



**Inquiry into the Cambridgeshire
Guided Busway Order Proposal:**

Statement of Case

June 2004

1 Introduction and Overview

This document contains the Statement of Case from CAST.IRON relating to the public inquiry to be held into the TWA Order application submitted in February 2004 by Cambridgeshire County Council for a Cambridgeshire Guided Busway.

This document starts with an overview of some of the more important points that are raised in this Statement of Case, before setting out the full statement. It should be noted that the all points raised in this document, including its appendix, form a part of the Statement of Case, whether or not referred to in the summary.

Throughout this document the following conventions are used:

References to other documents are indicated in the text in the form [x: page/section].

References are listed in Section 16.

References to other sections within this document are distinguished by being marked **x.y.z** in bold.

CGB = Cambridgeshire Guided Bus proposal

CCC = Cambridgeshire County Council

ToR = Terms of Reference

AST = Appraisal Summary Table

ODPM = Office of the Deputy Prime Minister

SCDC = South Cambridgeshire District Council

Much of the analysis in this document uses information produced by CCC relating to CGB, plus data from the CHUMMS report produced DTLR/GO-East. CCC has sought to rely heavily on the CHUMMS report in its justification for CGB. Most of the references made in this document are therefore to data and documentation produced by CCC and DTLR/GO-East.

Some CCC documents use the term 'CHRT' to refer to CGB. The term CGB has been used throughout this document, except in the case of direct quotations.

1.1 Overview: General Issues

- 1.1.1 The CGB scheme as proposed in the TWA Order application submitted in February 2004 by CCC [17] lacks firm proposals for on-road running sections – Huntingdon to St Ives or through Cambridge City. Without such proposals, the economic and transport case for CGB cannot be made. The TWA process should be suspended *sine die* until [17] is amended to include such proposals.
- 1.1.2 The on-road running sections will affect the timing of journeys. Also the journey times along guideway sections will be longer than stated in CCC's bid for funding of CGB [2]. Journey time savings form much of the claimed economic case for CGB in [2]. The TWA process should be suspended *sine die* until CCC has published amendments to its claims in [2], with full supporting documentation, to show the modified economic case for CGB, taking into account:
- o timings based on firm proposals for on-road running sections;
 - o all information that is known by CCC to affect the expected journey times along guideway sections.
- 1.1.3 The CGB scheme as proposed in [17] lacks firm proposals on services to be provided. However CCC's proposed draft TWA Order [10] indicates that CCC will have the power to prescribe all details of these services, whether provided by CCC or by one or more other operators. CCC should be required to make such firm proposals. The TWA process should be suspended *sine die* until [17] is amended to include such proposals.
- 1.1.4 A significantly greater level of transport and environmental benefits could be obtained, both in Cambridge City and along the A14 corridor, by the introduction of a demand management scheme within the City, than could be obtained from CGB. In place of capital expenditure on CGB, demand management should use revenue obtained from congestion charging to provide more frequent bus services and attractive fares. This model has been shown to be successful in London as a way both to reduce congestion within City areas and to increase public transport usage. Most of the environmental benefits claimed by CHUMMS [3] for CGB derive from demand management, but they would be obtained from demand management even if CGB were not implemented.
- 1.1.5 Many strategic transport needs of the region are poorly served by the CGB proposals. These needs require alternative transport options to be put in place, using the trackbed that [17] seeks to use for CGB. Many of these strategic transport needs were not taken into account in [2] or in the CHUMMS study [3]. A re-examination of solutions to these needs should be required and the TWA process should be suspended *sine die* until these needs and their possible transport solutions has been re-assessed. There are feasible alternative transport options available that would both cater for these needs and also meet all the transport needs that CGB is able to address.
- 1.1.6 CGB requires an unnecessarily high land take, significantly greater than that required for alternative transport options. This applies both to the land permanently required once the system were constructed and also to the land required for construction/material haul use during construction of CGB. CGB requires much of the track bed and associated drainage culverts to be rebuilt. This would have a significant impact on the wider landscape as it will create a visual scar which will take many years to mitigate. The level of disruption and nuisance associated with construction/material haul is also significantly greater than that required for alternative transport options. The level of severance (i.e. disconnection of communities or properties) is also significantly greater than that required for alternative transport options.
- 1.1.7 CGB would have a significantly adverse environmental effect. A major factor in its environmental effect is due to the need clear vegetation to construct the guideway and maintenance track, whose width is greater than required for alternative transport options. This applies even at those points where CGB construction is contained within the existing railway reserve.
- 1.1.8 A large number of issues relating to safety and permitted operating practices arise in the case of CGB. The TWA process should be suspended *sine die* until such time as these issues have

all be resolved and their impacts on the economic and transport case and the environmental impact have all been taken into account.

- 1.1.9 The comparison with alternative transport options produced by CCC in support of CGB is at best flawed and highly misleading. The transport benefits of CGB have been overstated by CCC. The benefits of possible alternative transport options have been understated. Sub-optimal versions of alternative options have been chosen for the purposes of comparison by CCC. A re-examination of alternative transport options should be required and the TWA process should be suspended *sine die* until [17] is amended to reflect a reasonable comparison with alternative transport options.
- 1.1.10 The full costs of CGB have been understated by CCC and have been partly diverted into other budgets. Even those costs that are admitted by CCC have risen sharply since [2] as CCC has been required to replace vague statements about CGB with a greater level of detail. The level of detail presented in [17] is still sufficiently inadequate and [17] raises such a large number of unanswered questions that its cost schedule [13] must be taken as subject to significant risk of substantial increases. To a significant extent this risk is associated with the untried technical nature of the CGB scheme, with no comparable rural guideway ever having been constructed previously in the UK. Many technical issues have been identified and remain unresolved relating to the scheme. The level of current technical uncertainty relating to the scheme, with its expected impacts of higher costs and reduced transport benefits, are such that the scheme should be rejected in its current form as being insufficiently defined for granting of a TWA Order.
- 1.1.11 Detailed study of the costs of a railway alternative to [17] has been carried out by CAST.IRON and this indicates that a railway system represents a lower cost alternative to [17]. Unlike the sub-optimal rail options used by CCC as the basis to reject rail, CAST.IRON has studied alternative rail options that take account of current best practice. Significantly, the style of design of rail system favoured by CAST.IRON closely matches the latest initiative by the Strategic Rail Authority (SRA) on rural railways, an initiative that was only first publicised by the SRA a few months after CAST.IRON had disclosed its favoured design. Unlike the CGB proposal, the technical aspects of reinstating a railway are well understood and this leads to a significantly lower risk attaching to a rail option than to CGB, as well as the lower cost. Furthermore the costs obtained by CAST.IRON in its study work are robust as they come from two sources:
- o Contractors who have recently carried out comparable works on UK railways and who have surveyed the existing trackbed as necessary to give a realistic assessment of the cost of reinstating the formation;
 - o Railway companies currently operating in the UK, which have provided CAST.IRON with information on their recent costs to carry out comparable works, these being works that have been sufficient to meet relevant approvals, e.g. from HMRI and HSE.
- 1.1.12 CCC has repeatedly claimed that the rail industry does not support rail alternatives to CGB. Canvassing of the rail industry by CCC has not taken place in an open or acceptable manner. CCC should be required to canvas support from the rail industry in a fair process with full public visibility. The TWA process should be suspended *sine die* until this has occurred.
- 1.1.13 CCC has claimed that CGB enjoys public support and all-party local government support. Both claims are incorrect. If, as asserted by the Secretary of State [19], CGB does not merit consideration as a scheme of national significance, then its lack of support by the public in the region affected should be a primary consideration and a sufficient ground for the scheme to be rejected.
- 1.1.14 [17] contains numerous mis-statements, technical inconsistencies, contradictions and weaknesses, raised by CAST.IRON and others during the public consultation period. CCC has stated [18] that it is contacting all objectors to [17] who have raised issues. No such contact has occurred in the 10 weeks following the raising of such issues by CAST.IRON or by numerous other parties. All issues raised by objectors should be addressed in writing by CCC, in accordance with its stated intention, before an inquiry into CGB occurs. The resolution of many of the issues raised will substantially affect the transport, environmental and economic case for CGB. There are many material errors in the CCC Environmental Statement. The

issues raised are sufficiently significant to demand a full reassessment of the case for CGB before an inquiry into CGB occurs.

- 1.1.15 CCC has repeatedly claimed that the details of the CGB scheme have been subject to expert, detailed and independent scrutiny. However [2] contains both:
- o assurances about the scheme, made by consultants engaged by CCC;
 - o at the same time, clearly visible elementary errors which strike at the heart of the economic case for CGB.

The public rightly believes that scrutiny of the scheme arranged by local and national government is of a less exacting quality than has been represented or is required, also that more exacting scrutiny will reveal yet more fundamental weaknesses in the CGB proposals.

- 1.1.16 The flawed nature of the CGB transport case and its misleading representation by CCC are both illustrated by comparison of the following:
- o The TWA application states that 61% of predicted CGB users are non car owners but that CCC's modelling does not explain their present mode of travel;
 - o A breakdown of CCC journey figures shows that 60% of predicted CGB journeys would be either journeys entirely along existing roads and served by existing, cheaper buses or journeys possible using current bus routes that are no slower and that are cheaper than CGB;
 - o Information in the CHUMMS report, much quoted by CCC in support of CGB, indicates that these journeys will simply replace journeys currently made by bus.

It is interesting to note a further 'coincidence' that 60% of riders on the Leeds guided bus system, again much quoted by CCC in support of CGB, have simply transferred from other bus services.

- 1.1.17 The flaws in the transport and economic case for CGB stated by CCC, along with the realistic potential benefits of the scheme are such that, irrespective of the earlier points in this summary, the scheme should be abandoned forthwith. A number of the more important flaws in the transport and economic case stated by CCC are highlighted in the remainder of this summary.

1.2 Summary: Usage Analysis for CGB and Alternative Transport Option

The analysis in this document demonstrates the following points.

- 1.2.1 Journeys by CGB would in most cases be slower or no faster than alternatives by existing bus services. Fares charged would be greater.
- 1.2.2 The public perception of CGB would be no higher than existing bus services.
- 1.2.3 Ridership of CGB would be much less than predicted by CCC.
- 1.2.4 The number of vehicles removed from the A14 by CGB is predicted to be as few as 2%. Given the reduced ridership predicted by this analysis, the actual number would be significantly less than 2%. Any journey time savings on the A14 would be minimal.
- 1.2.5 CCC says that CGB will provide associated journey time savings valued at £128 million discounted over 30 years. Due to **1.2.1, 1.2.2** and **1.2.4** the actual value will be much less than this. Journey time savings represent half of the claimed value of CGB. The overall justification for CGB must therefore be re-appraised. It is stated in the government offer of finance for CGB [8] that ODPM believes CGB has been shown to have a strong transport case when assessed as a stand-alone scheme. In the light of the information in this document, this belief cannot be justified. The offer should be withdrawn.
- 1.2.6 CGB has been promoted as a scheme that will ease congestion of the A14 corridor, especially at peak periods. Such a claim is inconsistent with 2% or lower reduction in vehicles on the A14. Furthermore, the claimed ridership for CGB is built up of short journeys, many of them:
 - o not replacing a journey which would have had an A14 component;
 - o not even involving use of the guideway at all.

Whereas the average commuting journey into Cambridge is 14.5 miles, the average journey predicted for CGB is 2.5 miles. These short journeys, even if they were made by CGB, would not ease congestion of the A14 corridor.
- 1.2.7 Low ridership of CGB would lead to either higher fares, to pay for the costs of running CGB, or subsidy from local taxation. CGB ridership levels would be highly sensitive to changes in fare levels. Hence in either case lower ridership of CGB would lead to subsidy from local taxation.
- 1.2.8 A 'do nothing' scheme of improved conventional bus services, capital cost £5 million, was discounted as an alternative by CCC. In fact it would produce the same or greater benefits than CGB.
- 1.2.9 An attractive rail alternative to CGB also exists. The comparison of CGB with both 'do nothing' and rail alternatives produced by CCC is so flawed and inequitable as to require the entire case for CGB to be re-evaluated.

1.3 Breakdown of Claimed Ridership

The **20,250** return journeys per day forecast for CGB by CCC cannot be justified. CCC data shows that these journeys break down into the following categories.

1.3.1	Journeys entirely along existing roads and served by existing, cheaper buses, hence: <ul style="list-style-type: none"> o No guideway element at all in these journeys; o Journeys no faster than existing bus services. Examples are St Ives to Huntingdon and Science Park to Drummer St. There is no good reason to include these in the CGB forecast.	5,800	29%
1.3.2	Journeys possible using current bus routes that are no slower and that are cheaper than CGB. For example St Ives to Drummer St is both faster and cheaper by existing bus services. Ridership can be expected to stay on existing routes. Alternatively these existing routes would deteriorate, producing net disadvantage from CGB.	6,300	31%
1.3.3	Journeys that are unattractive via CGB as a change of bus would be required. This increases the journey time substantially compared with CCC claims.	450	2%
1.3.4	Journeys dependent on investment in Chesterton Interchange. This scheme is not costed in CGB and CCC has recently proposed delaying the scheme yet again. To achieve this ridership, additional investment for Chesterton Interchange is required, affecting the cost/benefit justification for CGB.	1,500	7%
1.3.5	Journeys dependent on investment in Chesterton Interchange that would in any case then be made by rail. These clearly cannot be included in the CGB forecast	300	2%
1.3.6	Journeys for which CGB as proposed appears to provide a more attractive public transport option than currently available alternatives	5,900	29%
	Total projected by CCC	20,250	100%

In contrast a rail system, as described later in this document, would carry 12,700 passengers per day. The average length of journey for these passengers would be 5.7 miles, which is significantly longer than for CGB. The transport benefits due to carrying these 12,700 passengers would outweigh those due to carrying even 20,250 passengers by CGB.

The figures in this summary are supported by analysis in the following sections.

In predicting usage of CGB, CCC did not take account of affects on CGB patronage due to specific existing bus services [2]. The misrepresentation caused by this failure is sufficient to require the entire case for CGB to be re-evaluated.

CCC has based its predictions of off-peak travel statistics on areas where second car ownership is nearly five times lower than in South Cambridgeshire. This calls even the figure of 5,900 passengers per day into question – as only 1,960 Of these represent peak time travel.

1.4 Summary: Revenue and Cost Analysis for CGB

- 1.4.1 Analysis of the operating costs for CGB shows that the cost estimates presented by CCC are significant underestimates. CCC submissions to government have indicated an annual running cost for the system of £366,000. In contrast the cost elements indicated by information in the TWA application documents amount to an annual running cost of £873,000.
- 1.4.2 CCC estimates of the costs that would be incurred by bus operators in running CGB services have significantly understated items in the following key areas: capital cost of buses, driver remuneration, size of fleet and number of drivers required.
- 1.4.3 As a result of these underestimates, statements by CCC that CGB can be run without subsidy cannot be accepted. If CGB were to run at the patronage levels and service frequencies projected by CCC, CGB would require a cash subsidy of £11.6 million in its first 5 years of operation.
- 1.4.4 As previously described, a usage forecast at around 29% of CCC predictions is more realistic. To accommodate this lower usage level, a much less frequent service would almost certainly be operated.
- 1.4.5 At this lower patronage level and service frequency, CGB would require a cash subsidy of £14 million up to 2016.
- 1.4.6 Of much more concern is the fact that, at these lower levels, CGB would continue to require a cash subsidy even once the new town of Northstowe reaches 6,000 dwellings. CGB would be a long term cash liability on the finances of CCC.
- 1.4.7 Even the reduced patronage level in **1.4.4** is unlikely to be realised unless CCC dictates off-peak running service frequencies on the guideway greater than are commercially viable – in practice this can only be achieved if CCC provides subsidies to bus operators.
- 1.4.8 In the absence of such subsidies, CGB usage will be much lower, especially at off-peak times. Nevertheless CCC will still be liable to meet the annual running cost of £873,000 for the guideway system itself, which will mean a cash subsidy from public funds.
- 1.4.9 The level of off-peak usage is further called into question by CCC's inappropriate assumptions about peak/off-peak usage ratios. This is discussed in **2.7** below.
- 1.4.10 The construction cost of CGB, according to the technical specifications in the TWA application and other CCC documentation, will be at least £101.5 million. Of this, only £86.4 million has been disclosed in the TWA application. The remainder has been transferred to other CCC transport budgets.
- 1.4.11 Of the £101.5 million:
- o £32.5 million is provisionally allocated as a government grant;
 - o £45.6 million would be additional CCC borrowing, for which central government currently says it will meet some of the financing costs;
 - o £23.4 million would require contributions under 'Section 106' agreements.
- 1.4.12 The £45.6 million of CCC borrowing is a particular cause for concern. The government has issued no guarantees that it will continue to support this borrowing over the 25 year payback period.

2 Usage Analysis for CGB and Alternative Transport Options

2.1 Basis of CCC patronage predictions

This section sets out the basis on which CCC produced its patronage predictions for CGB. This section does not contain grounds for objection to CGB, but sets out information required to understand the following sections.

- 2.1.1 [1: p463] gives the expected peak hour usage of CGB as 3340 passengers in 2016.
- 2.1.2 [2:p45] says that there will be two 3-hour busy periods on weekdays, one in the AM and one in the PM. [2:p55] says that total usage during each 3-hour period will be twice the peak hour figure. This multiplier is taken from busy period P&R bus analysis in Coventry.
- 2.1.3 [2:p45] states that the system will operate for 18 hours per day, 7 days a week. [2:p55] says that total annual usage will be 1061 times the three hour peak period usage. This multiplier is taken from London Transport studies. [2:p45] assumes that operation is spread over 350 operating days per year.
- 2.1.4 These figures together produce a predicted daily usage level of 20,250 return journeys per day, or 7.1 million return journeys per year. ([1:p463] gives 21,500 trips/day. This discrepancy is not explained in CCC documentation.)
- 2.1.5 The CCC breakdown of AM peak hour journeys predicted for CGB in 2016 is as follows.

	Huntingdon	St Ives	Swavesey	Longstanton	Oakington	Impington	Regional College	Science Park	Sidings	Castle Street	Bridge St	Emmanuel Street	Drummer Street	Railway Station	Clay Farm	Trumpington	Addenbrookes	TOTAL
Huntingdon		90	0	12	1	6	10	10	7	2	0	28	0	3	3	0	0	172
St Ives	163		19	18	3	18	20	18	17	20	3	60	1	7	7	0	1	375
Swavesey	0	14		17	1	4	7	7	6	1	0	27	0	4	3	0	0	91
Longstanton	25	25	37		17	45	79	64	64	46	5	263	0	48	17	1	4	740
Oakington	1	3	1	5		14	31	15	12	3	0	65	0	8	3	0	1	162
Impington	2	4	1	5	5		9	7	6	1	0	34	0	7	2	0	0	83
Regional College	4	4	2	7	8	14		20	23	7	1	168	0	34	7	0	2	301
Science Park	6	6	3	11	6	15	35		17	1	1	169	0	58	9	0	2	339
Sidings	8	7	4	10	5	9	37	17		3	3	148	0	55	12	0	2	320
Castle Street	3	0	0	2	1	1	3	0	0		9	14	9	9	4	0	1	56
Bridge Street	1	0	0	0	0	0	1	0	0	2		3	2	3	1	0	0	13
Emmanuel Street	2	1	0	2	1	1	4	5	4	13	11		5	2	0	0	0	51
Drummer Street	1	0	0	1	0	0	1	0	0	8	6	3		49	12	1	5	87
Railway Station	2	1	0	2	1	1	4	4	4	8	11	14	129		47	2	26	256
Clay Farm	1	1	0	1	0	0	1	1	1	3	2	3	29	43		0	42	128
Trumpington	1	0	0	0	0	1	1	1	2	3	3	3	60	64	12		17	168
Addenbrookes	0	0	0	0	0	0	0	0	0	1	1	1	18	19	2	0		42
	220	156	67	93	49	129	243	169	163	122	56	1003	253	413	141	4	103	3384

This table indicates the number of passengers travelling from each of the locations listed along the left of the table to each of the locations listed along the top of the table.

