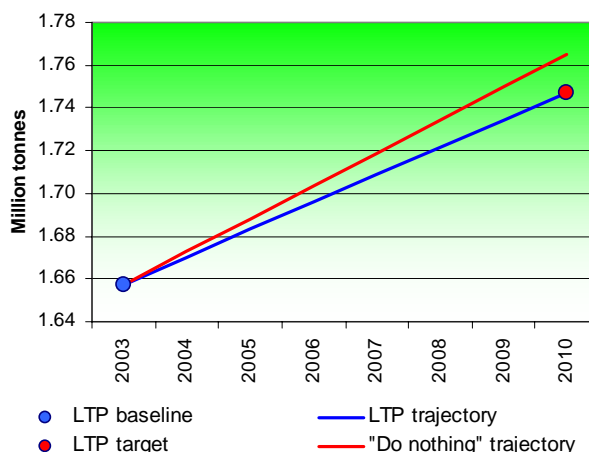
The target equates to a 5.4% increase in emissions in the period 2003-2010. The "do nothing" trajectory equates to a 6.5% increase in emissions in the period 2003-2010. These percentage increases will be valid for either baseline. Traffic growth in the period based on TEMPRO central forecasts is predicted to be 15.5%. Using the same factoring as for emissions based on CON6b and CON7, traffic growth would be 12.9%. The difference between the percentages for traffic and emission growth is due to changes in the make up of the vehicle fleet, and in emission standards in the period to 2010.

Work is ongoing to refine the emissions and traffic data that inform this indicator. Any changes to the target as a result of this work will be reported in future progress reports.

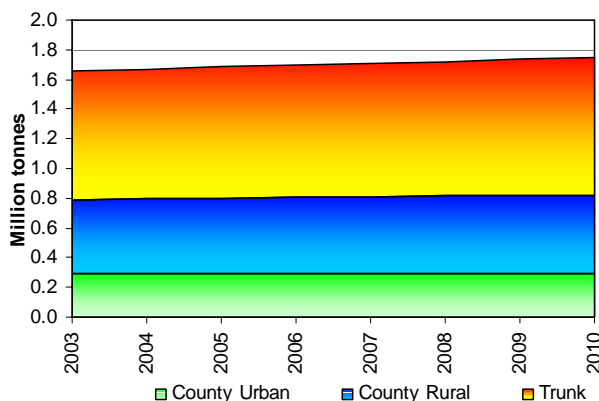
### 10. Assumptions

- Our programme will reduce predicted growth in Cambridge and the market towns. It will not change predicted traffic growth on the Trunk Road / Motorway or Rural county road networks.
- Mode share in Market Towns of vehicular traffic will drop from 78.1% to 76.1% (factored from CON7 trajectory).
- Mode share in Cambridge of vehicular traffic will drop from 87.3% to 78% (factored from CON6b) trajectory. This assumption is conservative, as modal share of vehicular traffic in the city as a whole is considerably lower than at the radial cordon.

### CO<sub>2</sub> emissions trajectory



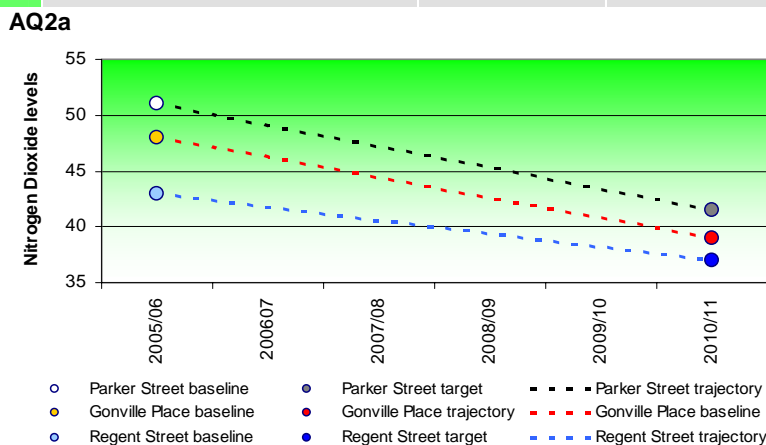
### Emissions by road type



## AQ2a (LTP8), AQ2b Cambridge Air Quality

1. Targets		Baseline	Baseline Year	LTP Target	Target Date
<b>AQ2a (LTP8):</b> To reduce annual mean concentrations of NO <sub>2</sub> at the Parker Street, Gonville Place and Regent Street monitoring stations to less than 41.5µg/m <sup>3</sup> , 39µg/m <sup>3</sup> and 37µg/m <sup>3</sup> respectively by 2010/11.	Parker St	51 µg/m <sup>3</sup>	2005	41.5 µg/m <sup>3</sup>	2011
	Gonville PI	48 µg/m <sup>3</sup>	2005	39 µg/m <sup>3</sup>	2011
	Regent St	43 µg/m <sup>3</sup>	2005	37 µg/m <sup>3</sup>	2011
<b>AQ2b: 90% of all Public Service Vehicles entering the Cambridge Low Emission Zone (LEZ) to meet a minimum of Euro II emission standards by the end of January 2009.</b>		To be set by January 2007		90%	2009

2. Trajectories	
AQ2a	NO <sub>2</sub> levels (µg/m <sup>3</sup> )
	2006 /07    2007 /08    2008 /09    2009 /10    2010 /11
Parker Street	49.1    47.2    45.3    43.4    41.5
Gonville Place	46.2    44.4    42.6    40.8    39
Regent Street	41.8    40.6    39.4    38.2    37



**3. Introduction**

47,500 new homes are planned in the Cambridge sub-region by 2016. Of these at least 12,500 are within the City Council boundary and around 16,000 if you include the urban fringe areas within neighbouring South Cambridgeshire. Around 8,500 new homes are expected within the city during the lifetime of this LTP. This represents an increase of 20% in the number of households.

This growth is predicted to lead to additional daily trips of 42,500 in and out of Cambridge by 2011. Such a rise could lead to a 23% increase in vehicle derived emissions of Nitrogen Oxides within Cambridge. Implementation of planned policies to maintain current traffic flows are very ambitious but must be achieved through proposed implementation of planned LEZ, greater public transport uptake and strengthened integrated planning policy if levels of NO<sub>2</sub> are to improve.

**4. General Principles**

- Traffic reduction will lead to a reduction in emissions
- New developments will lead to an increase in the number of vehicles entering Cambridge

**5. External factors**

- Extensive periods of warmer than average weather could have a negative impact on this target
- New developments may not be completed to current timescales

**6. Milestones**

- Establishment of Low Emission Zone in Cambridge core area.

7. Programme Areas / Schemes		Cost (£000s)	Impact on indicator					Relevant to	
Schemes / Programme areas			2006/07	2007/08	2008/09	2009/10	2010/11	AQ2a	AQ3a
1	Core Traffic Scheme Stage 4		✓	✓	✓			✓	✓
2	Core Traffic Scheme Stage 5				✓	✓	✓	✓	✓
3	Core Area Low Emission Zone			✓	✓	✓	✓	✓	✓

8. Risk		Impact	Probability	Max impact on indicator (No.)
1	Higher than forecast traffic growth	Medium	Low	
2	Bus operators delay in updating / retrofitting fleets to meet emission standards	Medium	Medium	
3	Faster than predicted growth in population	Medium	Low	
4	Hot, dry summer weather conditions	Low - High	Medium - High	

**9. Data issues**

- AQ2a targets are based on modelling derived from 2005 baseline data. AQ2a reduced concentrations in 2011 based on maintaining current traffic levels. 2011 value calculated using the year adjustment from LAQM.TG (03) update January 2006 taking account of the revised emission factors. Due to the time constraints involved in assessing the 2005 data prior to March 2006 detailed trajectory data is not available at this time, but will be provided in the future updates on progress.
- Nitrogen Dioxide levels are highly susceptible to weather conditions, and are likely to be significantly worse in hot, dry weather, as was witnessed in 2003. A degree of pragmatism will need to be applied when considering the data for indicator AQ2a, taking account of the overall weather patterns in the period to 2010/11. The trajectories shown can only be seen as providing an indication of hoped for progress.

**10. Assumptions**

Traffic flows are expected to fall in the core area marginally. As Core Scheme 4 and 5 are implemented this should also lead to a fall in vehicle flows crossing the inner cordon and the River cam. Some increase in traffic at the outer cordon may be expected. On balance it is expected that vehicle movements will remain equivalent in terms of the AQMA and thus net emissions will fall in line with the latest emission factors as cleaner vehicles enter the fleet over the plan period.

Improvement of the bus fleet emissions at a greater rate than normally expected will allow for an expansion of services while meeting emission reduction targets over the period. Full appraisal of the likely benefits of this measure will be assessed following the provision of the baseline data by the bus operators. Future interim targets to be informed by the impact of the initial target on emission levels.

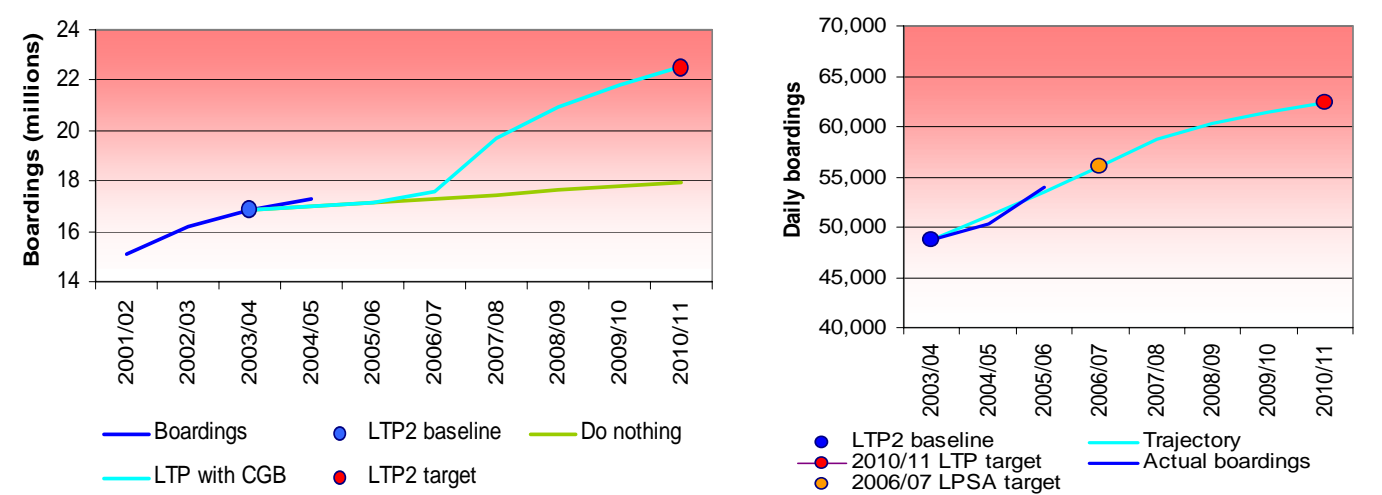
# Congestion

This section details the trajectories that have been developed for LTP Congestion indicators. In line with government guidance, targets and trajectories have not yet been set for indicators CON4a and CON4b (LTP4). The baseline and target for these indicators will be set in 2006/07.