- 2.1.6 This table shows a total of 3384 AM peak hour journeys, a discrepancy of 1.1% against the total of 3340 given in [1:p463]. The total in the table will be used in the sections that follow.
- 2.1.7 In 2002 [2:p15] CCC gave a lower AM peak hour total of 3149. This lower level is approximately equal to the traffic level obtained by discounting trips to and from Castle St/Bridge St – those trips for which a bus running along Histon Road would be appropriate rather than along Milton Road. It is accepted that CCC made a simple error in discounting these trips and that the table above is a reasonable basis for analysing CCC's predicted passenger demand.
- 2.1.8 The table shows that only 7.3% of trips relate to buses running along Histon Road. [2:p46] indicates a peak hour route pattern with 87.5% of buses using Milton Road and 12.5% using Histon Road. [2:p46] indicates that only one bus an hour would serve Histon Road during off-peak periods. For these reasons, phrases such as 'typical journey time' and 'typical service' must be interpreted as referring to a service along Milton Road.
- 2.1.9 [1:p463] indicates that 39% of users of CGB are predicted to be car owners. These are expected either to drive to the nearest Park and Ride site or to walk from their homes to the nearest stop. [2:p96] indicates that users can be expected to walk for up to 17 minutes to the nearest stop.
- 2.1.10 The remaining 61% of users are non car owners whose means of access to the CGB and present mode of travel are not explained, according to [1:p463], in CCC's patronage modelling.
- 2.1.11 [1:pIV] and [1:s4.2.3] indicate that CGB services are intended to run solely between the CGB route points in the table above - CCC has no plans to run services that leave the CGB route midway and run into nearby villages. Instead [1:pVI] says that passengers would transfer between conventional bus routes and CGB services at the Park and Ride sites.

2.2 Modal Shift Factors and Journey Times

This section considers the relative journey times by CGB and existing bus services. It considers the claims made by CCC for modal shift from car to CGB.

- 2.2.1 The usage levels in the CCC data at **2.1.5** represent solely a potential customer demand for a high-quality public transport system running between the points given in the table. This table does not support, imply or validate a claim that CGB would in fact attract the patronage shown in the table.
- 2.2.2 The public perceives rail as a higher quality service than buses. The modal shift from car to rail will be higher than that to a bus service. These facts are acknowledged in [1:p56].
- 2.2.3 The statement in [1:p56] that public perception of guided bus is closer to rail than bus cannot be accepted in the case of CGB. The supporting evidence offered by CCC in [1:p56], [1:p461] relates to the Leeds busway, where the guided sections are urban sections of the bus route. Public perception of the Leeds busway as a quality transport option derives from two factors:
- o the busway allows faster running through the urban section of a bus route, with customers seeing the bus as 'jumping the traffic queues';
 - o the busway is not subject to problems of delays due to parked vehicles obstructing the road. Customers perceive parked vehicles as a problem for urban bus lanes.

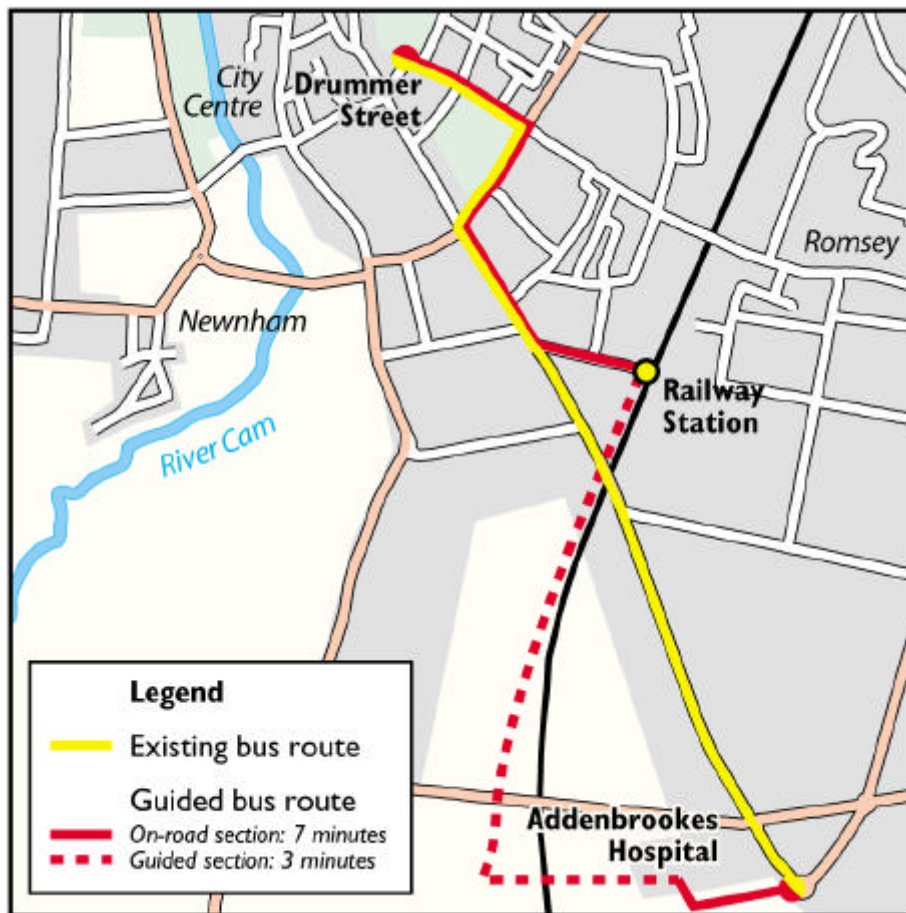
Neither of these factors applies to CGB; the public perception of CGB along the on-road sections will be the same as for conventional buses.

Timing of journeys within Cambridge

- 2.2.4 The running time for buses on on-road sections will be the same as for conventional buses. [4] indicates a typical journey time by CGB from the Science Park to Addenbrookes as 26 minutes. (This figure can be derived from [4] by noting, as **2.1.8** above, Milton Road is the typical route for purposes of assessing CGB timings.) 26 minutes is the same running time as can be achieved with current conventional buses. Science Park to Drummer St is timed at 15 minutes (routes 19/99) and Drummer St to Addenbrookes at 11 minutes (routes 32/99).

- 2.2.5 The CGB journey time for this segment will in practice be longer than 26 minutes. [1:p454] indicates that single deck buses will run from Drummer St to Addenbrookes while double deck buses will run from Science Park to Drummer St. Hence a change of bus will be required, adding to journey time and lowering the image of travel by CGB.
- 2.2.6 There is a low passenger demand for both Addenbrookes and Trumpington stops, of 145 and 172 passengers both ways in the AM peak hour respectively. This means that a 10 minute interval peak hour service as [1:p455] to each destination is unsustainable. Either fewer buses will be run or more likely a circular route including both destinations would be run. The minimum time for this circular route from Drummer St would be 26 minutes return.
- 2.2.7 Currently both Addenbrookes and Trumpington are served with a 10 minute interval service (routes 99/77). This would be more frequent, faster or both than the CGB alternative.
- 2.2.8 CGB services from the North would typically run into Cambridge via Milton Road. [6] says that Milton Road is the heaviest loaded road into Cambridge, with 26,300 vehicle movements each way in a 12 hour period. At peak hours, journey times are longer and subject to greater variation of delay. The timetable for bus route 19 increases the journey time allowance between Science Park and Drummer St to 20 minutes in the morning peak.
- 2.2.9 The timing for Addenbrookes to Drummer St by CGB is at best 1 minute shorter than existing services, or on average 2 minutes longer if a circular CGB route is operated. This is based on a dwell time of 30 seconds per stop [2:p52], maximum running speed of 55mph [1:p454] and speed of 20mph at guideway breaks and highway intersections [1:p464].

The map below shows the alternative routes to Addenbrookes via existing bus services and proposed CGB services. At peak times, the segment of both routes that is most liable to delay is the northern end, the on-road section of the CGB route, i.e. the section from Drummer St to Station Road. This is illustrated by the current bus 8 timetable, which allows an additional 5 minutes for this segment at peak times. As a consequence the southern CGB guideway will not produce either better or more reliable journey times than existing services.



- 2.2.10 Passengers who use buses from the Science Park to the Railway Station currently have a timetabled journey of at least 26 minutes, including a change at Drummer St. A survey at the Railway Station on 27 February found that passengers in practice allow 45 minutes for this journey because of bus delays, to avoid missing the train. This is the route that CGB would take through the city and it indicates the extent of journey unreliability likely with CGB.
- 2.2.11 The same survey produced written evidence of a company that had decided not to relocate to the Science Park on account of the inaccessibility of the station.
- 2.2.12 The unreliability of journey times on the city streets will be a major negative factor, inhibiting use of CGB. Nearly all journeys in the CCC table have a significant on-road component. This will cause CGB to have a public image that is no better than conventional bus services.
- 2.2.13 Bus priority measures, if implemented between the Science Park and the Railway Station, may reduce typical journey times. No firm commitment to specific measures is made in the TWA application; they cannot be relied on in CCC's justification of patronage forecasts. In any case, such measures:
- o should apply to all buses and would not make CGB services faster than conventional bus services;
 - o would still not give CGB a public image greater than conventional bus services, for which many bus lanes are already provided in Cambridge.

Timing of Journeys Outside Cambridge

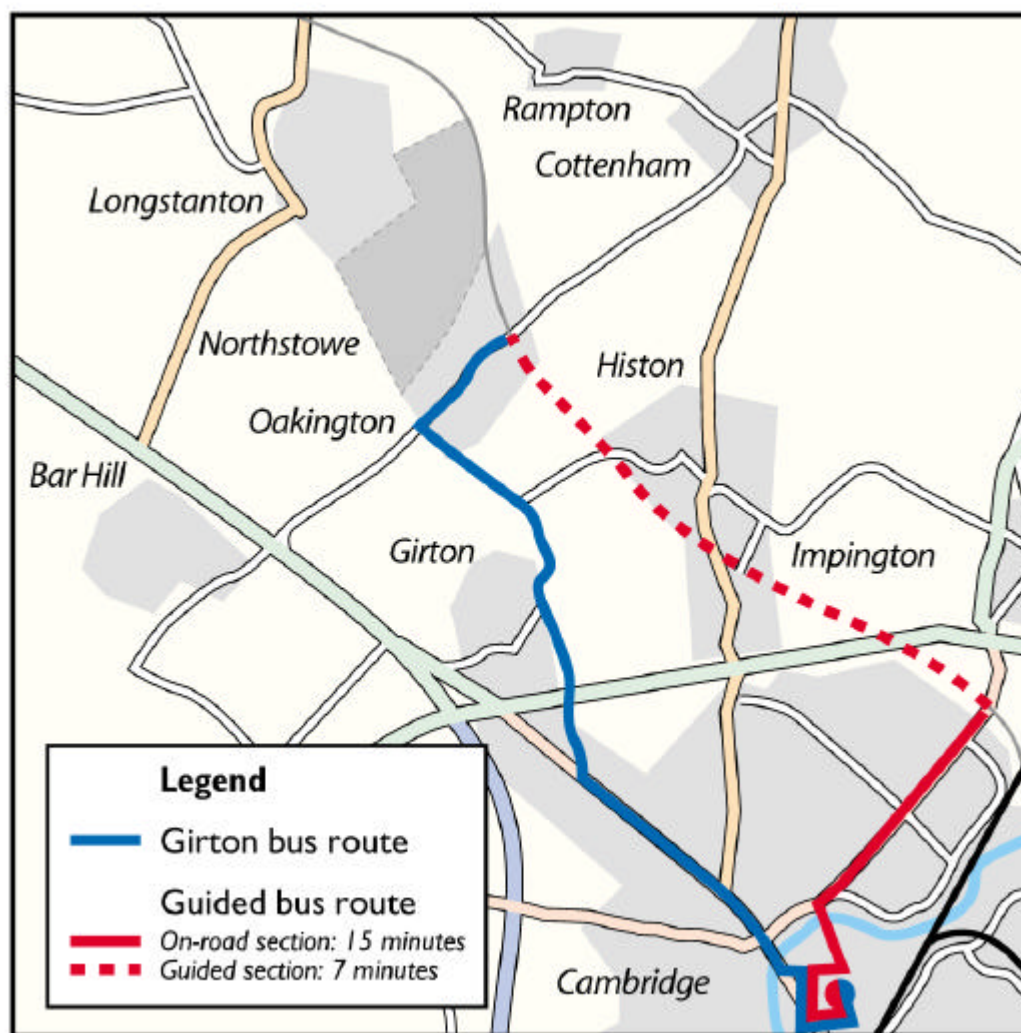
- 2.2.14 The rural guideway proposed for CGB to the north of Cambridge does not lead to improved journey times. As noted above nearly all CGB forecast journeys have a significant on-road component.
- 2.2.15 [4] gives the running time from St Ives to Science Park as 18 minutes. This is unsupported. [2] indicates that this must be based on a dwell time of 30 seconds per stop [2:p45], maximum running speed of 55mph [1:p454] with a speed of 20mph at guideway breaks [1:p464] and highway intersections. Applying these rules gives a time for this segment of over 19 minutes.
- 2.2.16 19 minutes assumes no delays at traffic lights. (This is unlikely given the tendency of motorists to obstruct junctions in rush hour and to 'jump' red lights.)
- 2.2.17 The 20mph speed claimed for 'hurry call' signal controlled junctions is higher than would be allowed and cannot be accepted. Other recently authorised 'hurry call' junctions have been restricted to 12mph by HMRI.
- 2.2.18 Furthermore many of these junctions are with busy roads, such that the danger of accidents at such signal controlled junctions means that either buses can be expected to be required by HMRI to come to a complete stop before proceeding or that barrier controlled crossings will be required by HMRI.
- 2.2.19 The modelling in [2] assumes unrealistic bus acceleration/deceleration performance. [2:p45] gives typical bus acceleration as 4.83m/s^2 , which is equivalent to 0-60mph in 5.5 seconds and is as fast as a Ferrari, and deceleration as 9.85m/s^2 , which is equivalent to 60-0mph in 2.7 seconds, or faster than free fall. Neither of these figures can be accepted.
- 2.2.20 These errors raise serious concern about the accuracy of CCC's predictions in general, particularly since such clearly unrealistic figures were not identified by the independent audit that CCC claims to have been carried out on [2]. The guideway times should be reappraised using more realistic values.
- 2.2.21 Technical weaknesses in the guideway design set out in [17] will increase journey times further.
- 2.2.22 For example the proposed Work 1E is shown in [21] as requiring both the existing roadway and the proposed maintenance track to be lowered significantly, to approximately the current level of the ground 50m east of the proposed bridge.

- 2.2.23 At this level, both the existing roadway and the proposed maintenance track will be flooded for a substantial part of the year. The ground 50m east of the proposed bridge was under water for much of the period from November 2003 until after Easter 2004.
- 2.2.24 In place of the proposed bridge, an at-grade crossing between the guideway and the existing roadway will therefore be required. This will increase the journey time along the guideway.
- 2.2.25 The guideway design set out in [17] identifies the need for an additional break in the guideway within Work 6, for a junction with a local route within Northstowe. However no such break is shown. The break is essential to the declared CGB services supporting Northstowe. Its effect, in increasing journey times, must therefore be factored into the transport case for CGB.
- 2.2.26 In order to comply with current disability access legislation, a number of footpath crossings proposed in [14] may require breaks in the guideway, with consequent effects on journey times.
- 2.2.27 The modelling of constant 55mph running along sections of guideway is too simplistic and leads to faster times journey times being predicted than will be achieved.
- 2.2.28 All safety factors, including those matters raised in Section 13 of this document, should be fully appraised and their affects on journey time, both average and variability should be taken into account as part of this process.
- 2.2.29 Errors or misrepresentations regarding expected journey times are of fundamental significance to the case for CGB, since so much of the transport and economic justification depends on claimed reductions in journey times.
- 2.2.30 The level of inaccuracy of CCC timing predictions, plus the level of public concern about other factors that may worsen guideway timings, are such that CCC should be required to declare all known speed restrictions to which guideway running will be subject and produce revised timings for the guideway, to which they should then be required to undertake to conform.
- 2.2.31 This declaration should be required before the TWA application is allowed to progress further.

Representative Journey Comparisons

- 2.2.32 Combining a 19 minute journey on the guideway with the City segment timings from buses 19/99 gives Drummer St – St Ives as 34 minutes. [2:p52] confirms that such a method of combining segment times is appropriate for an appraisal of CGB.
- 2.2.33 In contrast current bus services (routes 553-555) are timetabled at 30 minutes, or 4 minutes faster, for the same journey.
- 2.2.34 Similarly Drummer St – Oakington via CGB would take 22 minutes, using the same approach as above. In contrast current bus service 2 is timetabled at 20 minutes for the same journey.
- 2.2.35 Both of these timings in **2.2.33** are for journey times between Drummer St and the eastern tip of the proposed Northstowe development. This indicates that CGB will give no improvement for Northstowe residents over existing bus services.
- 2.2.36 It is stated in the government offer of finance for CGB [8] that ODPM believes CGB will facilitate Northstowe development. In the light of **2.2.34**, this belief cannot be justified. The offer should be withdrawn.

The map below compares the routes of existing bus services with the proposed CGB route. It will be noticed that the CGB is longer not only in journey time but also in distance. This produces a negative environmental effect.



- 2.2.37 Both **2.2.32**, **2.2.34** illustrate that existing bus services will be more attractive than CGB bus services. If CGB is commissioned, bus operators will continue to operate on the competing conventional bus routes, where fares will be less. This will significantly lower the patronage of CGB.
- 2.2.38 [1:p454] indicates that journey times used to assess likely patronage of CGB are based on country-wide norms - not on the actual roads to be used by CGB buses when not on the guideway. This cannot be accepted as reasonable practice. Current bus timetables must be used instead. The journey time predicted from Drummer St to Huntingdon at [1:p464] relies on a St Ives – Huntingdon segment time of 10 minutes. Current buses take 20 minutes.
- 2.2.39 In the absence of specific proposed bus priority measures on this segment, the total journey time would be 54 minutes for CGB against 50 minutes for current services (route 555). If bus priority measures *can* successfully be used to reduce this segment to 10 minutes, the total journey time would be 44 minutes for CGB against 40 minutes for conventional bus services (route 555) since, as already noted, on-road bus priority measures should produce identical time improvements for all services.
- 2.2.40 The examples given above represent key journeys that are appropriate as a basis for assessment of CGB. In each case the scheme offers no time benefit over current bus routes; public perception of CGB will be lower than for conventional routes as a result of the longer journey times.
- 2.2.41 CGB is claimed to offer better service in terms of time reliability. The unreliability of services through Cambridge means that this cannot be accepted.
- 2.2.42 Measurements of AM peak period journey times taken on the 6km stretch of A14 between Swavesey and the M11 intersection have shown that the average journey time over this stretch

is less than 1 minute greater at peak periods than under near-empty road conditions. This stretch is the heaviest loaded section of the both current A14 and planned A14 upgrade [3] and it accounts for a majority of potential journey time savings attributed to CGB.

- 2.2.43 Furthermore [2] notes that the upgrade to the A14, now authorised by government and included in the Highway Agency's Targeted Programme of Improvements, will reduce both journey times and time variations along the A14.
- 2.2.44 In contrast bus operators allow an additional 5 minutes for the journey time between the Science Park and the City Centre at peak times compared to off-peak times.
- 2.2.45 Hence a claim of better time reliability cannot be accepted for any of the CGB system.
- 2.2.46 CGB is claimed to offer a better service than conventional buses in terms of bus quality. However [1:p53] indicates that quality partnerships could be set up to ensure quality standards for conventional routes, comparable with those proposed by CGB. Hence this claim cannot be accepted.
- 2.2.47 CGB is claimed to offer a better service than conventional buses in terms of information systems. [5] indicates that CCC is committed to deploying information systems on conventional bus routes, in advance of the proposed construction of CGB. Hence this claim cannot be accepted.

The analysis in this section has demonstrated the following points:

- Journeys by CGB would in most cases be slower or no faster than alternatives by existing bus services;
- The public perception of CGB would be no higher than existing bus services.

2.3 Ridership to Sidings bus stop

This section and the following sections provide an analysis of the journeys on CGB as predicted by CCC. They illustrate that CCC predictions of patronage levels are at best questionable.

This section looks at the patronage forecast to and from 'sidings' bus stop. This bus stop is a proposed potential link up between CGB and the rail network at a proposed Chesterton Interchange.

- 2.3.1 Of the patronage forecast, 14% of journeys – 483 in the peak hour or 2,900 per day - are to or from the 'sidings stop'.
- 2.3.2 255 of these peak hour journeys, or 1,500 per day, would be made via Sidings to/from stops north of Cambridge. These journeys would occur only upon construction of Chesterton Interchange railway station, as the purpose of Sidings stop would be to connect CGB to the railway north of Cambridge. [5] indicates a cost of £18 million for Chesterton Interchange. This cost is not included in the CGB scheme cost.
- 2.3.3 For these 255 predicted peak hour users of Sidings, in the absence of Chesterton Interchange, their alternative would be to travel across the city to Cambridge Station not by rail but by CGB. This would mean a journey time lengthened by 15 minutes and subject to substantial journey time unreliability. It cannot be accepted that travellers would make a mode shift to CGB under these circumstances. Unless CCC commits to this additional investment, the CGB patronage forecast must be reduced by 1,500 per day.
- 2.3.4 Plans for Chesterton Interchange have been delayed repeatedly, so that the project must remain in doubt. In the last month a further delay of 2 years has been announced by CCC.
- 2.3.5 In the event that Chesterton Interchange is built, CCC must answer the following question about bus routes: will all buses for Milton Road run via Sidings, hence worsening all journey times into city, or will buses run either to the city or to the sidings, in which case additional bus journeys will be needed to accommodate the balance of loadings.
- 2.3.6 From the 483 predicted peak hour journeys involving Sidings, 59 of these would simply not be made by CGB. These journeys are between the two railway stations – journey time by rail 5 minutes. Passengers will not change onto a bus for a journey time of at least 20 minutes instead.

2.3.7 From the 483 predicted peak hour journeys involving Sidings, 169 of these would almost certainly be made via the Railway Station rather than Sidings. 152 out of the 169 are journeys from mainline rail services to Emmanuel Street/Drummer Street, for which the journey time to Emmanuel Street is at least 5 minutes quicker via the Railway Station than via Sidings. The remainder are journeys to/from points south of Cambridge, for which the journey is 15 minutes quicker via the Railway Station than via Sidings.

The table below shows the effect of the above points. 59 journeys are removed, making a revised total for CGB of 3325 peak hour journeys. Those journeys that are dependent on Chesterton Interchange being built are marked in italics. Changes due to **2.3.7** are marked in bold.

	Huntingdon	St Ives	Swavesey	Longstanton	Oakington	Impington	Regional College	Science Park	Sidings	Castle Street	Bridge St	Emmanuel Street	Drummer Street	Railway Station	Clay Farm	Trumpington	Addenbrookes	TOTAL
Huntingdon		90	0	12	1	6	10	10	7	2	0	28	0	3	3	0	0	172
St Ives	163		19	18	3	18	20	18	17	20	3	60	1	7	7	0	1	375
Swavesey	0	14		17	1	4	7	7	6	1	0	27	0	4	3	0	0	91
Longstanton	25	25	37		17	45	79	64	64	46	5	263	0	48	17	1	4	740
Oakington	1	3	1	5		14	31	15	12	3	0	65	0	8	3	0	1	162
Impington	2	4	1	5	5		9	7	6	1	0	34	0	7	2	0	0	83
Regional College	4	4	2	7	8	14		20	23	7	1	168	0	34	7	0	2	301
Science Park	6	6	3	11	6	15	35		17	1	1	169	0	58	9	0	2	339
Sidings	8	7	4	10	5	9	37	17		3	3	0	0	0	0	0	0	103
Castle Street	3	0	0	2	1	1	3	0	0		9	14	9	9	4	0	1	56
Bridge Street	1	0	0	0	0	0	1	0	0	2		3	2	3	1	0	0	13
Emmanuel Street	2	1	0	2	1	1	4	5	0	13	11		9	6	0	0	0	55
Drummer Street	1	0	0	1	0	0	1	0	0	8	6	3		49	12	1	5	87
Railway Station	2	1	0	2	1	1	4	4	0	8	11	162	129		59	2	28	414
Clay Farm	1	1	0	1	0	0	1	1	0	3	2	3	29	44		0	42	128
Trumpington	1	0	0	0	0	1	1	1	0	3	3	3	60	62	12		17	164
Addenbrookes	0	0	0	0	0	0	0	0	0	1	1	1	18	19	2	0		42
	220	156	67	93	49	129	243	169	152	122	56	1003	257	361	141	4	103	3325

2.4 Ridership not involving the guideway at all

This section deals with predicted 'guided' bus journeys that are in fact entirely on public roads.

2.4.1 Of the patronage forecast, 29% of journeys – 967 in the peak hour or 5,800 per day - do not involve any travel along a guideway at all. The whole journey would be along a public road, e.g. Huntingdon to St Ives or Drummer St to Railway Station. The routes along which these journeys would be made are all served today by existing bus services. These journeys are shown in the table below.

	Huntingdon	St Ives	Swavesey	Longstanton	Oakington	Impington	Regional College	Science Park	Sidings	Castle Street	Bridge St	Emmanuel Street	Drummer Street	Railway Station	Clay Farm	Trumpington	Addenbrookes	TOTAL	
Huntingdon		90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	
St Ives	163		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163	
Swavesey	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Longstanton	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Oakington	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	
Impington	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
Regional College	0	0	0	0	0	0		0	0	0	1	0	0	0	0	0	0	1	
Science Park	0	0	0	0	0	0	0		0	1	1	169	0	58	0	0	0	229	
Sidings	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	
Castle Street	0	0	0	0	0	0	3	0	0		9	14	9	9	0	0	0	44	
Bridge Street	0	0	0	0	0	0	1	0	0	2		3	2	3	0	0	0	11	
Emmanuel Street	0	0	0	0	0	0	4	5	0	13	11		5	6	0	0	0	44	
Drummer Street	0	0	0	0	0	0	1	0	0	8	6	3		49	0	0	0	67	
Railway Station	0	0	0	0	0	0	4	4	0	8	11	162	129		0	0	0	318	
Clay Farm	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	
Trumpington	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
Addenbrookes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
	163	90	0	0	0	0	13	9	0	32	39	351	145	125	0	0	0	967	

- 2.4.2 For all of the journeys shown in **2.4.1**, CGB will have no higher perceived attractiveness than existing bus services. In the event that a higher fare is charged for these journeys by CGB, negligible patronage can be expected. If no additional fare is charged, this means that CGB running costs, which are supposed to be met by fare premiums on CGB services, must be amortised over the remaining 71% of predicted journeys that do involve the guideway.
- 2.4.3 The 29% of CGB predicted journeys shown in **2.4.1** are most likely to simply represent passengers already using bus services along the same routes, in which case they cannot be accepted as part of the transport case.
- 2.4.4 Alternatively CCC may be claiming that the journeys shown in **2.4.1** represent potential new public transport journeys by passengers not currently using bus services. In that case they could all be made today were a sufficiently attractive transport option available. There is no reason to assume that new passengers will be attracted to make these 29% of journeys *at all*, since CGB will not offer a better standard of bus service than that presently available.

2.5 Ridership competing with existing bus services

This section deals with predicted CGB journeys where an existing bus service currently exists between the same two points.

- 2.5.1 Of the patronage forecast, a further 31% of journeys – 1,050 in the peak hour or 6,300 per day – are journeys at least partly along the guideway that can currently be made on existing bus routes on public roads. As established in **2.3**, these journeys would be cheaper and no slower using existing services.

This table indicates those CGB projected journeys that can be made using existing services.

	Huntingdon	St Ives	Swavesey	Longstanton	Oakington	Impington	Regional College	Science Park	Sidings	Castle Street	Bridge St	Emmanuel Street	Drummer Street	Railway Station	Clay Farm	Trumpington	Addenbrookes		TOTAL
Huntingdon		0	0	0	0	0	10	10	0	2	0	28	0	0	0	0	0		50
St Ives	0		0	0	0	0	20	18	0	20	3	60	1	0	0	0	0		122
Swavesey	0	0		0	0	0	0	0	0	1	0	27	0	0	0	0	0		28
Longstanton	0	0	0		0	0	0	0	0	46	5	263	0	0	0	0	0		314
Oakington	0	0	0	0		0	0	0	0	3	0	65	0	0	0	0	0		68
Impington	0	0	0	0	0		0	0	0	1	0	34	0	0	0	0	0		35
Regional College	0	0	0	0	0	0		20	0	7	0	168	0	0	0	0	0		195
Science Park	0	0	0	0	0	0	35		0	0	0	0	0	0	0	0	2		37
Sidings	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Castle Street	3	0	0	2	1	1	0	0	0		0	0	0	0	0	0	0		7
Bridge Street	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0		0
Emmanuel Street	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0		0
Drummer Street	1	0	0	1	0	0	0	0	0	0	0	0		0	12	1	5		20
Railway Station	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	28		28
Clay Farm	0	0	0	0	0	0	0	0	0	3	2	3	29	0		0	0		37
Trumpington	0	0	0	0	0	0	0	0	0	3	3	3	60	0	0		0		69
Addenbrookes	0	0	0	0	0	0	0	0	0	1	1	1	18	19	0	0			40
	4	0	0	3	1	1	65	48	0	87	14	652	108	19	12	1	35		1050

- 2.5.2 Conventional bus services to and from Clay Farm, although currently slow, can be expected to improve once the Clay Farm development goes ahead, to a level where they are as attractive as CGB. Since the table above relates to 2016, it is reasonable to make this projection about the effect on a future housing development on future enhancements to conventional bus services, which are run on a commercial basis and hence driven by demand. Assessments on this topic [25] predict substantial increases in conventional bus services around new developments.
- 2.5.3 Most of journeys in the table above – around 5,100 per day – represent journeys competing with existing bus services running along the A14.
- 2.5.4 CHUMMS [3:Fig4.2H] predicts that 5,000 CGB passengers a day would simply have switched from using A14 bus services to CGB services, rather than being new public transport users. The almost exact match between this prediction and 2.5.3 confirms that the table above represents almost entirely passengers already using bus services and switching from them to CGB.
- 2.5.5 In order to predict this switch, CHUMMS [3] assumed that running times on CGB would be more favourable than via current services. As noted at **2.2.32**, **2.2.34**, this is not the case. The largest traffic source in the table above is Northstowe, which would be served better by buses via Oakington than by CGB. A similar argument applies to other A14 representative routes that have also been discussed above.
- 2.5.6 The 31% of CGB patronage represented in **2.5.1** must therefore be considered extremely unlikely. In particular CCC [2:p95] intends CGB fares to be 10% more expensive than competing bus services. CCC studies [2:p56] have shown that ridership of CGB is extremely sensitive to the differential between conventional and CGB fares, with increases in the differential causing significant movement of passengers to the lower priced option.

2.5.7 If the event that the passengers forecast by CHUMMS were to move from existing bus services to CGB, the current bus service offered to passengers at Bar Hill and Fenstanton would deteriorate, producing a major negative transport impact resulting of CGB.

2.5.8 CGB is also likely to have an adverse effect on bus services to Girton and Huntingdon Road (Cambridge).

In summary the 31% of journeys above should be discounted from CGB patronage projections, in order to examine the likely benefits of CGB.

2.6 Likely patronage for CGB

2.6.1 Removing all of the spurious patronage elements identified above leaves the following journeys. These comprise the journeys shown in the following table.

	Huntingdon	St Ives	Swavesey	Longstanton	Oakington	Impington	Regional College	Science Park	Sidings	Castle Street	Bridge St	Emmanuel Street	Drummer Street	Railway Station	Clay Farm	Trumpington	Addenbrookes	TOTAL
Huntingdon		0	0	12	1	6	0	0	7	0	0	0	0	3	3	0	0	32
St Ives	0		19	18	3	18	0	0	17	0	0	0	0	7	7	0	1	90
Swavesey	0	14		17	1	4	7	7	6	0	0	0	0	4	3	0	0	63
Longstanton	25	25	37		17	45	79	64	64	0	0	0	0	48	17	1	4	426
Oakington	1	3	1	5		14	31	15	12	0	0	0	0	8	3	0	1	94
Impington	2	4	1	5	5		9	7	6	0	0	0	0	7	2	0	0	48
Regional College	4	4	2	7	8	14		0	23	0	0	0	0	34	7	0	2	105
Science Park	6	6	3	11	6	15	0		17	0	0	0	0	0	9	0	0	73
Sidings	8	7	4	10	5	9	37	17		3	3	0	0	0	0	0	0	103
Castle Street	0	0	0	0	0	0	0	0	0		0	0	0	0	4	0	1	5
Bridge Street	1	0	0	0	0	0	0	0	0	0		0	0	0	1	0	0	2
Emmanuel Street	2	1	0	2	1	1	0	0	0	0	0		4	0	0	0	0	11
Drummer Street	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
Railway Station	2	1	0	2	1	1	0	0	0	0	0	0	0		59	2	0	68
Clay Farm	1	1	0	1	0	0	1	1	0	0	0	0	0	44		0	42	91
Trumpington	1	0	0	0	0	1	1	1	0	0	0	0	0	62	12		17	95
Addenbrookes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0		2
	53	66	67	90	48	128	165	112	152	3	3	0	4	217	129	3	68	1308

2.6.2 Of these, some journeys were only identified as not served by existing bus routes because there is currently no *direct* route. However [1:p454] indicates that buses will not run through from end to end of CGB. (See also **3.4.4** below.) Depending on whether a change of bus is required at Drummer St or whether this occurs instead at the Railway Station, 193 or 75 journeys respectively in the above table will require a change of buses.

2.6.3 The CGB journeys in **2.6.2** requiring a change of bus will not be perceived as any better than conventional buses and will not attract new patronage. Depending on where the change of bus occurs, the total ridership for CGB is therefore predicted at 1,115 to 1,233 in the peak hour, or 6,700 to 7,400 per day.

2.6.4 1,500 of these journeys are dependent on Chesterton Interchange. This scheme is not included in CGB and has recently been postponed again by CCC. The patronage to be expected for CGB as currently proposed and costed is therefore 860 to 978 in the peak hour, or between 5,200 and 5,900 per day.

- 2.6.5 Based on the CCC predicted patronage figures, CGB is claimed to reduce A14 traffic by as little as 2% [7]. Given a much lower likely uptake of CGB, this figure will in fact be much lower.
- 2.6.6 In the light of this much lower demand for CGB, the benefits of £128 million claimed as a result of journey time savings cannot be accepted. The savings must be recalculated to take into account:
- o Lower patronage for CGB;
 - o Lower journey time savings for CGB riders;
 - o Lower journey time savings for other road users;
- than were used in producing the £128 million figure.
- 2.6.7 In the light of these facts, CCC should be required to re-compute the entire benefit analysis carried out for CGB.

2.7 Off-Peak usage of CGB

This section examines the peak to off-peak conversion factors used by CCC in predicting overall patronage of CGB. These conversion factors are derived from transport systems in Coventry and London. They are highly inappropriate for CGB, whose off-peak usage is likely to be significantly less than predicted by CCC.

- 2.7.1 CCC patronage forecasts for CGB are based on the peak hour usage levels set out at **2.1.1** and broken down at **2.1.5**. The conversion factors in **2.1.2**, **2.1.3** have then been used to predict a daily usage level of just over six times the peak hour usage level. **2.1.2**, **2.1.3** note that these conversion factors are derived from transport systems in Coventry and London.
- 2.7.2 The first conversion factor, from Coventry, indicates that peak usage is spread over 3 hours in each of AM and PM, with 50% of peak usage occurring in the busiest of these three hours.
- 2.7.3 This pattern of commuting is likely to be similar in Cambridge and is line with everyday experience of working patterns observed in Cambridge.
- 2.7.4 The second conversion factor, from Inner London, indicates that CCC anticipates daily off-peak usage to be twice the peak usage. This assumption is highly questionable.
- 2.7.5 80% of the likely patronage of CGB, as shown in **2.6.1**, relates to journeys in rural South Cambridgeshire, the remainder being due to trips in the southern part of Cambridge City.
- 2.7.6 The following table, from the 2001 census, compares car ownership levels in the CGB area with the areas from which the conversion factors were derived.

Area	Households with no car	Households with 2+ cars
Inner London	50.6%	10.1%
Coventry	33.1%	22.7%
Cambridge City	31.8%	20.7%
<i>Croydon – see 2.7.10</i>	<i>29.8%</i>	<i>24.6%</i>
South Cambridgeshire	11.8%	47.6%

- 2.7.7 Where the proportion of dual car ownership households is lower, off-peak travel by public transport can be expected to be higher. Thus the use of an off-peak multiplier factor from Inner London to support predicted use of CGB in rural South Cambridgeshire cannot be accepted.
- 2.7.8 Where the proportion of dual car ownership households is higher, there will be a tendency to use the car at off-peak times, when congestion is lowest, as being more convenient than public

transport. The only way to combat this tendency is to offer a high quality public transport option.