## CON1 (BV102) & CON6c: Bus Patronage

1. Targets				
	Baseline	Baseline Year	LTP Target	Target Date
<b>CON1 (BV102):</b> Countywide Bus Patronage	16.811M annual boardings	2003/04	<b>22.5M</b> annual boardings	2010/11
<b>CON6c:</b> Cambridge Bus Patronage	48,669 daily passengers	2003/04	<b>62,400</b> daily passengers	2010/11
<b>CON6c LPSA:</b> Cambridge Bus Patronage LPSA	48,669 daily passengers	2003/04	<b>56,000</b> daily passengers	2006/07

## 2. Trajectories



	2006/07	2007/08	2008/09	2009/10	2010/11
<b>CON1 (BV102):</b> Annual Countywide Bus Patronage	17.566M	19.685M	20.912M	21.822M	22.550M
<b>CON6c/CON6c LPSA:</b> Daily Cambridge Bus Patronage	56,000	58,743	60,349	61,499	62,400

## 3. Introduction

Cambridgeshire is one of few places in the country outside of London where bus use is increasing.

- ### 4. General Principles
1. Transport schemes need to be in place in time for the start of new developments, to ensure maximum take-up.
  2. Key factors in encouraging public transport use need to be addressed through all schemes. These are: reliability of services (especially punctuality), frequency of services, knowledge/information and cost (in that order).
  3. Work with operators to ensure continued investment in improved services to deliver the above (in particular a commitment to providing reliable services) is essential.

- ### 5. External factors
1. It is anticipated public transport use will grow even in the event of doing the minimum because of the expected growth in population over the period of the target. (See 9. Assumptions, 1)
  2. The tendency of operators to centralise services on more profitable routes (e.g. along corridors and in urban areas) will lead to growth in patronage on corridor routes and therefore an overall growth in patronage.

- ### 6. Milestones
- The following milestones will support an increase in bus usage:  
 Seven large developments close to Cambridge are planned to start within the timescale of the current LTP. Start dates range between 2004 for the Northern Fringe – Arbury and 2010 - between Huntingdon Road and Madingley Road.
- Developments close to Cambridge – start date 2004
  - The new town (Northstowe) could have 2,700 dwellings by 2011
  - Northstowe Development – start date 2007
- Developments are planned in all of the Market Towns. The most significant of these are planned for Huntingdon, Ely and St Neots.
- Ely, development underway to increase size by 1/3– finish date 2006
  - Huntingdon, significant development planned – start date 2007
  - St Neots, significant development planned – start date 2006

### 7. Inputs to trajectory

Schemes / Programme areas	Cost (£000s)	Additional daily passengers					Relevant to	
		2006/07	2007/08	2008/09	2009/10	2010/11	BV102	CON6c
1 Population growth	-	888	1,332	1,776	2,220	2,664	✓	✓
2 Background schemes		512	1,023	1,535	2,047	2,559	✓	✓
3 Inter-urban corridor bus schemes								
a A428 St Neots – Cambridge	3,027	158	315	375	400	400	✓	✓
b A10 Ely – Cambridge			142	213	285	300	✓	✓
c A1307 Haverhill – Cambridge					75	117	✓	✓
d A1301 Saffron Walden - Cambridge						27	✓	✓

4	Cambridgeshire Guided Busway	84,386	0	4,550	6,825	8,190	9,100	✓	✓
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## 8. Risk

Risk	Impact	Probability	Max impact on growth (%)	Max impact on growth (daily No.)	
1	Bus operators fail to deliver all of the required improvements	Low	High	-10%	2,220
2	Failure to implement Guided Bus/ failure to implement on time e.g. TWA process causes delay (assume 2 year delay)	Medium	Medium	-11%	2,442
3	Failure to implement integrated transport schemes/ failure to implement on time e.g. as a result of delayed consultation and planning processes	Medium	High	-12%	2,664
4	Insufficient Government funding for schemes	Medium	High	-21%	4,663
5	Guided Bus does not have anticipated impact on patronage	Low	Low	-10%	2,220
6	Other integrated transport schemes do not have anticipated impact on patronage	Low	Low	-10%	2,220
7	Highways Agency failure to deliver on time; • A428 improvements	Low	Low	-3%	666

## 9. Data issues

1. Data for bus usage for BV102 is collected using bus patronage information provided by bus operators.
2. Patronage figures do not include school buses or private buses.
3. Cambridge bus patronage figures are derived from all modes / all trip traffic counts on the radial cordon for journeys into and out of Cambridge, and from bus patronage data from the bus companies for journeys within Cambridge.

## 10. Assumptions

1. With a growth in the population, the same proportion of the population is expected to use buses. The “do minimum” trajectory in 5. Performance Trajectory, assumes that if minimal improvements are made, bus patronage will increase in line with population growth in Cambridgeshire. (% growth in population is taken from population forecasts to 2011 produced by the CCC Research Group).
2. The “forecast” performance trajectory in 2. assumes
  - i) CCC receives the funding as per the planning guidelines
  - ii) sufficient investment in buses and drivers from operators
3. It is assumed Cambridgeshire Guided Busway will be funded.
4. The effect of the Background schemes (see 7. Inputs, 1.) will increase at a steady rate over the course of the LTP. The effects of individual schemes are small so the growth in patronage has been aggregated across schemes. For the corridor target growth in patronage as a result of background schemes is estimated at 10%. For this target, growth is estimated at 5% because Real time Bus Information and low floor buses will not be implemented countywide. The impact on patronage across the county therefore will be smaller than on patronage on corridors.
5. Patronage figures for the Guided Bus scheme (see 7. Inputs, 4.) are taken from the Guided Bus bid within the LTP. According to the bid patronage will increase in the pattern Year 1 – 50%, Year 2 - 75%, Year 3 - 90% Year 4 – 100% (of total expected growth). Patronage figures shown are net values, i.e. they are new trips to this mode rather than displaced trips from other bus services.
6. The effect of Corridor schemes (see 7. Inputs, 2.) on patronage will increase over time. It is expected that on the majority of corridors, patronage will continue to increase after the end of the current LTP. The pattern of growth to 2011 is based upon the pattern of growth expected for the Guided Bus scheme (see 5 above).

## CON2 (BV104) Bus Passenger Satisfaction

### 1. Target

<b>CON2 (BV104): Bus Passenger Satisfaction</b>			
Baseline	Baseline Year	LTP Target	Target Date
31%	2003/04	60%	2010/11

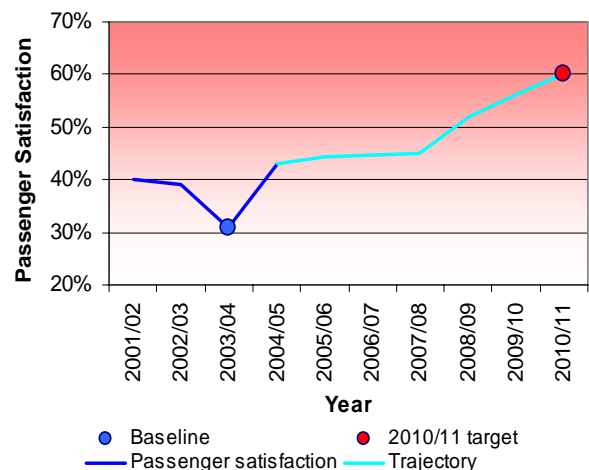
2. Trajectory				
2006/07	2007/08	2008/09	2009/10	2010/11
44.8%	45%	52%	56.3%	60%

### 3. Introduction

Cambridgeshire is one of few places in the country outside of London where bus use is increasing, however, this does not necessarily equate to an increase in satisfaction with bus services.

### 4. General Principles

1. There is no direct correlation between schemes and an increase in bus user satisfaction.
  2. The fundamental principle is that improvement in the quality of service (journey ambience, frequency, reliability and price) will lead to a rise in satisfaction levels. However, information from the latest user satisfaction survey suggests that perception and expectation are at least as important as the quality of the service. In Cambridgeshire for example, although reliability of bus services has improved, fewer bus users are now satisfied with the reliability of services than in 2000.
  3. People’s concept of Satisfaction changes over time; as they get “used to” improvements they have increasing levels of expectation
- Due to points 1 and 2 above, the following 3 points are best guesses:**
4. There are high levels of satisfaction with the Park & Ride services. Introducing services of a similar or better quality (e.g. new P&Rs and Guided Bus) will therefore lead to greater satisfaction. Improving services to a level that is closer to, though not as good as, P&R will lead to an improvement in satisfaction, albeit not as high as with P&R.
  5. The introduction of improved information, especially real time information, will have a positive impact on this target, but no information is available as to what this impact will be.
  6. Better management of changes to bus services will reduce short-term dissatisfaction



## 5. External factors

- Lower income/deprived people tend to be more satisfied with bus services than other socio-economic groups. Because Cambridgeshire has a strong economy and large proportions of bus users from higher income/less deprived people, may lead to lower levels of satisfaction generally.
- Urban bus users are generally happier with bus services than rural bus users. Thus, with the increasing urbanisation of the Cambridge area, satisfaction would be expected to rise. However, given the likely socio economic background (higher income) of the new population the overall impact on Satisfaction will probably be neutral.
- Major re-developments in the city centre will increase congestion and decrease reliability during the construction period, which may lead to a reduction in the numbers of people satisfied with bus services.
- Although an economic upturn or downturn is likely to affect bus patronage figures, it is unclear as to whether satisfaction would increase or decrease,
- Overall, the impact of external factors on this target will be neutral.

## 6. Milestones

Completion of the Cambridgeshire Guided Busway

## 7. Programme Areas / Schemes

Schemes / Programme areas	Cost (£000)	Impact on passenger satisfaction				
		2006/07	2007/08	2008/09	2009/10	2010/11
1 Inter-urban bus corridor schemes	3,027	✓	✓	✓	✓	✓
2 Bus priority measures	4,554	✓	✓	✓	✓	✓
3 Real Time Bus Information	1,975	✓	✓	✓	✓	✓
4 Cambridgeshire Guided Busway	86,486			✓		
5 Smartcard	450	✓	✓	✓	✓	✓

## 8. Risk

Risk	Impact	Probability	Impact (percentage points)
1 Insufficient LTP Funding (50% for all schemes except guided bus)	Low	High	3%
2 Failure to change perception of corridor bus services	Low	Medium	~2%
3 Late delivery of schemes (two year delay)	Low / Medium	High	5%
4 Bus Operators fail to deliver services required	Medium	High	3%
5 Failure to promote services properly (marketing, travel plans etc)	High	Low	20%

## 9. Data issues

- There is no data with regard to the effect of real time information. This has therefore been left out of the calculations, but will have a significant impact. Lower levels of government funding will lead to an incomplete roll out of RTI, which will also impact on the risks associated with this target.
- Data on Satisfaction with local bus services is collected once every 3 years, using the Best Value criteria. Such data may prove to be inaccurate with trend data being difficult to ascertain. We are looking at the possibility of introducing more frequent surveys to provide us with trend data.

## 10. Assumptions

- Because no information is available for Real Time Bus Information and its impact on satisfaction, schemes for RTBI have not been included in the calculations. It is likely, however, that RTBI will be beneficial, so the revised target of 55% could be higher.  
*NB. Cambridgeshire may be able to quantify the impact of RTBI as our programme progresses, as it is likely that some routes will see the introduction of RTBI before other improvements, allowing comparison of satisfaction levels to be made.*
- Figures for Cambridgeshire's Park & Ride show an 80% satisfaction rating for the bus service. It is assumed that this satisfaction rating will also apply to the Guided Bus scheme (which will be of a similar or better quality to P&R)
- Unchanged services are assumed to retain current levels of satisfaction, i.e. 29%
- It is also assumed that corridor improvements and new Park & Rides will introduce services of a higher quality than normal bus services, but not of as high a quality as for existing P&R close to Cambridge/Guided bus. For this reason, improvements in satisfaction along the corridors and new P&R is taken to be between 29% and 80% i.e. 55%
- Increase in satisfaction will apply to all users of improved/new services, not just new users

## CON3 (LTP3) Cycling Trips

### 1. Target

**CON3 (LTP3):** 10.6% increase in cycling trips in Cambridgeshire by 2010/11 (as measured at a representative number of counting points and expressed relative to an index, baseline 100 in 2003/04).

Baseline	Baseline Year	LTP Target	Target Date
100	2004/05	119	2010/11

### 2. Trajectory

2006/07	2007/08	2008/09	2009/10	2010/11
102	104.6	106.6	108.7	110.6

### 3. Introduction

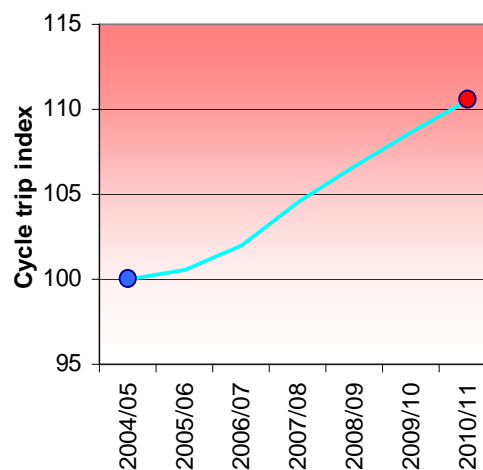
Cycle use in Cambridge is already amongst the highest in the country. Cycling levels are significantly lower in the rest of the county, although higher than the national average.

### 4. General Principles

Monitoring over the last LTP period has shown that cycling levels in Cambridge have remained consistently high. However, because of these existing high levels, there has been little increase in the actual figures and it presents an ongoing challenge to maintain these high levels. New residents to Cambridge may not have such high cycle usage initially as existing residents

### 5. External factors

The figure is comprised of a combination of one-day counts, multiple counts and automatic traffic counters. If the data is disaggregated to individual geographic locations then adverse weather on the day of the count could potentially affect the



● Baseline ● Target — Trajectory

figure. However, given that a combination of counts is used, we are confident that our monitoring regime is robust enough that such occurrences will not skew the figure.

## 6. Milestones

The biggest milestones are the opening of the St Neots cycle bridge and the Riverside cycle bridge

## 7. Programme Areas / Schemes

Schemes / Programme areas	Cost (£000s)	Additional trips				
		2006/07	2007/08	2008/09	2009/10	2010/11
1a Cycleway improvements	1,725	0.8%	1.6%	2.7%	3.7%	4.5%
1b Riverside cycle bridge	2,500					
2a Market Town Transport Strategies	3,087	5.2%	12.7%	17.5%	22.2%	26%
2b St. Neots cycle bridge	1,030					

## 8. Risk

Risk	Impact	Probability	Impact on growth
1 Key infrastructure for cyclists in both Cambridge and the Market Towns cannot be delivered	Medium	Medium	Impact likely to be felt more in Market towns than Cambridge due to existing high levels of cycling in the city
2 New infrastructure does not have anticipated impact on cycle/walking trips	High	Low	More likely to happen in Cambridge than the market town due to existing high levels of cycling
3 Severance of routes by major roads leads to lengthy diversions and either perceived or actual safety/journey time benefits	Low	Low	Likely to affect existing users the most
4 Uncertain development timescales and funding	Medium	Medium	Will impact on when we are able to implement some schemes

## 9. Data issues

In agreement with the DfT we will use the indicator baseline of 2004/05 (rather than 2003/04), as this is based on a larger, more robust set of sites than those monitored in previous years.

## 10. Assumptions

- Cycling by existing Cambridge residents will remain at the same very high levels
- Cycling for new Cambridge residents will start at the average for the rest of Cambridgeshire and then increase
- Cycling in the market towns will increase according to the trend that is the cycling component of the market town trajectory See indicator CON7 below.
- Cycling in rural areas will increase in line with population growth in Cambridgeshire outside of Cambridge

## CON5 (LTP5) Bus Punctuality

### 1. Targets

	Baseline	Baseline Year	LTP Target	Target Date
<b>CON5a (LTP5):</b> At least <b>90%</b> of bus services to start no more than 1 minute early or 5 minutes late, and to arrive at intermediate timing points no more than 1 minute early or 5 minutes late by <b>2010/11</b> .	To be set in 2006/07 – see section 2 below		90%	2010/11
<b>CON5b (LTP5):</b> To <b>improve year on year punctuality of bus services arriving at intermediate timing points</b> in the period to <b>2010/11</b> .			Year on year improvement from baseline.	2010/11
<b>CON5c (LTP5):</b> To <b>reduce excess waiting time for frequent bus services, year on year</b> , in the period to <b>2010/11</b> .			Year on year improvement from baseline.	2010/11

### 2. Introduction

As noted above, we do not at the current time have sufficiently robust information on bus punctuality to set a meaningful baseline for indicator CON5 (LTP5). In 2006/07, survey work will be undertaken in compliance with Department for Transport guidelines on bus punctuality monitoring, and this will be supplemented by data from operators where available, and from information from the Real Time Bus Information system, the first stage of which is now being implemented in Cambridge. While this means that at this time we do not have trajectories for indicator CON5 (LTP5), we have set targets consistent with the LTP guidance on bus punctuality, and will be in a position to monitor this indicator robustly over the period of the LTP. Trajectories will be developed from the baseline information collected in 2006/07, and more detailed targets for CON5b and CON5c will be set informed by this work

### 3. General Principles

- Improvements to infrastructure as well as off vehicle ticketing are required to bring about improvements in bus punctuality
- Close working with bus operators is also required to meet this target
- Real Time Bus Information will be utilised to monitor this indicator

### 4. External factors

- Higher than forecast traffic growth could negatively impact on this target, as buses would be delayed by the additional traffic

## 5. Programme Areas / Schemes

Schemes / Programme areas	Cost (£000s)	Impact on bus punctuality					Relevant to	
		2006/07	2007/08	2008/09	2009/10	2010/11	CON5a, b	CON5c
1 Cambridge bus priority measures	1,949	✓	✓	✓			✓	✓
2 Market Towns bus priority measures	1,500	✓	✓				✓	
3 Future year bus priority measures	1,300				✓	✓	✓	✓
4 A10 Ely – Cambridge corridor bus improvements	475	✓					✓	
5 A428 St Neots – Cambridge corridor bus improvements	483		✓	✓			✓	
6 A1307 Haverhill – Cambridge corridor bus improvements	587				✓		✓	
7 A1301 Saffron Walden – Cambridge corridor bus improvements	408					✓	✓	

8	Cambridgeshire Guided Busway	86,486			✓	✓	✓	✓	✓
9	Kickstart	2,489	✓	✓	✓			✓	✓
10	Multibus partnership	250	✓	✓	✓	✓	✓	✓	✓
11	Real Time Bus Information	1,975	✓	✓	✓	✓	✓	✓	✓
12	Bus lane enforcement	108	✓	✓	✓	✓	✓	✓	✓

## 6. Risk

Risk	Impact	Probability
1 Delay to implementation of bus priority measures	Medium	Medium
2 Bus operators fail to deliver the required improvements	Low	High
3 Insufficient LTP funding for schemes	Medium	High
4 Highways Agency fail to deliver improvements on time	Low	Low
5 Delay in implementation of Guided Bus	Low	Medium
6 Political process slows down progress on schemes	Low	High
7 Higher than forecast traffic growth	Medium	Low
8 Lack of public support for more stringent bus priority measures / enforcement	High	Medium

## 7. Data issues

See 2. above.