- 2.7.9 CGB does not offer a high quality public transport option. Particularly at off-peak times, it offers no benefits above conventional bus services. Therefore the peak hour predicted usage of CGB, 860 to 978 journeys in the peak hour as at **2.6.4**, cannot simply be used as the basis for a forecast daily usage of between 5,200 and 5,900 journeys per day.
- 2.7.10 CCC has indicated that it intends to operate an 'open access' policy for CGB. Thus it would be reliant on operators wishing to use the guideway to run services. CCC has a poor experience of 'open access' producing the service schedules that CCC wishes to see – in 2003 it has been given the required 56 days' notice required from operators to stop running various services that CCC wishes to see operated.
- 2.7.11 Running off-peak services on CGB will be particularly unattractive for operators. Operators may decide to use the guideway at peak times, where the alternative would be the A14, but are much more likely to run their services on public roads at off-peak times. Thus it is very likely that CGB would attract only peak period services (around 1,720-1,960 journeys per day, assuming the factor in **2.1.2** is accepted) and not the 5,200-5,900 journeys per day implied by CCC analysis.
- 2.7.12 Much of the likely patronage of CGB, shown in **2.6.1**, relates to future residents of Northstowe. The public transport options that are made available for Northstowe by CCC will have a direct impact on which of the following patterns the new residents of Northstowe decide to follow:
- | | | |
|-------------------------|-------------------------|-------|
| o Cambridge City: | Households with 2+ cars | 20.7% |
| o South Cambridgeshire: | Households with 2+ cars | 47.6% |
- 2.7.13 There is little doubt that a high proportion of the future residents of Northstowe will be able to afford the choice as to whether to use a second car for off-peak travel. Whether they do so or not will depend on there being a high-quality transport alternative. CGB does not constitute such a high-quality transport alternative. As previously stated, the belief of ODPM that CGB will facilitate Northstowe development cannot be justified.
- 2.7.14 The experience of rapid transit in Croydon is highly relevant in predicting the results that will flow from CCC's decisions on public transport. In Croydon, a new light rail scheme has been implemented using both on-street tracks in the central area and former railway routes on the outskirts. Off-peak usage of this system is extremely good and the service frequency is as high as 20 trams per hour **off-peak** in the central area. The high off-peak utilisation is due to public perception that the system is a high-quality transport option. CGB will not produce such a perception – CGB will cause public transport usage along the A14 corridor to follow the current South Cambridgeshire off-peak travel pattern rather than the much more desirable Croydon pattern.

2.8 Comparison of CGB with CHUMMS figures and recommendations

- 2.8.1 CCC relies repeatedly on the CHUMMS study to justify CGB. CCC claims that CGB is an implementation of the CHUMMS recommendations. There are significant differences between CHUMMS assumptions and CGB as now proposed. These differences weaken the case for CGB.
- 2.8.2 CCC claims [9] that CHUMMS offered the people of Cambridgeshire a number of options and they chose CGB. Since CGB in its current form was not offered by CHUMMS, this claim is invalid.

This rest of this section highlights key differences between CHUMMS and CGB.

- 2.8.3 In recommending a guided bus system, CHUMMS predicted a ridership of 20,000 passengers per day [3: AST – 2]. This figure is used by CCC to support CGB. However [3:Fig4.2H] indicates that of these, 5,000 passengers a day would move from A14 bus services to CGB services. Hence the new public transport ridership predicted for CGB is 15,000.
- 2.8.4 CHUMMS asserted that it would be possible for a guideway to be built alongside the Chesterton-City railway line segment in Cambridge. [3:Fig4.2H] indicates that 6,000 riders

were expected to use this guideway to avoid Cambridge City. However [1:App 2A] indicates that provision of such a guideway will not be possible. Without this section, these 6,000 riders cannot be expected to view a guided bus as a quality transport option. They must be discounted from the CGB total.

- 2.8.5 In proposing the Chesterton-City guideway segment, CHUMMS was fatally flawed and its recommendations are unsound. Many of the public believe that this guideway segment is still proposed. CCC has allowed this misconception to stand, hoping that public support for CGB will not be lowered any further.
- 2.8.6 The strategy recommended by CHUMMS included demand management as a key element. This has not been taken forward by CCC as part of its transport strategy. Without demand management it is entirely inappropriate for CCC to be claiming CGB as an implementation of the CHUMMS recommendations.
- 2.8.7 Without demand management, both the CHUMMS and the CGB patronage predictions must be reduced. Congestion charging in London has demonstrated a clear link between demand management and increased use of public transport. Most of the environmental benefits claimed for CGB derive from demand management, but they would be obtained from demand management even if CGB were not implemented.
- 2.8.8 In all respects, a scheme of demand management on its own would be of greater transport and environmental benefit than CGB on its own. Revenue obtained from congestion charging should be used to provide more frequent bus services and attractive fares. This model has been shown to be successful in London as a way to reduce congestion and increase public transport usage.
- 2.8.9 The average length of journey predicted on CGB provides an important indicator as to why CGB is unlikely to make a useful difference to commuter journeys along the A14 corridor. CHUMMS indicated that improved commuting into Cambridge is a major motivation for CGB and gave the average commuting distance into Cambridge as 14.5 miles in each direction [3:2-2]. [2:p95] indicates that in contrast the average distance travelled on CGB during the peak hour would be 1.8 miles in each direction in 2006, rising to 2.5 miles in 2016 as a result of development at Northstowe.
- 2.8.10 This major discrepancy in journey lengths highlights the fact that CGB will not make a significant impact on traffic conditions in the A14 corridor. Instead the patronage forecast by CCC is based on diverting short-distance journeys from other bus routes running along the same public roads. These short distance journeys are already possible today by other equally attractive transport options. Their inclusion to try to create a business case for CGB is unacceptable and should be disallowed.

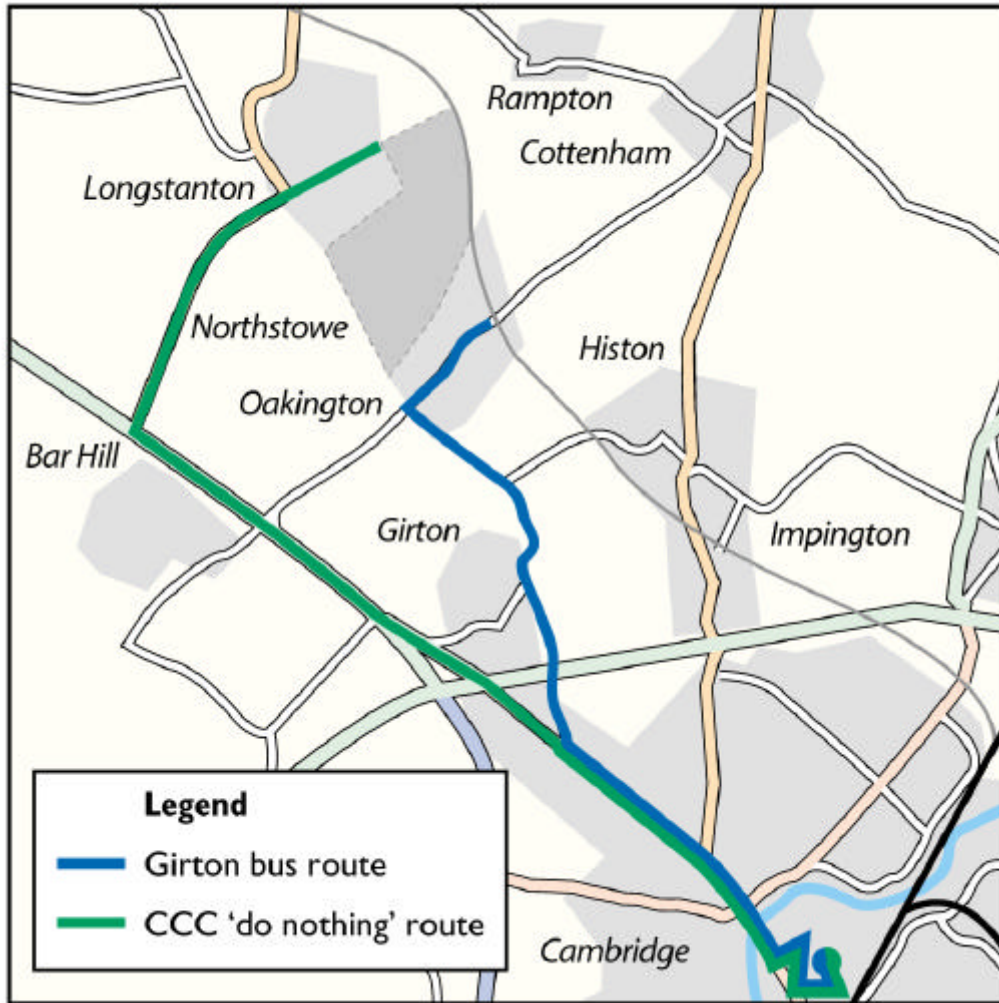
2.9 Alternative Public Transport Options

- 2.9.1 [1:p53] claims that the alternative transport systems considered by CCC demonstrate that CGB is the most appropriate public transport system to run along the disused St Ives to Cambridge rail route. This statement is unsound for at least three reasons.
- o The presentation of the alternative transport systems is flawed and at best highly misleading.
 - o The alternatives considered by CCC were poor alternatives – the existence of better alternatives should have been apparent to any transport planner charged with assessing CGB.
 - o The alternatives in fact all provide better cost/benefit than CGB.

2.10 Alternative Public Transport Option – ‘Do Nothing’

This section looks at the key features of the ‘do nothing’ strategy considered and dismissed by CCC as an alternative to CGB. This section concludes that a ‘do nothing’ strategy would be more beneficial than CGB and would be cheaper to implement.

- 2.10.1 The 'do nothing option' is described at [1:p53], [2:p24] and [2:p51]. The scheme uses express buses of the same quality as proposed for CGB [1:p53] running along existing roads and linking the same stops as for CGB. It would benefit from the improved running times and greater journey time reliability predicted on the A14 [2:p51].
- 2.10.2 The cost of the scheme would be £5 million in total, to provide bus lane/priority measures from Northstowe to Cambridge and at the Science Park.
- 2.10.3 In what can only be viewed as an attempt to artificially reduce the relative attractiveness of the scheme, [2:p51] limited the proposed 'do nothing' bus service frequency to 3 per hour, compared to 4-8 per hour [2:p46] then claimed for CGB. Ironically CCC now admits that the bus frequency for CGB will be as low as 3 per hour [1:pV]. Also subsequent analysis by CCC [2:p56] then showed that usage of a transport system is only weakly affected by service frequency.
- 2.10.4 [2:p52] gives the predicted patronage for the 'do nothing' scheme as 14,400 per day, compared with estimates for CGB in the same analysis at 19,000 per day. An erroneous conclusion is then drawn that on this basis CGB is to be preferred.
- 2.10.5 It has already been established that CHUMMS predicted 25% of forecast CGB ridership would be as a result of direct transfer from existing A14 bus services. If these are removed from the CGB total, it can be seen that the bus ridership in both cases is identical and that the CCC conclusion is erroneous.
- 2.10.6 The two schemes are identical in many respects. The quality of buses would be identical. The journey times for CGB would be on average slightly worse than for the 'do nothing' scheme. Because CGB runs through congested city roads, the public image of the two schemes would be identical. All of the shortcomings of the 'do nothing' scheme as set out at [1:5.2.5] apply equally to CGB. The fact that they are highlighted as applying only to the 'do nothing' scheme indicates the extent to which the presentation by CCC is misleading.
- 2.10.7 CGB is claimed by CCC to reduce A14 traffic by as little as 2% [7]. Since it would attract no more new bus riders than the 'do nothing' scheme, it would remove no more cars from the A14.
- 2.10.8 There are four major benefits for the public to adopting the CCC 'do nothing' scheme in place of CGB:
- o a construction cost saving of £98 million;
 - o bus fares 10% cheaper;
 - o minimal land purchase required and minimal building works required;
 - o earlier in-service date.
- There are no grounds to justify implementation of CGB in place of the 'do nothing' scheme.
- 2.10.9 The works proposed in the CCC 'do nothing' scheme are largely targeted at improving bus journey times from Northstowe to Cambridge via Longstanton. A modified 'do nothing' scheme for bus improvements could be adopted that would be substantially superior to that proposed by CCC with respect to the Northstowe development. This alternative should have been apparent to any transport planner charged with assessing CGB.



This map indicates an available alternative not used in the CCC 'do nothing' scheme.

- 2.10.10 At present the bus journey time from Drummer St to Northstowe via Longstanton is 33 minutes, against 26 minutes predicted for CGB.
- 2.10.11 An alternative route via Girton and Oakington is already served by buses 6 (25 minutes) and 2 (20 minutes) which run to the east corner of Northstowe. The comparable time by CGB for this journey is 22 minutes.
- 2.10.12 The route via Girton and Oakington avoids the A14 completely, unlike the route via Longstanton. By extending a limited stop version of routes 2/6 into Northstowe, the 'do nothing' scheme would be substantially enhanced, providing a better transport service to Northstowe than CGB, while improving the transport provision for residents of both Oakington and Girton.
- 2.10.13 In order to prevent car traffic from Northstowe following this route, rising bollards could be installed on a bus-only link between Northstowe and the Oakington road.
- 2.10.14 The 'do nothing' scheme, if enhanced in this way, would be in all respects preferable to CGB.

2.11 Alternative Public Transport Option – Rail

This section sets out the key elements of a valid and attractive rail transport alternative to CGB that should have been considered by CCC in its comparison of transport options. The CCC assessment of rail as an alternative was based on a much less attractive rail solution.

- 2.11.1 [1:p55] contends that all studies undertaken into rail have shown that the costs of rail would be greater than for CGB while the benefits would be lower.
- 2.11.2 In fact prior to publishing [1], CCC received a study from CAST.IRON, acknowledged its receipt, acknowledged CCC's detailed review of the study and also published a statement that it had understood the contents of the study. The CAST.IRON study does not support any of the CCC's conclusions on rail. The salient points of the CAST.IRON study are set out in the following sections.
- 2.11.3 Despite CCC's acknowledgement of its detailed review of the study, it subsequently published material misrepresentations of CAST.IRON's plans. CCC distributed these misrepresentations during the public consultation period, *inter alia*, to bodies entitled to be Statutory Objectors to CGB.
- 2.11.4 The study considered two major stages, preceded by a pilot system.
- 2.11.5 Stage 1 comprises the following elements:
 - o building an electrified spur line from Chesterton Junction to Science Park. The spur to be used to extend London – Cambridge services to the Science Park, typically 1 per hour;
 - o building a private railway system from the Science Park to St Ives along the former railway route, with a link onto the electrified spur between Science Park and Chesterton Junction;
 - o running some trains from the St Ives to Cambridge station, with others terminating at Science Park.
- 2.11.6 Stage 2 comprises an extension from St Ives to Huntingdon, running mainly along the current A14 corridor, with a station in Godmanchester and terminating at Mill Common, Huntingdon. Services from Stage 1 to be extended from St Ives to Huntingdon.
- 2.11.7 Beyond Stage 2, links in either or both directions onto the East Coast Main Line could then be added at Huntingdon.
- 2.11.8 The arrangement of a private railway system whose trains then run onto the national network has a precedent in the form of Heathrow Express. Heathrow Express is a recently constructed private railway, independent of the SRA, whose trains run onto the Great Western main line at Hayes, to reach Paddington.
- 2.11.9 The CAST.IRON study identified a Train Operating Company willing to run trains both on the private railway proposed in the study and through to Cambridge and holding the necessary permissions etc. to do so.
- 2.11.10 The use of a carriageway of the A14 from St Ives to Huntingdon as proposed in Stage 2 is in accordance with the CHUMMS policy that the current A14, once de-trunked, should become reallocated for public transport use.
- 2.11.11 The CAST.IRON study found that Stages 1 and 2 together could both be implemented for less than the cost of CGB, including the provision of identical Park and Ride facilities to those proposed for CGB [1].
- 2.11.12 The study found that this rail system could be operated without subsidy.
- 2.11.13 The combination of this rail system and enhanced conventional bus services would provide a better transport options in all respects than CGB.

2.12 Rail Patronage Forecast

This section sets out the patronage predicted for the rail option set out in **2.11**.

2.12.1 The following chart indicates the journeys from the CCC patronage study that would be made possible by the CAST.IRON system phases 1 and 2. These amount to 1466 peak hour trips or 8,900 return journeys per day.

	Huntingdon	St Ives	Swavesey	Longstanton	Oakington	Impington	Regional College	Science Park	Sidings	Castle Street	Bridge St	Emmanuel Street	Drummer Street	Railway Station	Clay Farm	Trumpington	Addenbrookes	TOTAL
Huntingdon		90	0	12	1	6	10	10	7	0	0	0	0	3	0	0	0	139
St Ives	163		19	18	3	18	20	18	17	0	0	0	0	7	0	0	0	283
Swavesey	0	14		17	1	4	7	7	6	0	0	0	0	4	0	0	0	60
Longstanton	25	25	37		17	45	79	64	64	0	0	0	0	48	0	0	0	404
Oakington	1	3	1	5		14	31	15	12	0	0	0	0	8	0	0	0	90
Impington	2	4	1	5	5		9	7	6	0	0	0	0	7	0	0	0	46
Regional College	4	4	2	7	8	14		20	23	0	0	0	0	34	0	0	0	116
Science Park	6	6	3	11	6	15	35		17	0	0	0	0	58	0	0	0	157
Sidings	8	7	4	10	5	9	37	17		0	0	0	0	55	0	0	0	152
Castle Street	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
Bridge Street	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0
Emmanuel Street	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Drummer Street	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
Railway Station	2	1	0	2	1	1	4	4	4	0	0	0	0		0	0	0	19
Clay Farm	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
Trumpington	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
Addenbrookes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
	211	154	67	87	47	126	232	162	156	0	0	0	0	224	0	0	0	1466

- 2.12.2 [1:p56] notes that the public perceives rail to be a higher quality service than buses. It is reasonable to assume that these journeys would be made on a rail system. They exceed the 7,400 daily journeys that might be made by CGB, even if Chesterton Interchange were to be built and CCC off-peak predictions for CGB were tenable.
- 2.12.3 The journeys above represent longer journeys than the average predicted for CGB and represent journeys that a higher quality transport option is likely to facilitate.
- 2.12.4 It is valid to include the journeys to and from Sidings station shown in the above table for the CAST.IRON system since the function of those trips is to access the national rail network from stations along the CGB/CAST.IRON route. The CAST.IRON system facilitates the overall trips of which these form a component.
- 2.12.5 The 8,900 daily journeys shown above represent those made by passengers who either walk to the stations or drive to one of the Park & Ride sites along the route. Three factors will increase usage of a rail system beyond this level.
- 2.12.6 The first factor concerns cyclists. Cyclists will make greater use of a rail system than they would of CGB. [3 – AST 2/3] indicates that 3.6% of passengers on CGB would travel to a bus stop by bicycle, while 22.5% of passengers for the CAST.IRON system would travel to the station by bicycle.