## 8. Assumptions

Real Time Bus Information will not have a direct influence on bus punctuality, but will allow the identification of areas where hold ups are occurring, and may allow interventions through the traffic control centre on a real time basis, or the identification of specific reasons for delay.

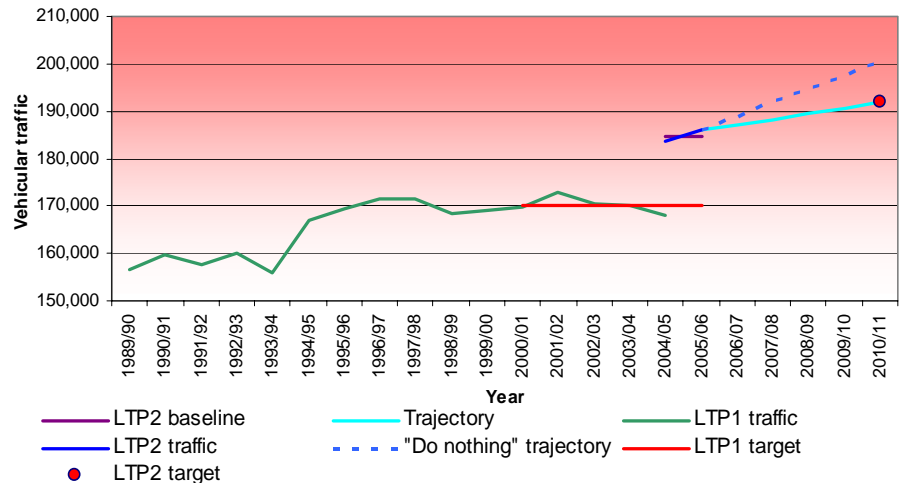
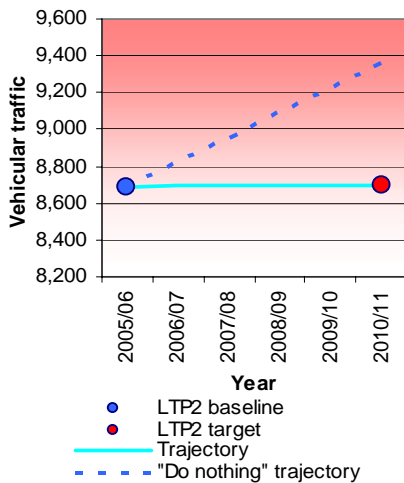
## CON6a (LTP6), CON6b Trends in travel in Cambridge

### 1. Targets

	Baseline	Baseline Year	LTP Target	Target Date
<b>CON6a (LTP6):</b> No more than <b>8,424</b> peak hour (7am-10am) inbound vehicular trips across the Cambridge inner ring road cordon in <b>2010/11</b> .	8,689	2005	8,700	2010/11
<b>CON6b:</b> Less than <b>191,800</b> motor vehicles per day crossing the Cambridge radial cordon in <b>2010/11</b> .	184,793	2004-2006 av.	191,800	2010/11

### 2. Trajectories

CON6a (LTP6)      CON6b



	2006/07	2007/08	2008/09	2009/10	2010/11
<b>CON6a (LTP6):</b> Cambridge morning peak hour traffic	8,700	8,700	8,700	8,700	8,700
<b>CON6b:</b> Cambridge radial cordon traffic	187,150	188,300	189,500	190,650	191,800

### 3. Introduction

CON6a is inbound Cambridge peak period motor vehicle traffic crossing the City Centre inner cordon (drawn just inside the inner ring road).

CON6b is the number of motor vehicles entering and leaving Cambridge as defined by the new outer cordon minus cars intercepted by the Park and Ride sites (as outlined in Section 9 below).

The analysis outlined in Section 11 below shows how we can achieve stability in the peak period, but that off-peak traffic will increase –hence the two differing trajectories above.

### 4. General Principles

1. We will continue to use our successful policy of “carrots” and “sticks” to limit the expected increase in the number of motor vehicles entering and leaving the city.

#### Carrots

- Cycle priority measures
- Improvements to the pedestrian environment
- Existing Park and Ride service
- New and improved bus services into the city (see corridors template)
- Travel plans – these will become more important over the period of the target especially for new developments.

#### Sticks

- Continue with existing Car Parking policy
  - Parking charges higher where demand is greater and alternatives to the car are available (e.g. Parking charges higher than the price of Park and Ride to encourage use)
  - Parking charges set to discourage long stay parking in the city centre

- Decriminalisation of parking to allow better enforcement of on-street parking
- Between the inner ring road and the city boundary, stabilisation of traffic levels will rely on city centre management measures and the reallocation of road space in favour of bus and cycle priority measures. Other than this, travel plans will become increasingly important as schemes are delivered in ensuring that developments are sustainable.

## 5. External factors

- It is anticipated motor vehicles entering and leaving the city over the period of the target will increase in line with national estimates for Cambridge + South Cambridgeshire (which are higher than predicted population growth)
- New mixed development within the city (i.e. inside the cordon) will generate extra traffic and attract traffic into the city.
- Radial routes into Cambridge are at/over capacity during peak periods. There is a possibility that flexible working practices may lead to peaks spreading, however current information suggests that this will not be significant in the period to 2011. See also **Assumptions 2 and 3.**
- The development of the Grand Arcade in the city centre plus other developments will disrupt traffic and lead to a short term reduction in parking spaces. This provides an opportunity to change travel habits permanently.

## 6. Milestones

The following milestones will contribute to the expected increase in motor vehicles entering and leaving the city:

- Seven large developments close to Cambridge are planned to start within the timescale of the current LTP. Start dates range between 2004 for the Northern Fringe – Arbury and 2010 - between Huntingdon Road and Madingley Road.
  - **Developments close to Cambridge – start date 2004**
- The new town (Northstowe) will have 2,700 dwellings by 2011
  - **Northstowe Development – start date 2007**
- Developments are planned in all of the Market Towns. The most significant of these are planned for Huntingdon and Ely.
  - **Ely, development underway to increase size by 1/3– finish date 2006**
  - **Huntingdon, significant development planned – start date 2007**

## 7. Programme Areas / Schemes

Schemes / Programme areas		Cost (£)	Additional Patronage					Relevant to	
			2006/07	2007/08	2008/09	2009/10	2010/11	BV102	CON6c
1	Core Traffic Scheme Stage 4	1,530	✓	✓	✓			✓	✓
2	Core Traffic Scheme Stage 5	220	✓	✓	✓	✓		✓	✓
3	Ring Road Improvements	775	✓	✓	✓	✓	✓	✓	✓
4	Bus Priority Measures	1,949	✓	✓	✓	✓	✓	✓	✓

## 8. Risk

Risk		Impact	Probability	Max impact on growth (%)	Max impact on growth (No.)
1	Political process slows down progress on schemes (assume 2 year delay)	Low	High	3.2%	5,462
2	Central government overrule local policies for new development, specifically parking policies	Medium	Medium	10%	17,000
3	Insufficient Government funding for schemes	Medium	High	5%	8,500

## 9. Data issues

Our old radial cordon was set up in 1978. Three Park and Ride sites are within the old cordon and the two newest sites (Trumpington and Babraham Road) are outside. People travelling to the Park and Ride sites within the cordon by car were counted as car occupants, whereas those using the two sites outside the cordon were counted as bus passengers. (Separate extensive Park and Ride monitoring is also undertaken.)

We have recently reviewed and revised our outer cordon, as shown in the map in Section 11. We have taken the view that the new developments within the cordon should be measured in terms of their impact as *attractors* for traffic (all of the developments are for mixed use) rather than as a *generator* of traffic. For this reason, the new developments are inside the new cordon.

For the purpose of monitoring our Cambridge traffic and Cambridge bus patronage targets, Park and Ride sites will now be within the new cordon. Park and Ride passengers will be added to bus passenger figures, and cars parking at the Park and Ride sites will be deducted from traffic entering and leaving Cambridge.

In 2004 and 2005, surveys of motor vehicles and bus passengers were undertaken at both the new and old survey points, thereby enabling a revised baseline to be linked with historic trend data.

## 10. Assumptions

- National Road Traffic Forecasts (modified for local planning and population growth in the combined area of Cambridge and South Cambs) from DfT TEMPRO car driver forecasts, were used to give the “do-nothing” line between 2005 and 2011. Central forecast (an average of high and low growth forecasts) were used.
- The “forecast” performance trajectory assumes
  - CCC receives the maximum capital funding set out in the LTP
  - sufficient investment in buses and drivers from operators to allow improvements in bus services to go ahead.
- A worst case scenario regarding Government funding for schemes is assumed to be 50% of the total required for integrated transport schemes. Funding for Guided Bus has already been approved.
- It is assumed the introduction of the 3<sup>rd</sup> and 4<sup>th</sup> phases of the City Centre Core Scheme will reduce the overall amount of traffic entering and leaving the city (i.e. not just the traffic entering the city centre).
- It is assumed improvements to bus services and the resultant increase in patronage will reduce the number of motor vehicles entering and leaving the city. To obtain figures for the expected reduction in vehicles from 2004 to 2011, annual figures for total additional bus patronage on corridors were divided by the average number of people per vehicle (measured at cordon points) – 1.26. **For assumptions associated with improved bus services see template for Increasing bus Patronage on corridors into Cambridge.**
- Existing city Park and Ride sites are running close to capacity therefore their effect on traffic entering and leaving is assumed to be neutral.
- It is assumed cycling will remain at a stable level because current figures for cycling are high (i.e. there will be no impact on traffic entering and leaving the city). Figures for the last 10 years show cycling trips have remained stable against a background of national decline in cycle use.
- Please also see additional note in Section 11, which outlines a number of further assumptions used in calculating estimated increases in trips across the cordon.