- 2.12.7 As the 8,900 figure contains only a 3.6% component of cyclists, the true figure for rail will be 24% higher, at 11,000 daily journeys. These additional passengers would not be available to CGB.
- 2.12.8 The high percentage of cyclists expected to use rail is compatible with the high use of bicycles in the flat Cambridgeshire fens. The attraction of rail for additional cyclist journeys is that it allows a commuter to cycle from an adjacent village to the nearest railway station, take the bicycle on the train and then cycle from the nearest railway station to the workplace. In this way rail extends the 'reach' of a commuter transport system in a way not possible with CGB.
- 2.12.9 Clearly a high proportion of cyclists implies that the rail system would require special accommodation (compartments with cycle racks) to cope with the demand. The CAST.IRON study found that both providing this accommodation and carrying bicycles at no extra charge were justified by the increased revenue and system usage produced.
- 2.12.10 The CHUMMS prediction of enhanced bicycle patronage of a rail system is entirely compatible with the geography of the area. Villages such as Needingworth, Over and Willingham are within cycling reach of a railway station but not within cycling reach of Cambridge (except for the most enthusiast cyclists). In addition, many of the villages with proposed stations have the predominantly linear configuration typical of the fens (i.e. they are long and thin) so that cycling to the station increases the number of passengers likely to access the transport system from villages such as Swavesey and Longstanton.
- 2.12.11 The additional 2,100 bicycle journeys in **2.12.7** represents a public transport use that would not be generated by CGB at all. This additional public transport use substantially increases the benefits of a rail option over CGB.
- 2.12.12 Cycle/rail journeys that replace a car journey both have community health benefits and substitute for a length of car journey greater than the rail segment. Therefore the transport benefits per journey are correspondingly increased for rail over CGB. This is in addition to the greater average journey length identified elsewhere in this document.
- 2.12.13 The second factor concerns the inclusion of a station at Godmanchester. This will generate additional journeys not included in the CCC forecast of 3,384 peak hour passengers.
- 2.12.14 The third factor is national journeys. These were not considered in the CHUMMS and CCC analysis work.
- 2.12.15 Neither CHUMMS nor the CCC assessment of CGB took account of the proposed expansion of Stansted, which will significantly increase the patronage of a rail system.
- 2.12.16 National journeys and the strategic importance of a rail link are discussed further elsewhere in this document.

2.13 Complementary Bus Services

This section sets out how a combination of rail and enhanced conventional bus services would provide the best option for public transport along the A14 corridor.

- 2.13.1 The stations served by the CAST.IRON system leave a balance of 11,350 daily journeys from the CCC patronage forecast that are not catered for.
- 2.13.2 As noted in the breakdown of CGB projected patronage, most of the journeys in the CCC patronage forecast are addressed today by existing bus services, in many case being short journeys.
- 2.13.3 The 11,350 daily journeys identified in **2.13.1** are mostly journeys that would not be made by CGB, even if CGB were to be constructed. They will be made using conventional bus services. This is as set out in **2.4, 2.5** above.
- 2.13.4 The combination of a CAST.IRON rail system and current bus services serves 18,250 of the journeys in the CCC patronage forecast, i.e. all but 2,000 daily journeys from the forecast. These 2,000 daily journeys correspond to the table below.

	Huntingdon	St Ives	Swavesey	Longstanton	Oakington	Impington	Regional College	Science Park	Sidings	Castle Street	Bridge St	Emmanuel Street	Drummer Street	Railway Station	Clay Farm	Trumpington	Addenbrookes	TOTAL	
Huntingdon		0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0		3
St Ives	0		0	0	0	0	0	0	0	0	0	0	0	0	7	0	1		8
Swavesey	0	0		0	0	0	0	0	0	0	0	0	0	0	3	0	0		3
Longstanton	0	0	0		0	0	0	0	0	0	0	0	0	0	17	1	4		22
Oakington	0	0	0	0		0	0	0	0	0	0	0	0	0	3	0	1		4
Impington	0	0	0	0	0		0	0	0	0	0	0	0	0	2	0	0		2
Regional College	0	0	0	0	0	0		0	0	0	0	0	0	0	7	0	2		9
Science Park	0	0	0	0	0	0	0		0	0	0	0	0	0	9	0	0		9
Sidings	0	0	0	0	0	0	0	0		3	3	0	0	0	0	0	0		6
Castle Street	0	0	0	0	0	0	0	0	0		0	0	0	0	4	0	1		5
Bridge Street	0	0	0	0	0	0	0	0	0	0		0	0	0	1	0	0		1
Emmanuel Street	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0		0
Drummer Street	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0		0
Railway Station	0	0	0	0	0	0	0	0	0	0	0	0	0		59	2	0		61
Clay Farm	1	1	0	1	0	0	1	1	0	0	0	0	0	44		0	42		91
Trumpington	1	0	0	0	0	1	1	1	0	0	0	0	0	62	12		17		95
Addenbrookes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0			2
	2	1	0	1	0	1	2	2	0	3	3	0	0	106	129	3	68		321

2.13.5 The best way to improve public transport in the A14 corridor is to:

- o Implement the CAST.IRON rail proposals;
- o Improve bus service along routes not served by the rail system, using quality standards as proposed for the 'do nothing strategy' plus bus priority measures.

2.13.6 **2.13.5** represents a quality integrated transport policy. In the absence of serious study of this option, the claim at [1:p53] that CCC has demonstrated CGB to be the most appropriate public transport system to run along the disused St Ives to Cambridge rail route has no validity at all. The TWA process should be halted and CCC should be required to make a reappraisal of alternative transport options, taking into account the options set out in this document.

2.14 Southern Rail Option

The patronage forecast in **2.12** is sufficient to justify rail over CGB. However this section sets out provisions that could be made to address the 2,000 daily trips identified in **2.13.4** above.

- 2.14.1 Nearly all of the trips identified in 2.13.4 above relate to Clay Farm, Addenbrookes and Trumpington.
- 2.14.2 Of these trips, 1,400 could be addressed by providing a southern rail spur from Cambridge Station along the former Bedford railway line. Two stations, at Long Road and Hauxton Road, would support these 1,400 daily trips.
- 2.14.3 Because of the carriage of cycles, this patronage forecast should be increased to 1,700. This would bring rail patronage to 12,700 journeys per day.
- 2.14.4 Because of cycle carriage, a southern rail spur would provide an additional public transport option serving the needs of Addenbrookes and of the proposed new developments between Addenbrookes and the new Long Road station.

- 2.14.5 These 1,700 additional trips might not on their own make a good business case for a southern rail spur. However on a marginal costing basis a southern spur can be justified, for the following reasons.
- o The CAST.IRON plan envisages running four trains per hour into the Science Park from Huntingdon/St Ives, two terminating at Science Park and two running on to Cambridge. The hourly Cambridge Cruiser service and/or other London services currently terminating at Cambridge would be run up to the Science Park. A terminating service from Huntingdon/St Ives to Science Park would connect with the Cambridge Cruiser.
 - o The timing of the trains running through to Cambridge can readily be arranged so as to provide sufficient time for a return journey to Hauxton Road. Thus the southern spur can be run on marginal timing. The only operational cost would be the additional mileage, justified by the incremental fare revenue.
 - o The cost of a rail link would be substantially less than for a southern guideway system, most notably because there would be no new tunnel under Hills Road.

2.15 CAST.IRON Stage 1 Passenger Levels

- 2.15.1 The rail patronage forecast of 11,000 journeys per day in **2.12** applies to the CAST.IRON Stage 2 system. CAST.IRON's study envisages construction and operation of Stage 1 prior to Northstowe construction. Stage 2 would follow on from the A14 upgrade.
- 2.15.2 The patronage that would apply to Stage 1 only and without the Southern extension is 8,400 journeys per day. The figure for Stage 1 with the Southern extension is 10,100 journeys per day. These reduced numbers are due to discounting all trips to/from Huntingdon. In the event that an enhanced transport option to Huntingdon is desired in advance of Stage 2 completion, bus priority measures costed by CCC at £4.9 million [5] should be considered as an interim solution.

2.16 Comparison of CAST.IRON rail with CHUMMS figures and recommendations

CCC relies on the CHUMMS study for its repeated claims that rail is an expensive and inappropriate option. This includes reliance by CCC on CHUMMS findings to support its TWA Order application for CGB. This occurs repeated throughout [1] and [2]. This section identifies fundamental flaws in the CHUMMS rail assessment.

- 2.16.1 The CHUMMS rail assessment contains serious flaws that invalidate its use as supporting material for [1] and [2].
- 2.16.2 CHUMMS [3:4-4] states that there is no satisfactory means to run a railway along the A14 corridor from St Ives to Huntingdon– even though CHUMMS recommended this corridor should be used for a new public transport system. This corridor was proposed for light rail and for CGB because it is the ideal route to serve commuters; CAST.IRON's engineering studies have shown that such a rail route is perfectly possible.
- 2.16.3 The grounds on which a rail route along the A14 corridor was declared 'unsatisfactory' [22] during the CHUMMS study are flawed. Many of them apply equally to the CGB proposals actually presented in [17].
- 2.16.4 Ignoring the best rail route completely, CHUMMS instead studied a different route to Huntingdon. 38% of the Cambridge–St Ives trackbed– by far the most cost-effective place to run a new rail link– was left out. The CHUMMS route was significantly longer than CAST.IRON's route. 51% of the route, or 19km, would have been on green field sites– compared to just 9% as recommended by CAST.IRON. The CHUMMS route even bypassed St Ives completely.
- 2.16.5 The CHUMMS rail route avoided key population centres– so CHUMMS claimed rail would not attract many passengers.

- 2.16.6 The CHUMMS rail route made heavy use of green field sites– so CHUMMS claimed rail would be less environmentally friendly.
- 2.16.7 The CHUMMS rail route failed to use much of the former trackbed– so CHUMMS claimed rail would be too expensive.
- 2.16.8 The CHUMMS environmental comparisons assessed only:
- o an environmentally damaging A14 option plus rail; against
 - o a less damaging A14 option plus CGB.
- A rail route identical to that proposed for CGB is both feasible technically and also compatible with the less damaging A14 option, which the government in any case has selected for development.
- 2.16.9 CHUMMS also mixed heavy rail and light rail in a single environmental assessment, selecting the worst result in each case. This produced entirely inappropriate results [3: AST 2/3] such as
- o CGB: severance of 5,910 people is pronounced 'slight negative'
 - o Heavy rail: severance of 6,150 people is pronounced 'large negative'.

There are many similar examples.

- 2.16.10 In order to present CGB as the more attractive transport option, CCC went on [2:p30] to compare the environmental impacts of:
- o rail plus all A14 upgrade construction;
 - o CGB without A14 construction.

This flaw is sufficiently serious to require reappraisal of [2].

- 2.16.11 The environmental comparisons made in CHUMMS, [2] and [1] should be replaced with one between the CAST.IRON rail route and CGB, in each case assuming the same less damaging A14 option. The TWA process should be stopped until this has been done and reflected in a modified version of [1].

Comparison of CHUMMS and CAST.IRON patronage estimates

Although the selection, combination and comparison of options carried out in the CHUMMS study is fundamentally flawed, the CHUMMS modelling of transport demand appears to follow normal industry practice and not to be contentious. It is instructive to compare results from CHUMMS demand modelling with CAST.IRON patronage estimates.

- 2.16.12 CHUMMS appraised only light rail along the CAST.IRON route. The CHUMMS light rail option follows the CAST.IRON route exactly, if the southern rail spur is included, except that CHUMMS light rail included a tramway into Addenbrookes. The CHUMMS light rail figures form an appropriate basis for assessing CAST.IRON rail proposals.
- 2.16.13 CHUMMS patronage forecast for light rail was 12,000 journeys per day. However in producing an equivalent figure for heavy rail, the following corrections should be made:
- o an additional allowance for cycle journeys would increase the figure to 13,800 journeys per day;
 - o heavy rail was predicted not to divert existing bus users from the A14, while light rail showed 1,000 diverted journeys per day;
 - o an allowance must be made for loss of traffic to Addenbrookes, but this is tempered by cycle accessibility of Addenbrookes from the CAST.IRON route.
- 2.16.14 With these corrections, the CHUMMS figures closely support the 12,700 new public transport journeys per day for a rail system, as indicated in CAST.IRON's study.
- 2.16.15 Recent developments in both tram technology and rail operating practices make mixed tram and heavy rail running possible on a single rail system over common tracks. A southern rail spur would make possible future dual use of the southern spur for trams running from Addenbrookes to the City centre, thus producing a completely integrated transport system.

3 Revenue and Cost Analysis for CGB

The following sections provide the analysis that underpins the overview in **1.4**.

3.1 Revenue

This section examines CCC's guided bus revenue projections.

3.1.1 This section refers to data in [2], issued in Summer 2002, when CCC stated that CGB would be operational during 2006. Since then CCC has now put back its estimated service start date to 2007. For consistency with [2], this section will give revenue projections based on operation beginning in 2006.

3.1.2 [2:p95] gives projected demand for CGB as follows:

Year	Average fare per passenger (pence)	Passengers per year	Total Revenue (£)
2006	104	2088048	2171570
2011	120	5353806	6424567
2016	120	6680056	8016067

Average fares are from [2:p95]. Total passengers per year are derived from [2:p15] using the multiplier factors explained in **2.1** above. Total revenue can thus be calculated. The revenue totals given at [2:p95] are about 0.4% different from the above – this discrepancy will be ignored.

3.1.3 The 2006 figure represents a projected demand for CGB. However [2:p15] notes that for the first 3 years of system operation, actual patronage is expected to fall short of this level, since passengers will take time to adopt the new transport option. [2:p15] indicates that patronage can be expected to be only 50%, 75% and 90% of the projected demand during 2006-2008 respectively.

3.1.4 [2] gives contradictory indications of how passenger demand is expected to grow during 2009/10 and 2012-2015. CCC [2:p95] indicates that demand for intermediate years should be calculated through interpolation – this has the effect of increasing CCC's revenue projections. However interpolation is not used by CCC when calculating costs – this has the effect of reducing CCC's cost projections. A consistent approach is clearly required.

3.1.5 The approach followed here is to note that the bus purchasing schedule at [2:p14] indicates that:

- o demand will not exceed 2088048 passengers up to 2010;
- o demand will not exceed 5353806 passengers up to 2015.

While a sudden step change seems unlikely in either 2011 or 2016, this will be used in the following analysis.

3.1.6 Predicted usage for CGB is thus as follows:

Year	Average fare per passenger (pence)	Passengers per year	Total Revenue (£)
2006	104	1044024	1085785
2007	104	1566036	1628677
2008	104	1879243	1954413
2009	104	2088048	2171570
2010	104	2088048	2171570
2011	120	5353806	6424567
2012	120	5353806	6424567
2013	120	5353806	6424567
2014	120	5353806	6424567
2015	120	5353806	6424567
2016	120	6680056	8016067

3.1.7 A gradual build-up of demand during early years of operation, as noted in **3.1.3** above, is a very important factor to take into account in the planning of any new public transport system. However a number of figures in [2], such as [2:table 12] and [2:p95], are presented as if 100% demand was realised in the first year of operation. This has the misleading effect of reducing the apparent level of subsidy required for CGB.

3.1.8 It will be noted that the revenue levels in **3.1.6** are based on the CCC forecast of 20,250 passengers per day. Scaling these levels in line with the more realistic passenger levels in **1.3.6** would reduce the levels to the following:

Year	Total Revenue (£)
2006	314878
2007	472316
2008	566780
2009	629755
2010	629755
2011	1863124
2012	1863124
2013	1863124
2014	1863124
2015	1863124
2016	2466443

3.1.9 This is however not the worst case scenario for which CCC needs to plan, since it assumes a level of off-peak traffic that follows the Inner London off-peak usage profile. This is very optimistic in the case of CGB.

3.2 Running Costs for Bus Operators

- 3.2.1 These running costs divide into three categories:
- o Bus depreciation and fixed running costs;
 - o Distance-related running costs;
 - o Staff costs.
- 3.2.2 [2:p13] states that the useful life of a bus is 10 years and its capital cost at 2002 prices is £150,000. [2] makes no provision for the financing costs relating to buses. In contrast current figures, disclosed by Stagecoach [11], are a capital cost of £200,000 and a useful life of 5-7 years. Assuming a useful life of 7 years and financing charges at 7% APR means a combined depreciation and financing cost for a bus of £36,600 per year. [2:p46] makes an allowance of £2,000 in addition for tax, insurance and time-based maintenance such as MOT preparation. Accepting this figure, in total the annual fixed cost for a bus is therefore £38,600.
- 3.2.3 [2:p46] breaks the distance-related running costs for a bus into two parts: fuel, assumed to cost £1.50 per gallon with a consumption rate of 12.9 km per gallon, plus tyre wear and distance-related maintenance costs at 22.7p per km. These factors together produce a running cost per km of 33.4p
- 3.2.4 Staff costs are given in [2:p46] as comprising solely drivers' hourly pay, at £7.98 per hour including sickness, holidays and schedule inefficiency. In this analysis, schedule inefficiency will be dealt with separately in section **3.4.7**. Current local rates for drivers' basic pay are around £7.00 for normal business hours. An additional allowance of 33% should be added to this for national insurance, pension, sickness and holidays. This produces a total of £9.31 for normal business hours. For bus operation 18 hours per day, 7 days per week, a variety of unsocial hours rates may apply. For the purposes of this analysis, time-and-a-half has been assumed to apply uniformly outside for normal business hours, amounting to £13.97 per hour. It should be noted that driving a guided bus requires the normal PSV qualifications plus additional skills relating to the special requirements of driving on a guideway, so that guided bus drivers will almost certainly command a salary premium over standard bus drivers.
- 3.2.5 An operator will have office/administrative costs, plus a requirement for additional staff such as ticket inspectors. These are assumed as included in **3.3.10** below. Costs for bus maintenance staff, plus their maintenance facilities, are assumed to be covered by the distance-related maintenance costs in **3.2.3**.

3.3 Running Costs of the guideway

This section looks at the annual costs to run the CGB system itself.

- 3.3.1 The Annex E submission [2:p13] identified 5 components of expenditure:
- | | |
|----------------------------------|--------------------|
| o park and ride (including CCTV) | £200,000 |
| o real time information system | £ 50,000 |
| o carriageway repairs | £ 66,300 |
| o general maintenance | £ 43,500 |
| o recovery vehicle | £ 6,700 |
| Total: | £366,500 per annum |
- 3.3.2 CCC has repeatedly claimed that the running costs of CGB can be covered by a 10% levy on CGB bus fares over conventional bus fares. CCC has repeatedly claimed that none of the running costs of CGB will require subsidy from public funds.
- 3.3.3 In order for this level of running costs to be met from a 10% levy on CGB bus fares, CGB bus fares collected would clearly need to amount to £4.03 million per year, including levy. **3.1.6** indicates that even CCC figures show CGB bus fares as significantly less than £4.03 million for the first 5 years of operation, so that a subsidy would be required for at least 5 years.

- 3.3.4 Further information in [1:p444] shows that the annual costs of running CGB would be much in excess of £366,500 per year. The following sections consider each area of expenditure in turn.
- 3.3.5 Park and Ride running costs: [2:p13] gives these as £200,000 per year including CCTV costs. The figure is said to be obtained from actual experience of running CCC Park and Ride sites. [1:p444] indicates that 8 full time equivalent staff are required. This cost level is accepted as plausible.
- 3.3.6 Real time information system: [2:p13] gives this cost as £50,000 per year. Little information is provided on the nature of this expenditure, nor is CCC able to demonstrate any prior operating experience from which to estimate this figure as being adequate. This figure will be used in the following analysis.
- 3.3.7 Carriageway repairs: [2:p13] gives this cost as £66,300 per year. CCC operates road maintenance depots, although it has no experience of repairs to the specialist structure of a guideway. This figure will be used in the following analysis.
- 3.3.8 However it should be noted that concrete wears comparatively quickly and is highly susceptible to damage by frost, snow and ice. CCC should be required to provide a more thorough evaluation of the expected performance of the guideway and of an associated programme of remedial works on the guideway structure.
- 3.3.9 Maintenance of the guideway (grass cutting etc.): [2:p13] gives this cost as £50,000 per year. However [1:p444] states that 8 full time staff will be required for maintenance of the guideway. Assuming an average salary of £15,000 plus an overhead of 33% for National Insurance, pension contributions and other overheads, the cost of maintenance staff alone will be £160,000 per year.
- 3.3.10 Maintenance of ticketing facilities: no cost for this is indicated in [2:p13]. However [1:p444] states that 3 full time staff will be required for servicing and maintenance of these facilities. Again assuming an average salary of £15,000 plus an overhead of 33% for National Insurance, pension contributions and other overheads, the cost of these staff will be £60,000 per year.
- 3.3.11 Management and administration of the CGB operation: no cost for this is indicated in [2:p13]. However [1:p444] states that 10 full time staff will be employed for management and administration of CGB. These staff will require some office facilities. Assuming an average salary of £15,000 plus an overhead of 66% for accommodation, National Insurance, pension contributions and other overheads, the cost of these staff will be £250,000 per year.
- 3.3.12 Recent job advertisements by CCC and other comparable authorities suggest that the salary estimates above are probably a little low.
- 3.3.13 Policing: no cost for this is considered in [2:p13]. However [10] notes the need for CCC to arrange for the services of British Transport Police to be provided in connection with the guideway.

The Wensleydale Railway, a private transport system of comparable extent, is required to finance the services of 0.5 full time equivalent British Transport Police staff, the charge per full time British Transport Police staff being £72,000 per year. The Wensleydale Railway is 50% longer than CGB but operates for 50% less time per day than proposed for CGB.

Scaling the cost of policing both by the length of the system being policed and by the hours of operation produces a policing cost for CGB of £48,000 per year.

- 3.3.14 Recovery vehicle: [2:p13] gives this cost as £6,700 per year.
- o [7] indicates that a recovery vehicle is required that can tow a bus along a guideway and which can drive in both directions along the guideway, in order to reach a vehicle that requires to be towed.
 - o Towing using a towbar from the maintenance track is clearly not possible. Without considering the mechanical problems this would involve, the maintenance track does not run along the full length of the guideway; at some points it runs under separate bridges from the guideway and at others it runs up to 5m below the level of the guideway.

- o [7] indicates that the specialist vehicle required to tow buses along the guideway would require all-wheel steering and would require to be drivable from both ends. The vehicle would need to be specially made to the exact width required, with an allowance for guidewheels, to fit in between guideway walls.
- o A standard car recovery vehicle costs around £30,000. The vehicle required for CGB would not only have a much larger towing weight requirement but also would require customisation as above. A capital cost of £60,000 is therefore assumed, with an operating life of 10 years. With allowance for finance, the annualised cost is therefore £8,400. It should be noted that this is a moderate cost assumption, given the specialist nature of the vehicle required and given that a bus costs around £200,000.
- o Servicing of the maintenance vehicle is additional to the above costs. [2:p46] indicates that a basic cost of £2,000 per vehicle is required for tax, insurance and mileage-independent servicing such as MOT preparation.
- o Specially trained staff would be required to be on standby, for the 126 hours of CGB operation per week, to drive such a vehicle. Assume £6/hr for such specialist staff, plus 33% overheads.

These considerations produce a cost for financing and operating the recovery vehicle of £ 39,400 per year.

3.3.15 The total annual expenditure for operating CGB is therefore:

o park and ride (including CCTV)	£200,000
o real time information system	£ 50,000
o carriageway repairs	£ 66,300
o general maintenance	£160,000
o maintenance of ticketing	£ 60,000
o administration and management	£250,000
o policing	£ 48,000
o recovery vehicle	£ 39,400

Total: £873,700

3.4 Costs to Run the CCC Proposed Service Schedule

This section calculates the service running hours and running distances for the proposed CCC service schedule. This is used to determine the fleet size required and hence the total cost of running the proposed service.

3.4.1 The following service intervals are indicated by CCC. Figures indicate the number of services run per hour.

Route segment	Off-peak service	Peak service 2006	Peak service 2011	Peak service 2016
Huntingdon-St Ives	4	4	4	4
St Ives-Longstanton	6	6	6	7
Longstanton-City	9	9	15	20
City-Truntington	6	6	6	6

Source: [1:p455] [2:p46] [2:p46] [1:p455 – central]

- 3.4.2 There are problems with operating at a regular service interval while meeting these service frequencies. As an example, suppose buses run from St Ives to Longstanton 6 times an hour, so every 10 minutes. Only four of these have come from Huntingdon. Did these buses run on a 10/20/10/20 minute pattern, or did they arrive at St Ives every 15 minutes, with every other one waiting an additional 5 minutes. In the former case, the service from Huntingdon is poorer and passenger queuing/crowding will occur at peak times. In the latter case the average journey time is increased, further reducing the transport benefits of CGB. Also operating costs are increased. The same problem arises at Longstanton. CCC should be required to explain how a timetable would be run that is compatible with **3.4.1** above and then the cost/service implications should be analysed.
- 3.4.3 [2:p45] indicates that the same off-peak service will be run regardless of demand level and regardless of year of operation.
- 3.4.4 The system is to operate 18 hours every day, excluding 8 bank holidays per year. Peak hour service applies for 6 hours per day Mondays to Fridays.
- 3.4.5 CCC passenger demand forecasts, taken in conjunction with the service frequencies above, require the service from Longstanton to Cambridge City to be operated by double decker buses. Height restrictions require the services south of the City to be operated by single decker buses.
- 3.4.6 The lowest cost method to run a service south of the city is a City-Addenbrookes-Trumpington-City circular route.
- 3.4.7 Taking **3.4.5**, **3.4.6** into account, the patterns of service will therefore be as follows:

Route pattern	Off-peak service	Peak service 2006	Peak service 2011	Peak service 2016
Huntingdon - City	4	4	4	4
St Ives – City	2	2	2	3
Longstanton-City	3	3	9	13
South City circular	6	6	6	6

- 3.4.8 The distances and running times associated with each of these route patterns are as follows:

Route pattern	Return time (mins)	Return time (mins) incl. layover	Return distance (km)	Average speed (km/h)
Huntingdon – City	96	120	66	33
St Ives – city	68	90	46	31
Longstanton-City	52	60	28	28
South City circular	27	40	15	23

The basic return times show actual running time. These do not allow for layovers - waiting times at ends of the route. These waiting times are built into the second column of figures. It should be noted that the actual layover times will depend on details of the timetable and the need to operate to a 'clock face' schedule etc.

- 3.4.9 At peak hours all of these journey times will be subject to significant delays, since all of the route patterns involve significant segments of operation through congested streets. The layovers shown are the minimum acceptable to cope with these delays.
- 3.4.10 The combination of the service frequency for each route pattern and the return trip time including layover can be used to determine the number of buses required to operate each

route pattern. In addition the combination of average speeds on each route and number of buses operating on each route can be used to determine the total distance run per hour of operation.

Route pattern	Off-peak service	Peak service 2006	Peak service 2011	Peak service 2016
Buses operating:				
Huntingdon – City	8	8	8	8
St Ives – City	3	3	3	5
Longstanton - City	3	3	9	13
South City circular	4	4	4	4
Buses operating	18	18	24	30
Service spares		2	2	2
Total fleet required		20	26	32
route distance run per hour (km)	530	530	698	856

3.4.11 The two spare buses shown above – one double decker and one single decker – are the absolute minimum required to accommodate maintenance schedules.

3.4.12 CGB is intended to be operational 126 hours per week, 51 weeks per year (i.e. excluding bank holidays). Operational hours will divide into:

- o Peak hours 30 per week
- o Off-peak business hours 30 per week
- o Off-peak unsociable hours 66 per week

The distinction between the last two categories is that driver pay would be 50% higher during unsociable hours.

3.4.13 Combining all of the factors in **3.4.9** and **3.4.11** with the unit costs in **3.2.2**, **3.2.3** and **3.2.4** produces the following bus operator costs:

Annual cost (£)	2006	2011	2016
	service pattern	service pattern	service pattern
Driver costs	1358906	1444372	1522716
Distance costs	1123907	1208731	1288505
Bus costs	772000	1003600	1215900
Total operator costs	3254814	3656703	4027120
Drivers required	57	61	65

3.4.14 The number of full time equivalent drivers required is also shown in this table. It should be noted that in December 2003 there was a shortage of 53 bus drivers in the Cambridge area of Stagecoach's operation alone.

3.5 Profit and Loss Forecast for CGB

This section considers the cash requirements to operate CGB, in line with CCC service and patronage forecasts.

3.5.1 CCC revenue expectations for CGB are identified in **3.1.5**

3.5.2 The costs to operate CGB itself are identified in **3.3.13**

3.5.3 The costs to operate services on CGB are identified in **3.4.12**

3.5.4 Combining these factors produces the following cash requirements to operate CGB.

Operating year	Revenue (£)	CGB costs (£)	Operator costs (£)	Cash surplus (£)	Cumulative cash (£)
2006	1085785	873700	3254814	-3042729	-3042729
2007	1628677	873700	3254814	-2499836	-5542565
2008	1954413	873700	3254814	-2174101	-7716666
2009	2171570	873700	3254814	-1956944	-9673609
2010	2171570	873700	3254814	-1956944	-11630553
2011	6424567	873700	3656703	1894165	-9736388
2012	6424567	873700	3656703	1894165	-7842224
2013	6424567	873700	3656703	1894165	-5948059
2014	6424567	873700	3656703	1894165	-4053895
2015	6424567	873700	3656703	1894165	-2159730
2016	8016067	873700	4027120	3115247	955517

3.5.5 This table indicates that total subsidies of £11.6 million would be required to operate CGB in its first five years, assuming CCC predictions of patronage and service frequencies were correct.

3.5.6 CCC has claimed that CGB can be run without subsidy. This claim does not stand up to analysis.

- 3.5.7 The figures above show the cash subsidy required, assuming it is simply written off from public funds as paid. If interest costs were to be applied to CGB operating losses as would be required in a normal business plan, then assuming a 7% APR cost of finance the cumulative cash position would be as follows:

Operating year	Operating surplus	Finance costs	Cumulative cash position
2006	-3042729	0	-3042729
2007	-2499836	-212991	-5755556
2008	-2174101	-402889	-8332545
2009	-1956944	-583278	-10872767
2010	-1956944	-761094	-13590805
2011	1894165	-951356	-12647996
2012	1894165	-885360	-11639192
2013	1894165	-814743	-10559771
2014	1894165	-739184	-9404790
2015	1894165	-658335	-8168961
2016	3115247	-571827	-5625541

Hence CGB would show an operating loss of £5.6 million up to 2016.

- 3.5.8 The cash figures in 3.5.4 are dependent on achieving 20,250 passenger journeys per day, as predicted by CCC. Given that at most 29% of these journeys are actually likely to be made using CGB, a very different cash position will result.
- 3.5.9 If the service patterns in **3.4.1** were to be operated for this lower level of patronage, a cash loss of £33.9 million would be incurred over the period 2006-2016.
- 3.5.10 At this lower level of patronage, the service patterns in **3.4.1** and this level of subsidy cannot be justified. In practice, the 20 minute off-peak service mentioned in [1] could be expected to apply throughout the system. The overall service pattern would therefore be:

Route segment	Off-peak service	Peak service 2006	Peak service 2011	Peak service 2016
Huntingdon-St Ives	3	3	3	3
St Ives-Longstanton	3	3	3	3
Longstanton-City	3	3	8	10
City-Trumpington	3	3	3	3

The peak service levels above are set by the patronage figures in **2.6.1**, which predict passenger numbers from Longstanton/Oakington (Northstowe) to be half the levels predicted by CCC in **2.1.5**

- 3.5.11 Combining these service patterns with the lower revenue forecast obtained from **2.6.1** produces a cumulative cash position as follows:

Operating year	Revenue (£)	CGB costs (£)	Operator costs (£)	Cash surplus (£)	Cumulative cash (£)
2006	314878	873700	1505259	-2064082	-2064082
2007	472316	873700	1505259	-1906643	-3970724
2008	566780	873700	1505259	-1812180	-5782904
2009	629755	873700	1505259	-1749204	-7532108
2010	629755	873700	1505259	-1749204	-9281312
2011	1863124	873700	1840167	-850742	-10132054
2012	1863124	873700	1840167	-850742	-10982796
2013	1863124	873700	1840167	-850742	-11833539
2014	1863124	873700	1840167	-850742	-12684281
2015	1863124	873700	1840167	-850742	-13535023
2016	2324659	873700	1974130	-523170	-14058194

- 3.5.12 The cash position in **3.5.11** by far more likely as outcome than that in **3.5.4**, if CCC proceeds with its plans to construct CGB.
- 3.5.13 The total cash subsidy required to 2016 in this scenario is £14 million.
- 3.5.14 Much more concerning, this cash statement indicates that CGB will continue to require a subsidy even once Northstowe has reached 6,000 dwellings. CGB will be a long term cash liability on the finances of CCC.
- 3.5.15 Once again, this is however not the worst case scenario for which CCC needs to plan, since it assumes a level of off-peak traffic that follows the Inner London off-peak usage profile. This is very optimistic in the case of CGB.

3.6 Costs of Constructing CGB and Proposed Funding Elements

This section summarises the total costs of constructing CGB and identifies the terms on which partial funding for these costs has been provisionally offered to CCC.

- 3.6.1 Estimates of the cost of CGB are given at [13] in the TWA application as £86.4 million.
- 3.6.2 The figure in [13] does not include any preparatory costs, for example all the costs associated with the TWA application process. These costs are specifically excluded in [13], which covers only those professional fees incurred once implementation of the project has finally been authorised. [2:p12] gives preparatory costs as £2 million. This £2 million is a component of the £65 million government grant/borrowing support provisionally authorised in [8]. This means that the £65 million government grant/borrowing support provisionally authorised in [8] will cover only £63 million of the £86.4 million identified in [13].
- 3.6.3 In addition to the costs in [13], CCC funding applications to government [5] include 'Cycle Schemes for CHRT' and 'Improved Pedestrian and Cycle Access to CHRT' at a total cost of £6.8 million. (CHRT is another name for CGB.) These costs have been omitted from [13]. However [14] indicates that CGB will provide rights of way in the form of bridleway/cycle access (north of Cambridge) and cycle access (south of Cambridge) along the whole of the CGB guideway routes. These costs of £6.8 million are expenditure necessary to deliver the CGB system as advertised to the public in the TWA documentation and in [15].

- 3.6.4 Further in addition to the costs in [13], CCC funding applications to government [5] include 'CHRT Bus Priority Measures from St Ives to Huntingdon' at a total cost of £4.9 million. These costs have been omitted from [13]. However they are essential for CGB to approach the journey times stated in [1:p464] and in [4]. Hence they are expenditure necessary to deliver the CGB system as advertised to the public in the TWA documentation.
- 3.6.5 Yet further in addition to the costs in [13], CCC funding applications to government [5] include bus priority measures from Elizabeth Way to Milton Road level crossing at a total cost of £1.4 million, which [4] indicates as being an essential part of CGB. These costs have been omitted from [13]. However they are expenditure necessary to deliver the CGB system as advertised to the public.
- 3.6.6 In total the scheme costs are therefore as follows:

Item	Cost (£ million)	Source of funding		
		Government Grant Element (£ million)	CCC Borrowing Element (£ million)	Section 106 Element (£ million)
Scheme preparation costs	2.0	1.0	1.0	
TWA disclosed costs	86.4	31.5	31.5	23.4
Cycle and Pedestrian Provisions	6.8		6.8	
Huntingdon-St Ives bus provisions	4.9		4.9	
Cambridge City bus provisions	1.4		1.4	
Totals	101.5	32.5	45.6	23.4

- 3.6.7 The allotment of costs in the table above to provisional government grant and CCC borrowing elements is in accordance with the allotment of these costs to budget categories by CCC [5] and with the information set out in [8].
- 3.6.8 With regard to the CCC borrowing element, this represents borrowing for which the government currently contributes towards the finance costs, through the Revenue Support Grant. This is on the basis of repayment of the borrowing over 25 years.
- 3.6.9 CCC will have this liability for 25 years. In contrast the government is at liberty to alter, or cancel, its Revenue Support Grant support at any time. This could occur through a change to local government legislation, over which CCC would have no control.
- 3.6.10 All of the costs so far indicated by CCC, as tabulated in **3.6.6**, are provisional estimates. Many aspects of CGB specification are still to be determined. The costs do not indicate any provision for contingencies. Further cost increases can be expected.
- 3.6.11 A number of significant items in the CCC costings are still only 'ball park' figures. For example land costs are given as £5 million. CCC [12] has indicated that it still has no real data to support these costs.
- 3.6.12 CCC has a very poor record of contingency estimation on this project. Therefore significant provision should be added to current CCC figures for contingencies.
- 3.6.13 As an example, in 2002 CCC [2:p12] gave the cost of Hills Road bridge at £2.5 million. A contingency of £1.2 million was placed on this figure, as [2:p91] identified the item as one of the highest risk items in [2]. So far CCC has admitted [24] to a revised cost estimate for this bridge of £10 million – this may still be an underestimate.
- 3.6.14 Also, at a late stage in the TWA Order application process CCC disclosed engineers' findings that much of the track bed and associated drainage culverts would require rebuilding to construct CGB [25]. Apart from the environmental impact, this raises the costs of CGB still further and illustrates why it is substantially more expensive than a rail alternative.

- 3.6.15 Throughout the CCC 'business justifications' for CGB, all construction costs are ignored. Their repayment is not included as a cost in the financial analysis of the scheme and its benefits/paybacks.
- 3.6.16 The scheme costs of £101.5 in **3.6.6** do not include any subsidies for running the system. Yet even if the cost data in [2] were accepted a subsidy will be required in the initial years of the scheme.
- 3.6.17 The scheme costs of £101.5 in **3.6.6** do not include any elements of expenditure from the CCC 'Sustainable Communities' budget, but it is understood that some expenditure relating to CGB has been earmarked in that budget.

4 Completeness of Scheme

- 4.1.1 The proposed scheme, as applied for in this application, does not provide firm details for on-road running sections – Huntingdon to St Ives or through Cambridge City.
- 4.1.2 CCC has stated [16] that it is not possible to include these details in the application. This is contested.
- 4.1.3 Notably, 6(1) of the proposed draft order [10] includes provisions for alterations to streets in connection with the scheme.
- 4.1.4 Furthermore, 42 of the proposed draft order [10] includes provisions that such alterations to streets may be carried out any time up to 12 months after commencement of operation of the CGB system.
- 4.1.5 CCC has repeatedly promoted CGB as providing journey time reliability as a result of avoiding use of the A14.
- 4.1.6 However most journey time unreliability on CGB would be caused by city/town running.
- 4.1.7 Indeed CCC [2:p90] has identified 'service unreliability leading to decreased demand' as a risk factor for CGB, with a high potential impact on the project.
- 4.1.8 CCC [2:p90] has identified that removal of this risk depends on satisfactory bus priority measures on the existing highway network.
- 4.1.9 However CCC has not published firm plans for bus priority or other measures on existing roads or for the associated compulsory purchase of land.
- 4.1.10 Furthermore CCC has stated [7] its intention to postpone consultation on these plans until after a TWA Order is granted.
- 4.1.11 The details relating to existing roads will fundamentally affect the benefits of the CGB scheme.
- 4.1.12 The journey times on CGB stated by CCC are significantly dependent on the details of these plans.
- 4.1.13 Environmental impacts of CGB are significantly dependent on the details of these plans.
- 4.1.14 Overall benefits of CGB are significantly dependent on the details of these plans.
- 4.1.15 The exact nature of on-road bus priority measures will also affect running of buses on the guideway. For example the current traffic congestion on Milton Road, if not specifically ameliorated, will lead to buses coming from the direction of the Science Park guideway stop being unable to turn right onto Milton Road. Following buses, including services running from the Science Park towards Sidings, are liable to become backed up along the guideway. In this case buses not attempting to use the roads at this point in their journey will have their running affected by the nature of the on-road bus priority measures. In extreme cases buses are liable to back up beyond Science Park stop, delaying passenger boarding/alighting on a guideway section. In view of these issues, it cannot be claimed that design and operation of the guideway system as set out in [17] is independent of the details of on-road bus running.
- 4.1.16 CCC has separately announced plans to alter bus routing arrangements in the centre of Cambridge. For example CCC plans to make Emmanuel Street one-way, with northbound services using St Andrews Street instead. These plans would have the effect of increasing bus journey times through the City for CGB services.