## 11. Additional Information

### Growth in trips across the Cambridge radial cordon

#### 1. Introduction

- This note looks in detail at trips across the Cambridge radial cordon (i.e. person trips rather than numbers of vehicles), taking account of the planned growth in jobs and houses between 2003 and 2011, and including the effect of travel planning.

## 2. Summary

- 2.1 There will be 16,000 new jobs and 8,000 new houses in Cambridge by 2011. Some of the new people will commute out of the city to work, and in total there will be 10,600 additional (one-way) commuting trips across the cordon each day. Adding in trips for other purposes (leisure, shopping etc.)\* gives a total of 21,200 additional trips per day in total (one-way all purpose).
- \* Please see separate calculations in appendix, which show that approximately 50% of all trips across the Cambridge cordon are for the purpose of commuting.*
- 2.2 10,250 of these additional trips will be by public transport (4,500 by guided bus and 5,750 by other service buses). This includes the effect of travel planning.
- 2.3 There will be an additional 2,000 trips by cycling, walking or train, maintaining the existing modal share for these methods of travel despite more trips overall (due to significantly increased bus use). This equates to an increase of 16% in the number of trips by each of these three modes.
- 2.4 This leaves approximately 4,500 additional commuting trips (mostly during the peak period) and 4,500 trips for other purposes (mostly off-peak).
- 2.5 Monitoring of County Council and Addenbrooke's staff journeys over the past five years has shown little change in the proportion of trips by car-sharing (a slight reduction overall), but teleworking and flexible working are increasing.
- 2.6 We therefore aim to pick up the additional commuting (mostly peak-period) trips by travel planning, with an ambitious target to eliminate 10% of all existing car-commuting trips by teleworking or flexible working by 2011 (this is over and above current levels of e.g. 4% for Shire Hall staff).
- 2.7 There is no mechanism to remove the 4,500 additional non-commuting (mostly off-peak) trips. However, this is acceptable as there remains capacity during the off-peak period.
- 2.8 We can therefore stabilise traffic in the peak period, although off-peak traffic would increase, resulting in an overall increase of  $9500/1.3 = 6,900$  motor vehicles crossing the cordon per day (two-way); equating to 5,770 between 2005 and 2010.

## 3. Analysis

### 3.1 Background

- 3.1.1 This analysis focuses on the effects of additional jobs and houses. No account is taken of increased car ownership and journey length (please see 3.7 below).

### 3.2 2003 position

- 48,500 households in Cambridge
  - 54,500 workers in Cambridge
  - $54,500/48,500 = 1.12$  workers per household
  - 98,900 jobs in Cambridge
    - 80% of Cambridge residents work in Cambridge (1991 census)
  - This gives 66,200 one-way commuting trips across the cordon\*
  - 122,000 one-way trips across the cordon per 12-hour day by all modes except train (includes cycles and pedestrians)
  - 8,200 pedestrians enter Cambridge railway station over 12-hours
  - Therefore, about 50% of all trips are for purposes other than commuting\*
- \* see separate calculations below*

### 3.3 2011 compared with 2003

- 16,000 new jobs
- 8,000 new houses
- $1.12 * 8,000 = 9,000$  new workers
- 10,250 extra public transport trips per 12-hour day into Cambridge

### 3.4 Growth between 2003 and 2001

- $0.2 * 9,000 = 1,800$  of the new workers will commute out of Cambridge to work.
- $0.8 * 9,000 = 7,200$  of the new workers will work in Cambridge, resulting in  $16,000 - 7,200 = 8,800$  additional workers commuting in from outside.
- Total extra commuting trips (one-way) =  $8,800 + 1,800 = 10,600$
- Total extra trips all modes (one-way) =  $10,600 * 2 = 21,200$

### 3.5 How the additional trips will be accommodated

- 3.5.1 **10,250** trips will be by public transport (as per the bus use target): 4,500 by guided bus and 5,750 by other service buses.
- 3.5.2 Currently 4% of all trips across the cordon are by pedal cycle or on foot and 6% are by train. Maintaining the existing modal share for these methods of travel (despite more trips overall), would account for about **2,000** of the extra trips (equating to an increase of 16% in the number of trips by each of these three modes).
- 3.5.3 This leaves approximately 4,500 additional commuting trips (mostly during the peak period) and 4,500 trips for other purposes (mostly off-peak).
- 3.5.4 As outlined in 2.5 above, there has been little change in the proportion of trips by car-sharing (a slight reduction overall) over the past five years, but teleworking and flexible working are increasing, with 4% of County Council Shire Hall staff trips eliminated by teleworking at present.
- 3.5.5 We therefore aim to pick up the additional **4,500** commuting (mostly peak-period) trips by travel planning, with an ambitious target to eliminate 10% of all existing car-commuting trips by teleworking or flexible working by 2011.
- 3.5.6 There is no further mechanism to remove the 4,500 additional non-commuting (mostly off-peak) trips.

### 3.6 Examples of "drivers" that will contribute to increased public transport use and teleworking.

- 3.6.1 It is estimated that there will only be about 5,000 car parking spaces for the 16,000 new jobs in Cambridge. This will result in fewer cars per day crossing the cordon than would have been expected if parking were available for all employees who wished to drive to work.

3.6.2 There is no additional parking for the Grand Arcade development, and the traffic impact assessment for this scheme explains how all of the trips will be accommodated by Park and Ride.

### 3.7 Suppressed demand

3.7.1 In practice, the level of traffic on the radial routes at peak times will suppress some "optional trips" and encourage changes in travel mode, and this has been recognised to some extent in the analysis by excluding increased car ownership and journey length from the equation.

3.7.2 In order to achieve traffic lower than the current level during the peak period, significant additional restraint measures would be required to prevent traffic expanding to fill the additional road space.

### \*Appendix – % of trips across the cordon that are journey to work

#### 2003 position

- 54,500 workers
- 98,900 jobs
- 20% of the 54,500 will commute out to work (10,900) leaving 43,600 to take up jobs within Cambridge. This leaves 98,900 – 43,600 = 55,300 extra workers who have to commute in. Total commuting trips (one-way) therefore = 55,300+10,900 = 66,200.
- % of trips that are commuting = 66,200/(122,000+8,200) = approximately 50%.

## CON7: Travel in the market towns

### 1. Targets

<b>CON7:</b> More than <b>23.9%</b> modal share for daily bus, cycle and pedestrian trips in the market towns in <b>2010/11</b> .			
Baseline	Baseline Year	LTP Target	Target Date
21.9%	2003/04 - 2004/05 av.	23.9%	2010/11

### 2. Trajectories

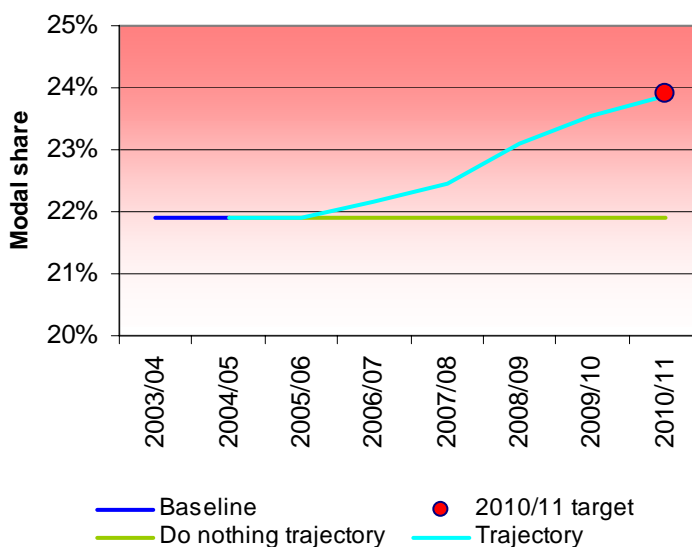
2006/07	2007/08	2008/09	2009/10	2010/11
22.2%	22.4%	23.1%	23.6%	23.9%

### 3. Introduction

This trajectory derives directly from previous work carried out with the DfT in developing trajectories. That work developed three trajectories:

- Full implementation of interim LTP 2004-11 programme 25.5%
- Funding at current levels 24.1%
- Do Nothing 21.9%

Projected growth figures for walking, cycling and public transport are factored from that work on the basis of the level of funding assumed at that time compared to actual funding over the period of this LTP. The target of 23.9% is slightly less than the previous 'funding at current levels' trajectory, reflecting the fact that Cambridgeshire Integrated Transport Block allocation has gone down compared to the period 2001-2006.



### 4. General Principles

1. The level of improvements to bus services for market towns will be similar to that proposed for corridors into Cambridge. Alongside public transport improvements there will be an emphasis on increasing cycling and walking in Market Towns.
2. Market Town Strategies co-ordinate the approach to improving public transport, walking and cycling facilities within each Market Town. The strategies will not directly increase public transport use, but they will increase cycling and walking through infrastructure schemes.

#### Public transport

3. Transport schemes need to be in place in time for the start of new developments, to ensure maximum take-up.
4. Key factors in encouraging public transport use need to be addressed through all schemes. These are: reliability of services (especially punctuality), frequency of services, knowledge/information and cost (in that order).
5. Work with operators to ensure continued investment in improved services to deliver the above (in particular a commitment to providing reliable services) is essential.

#### Walking and cycling

6. A network of cycling/walking routes should be provided in Market Towns plus greater pedestrianisation of town centres. This approach will maximise the increase in cycling and walking trips.
7. New infrastructure should serve core routes (e.g. schools and employment areas and town centres)

### 5. External factors

1. It is anticipated public transport use, cycling trips and walking will increase even in the event of doing the minimum because of the expected population growth in Market Towns over the period of the target.
2. The tendency of bus operators to centralise services on more profitable routes (e.g. along corridors and in urban areas) will lead to growth in patronage on corridor routes and in market towns and therefore an overall growth in patronage.