- 4.1.17 CCC should be required to produce firm proposals for routing of all CGB services through the City.
- 4.1.18 CCC should be required to produce firm proposals for all on-road priority measures affecting CGB services.
- 4.1.19 In the absence of such firm proposals, the scheme should only be assessed on the basis that no on-road alterations will occur and that current bus timetable information is the correct reference for assessment of CGB journey times. It is not acceptable for CCC to claim projected CGB journey time improvements that are predicated on works that are not fully defined and costed. In particular CCC has a history of delaying transport schemes, as recent announcements regarding Chesterton Interchange illustrate.
- 4.1.20 All required alterations to streets that affect the scheme should be specified at Schedule 3 of the Order. No further street provisions should then be permitted in connection with the scheme. Section 6(2) of the Order should be deleted.
- 4.1.21 CCC should be required to resubmit their proposals including all such details. A further period of public consultation should then occur. The TWA process should be suspended *sine die* until the proposals are amended to include these details.

5 Traffic and Environmental Issues

- 5.1.1 Most bus running time along the CGB route will be spent not on a guideway but on existing roads. On these roads, buses will be held up in traffic, leading to poor and unreliable journey times.
- 5.1.2 Slow running of buses in Cambridge, St Ives and Huntingdon will increase pollution in these areas. Additional buses through Cambridge City centre will worsen already severe problems of bus congestion in this area.
- 5.1.3 CCC has claimed [2:p6] that bus traffic could be balanced between Milton Road and Histon Road, in order to minimise the impact on each of these roads. However [2:p46] indicates CCC intends to operate a peak hour route pattern with 87.5% of buses using Milton Road and 12.5% using Histon Road.
- 5.1.4 For a substantial portion of the guideway route, the maintenance track is planned to run at a level below the guideway, in some cases up to 5m lower.
- 5.1.5 Where the maintenance track is planned to run at a level below the guideway, its suitability for emergency access must be called into question, particularly in poor weather conditions.
- 5.1.6 At most points where the maintenance track is planned to run at a level below the guideway, the guideway is planned to follow the embankment level of the railway trackbed.
- 5.1.7 At most points along the trackbed where embankments were constructed, this was because the surrounding land is subject to flooding and the embankments are necessary to keep the trackbed above the surrounding water level.
- 5.1.8 The maintenance track as proposed is liable to be under water for substantial portions of the year.
- 5.1.9 This renders the maintenance track as proposed unsuitable for both maintenance and emergency access. If this is not the case, CCC should be required to publish assurances from HMRI to this effect.
- 5.1.10 It is unacceptable for CCC to be allowed to promote the maintenance track as a public cyclepath/bridleway when it is liable to be flooded for substantial portions of the year.
- 5.1.11 Concrete is one of the most environmentally unfriendly construction materials, with each ton of concrete produced being responsible for approximately a ton of CO₂ emission. In view of the 70 acres of land that CGB would cover with guideways and maintenance tracks, it is questioned whether this has adequately been taken into account in the environmental impact analysis.

6 Usage and disposal of CGB

- 6.1.1 Publicity of CGB by CCC, including [15], indicates that a bridleway and/or cycleway will be provided along the whole of the guided sections.
- 6.1.2 CCC drawings [14] indicate public rights of way over a bridleway/cycleway north of Cambridge and cycleway to the south.
- 6.1.3 9(2) of the draft order [10] allows for emergency/maintenance use to take precedence over rights to access the cycleway.
- 6.1.4 However 9(1) of [10] only entitles CCC and does not require CCC to construct or to provide public rights of way for the bridleway/cycleway, other than under 9(2). The order should be amended such as to require CCC both to construct and to provide such rights of way for the bridleway/cycleway.
- 6.1.5 The proposal in [17] to stop up a number of existing rights of way that cross CGB, coupled with proposal to make many others inaccessible to disabled users, means that the affect of CGB on public access is severely negative. The amendment in **6.1.4** is essential as partial mitigation of this affect.
- 6.1.6 34 of [10] allows CCC exclusive rights of access to CGB. In the case of the bridleway/cycleway public access should not be restricted except under the terms of 9(2) or in more exceptional circumstances.
- 6.1.7 44 of [10] allows CCC to limit rights of access to CGB. In the case of the bridleway/cycleway public access should not be restricted except under the terms of 9(2) or in more exceptional circumstances.
- 6.1.8 47(1) of [10] permits CCC to sell or otherwise dispose of CGB or 'any land held in connection therewith' on any terms that it thinks fit. CCC should be required to procure in the event of a sale or other disposal that all assets and works relating to CGB remain used solely for the purpose of guided public transport or public bridleway/cycleway access and CCC should be required not to promote nor permit any other use by any party.
- 6.1.9 53 of [10] specifies that certain local railway enactments shall cease to have effect.
- 6.1.10 The provisions of these railway enactments should be permitted to cease only to the extent strictly necessary to permit construction and operation of CGB.
- 6.1.11 All amendments to these railway enactments should be made such as not to exclude future use of the assets and works for the operation of a railway system on the same land.

7 Services on CGB

- 7.1.1 The TWA application documentation and other promotional material includes contradictory statements as to the services to be operated.
- 7.1.2 For example [1:pV] indicates an off peak service frequency of 3 per hour, while [1:p455] indicates a higher level.
- 7.1.3 CCC has heavily promoted the fact that services can join the guideway at intermediate points along its length, but [1:s4.2.3] excludes any such services from the environmental assessment.
- 7.1.4 CCC has repeatedly maintained that the level and timing of services provided on CGB will be a commercial matter for multiple bus operators.
- 7.1.5 However 38 of [10] permits CCC to specify the frequency and timing of services provided by bus operators.
- 7.1.6 Furthermore 34 of [10] permits CCC to authorise a single bus operator to operate services on CGB.
- 7.1.7 Furthermore 34 of [10] permits CCC alternatively to operate the CGB system itself.

- 7.1.8 In view of 34/38 of [10], CCC should be required to make a commitment to the frequency and timing of all services that will be run and that use any section of the guideway as a component of the route.
- 7.1.9 CCC should then be required to provide a revised environmental statement relating to the system as it is proposed to be operated.
- 7.1.10 CCC should also then be required to provide a revised analysis of all costs and benefits of the CGB system.
- 7.1.11 CCC should be required to resubmit their proposals including all such revisions. A further period of public consultation should then occur. The TWA process should be suspended *sine die* until the proposals are amended to include these revisions.
- 7.1.12 The provisions in 34 of [10] should be construed as representing CCC's intentions for operation of CGB. This directly contradicts the representations made in CCC's application for funding - [2:p2] represents 'open access' as a key feature of CCC's proposal. This calls into question the entire basis on which funding has been sought and provisionally allocated to CG; that allocation should be reappraised accordingly.

8 Representations made by CCC relating to CGB

- 8.1.1 CCC indicates the need for CGB [1:pII] as being related to A14 congestion.
- 8.1.2 Furthermore CCC has claimed that the "guided bus project will ease A14", this being the headline in a CCC newspaper, 'Prospects 2004', delivered to over 200,000 Cambridgeshire households during March 2004.
- 8.1.3 The fact that this newspaper was delivered during the public consultation period on [17] means that many people may have been misled into not registering an objection to the scheme.
- 8.1.4 CCC has been formally asked to produce evidence to support its claim that the "guided bus project will ease A14". It has so far failed to do so.
- 8.1.5 However CCC has separately indicated [7] that in fact as few as 2% of vehicles would be removed from the A14 by CGB.
- 8.1.6 The claims in 8.1.1 are incompatible with the true situation. They indicate the extent to which CCC has circulated misleading information about CGB.
- 8.1.7 CCC claims [2:p21] that CGB has all-party support within CCC. The voting records for the CCC votes on CGB in September 2003 and February 2004 indicate that this is false.
- 8.1.8 CCC claims [2:p21] that CGB is supported by all Cambridgeshire districts. However [25] shows the reservations of SCDC, through whose district much of CGB would run, on matters of proper transport assessment, environmental effects and public amenity. [25] indicates that SCDC would actively oppose CGB, were it not constrained by lack of funds.
- 8.1.9 CCC claims [2:p21] that public consultation has shown conclusively that CGB 'would be very popular'.
- 8.1.10 Public meetings leading up to and during the public consultation period have shown that this is not the case.
- 8.1.11 CCC carried out a consultation on CGB plans in summer 2003, at which time it provided substantially less detail about CGB than in [17]. In response to the distribution of 155,000 questionnaires, it received a total of 2,219 responses. The questionnaire did not ask whether respondents considered CGB to be an appropriate rapid transit solution for the area, only whether they were in favour of rapid transit *per se*. Nevertheless, over 17% of respondents chose to add comments expressing a preference for some type of rail system [26].
- 8.1.12 Following the 2003 consultation, CAST.IRON was formed by Cambridgeshire residents wishing to determine the feasibility and desirability of reinstating the railway from Cambridge to St Ives and beyond, and to promote such a railway accordingly. CAST.IRON has a paid-up

membership of over 850. Allowing for household memberships of two or more adults, CAST.IRON represents over 1,000 adults in calling for reinstatement of the railway.

- 8.1.13 The TWA Order public consultation period produced over 2,700 objections to the CGB proposal.
- 8.1.14 It will be noted that the number of objectors exceeds the total number of respondents to the CCC 2003 consultation.
- 8.1.15 Also CAST.IRON has raised a petition calling for the restoration of regular, timetabled rail services on the line from Cambridge to St Ives and beyond. Currently the petition has in excess of 3,200 signatures. This petition will be presented in due course.
- 8.1.16 It will be noted that the number of petitioners exceeds the total number of respondents to the CCC 2003 consultation.
- 8.1.17 A recent survey of residents of Histon and Impington indicates that:
- o 74% are opposed to CGB;
 - o 78% are in favour of a rail alternative.
- 8.1.18 All the evidence suggests that CGB is very unpopular with the public.
- 8.1.19 CCC has repeatedly claimed, for example recently in [18], that the rail industry does not support rail alternatives to CGB.
- 8.1.20 In this regard, comparison is made with the recent Translink guided bus TWA Order Application. The Translink promoters claimed that the rail industry did not support railway alternatives. However in fact those consulted in the rail industry had been asked whether they each would support a different, entirely infeasible railway option in place of Translink. Then, during the TWA Application process, one of the promoters of Translink voted not to proceed with the application. At this point Laing Rail was invited to indicate whether it had any interest in producing a rail alternative. Laing responded with a proposal, highlighting a rail system that would be appropriate in place of the guided bus scheme and indicating its interest in both constructing and operating such a system. The Laing proposal [23] highlighted the following aspects of a rail alternative to a guided bus.
- 8.1.21 Based on Laing's own experience in constructing and operating rail systems, a rail system would be less expensive to construct than the guided bus promoters had claimed.
- 8.1.22 The system could be built as a 'starter kit', using the lowest cost system compatible with meeting the initial demand, and then upgraded gradually in line with rising demand levels. Laing has successfully demonstrated that a rail system can be upgraded gradually in line with rising demand levels on its Chiltern Railways franchise. This franchise also demonstrates Laing's expertise in generating increased demand.
- 8.1.23 A railway, if under operational control of Laing or an equivalent independent company, even while the infrastructure remained in local government ownership, could be constructed to appropriate standards for an independent rail system, with consequent cost benefits.
- 8.1.24 A TWA Order and the associated works required to reinstate a moribund railway would be simpler than for a guided bus.
- 8.1.25 A 'starter kit' railway could be brought into operation at an early date.
- 8.1.26 The rail system could form the hub of a multi-modal system, with bus interchanges, as successfully developed by Laing on its Chiltern Railways franchise.
- 8.1.27 Aspects of successful multi-modal operation demonstrated on the Chiltern Railways franchise include Demand-Responsive Transport feeder services to rail, where conventional bus services are inappropriate.
- 8.1.28 All of these aspects of Laing's proposal are equally applicable to a rail alternative to CGB. This has been confirmed by the investigations by CAST.IRON into rail alternatives to CGB.
- 8.1.29 The use of appropriate construction standards for each part of a rail system can significantly affect the cost of the system. For example in 2004, ScotRail publicised a study carried out on comparative costs of equivalent works undertaken by ScotRail and Network Rail. The study concluded that equivalent works were carried out by ScotRail at between 33% and 50% of the

costs of Network Rail. The ScotRail works were in compliance with relevant HMRI, HSE and other appropriate standards.

- 8.1.30 While CCC has repeatedly represented the rail industry as not being supportive of a rail system, CCC has been unable to name a single bus operator which is committed to operating on CGB.
- 8.1.31 Indeed, since submission of [17] CCC has found it necessary to advertise in the press a request for bus operators to come forward if they are interested in operating CGB.
- 8.1.32 CCC has even represented in its advertisements that certain bus priority measures that it proposes to introduce on public roads may be made available only to those operating on CGB.
- 8.1.33 Any such selective availability of bus priority measures to PSV operators is against the public interest and should not be permitted.
- 8.1.34 In contrast to these advertisements, canvassing of the rail industry by CCC has not taken place in an open or reasonable manner, but has followed the early pattern of Translink as set out above. CCC should be required to invite the rail industry to express interest in building and/or operating a rail alternative to CGB, along such lines as the industry players recommend as being suitable to the region's transport needs. The TWA process should be suspended *sine die* until this has occurred and an open process of evaluation of all responses has taken place, with full public visibility.

9 Transport Strategy

- 9.1.1 The recently announced expansion of Stansted Airport was not taken into account when the case for CGB was promoted. CGB does not provide a solution for the additional traffic that will be generated by Stansted.
- 9.1.2 The proposed expansion of Stansted Airport will add 120,000 passengers per day to the current levels, meaning that more passengers will use Stansted than currently use Heathrow.
- 9.1.3 The expansion of Stansted Airport requires a reassessment of both local and regional transport provisions affecting Cambridgeshire. CGB should not be permitted to progress until this reassessment has been satisfactorily carried out.
- 9.1.4 The London-Stansted-Cambridge-Peterborough growth area was not taken into account when the case for CGB was promoted. Significantly this growth corridor has recently been extended north to include Peterborough. CGB does not provide a solution for the additional traffic that will be generated by this growth area.
- 9.1.5 This growth area requires a reassessment of both local and regional transport provisions affecting Cambridgeshire. CGB should not be permitted to progress until this reassessment has been satisfactorily carried out.
- 9.1.6 ODPM has identified construction of an East-West rail link as being of strategic importance for linking the Milton Keynes-South Midlands growth area with the London-Stansted-Cambridge-Peterborough growth area.
- 9.1.7 Construction of CGB would prevent two of the former railway routes out of Cambridge from being used to facilitate an East-West rail link.
- 9.1.8 CCC should be required to show in detail how an East-West rail link can be constructed if CGB is also in place, what route would be proposed for the link and what additional cost of land acquisition and construction there would be compared to a route using either of the former railway routes.
- 9.1.9 This additional cost should be factored, as an additional expense of CGB, into the economic justification for CGB and its comparison with a railway alternative to CGB.
- 9.1.10 The East-West rail link proposed in **9.1.8** should then be accepted and reserved as a protected route by the SRA.
- 9.1.11 CGB should not be permitted to progress until the steps in **9.1.8** to **9.1.10** have been satisfactorily carried out.

- 9.1.12 CCC has stated that relief of freight traffic from the A14 is catered for by the Felixstowe-North London-Nuneaton freight route.
- 9.1.13 However the North London line is operating close to capacity. Many freight and passenger routes place demands on that capacity.
- 9.1.14 The proposed freight development at Alconbury requires reassessment of freight provisions affecting Cambridgeshire. CGB should not be permitted to progress until this reassessment has been satisfactorily carried out.
- 9.1.15 The Alconbury freight facility cannot practically be served by the Felixstowe-North London-Nuneaton freight route and capacity problems arise with any route via North London. It should be served by restoring the Cambridge-Huntingdon rail link.
- 9.1.16 This rail link would remove significant HGV traffic from the A14, for example HGVs from Felixstowe. Removal of such HGVs would have a greater impact both on A14 accident rates and A14 congestion than the small number of cars that would be removed as a result of CGB even according to the claims of CCC, let alone the much smaller number of cars that this document has demonstrated as being likely to be removed.
- 9.1.17 The proposed two-phase expansion of Felixstowe docks will add an extra 1 million HGV movements per year to the A14 unless suitable rail freight capacity is available. The Cambridge-Huntingdon rail link is essential to support this capacity.
- 9.1.18 The proposed expansion of Harwich docks will add an extra 0.5 million HGV movements per year on the A14 unless suitable rail freight capacity is available. Again the Cambridge-Huntingdon rail link is essential to support this capacity.
- 9.1.19 The proposed Shellhaven development will place additional capacity demands on the North London line, further increasing the importance of the Cambridge-Huntingdon rail link.
- 9.1.20 The proposed 'Snoasis' leisure park in Gt Blakenham, Suffolk will bring additional East-West light vehicle traffic onto the A14. Access to this leisure park via an East-West rail link is essential to counteract this additional traffic.
- 9.1.21 Building CGB along the former Cambridge St Ives railway line would destroy a strategic transport option, of significance to Stansted, Alconbury and the growth area. This would not be in the public interest.
- 9.1.22 CGB is being promoted by CCC as a sub-regional transport system. CCC should instead promote a scheme that caters for both sub-regional and regional transport.
- 9.1.23 The need to cater for Stansted expansion makes the CGB proposal a matter of national significance. The CGB scheme should be referred to Parliament for approval.
- 9.1.24 CGB fails to meet the CCC LTP objective to provide a transport system that meets the needs of the economy. This failure is reflected in failures, inter alia, to meet the needs of business travellers to Cambridgeshire high-technology companies, the needs of business travellers to Stansted and the freight needs of Cambridgeshire companies.
- 9.1.25 Trumpington Park and Ride scheme is already well used for access to the City Centre via existing bus services. Any time improvement to the City Centre as a result of CGB will not improve usage of the site. Indeed [2:p15] indicates that CCC anticipates usage of the site falling during the first 10 years of CGB operation.
- 9.1.26 CCC plans to reroute long distance coaches that currently terminate in the City Centre so that instead they terminate at Trumpington Park and Ride site. For passengers wishing to proceed onwards into the City Centre, the time improvement to the City Centre as a result of CGB will be minimal and will not affect patronage of the coaches.
- 9.1.27 In contrast, for residents of North Cambridge and villages north of Cambridge, a railway connection to Trumpington will substantially affect journey times to the coach terminus and hence the attractiveness of using it.
- 9.1.28 The benefits of a CGB link to the Addenbrookes area cannot properly be assessed without consideration of the new access roads that are proposed for this area. The details of these roads should be provided as part of the CGB application and the likely benefits of a CGB link to the Addenbrookes area should be reappraised in the light of these details.