### 6. Milestones

External factors affecting demand

- **Developments are planned in all of the Market Towns. The most significant of these are planned for Huntingdon and Ely.**
  - Ely, development underway to increase size by 1/3 – finish date 2006
  - Huntingdon, significant development planned – start date 2007

### 7. Programme Areas / Schemes

Schemes / Programme areas	Cost (£000s)	Impact on indicator					Additional bus users, cyclists and pedestrians		
		2006/07	2007/08	2008/09	2009/10	2010/11	Bus	Cycle	Walk
1 Public Transport Background Schemes									
Real Time Bus Information	1,975	✓						-	-

	Better bus information		✓					503		
	Low floor buses		✓							
2	<b>Cambridgeshire Guided Busway</b>	86,486		✓				1,620	-	-
3	<b>Market Town Strategies – cycling and walking infrastructure</b>									
	Ely	250	✓	✓	✓			-	156	156
	March	250	✓	✓	✓			-	325	325
	St Neots	776	✓	✓	✓	✓	✓	-	86	86
	Huntingdon/ Godmanchester	1,570	✓	✓	✓	✓	✓	-	165	165
	Wisbech	511	✓	✓	✓	✓		-	64	64
4	<b>St Neots cycle bridge</b>				✓			-	200	100
5	<b>Safe Routes to School</b>		✓	✓	✓	✓	✓	-	50	50

## 8. Risk

Risk	Impact	Probability	Max impact on indicator
1 Failure to implement pedestrian & cycle infrastructure / failure to implement on time (i.e. lose network benefits and 2 year delay)	Medium / High	Medium	0.8%
2 Insufficient funding for public transport schemes	Medium	Medium	0.2%
3 Bus operators fail to deliver all required improvements	Low	High	0.2%
4 Integrated transport schemes do not have anticipated impact on public transport use	Low	Low	0.2%
5 New infrastructure does not have anticipated impact on cycle/walking trips	Low	Low	0.2%

## 9. Data issues

- Existing data is from our Network Monitoring Statement. Data is collected annually at cordon and city centre points
- The target is measured as an aggregate of growth across all Market Towns
- We have identified that the current level of monitoring in Market Towns is adequate to measure this target. We are looking at options for funding the improved monitoring set out below.
- Improved monitoring is required in the following Market Towns to ensure a better sample of multimodal trips are picked up:
  - Huntingdon
  - St Ives
  - March
  - Ely

Once implemented a new baseline will be ascertained.
- Fare box data from bus operators in Market Towns is required to obtain robust patronage figures (as opposed to measuring patronage at cordon points).
- Data will be supplemented with ticketing information from new Park and Ride sites and the Guided Bus. This will be collected as for our existing Park and Ride sites through a partnership arrangement with the bus operators.
- All new cycle routes will have monitoring loops (counters installed)
- We will look to monitor the modal split for the new town Northstowe in a similar way, once development starts. Northstowe (start date 2007) will have 6,000 dwellings by 2016, with 2700 dwellings due to be completed within the timescale of the current LTP.

## 10. Assumptions

- With a growth in the population of Market Towns, the same proportion of the population is expected to use buses, cycle and walk. The trajectory in **2. Trajectory** assumes that if minimal improvements are made, bus patronage, cycling and walking will increase in line with population growth in the Market Towns. (% growth in population is taken from population forecasts for Huntingdonshire, East Cambridgeshire and Fenland districts to 2011, produced by the CCC Research Group.)
- The trajectory in **2.** assumes funding for the programme at the levels shown in Chapter 12 of the LTP.
- Funding for the Cambridgeshire Guided Bus is assumed.
- The public transport element of the trajectory assumes sufficient investment in buses and drivers from operators.
- The effect of the Background schemes (see **7. Schemes, 1**) will increase at a steady rate over the course of the LTP. The effects of individual schemes are small so the growth in patronage has been aggregated across schemes. For the Market Towns growth in patronage as a result of background schemes is estimated at 5%.
- The Guided Bus will increase bus patronage in Huntingdon and St Ives. Patronage figures for the Guided Bus scheme (see **7. Schemes, 2.**) are based on the Guided Bus bid figures within the LTP. According to the bid patronage will increase in the pattern Year 1 – 50%, Year 2 - 75%, Year 3 - 90% Year 4 – 100% (of total expected growth). Patronage figures shown are net values, i.e. they are new trips to this mode rather than displaced trips from other bus services.
- Market Town Strategies - Growth in the number of cycling trips is calculated using data provided by Sustrans (data taken from surveys of users of new Sustrans routes). This data provides an estimate of the number of cycling trips generated per km of new cycleway (16.12 trips per km). **CCC has concerns over the robustness of this data.** Figures will be revised when data is available from monitoring loops installed on new cycle routes.
- Market Town Strategies – Growth in the number of walking trips is assumed to grow in line with the number of cycling trips. In the absence of any other data we have had to rely on the Sustrans data (above). **This is a highly unsatisfactory measure of growth in walking.** We will need to address this issue through better monitoring to measure the effects of new infrastructure.
- Market Town Strategies – Once a comprehensive cycling/walking network has been developed it has been assumed there will be an additional increase in the number of cycling and walking trips over and above the expected number of trips generated per km. Cycling trips - +10% of all new trips generated. Walking trips - +5% of all new trips generated.
- St Neots Cycle Bridge - Numbers of cycling and walking trips generated by this new bridge are estimated from figures for a new cycle bridge in Devon (Millers Bridge). The area is similar in terms of population to St Neots. Figures for daily cycling trips (in the autumn which is when we measure cycling trips) were: Year 1 - 131, Year 2 - 166. Although figures are not yet available it is assumed trips will increase again in Year 3 (by 35 trips per day – the increase from Year 1 to Year 2) and stabilise at 201 trips per day.
- St Neots Cycle Bridge – It is assumed the bridge will be used by pedestrians as well as cyclists. The same figures are used as in 10. but these have been reduced by 50% to reflect the smaller number of walking trips expected. **It is recognised this assumption is not robust** and better monitoring to measure the effect of the bridge is required.
- A further 2% increase of cycling and walking trips has been added to the additional trips generated by Market Town Strategies, to account for an increase in trips due to Safe Routes to School (SRTS) schemes. All schools within the Market Towns will have SRTS by 2011.

## Road Safety

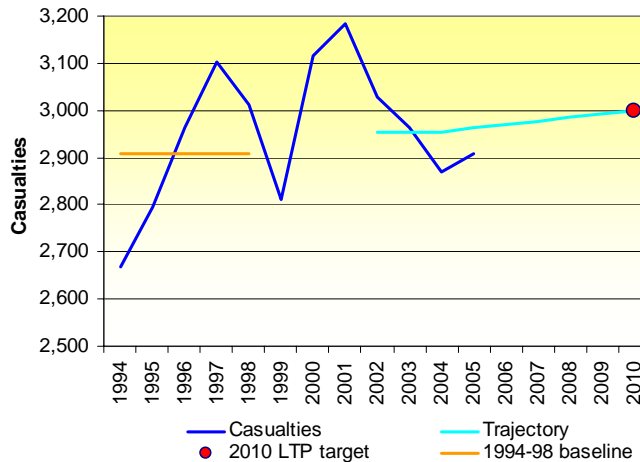
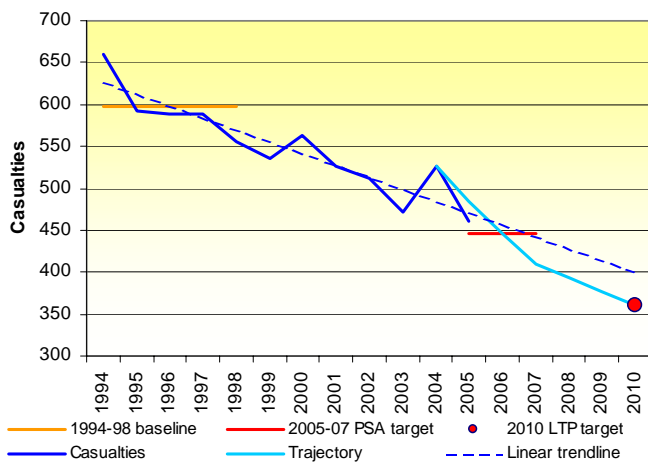
### RS1a (BV99x), RS1c (BV99z) Road accident casualties

#### 1. Targets

		Baseline	Baseline Year	Target	Target Date
<b>RS1a (BV99x):</b>	Casualties killed or seriously injured	597	1994-98 av.	Less than <b>360</b>	2010
<b>RS1a LPSA (BV99x):</b>	Casualties killed or seriously injured	503	2002-03 av.	Less than <b>447</b>	2005-07 av.
<b>RS1c (BV99z):</b>	Casualties slightly injured	1994-1998 av	2,908	Less than <b>3,000</b>	2010

#### 2. Trajectories

RS1a / RS1a LPSA (BV99x)	RS1c (BV99z)
--------------------------	--------------



	2006/07	2007/08	2008/09	2009/10	2010/11
<b>RS1a / RS1a LPSA (BV99x):</b>					
Casualties killed or seriously injured	447	429	406	383	<b>360</b>
<b>RS1c (BV99z):</b>					
Casualties slightly injured	2,980	2,985	2,990	2,995	<b>3,000</b>

#### 3. Introduction

The Council is working in partnership with others, including the Police, the Highways Agency, the Health Service, the Fire & Rescue Service, the Magistrates' Courts and the Crown Prosecution Service to reduce road casualties in Cambridgeshire.

#### 4. General Principles

- We are working to reduce the underlying number of deaths and serious injuries, but road accidents are random events, and hence the total number of KSI casualties in a given year will be subject to a degree of random variation, with random changes of plus or minus 8% not being too unusual and larger fluctuations being possible.
- The underlying trend can be influenced by (amongst other things):
  - road safety engineering
  - education, training and publicity
  - police enforcement
  - improved vehicle design
  - national legislation
- The effect of road safety engineering schemes and safety cameras can be quantified in terms of expected casualty reductions per type of schemes, but the effects of the other things listed above cannot all be quantified.
- The Council has entered into a Local Public Service Agreement with the Government to achieve a challenging stretch target of a 447 KSI casualty average over the period 2005-2007, and this will help us to achieve the Government's target of a 40% reduction from the 1994-1998 average baseline by the year 2010.
- The targets shown for indicator RS1a (BV99x) are based on our LPSA target for 2005-2007 and the national 40% reduction target for 2010.
- The target for indicator RS1c (BV99z) equates to a 20% decrease in the rate of injuries per million vehicle kilometres compared to the 1994-98 baseline.
- Time series modelling of historical data (using a seasonal ARIMA model) has proved to be a reliable method of providing short-term forecasts of KSI casualty totals in Cambridgeshire.
- Our 2010 target for RS1a (BV99x) represents a greater decrease than the recent historical trend, and is therefore very challenging, but, subject to full funding, we believe that it is achievable.

#### 5. External factors

- The weather can have a significant effect on the number of KSI casualties. In particular, wet weather / a wet road surface is related to an increase in casualties. This is mitigated to some extent in the Council's LPSA agreement by having a target based on a 3-year average, but the targets for individual years can be affected.
- For Cambridgeshire the national casualty reduction targets for deaths and serious injuries are very challenging because of the growth agenda in the County and the fact that the targets are based on absolute numbers (unlike the slight injury target which is based on a rate per vehicle Km). There is a strong relationship between overall traffic volume and numbers of accidents/casualties, so traffic growth will have a direct effect on the KSI total.

#### 6. Programme Areas / Schemes

Schemes / Programme areas		Cost (£000)	Impact on indicator					Relevant to	
			2006/07	2007/08	2008/09	2009/10	2010/11	RS1a (BV99x)	RS1c (BV99z)
1	Safety schemes programme	4,500	✓	✓	✓	✓	✓	✓	✓
2	Major safety schemes	2,390	✓	✓			✓		✓

7. Risk					
Risk	Impact	Probability	Max impact on target (casualties)		
			RS1a (BV99x)	RS1c (BV99z)	
1	Insufficient LTP funding (assume £200,000 cut per year)	Medium / High	Low	2	11
2	Insufficient revenue funding (assume £200,000 cut per year)	High	Medium	6	42
3	Any changes in national guidance or legislation that make it more difficult to continue to introduce safety cameras	High	Low	3	20

**8. Data issues**

1. As outlined above, road accidents are random events, and the total will vary randomly from one year to the next, with random changes of plus or minus 8% not being too unusual and larger fluctuations being possible.

**9. Assumptions**

- For low cost (<£25,000) remedial schemes the average saving is 1.14 accidents per scheme and 0.042 accidents per £1,000 spent.
- For higher cost (>£25,000) remedial schemes the average saving is 3.9 accidents per scheme and 0.011 accidents per £1,000 spent.
- On average there are 0.2 KSI (fatal or serious) casualties per injury accident and 1.172 slight injuries per injury accident.
- It is assumed that sufficient Government funding will be available
- It is assumed that sufficient revenue funding for low-cost accident remedial schemes will be available.
- The combined effect on the KSI total of education, training, publicity, enforcement, improved vehicle design and national legislation will continue at the same rate as in recent years.

**10. Additional Information**

- Our target for slight casualties is more challenging than the government target of a 10% reduction due to the predicted increase in traffic in the county
- Traffic is forecast to increase by 29.6% from 1994 to 2010, therefore if we maintain slight casualties at current levels this is equivalent to a 20% reduction in the rate of slight casualties per million vehicle kilometres.

## RS1b (BV99y) Child road accident casualties

**1. Target**

RS1b (BV99y): Child casualties killed or seriously injured			
Baseline	Baseline Year	Target	Target Date
48	1994-1998 av	25	2008-2010 av.

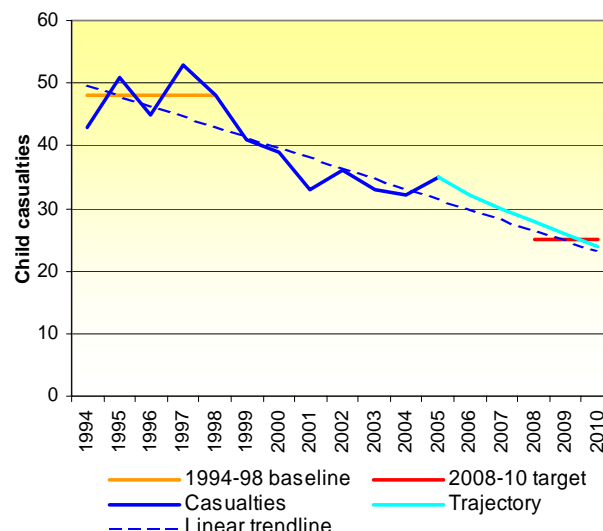
2. Trajectory				
2006/07	2007/08	2008/09	2009/10	2010/11
32	30	28	26	24

**3. Introduction**

The Council is working in partnership with others, including the Police, the Highways Agency, the Health Service, the Fire & Rescue Service, the Magistrates' Courts and the Crown Prosecution Service to reduce road casualties in Cambridgeshire.

**4. General Principles**

- We are working to reduce the underlying number of deaths and serious injuries, but road accidents are random events, and given that the total number of child KSI casualties in a given year is relatively small, it will be subject to a high degree of random variation.
- The underlying trend can be influenced by (amongst other things):
  - road safety engineering
  - education, training and publicity
  - police enforcement
  - improved vehicle design
  - national legislation
- The effect of road safety engineering schemes and safety cameras can be quantified in terms of expected casualty reductions per type of schemes, but the effects of the other things listed above cannot all be quantified.
- The Council is aiming to achieve the Government's target of a 50% reduction from the 1994-1998 average baseline by the year 2010, and the targets shown are on this basis.
- 70% of child KSI accidents involve car, with car occupants making up a significant proportion of the child KSI total, and the policies aimed at reducing all deaths and serious injuries will also help to reduce the child KSI total.



**5. External factors**

- The weather can have a significant effect on the number of KSI casualties. In particular, wet weather / a wet road surface is related to an increase in casualties. This is mitigated to some extent in the Council's LPSA agreement by having a target based on a 3-year average, but the targets for individual years can be affected.
- For Cambridgeshire the national casualty reduction target for child deaths and serious injuries is very challenging because of the growth agenda in the County and the fact that the targets are based on absolute numbers (unlike the slight injury target which is based on a rate per vehicle Km). There is a strong relationship between overall traffic volume and numbers of accidents/casualties, so traffic growth will have a direct effect on the child KSI total.

**6. Programme Areas / Schemes**

Schemes / Programme areas	Cost (£000)	Impact on indicator				
		2006/07	2007/08	2008/09	2009/10	2010/11
1 Safer routes to schools programme	1,590	✓	✓	✓	✓	✓
2 Safety schemes programme	4,500	✓	✓	✓	✓	✓
3 Major safety schemes programme	1,290	✓	✓			✓

**7. Risk**

Risk	Impact	Probability	Max impact on casualties
1 Insufficient LTP funding	High	Medium	3
2 Insufficient Revenue funding	High	Medium	
3 Any changes in national guidance or legislation that make it more difficult to continue to introduce safety cameras	High	Low	

## 8. Data issues

1. As outlined above, road accidents are random events, and the total will vary randomly from one year to the next. Because the number of child KSI casualties is relatively small, this random variation could be a large proportion of the figure in a given year.

## 9. Assumptions

1. For low cost (<£25,000) remedial schemes the average saving is 1.14 accidents per scheme and 0.042 accidents per £1,000 spent.
2. For higher cost (>£25,000) remedial schemes the average saving is 3.9 accidents per scheme and 0.011 accidents per £1,000 spent.
3. On average there are 0.2 KSI (fatal or serious) casualties per injury accident and 1.172 slight injuries per injury accident.
4. It is assumed that sufficient Government funding will be available
5. It is assumed that sufficient revenue funding for low-cost accident remedial schemes will be available.
6. The combined effect on the KSI total of education, training, publicity, enforcement, improved vehicle design and national legislation will continue at the same rate as in recent years.

## Wet skid resistance

### 1. Target

	Baseline	Baseline Year	Target	Target Date
RS2: Wet skid resistance (SCRIM)	40%	2004/05	To be set in 06/07	2010/11

### 2. Trajectory

The figure for 2005/06 is a significant reduction from the previous years baseline, and following investigations we have not determined the reason for this. It is not our intention to set a trajectory (other than 3%) for next year, however will review the position then once the next result has been calculated.

	2006/07	2007/08	2008/09	2009/10	2010/11
RS2: Wet skid resistance (SCRIM)	(3%)	-	-	-	-

### 3. Introduction

The Sideways-force Co-efficient Routine Investigation Machine (SCRIM) value measures the wet-skid resistance of the road surface.

### 4. General Principles

Carriageway maintenance works will improve the wet skid resistance of the network.

### 5. External factors

The UK Climate Impacts Programme (UKCIP) is predicting drier summers and wetter winters by 2020, which will mean the dry summer of 2003 could become the norm. This would cause increased amounts of damage to road surfaces in Cambridgeshire. Adaptation strategies to minimise the risk of future damage will have a cost implication, although this may be less than remedial works at a later date.

Additional funding from government has been available to cover such impacts in the past, at a level that allowed progress against BV96 (BV223) and BV97a (BV224a) to be maintained, while significantly impacting on progress on BV97b (BV224b).

### 6. Programme Areas / Schemes

Schemes / Programme areas		Cost (£000)	Impact on indicator				
			2006/07	2007/08	2008/09	2009/10	2010/11
1	Principal roads carriageway maintenance	7,911	✓	✓	✓	✓	✓
2	Non-principal/Unclassified roads carriageway maintenance	19,978	✓	✓	✓	✓	✓

### 7. Risk

Risk	Impact	Probability
1 Hot dry summers accelerating the deterioration of the network	High	Medium
2 Insufficient LTP funding for maintenance	Medium	Medium
3 Interventions not having anticipated impact on the target	Medium	Low

### 8. Data issues

The methodology for this measurement has been changed so figures for 2004/05 onwards cannot be directly compared to previous progress against this indicator.

## Asset Management

This section details the trajectories that have been developed for asset management LTP indicators. In line with government guidance, a target and trajectory have not yet been set for Indicator AM1b (BV224a).

### AM1 (BV223, BV224a, b) Condition of principal, non-principal and unclassified roads

1. Targets					
		Baseline	Baseline Year	Target	Target Date
<b>AM1a (BV223):</b>	Less than 5% of principal roads with a notional residual life of less than 0 years in 2010/11.	4%	2005/06	5%	2010/11
<b>AM1c (BV224a):</b>	Condition of non-principal roads	13%	2005/06	<b>To be set in 2006/07</b>	
<b>AM1c (BV224b):</b>	Less than 15% of unclassified roads with a notional residual life of less than 0 years in 2010/11.	26.6%	2003/04	15%	2010/11

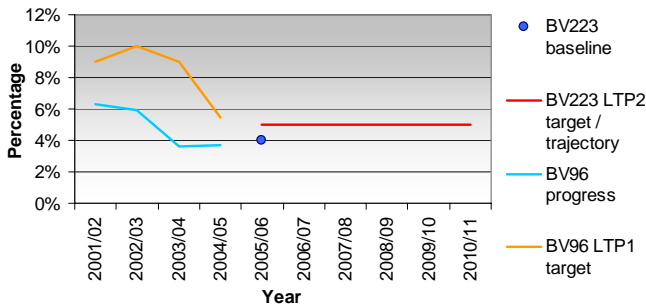
**2. Trajectories**

We aim to sustain the condition level of principal roads where structural maintenance may be required at 5%, which for Cambridgeshire is the 'steady state' in respect of overall condition, and the level of funding available for the classification of road.

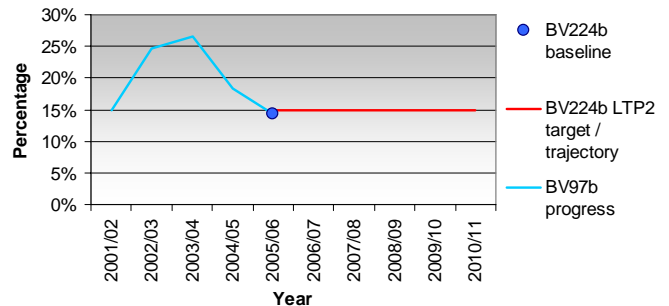
We aim to maintain the condition of unclassified roads where structural maintenance should be considered to less than 15% in the period to 2010/11.

We will be targeting maintenance expenditure in the period of this LTP on improving the condition of the non-principal road network. At the time of this LTP, we are not in a position to set a target, as due to the change in measurement methodology, we need to assess the impact of our programme on road condition. We hope that this work will allow us to set a trajectory showing an improvement in the condition of the non-principal road network. It is possible that this work will also allow us to revise the trajectory for indicator BV224b.

#### AM1a (BV223)



#### AM1c (BV224b)



	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>AM1a (BV223):</b>	Condition of principal roads	4%	5%	5%	5%	5%
<b>AM1c (BV224a):</b>	Condition of non-principal roads	13%	<b>To be set in 2006/07</b>			
<b>AM1c (BV224b):</b>	Condition of unclassified roads	15%	15%	15%	15%	15%

### 3. Introduction

#### AM1a (BV223)

This is the first year that BV223 has been collected and reported. The physical survey is similar to last years BV96 TTS, using the same type of machine, but the method of analysis and reporting has altered slightly so the figures cannot be directly compared (although they are similar, as shown on graph above).

#### AM1b (BV224a)

BV224a replaces indicator BV97bas the measure of non-principal road condition, and is now based on scanner data, rather than the previously used Coarse Visual Inspection (CVI) data.

#### AM1c (BV224b)

This performance indicator has previously been identified as BV97b. The survey and reporting mechanisms have not changed, only the PI number has altered to bring it in line with the new BV224a non-principal classified roads indicator.

### 4. General Principles

#### AM1a (BV223)

BV223 will be produced from the TTS and Scanner survey results using a UKPMS accredited pavement management system. We are required to report the percentage length of road in poor overall condition which are likely to require planned maintenance soon, (typically within a year), on a worst first basis, i.e. the "red" length. The report is split into 3 categories, Red, Amber and Green.

- "Red" = lengths in poor overall condition which are likely to require planned maintenance soon
- "Amber" = lengths where some deterioration is apparent which should be investigated to determine the optimum time for planned maintenance treatment
- "Green" = lengths where the carriageway is generally in a good state of repair

#### AM1c (BV224b)

This indicator is based upon a visual survey of at least 25% of the unclassified road network using a UKPMS Coarse Visual Inspection (CVI).

### 5. External factors

Climate change will have an affect on the condition of the network, with dryer, hotter summers and wetter winters causing increased deterioration and damage to our network typical signs being subsidence, heave and 'fattening up' from high temperatures. Additional funding from government has been available to cover such impacts in the past, at a level that allowed progress against BV96 (BV223) and BV97a (BV224a) to be maintained, while significantly impacting on progress on BV97b (BV224b).

6. Programme Areas / Schemes										
Schemes / Programme areas		Cost (£000s)	Effect on road condition					Relevant to		
			2006/07	2007/08	2008/09	2009/10	2010/11	AM1a (BV223)	AM1b (BV224a)	AM1c (BV224b)
1	Principal road maintenance programme	7,911	No change					✓		
2	Non-principal / unclassified road maintenance programme	19,978	To be quantified in 2006/07						✓	✓
			No change							

7. Risk				
Risk	Impact	Probability	Impact on road condition	
1a	Hot summer conditions / wet winter conditions in lifetime of LTP2 causing more rapid deterioration and greater damage to the network.	High	Medium	Potential for up to 10% increase in BV224b, assuming emergency funding available at historic levels.
1b	Climate change – longer term requirement for greater levels of funding to maintain network condition in same state	Low (in lifetime of LTP2) High (long term)	Low (LTP2) High (long term)	Minimal impact in lifetime of LTP, based on funding at levels shown (see risk 1).
2	Budget reductions for road maintenance	Low - Medium	Low	If funding shortfall existed, funds would be prioritised to highly trafficked routes. Impact would therefore primarily fall on BV224b.

**8. Data issues**

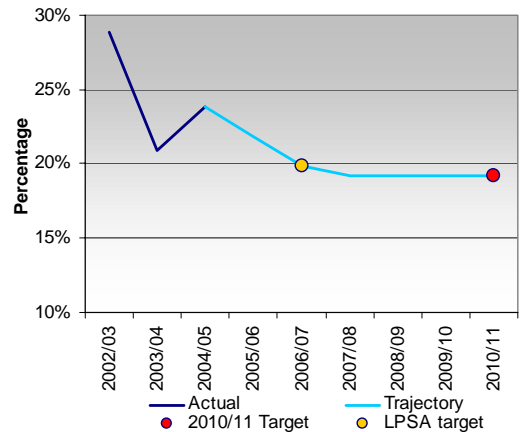
**AM1a (BV223)**  
It is accepted that there is the possibility of a 2-3% difference in reported figures for BV223 that may be attributable to survey method anomalies only, and therefore a small fluctuation either way may not indicate an improvement or deterioration in the condition of the network.

**AM1c (BV224b)**  
As the indicator is based upon a 25% sample of the network, there will be some variation expected based upon geographical anomalies. For instance the condition of unclassified roads in the Fens, where peat desiccation and shrinkage may occur more freely than other parts of the network, will mean this indicator fluctuates to a certain degree. It may be more appropriate to look at the long-term trends for this indicator rather than compare one year to the next.

**9. Assumptions**  
The trajectories have been based upon the assumption that current budget levels will be maintained, with allowances for inflation and increased industry costs. If maintenance budgets are reduced then this would impact upon these trajectories, most markedly on AM1c (BV224b) as funds would need to be prioritised to the more heavily trafficked classified routes.

## AM2 (BV187) Condition of surface footway

1. Targets							
	Baseline	Baseline Year	Target	Target Date			
AM2/AM2 LPSA (BV187): Condition of surface footway	20.9%	2003/04	19.2%	2010/11			
AM2 LPSA (BV187): Condition of surface footway			19.85%	2006/07			
2. Trajectories							
2006/07	2007/08	2008/09	2009/10	2010/11			
19.85%	19.2%	19.2%	19.2%	19.2%			
We aim to improve the condition of the footway network using the limited funds available. A lower figure for this target indicates an improvement in the condition of the footway network.							
3. Introduction							
To improve footway maintenance and construction to make them safer to use and reduce insurance claims.							
4. General Principles							
1. Carrying out maintenance works on the footway will improve it's condition.							
5. External factors							
Climate change will have an affect on the condition of the network, with dryer, hotter summers and wetter winters causing increased deterioration and damage to our network typical signs being subsidence, heave and 'fating up' from high temperatures. Additional funding from government has been available to cover such impacts in the past, at a level that allowed progress against BV96 (BV223) and BV97a (BV224a) to be maintained, while significantly impacting on progress on BV97b (BV224b). BV187, as an LPSA indicator, would receive funding as a priority in this instance in 2006/07.							
Uncertainty about the impact of the proposed level of intervention may result in adjustments to the target and trajectory.							
Concentration on high use routes could increase rate of deterioration of less used footways. The programme will need to be flexible enough to deal with this and maintain less well used routes in a safe condition,							
6. Programme Areas / Schemes							
Schemes / Programme areas		Cost (£)	Impact				
			2006/07	2007/08	2008/09	2009/10	2010/11
1	Footway and cycleway maintenance	5,433	✓	✓	✓	✓	✓



<b>7. Risk</b>				
<b>Risk</b>		<b>Impact</b>	<b>Probability</b>	<b>Max impact on growth (%)</b>
<b>1</b>	Extensive periods of hot dry weather causing increased deterioration of the network	Medium - High	Medium	
<b>2</b>	Maintenance works not having the anticipated impact	Low- Medium	Low - Medium	
<b>3</b>	Budget reductions for road maintenance	Low - Medium	Low	If funding shortfall existed, funds would be prioritised to highly trafficked routes. Impact would therefore primarily fall on BV224b and BV187.
<b>8. Data issues</b>				
We currently have little available trend data for this indicator. Future years data will be used to validate the target and trajectory or allow us to make changes to them to ensure they remain challenging and realistic.				
<b>9. Assumptions</b>				
The trajectories have been based upon the assumption that current budget levels will be maintained, with allowances for inflation and increased industry costs. If maintenance budgets are reduced then this would impact upon these trajectories, most markedly on AM1c (BV224b) as funds would need to be prioritised to the more heavily trafficked classified routes.				