- 9.1.29 The benefits of a CGB link to the Addenbrookes area are anyhow called into question by the CGB usage projections. Addenbrookes has been declared by CCC to be a significant destination for CGB because it is the largest single employer in Cambridge (although not the largest employment park), with over 5,500 employees. The significance of Addenbrookes to CGB is however called into question by CCC's prediction that only 103 passengers would travel to the location by CGB in the peak hour.
- 9.1.30 Rail travel has consistently risen in popularity over the last 20 years, with passenger journeys up 60% and passenger-miles up 38% in this period. They continue to rise. In contrast bus and coach passenger-miles have fallen 6% in the same period and have been level for the last decade. Well-promoted and integrated rail systems have risen faster still – Chiltern Railways has doubled its passenger numbers in the last ten years, for example.
- 9.1.31 New train services in the Cambridge area have also been shown to be well-used. The most notable example is Anglia Railways' new route from Cambridge to Norwich.
- 9.1.32 In order for rail travel to increase, with its attendant environmental benefits, greater network capacity is required, including the introduction of new strategic links. The factors above make Cambridge - St Ives - Huntingdon a strategic link.
- 9.1.33 Passenger journey levels by rail are now over 20% higher than they were when the Cambridge - St Ives railway was last operational. The population along the A14 corridor has risen dramatically during this time and adequate demand now exists to support a railway.

10 Assessment of Alternatives

- 10.1.1 The assessment of alternative public transport systems submitted by CCC is analysed in other parts of this document. This section will address general issues.
- 10.1.2 [1:pIII] claims that the environmental assessment submitted as a part of [17] includes a detailed assessment of alternative public transport systems, at [1:p53]. The assessment lacks detail, is flawed and is at best highly misleading.
- 10.1.3 [1:pIII] claims that a scheme of bus priorities along existing roads would bring minimal benefit to either scheme users or other transport users. However CCC has provided no satisfactory evidence that the CGB would bring any greater benefit, either to scheme users or to other transport users.
- 10.1.4 In the case of all of the disadvantages of a scheme of bus priorities along existing roads that are claimed in [1:s5.2.5], CCC has provided no satisfactory evidence that the CGB would bring any greater benefit.
- 10.1.5 [1:pIII] and [1:p55] claim that the cost of a rail system would be considerably higher than for CGB. CAST.IRON has clear evidence that the opposite is the case.
- 10.1.6 In particular, a railway system from Cambridge to Huntingdon could be constructed for £50 million including land costs, for a system including the same Park and Ride provisions as proposed for CGB.
- 10.1.7 In contrast, the cost of the CGB scheme, including all of the advertised facets of the scheme, is currently disclosed as £101 million.
- 10.1.8 Thus there is a cost ratio is 1:2 in favour of rail rather than 1:2 in favour of CGB as claimed at [1:s5.2.9].
- 10.1.9 Furthermore, information in other parts of this submission shows that the relative patronage claim made in [1:s5.2.9] is also incorrect.
- 10.1.10 CAST.IRON also has clear evidence that a rail system could be operated without a need for subsidy.
- 10.1.11 CCC [2:p37] claims that CGB can be built faster than other public transport options. This is incorrect.
- 10.1.12 [1:pIII] claims that a rail system is unable to serve town and city centres as flexibly as CGB. However analysis of the likely usage of CGB indicates that any usage arising from this claimed

flexibility would be very low. This flexibility is no more than a theoretical possibility, whose real value is therefore very low.

- 10.1.13 Furthermore the provision for bicycle carriage on a rail system will mean that a rail system is able to serve town and city centres more flexibly than CGB.
- 10.1.14 [1:pIII] omits the key benefit that a rail system allows passengers wishing to cross Cambridge City centre to do so quickly on an environmentally more friendly transport system. In doing so it will encourage a greater number of travellers to use public transport.
- 10.1.15 [1:p54] claims that a rail system is unable to provide feeder services as flexibly as CGB. However the CCC environment assessment of CGB indicates that there is no real demand and no real intention to run such services. This flexibility is no more than a theoretical possibility, whose real value is therefore very low.
- 10.1.16 [2:p15] indicates that 84% of CGB passengers are expected to walk to CGB bus stops. This demonstrates that the flexibility of feeder services is no more than a theoretical possibility, whose real value is therefore very low.
- 10.1.17 [2:p7] indicates that CCC expects feeder bus services to meet CGB services at the Park and Ride sites and that CCC anticipates passengers changing between services. This indicates that CGB is expected to provide no real benefits in terms of feeder services.
- 10.1.18 The cost claims regarding light rail infrastructure at [1:p54] are backed by no evidence in [1] or [2] and cannot be supported. Recent changes in technologies, techniques and costs to install light rail tracks along street sections mean that this statement cannot be justified. CCC should be required to reevaluate costs for light rail before being permitted to proceed with CGB.
- 10.1.19 [1:p54] claims that rail would be likely to result in greater severance, on account of HMRI being likely to require permanent closure of public rights of way crossing the railway system. This is pure supposition and is backed by no evidence.
- 10.1.20 There are recent examples of completely new stretches of railway system that do not follow the path of any previous rail route, such as in Croydon, where HMRI has permitted existing vehicle and foot ways to remain open, with new at-grade crossings constructed for these vehicle and foot ways.
- 10.1.21 Also there is in Croydon a re-opened rail system with two at-grade crossings with roads, at locations where the previous rail route crossed the roads on bridges.
- 10.1.22 There are various other examples of recently introduced at-grade road/rail crossings.
- 10.1.23 In the case of many rail routes recently reopened as 'heritage railways', HMRI has also permitted the railway to cross rights of way at grade.
- 10.1.24 In contrast CGB would produce far more severance than a rail system. This is on account of the desire by CCC not to make a break in the guideway at many existing vehicle crossing points. This has led to the proposed closure of multiple existing crossing points.
- 10.1.25 The closure of these crossing points has led to additional proposed land purchase and roadway construction requirements in the case of CGB. This would be unnecessary in the case of rail.
- 10.1.26 Furthermore many of the crossing points for existing footpaths and bridleways shown in [14] as being provided (at 'chicanes' and at other points) are entirely unsuitable for wheelchair access. Unless breaks in the guideway are provided at these points or the footpaths are closed off, these crossing points are likely to be in breach of current disability access legislation. Closing off the footpaths would substantially increase the level of severance due to CGB.
- 10.1.27 In summary, CGB produces a much less favourable outcome than rail with regard to severance.
- 10.1.28 The promoters of CGB have relied on findings of the CHUMMS study to support their rejection of rail options and for justification for CGB. Flaws in the CHUMMS study are equally flaws in the promoters' assessment of transport alternatives.
- 10.1.29 The modelling of potential peak hour customer demand for a high-quality public transport system running between various points considered in the CHUMMS study is along similar

lines to that described in [2] and appears to follow normal industry practice. This modelling forms a reasonable basis for assessing a rail system. CHUMMS also quantified differences in cycle patronage related to different public transport systems; these findings are accepted.

- 10.1.30 As noted at **2.2.1**, demand predictions for a high-quality public transport system do not however support, imply or validate a claim that CGB would in fact attract such patronage. Other sections of this document identify reasons why CGB does not fall into the category of a 'high-quality public transport system'.
- 10.1.31 Many of the major flaws in CHUMMS arise out of the fact that only a pre-selected set of combined road/public transport options were studied and offered to the public for comment. Rail was offered as an option only in conjunction with a highly unpopular road scheme. Furthermore CGB was offered as part of 5 different combined road/public transport options, against rail in only 1 option. No single road option was offered with both CGB and rail. The combination of these three factors makes it impossible to avoid the conclusion that the pre-selected options were chosen with the intention that CGB would be selected as an outcome.
- 10.1.32 The terms of reference for CHUMMS [3:ToR3.1.3] required it to take account of national and inter-regional pressures in the A14 corridor as well as local pressures. This it failed to do. CGB also fails to do so.
- 10.1.33 The terms of reference for CHUMMS [3:ToR3.4.7] required it to facilitate freight to and from industrial areas within the A14 corridor. This it failed to do. CGB also fails to do so.
- 10.1.34 The terms of reference for CHUMMS [3:ToR3.4.8] required it to increase travel choice for business travellers to Cambridge. This it failed to do. CGB also fails to do so.
- 10.1.35 CCC LTP objectives fed into CHUMMS [3:p1-4] included implementation of demand management. This would be more effective than CGB. CGB should be rejected and demand management should be pursued in its place.
- 10.1.36 CCC LTP objectives fed into CHUMMS [3:p1-4] included promoting road-to-rail mode transfer. This would be achieved by a rail strategy and not by CGB.
- 10.1.37 The CHUMMS study ignored the most beneficial rail route along the A14 corridor. It incorrectly rejected this route as not being viable. CHUMMS instead considered a longer rail route that bypassed key population centres. It then stated that heavy rail would serve St Ives and Godmanchester poorly [3:p4-11].
- 10.1.38 The grounds on which a rail route along the A14 corridor was declared 'unsatisfactory' [22] during the CHUMMS study are flawed. A number of them (for example difficulty of boring an underbridge at an acute angle beneath a road while maintaining traffic flows) apply equally well to the CGB proposals actually presented in [17].
- 10.1.39 CHUMMS considered only local journeys. This promoted the incorrect conclusion that rail would have a high cost and low usage.
- 10.1.40 CHUMMS proposed rail only in conjunction with a highly unpopular new route for the A14 [3:p4-27]. This produced the incorrect conclusion that rail had low public support. CCC claims [2p:89] that the public strongly supports CGB, supporting this claim on the basis of a CHUMMS consultation on 6 options, of which 5 included CGB and remaining one the highly unpopular new route for the A14 plus rail.
- 10.1.41 CHUMMS proposed rail only in conjunction with an environmentally unattractive new route for the A14 [3:p4-27]. This also produced incorrect conclusion that CGB was more environmentally attractive. All of the environmental disadvantages claimed for rail stem from the accompanying A14 route.
- 10.1.42 CHUMMS excluded noise [3:p3-14] and air pollution [3:p3-15] as considerations for assessing alternative transport options. This is unacceptable and is particularly relevant for Cambridge City.
- 10.1.43 CHUMMS assumed that the number of passengers transferring between rail trips outside the CHUMMS area and local public transport within the area would be the same regardless of the local transport system offered [3:p3-17]. This cannot be justified and alters the balance of preference between rail and CGB.

- 10.1.44 CHUMMS found that the economic benefits of light rail exceed those for CGB [3:p4-29] but then ignored this fact.
- 10.1.45 CHUMMS made its recommendation on the basis that an East-West rail link would also be provided [3: AST 1-5]. In the absence of firm plans for an East-West rail link the CHUMMS recommendations are unsound.
- 10.1.46 All of the significant CHUMMS findings regarding rail compared with CGB are invalid.
- 10.1.47 Most car traffic on the A14 is local [3:p2-1]. CGB provides an unacceptably poor solution for this traffic.
- 10.1.48 Most HGV traffic on the A14 is non-local [3:p2-1]. CGB provides an unacceptably poor solution for this traffic.
- 10.1.49 CCC should be required to re-evaluate the benefits of rail compared with CGB, based on a more beneficial rail route and based on the same A14 upgrade programme in both cases. The TWA application process should be suspended until the proposals are amended to include this re-evaluation.
- 10.1.50 The promoters have failed to consider combined transport options. A combination of enhanced conventional bus services, supported by road priority measures, and a St Ives-Cambridge Rail link would deliver a higher level of benefits at a lower cost than CGB. Extension of the railway from St Ives to Huntingdon would also then be possible.
- 10.1.51 CCC should be required to evaluate such a combined transport option. The TWA application process should be suspended until the proposals are amended to include this reevaluation.

11 Land and Construction Requirements

- 11.1.1 CGB requires the acquisition and use of land additional to that within the existing railway reserve for the purposes of constructing balancing ponds to compensate for the guideway. This acquisition should not be sanctioned. It would not be required in the case of a rail scheme.
- 11.1.2 CGB requires the acquisition and use of land additional to that within the existing railway reserve for the purposes of building the maintenance track. This acquisition should not be sanctioned. It would not be required in the case of a rail scheme.
- 11.1.3 CGB requires the acquisition and use of land additional to that within the existing railway reserve for the purposes of diverting rights of way that currently cross the disused railway bed. This acquisition should not be sanctioned beyond that required in the case of a rail scheme. CGB would require land additional to that required for a rail scheme, while a rail scheme would require no land additional to that required for CGB.
- 11.1.4 CGB requires closure of the Milton Road underpass. This is heavily used and its closure would lead to a safety hazard for pedestrians and cyclists. This closure should not be sanctioned. It would not be required in the case of a rail scheme.
- 11.1.5 CGB requires much of the track bed and associated drainage culverts to be rebuilt [25]. This will have a significant impact on the wider landscape as it will create a visual scar which will take many years to mitigate. This work should not be sanctioned. It would not be required in the case of a rail scheme.
- 11.1.6 CGB construction entails a 6-8 month closure of the Over-Longstanton road. This closure should not be sanctioned. It would not be required in the case of a rail scheme.
- 11.1.7 CGB construction entails temporary creation/use of a number of access roads along the CGB route, as heavy haul routes for delivery of construction materials and plant. This creation/use should not be sanctioned. In the case of a rail scheme, construction materials and plant could be delivered, either by road or by rail, to a central point along the route. From there heavy haul could be carried out along the railway reserve itself.
- 11.1.8 A comparison between the land and infrastructure requirements for CGB [17] and an alternative rail system [20] shows clearly the substantial reduction in land requirements both

for construction and operational phases, as well as the much lower level of construction work required for a rail system.

- 11.1.9 Comparison of [20] and [17] highlights that, as mentioned in other sections of this document, even at locations where CGB land requirements fall within the railway reserve, the environmental affects, particularly related to vegetation loss, will be more substantial for CGB due to the greater width of its trackways.

12 Economic Factors

- 12.1.1 CCC has declared [2:p94] that CGB is unsuitable for PFI due to 'uncertainties as to patronage figures and thus reductions in traffic emissions and a modal shift to public transport'.
- 12.1.2 In less opaque language, this means that the economic case for CGB is so weak, also so difficult to quantify, that CCC knows no commercial company would be prepared to take it on as a business proposition.
- 12.1.3 In connection with the above, we note concerns over likely levels of patronage, identified elsewhere in this submission.
- 12.1.4 CCC [2:p56] says that CGB requires 23% of its predicted patronage for break-even against its economic appraisal.
- 12.1.5 However CCC [2:p56] also indicates that 50% of this predicted patronage is required for operators to break even. The difference is accounted for by cash equivalents of social/environmental benefits.
- 12.1.6 It is therefore noted that below 50% of the predicted patronage, CGB will require a subsidy from public funds, even according to CCC figures.
- 12.1.7 In connection with the above, we note concerns over likely levels of patronage, identified elsewhere in this submission. We further note that CCC estimates of running costs are substantial underestimates, as also identified elsewhere in this submission.
- 12.1.8 Furthermore [2:p56] indicates that more than half of the value of CGB as stated by CCC is in by cash equivalents of social/environmental benefits. Since these are dominated by journey time saving benefits, which CCC has overstated, this calls the whole justification of the scheme into question.
- 12.1.9 CCC has identified [2:p56] that a differential between CGB fares and conventional bus fares is the greatest inhibitor to use of CGB. [2:p56] indicates that a 10% change in differential between fares would lead to a 21% fall in demand for CGB.
- 12.1.10 In connection with the above, we note concerns over likely levels of patronage, public perception of CGB and running costs of CGB, identified elsewhere in this submission. Higher running costs will result in higher fares, lower usage and a greater subsidy required from local tax payers' funds.
- 12.1.11 The level of Section 106 funding required for CGB has risen to 260% of the £8.8 million indicated as being required when provisional funding approval for CGB was given by government. CCC has indicated that contributions from at least 5 developers will now need to be sought.
- 12.1.12 The additional Section 106 funding that CCC requires for CGB is funding that would otherwise be available for the provision of other local amenities, such as schools and public open spaces. This use of Section 106 funds should not be permitted until other transport options have been fairly appraised by CCC.
- 12.1.13 The level of Section 106 and other funding required can be expected to rise further. The total cost of CGB was disclosed to government in 2002 as £73.8 million, whereas to date actual costs of £101.5 million have been identified.
- 12.1.14 All CCC figures are still estimates. The TWA documentation includes significant elements of 'illustrative drawings' and 'visual design guidance drawings', with no evidence that the quality standards recommended can be obtained from the estimated budget.

- 12.1.15 CCC has said [13] that it still anticipates spending a further £2.3 million on design of CGB. This gives an indication of the significant extent that specifications are likely to change, with accompanying increases in costs.

13 Safety Aspects

This section contains an appraisal of safety aspects relating to the TWA Order application [17].

The preparation of this section has included both an analysis of the proposals in the application and an expert witness report from an Associate of the Institute of Railway Signalling Engineers on safety aspects of the busway.

- 13.1.1 In view of the diverse safety hazards associated with the proposed CGB a full safety case should be required as a condition for operation of CGB. CGB is a guided structure. The operation of CGB is subject to similar safety concerns as apply for a railway. Operation of CGB should be subject to a safety case on the same terms as required for a railway system. Operation of CGB should be subject to agreement of such a safety case with HSE. A proper risk assessment of all activities be undertaken and appropriate measures taken to mitigate those risks should require in accordance with the Health and Safety Regulations 1992.
- 13.1.2 A bus driver, when on a guided busway and unable to steer out of trouble in the way that is natural for him, will be unable to deal with items that come across his path. It will be necessary to fence the guided busway against pedestrians, straying animals, huntsman and dogs etc, but complete protection against trespass is impossible. The low frequency of guided bus movements, compared to movements of traffic on public roads, will be likely to invite more rather than less unauthorised access to the busway. The light construction of buses and the inability to steer to minimise danger may mean that 55 mph operation could prove to be an unacceptable hazard. This situation requires further in-depth study.
- 13.1.3 The inability to steer to minimise danger must be taken into account when determining safety procedures that mitigate risk of collisions both between buses and with other objects.
- 13.1.4 The vehicles used on the guided busway will need to be crashworthy. The regulations with regard to introduction of crashworthy vehicles are stringent within both heavy and light railways. It requires to be established what the situation is for a busway; this determination should take into account the other risk factors identified in this document.
- 13.1.5 The closest system in existence to the proposed CGB is the system in Adelaide, Australia. All safety hazards that have arisen in Adelaide, and their mitigation, must be taken into account in the safety case for CGB.
- 13.1.6 The system in Adelaide was initially constructed with signalled junctions, as proposed in [17]. A series of accidents at the busier junctions led to these being reconstructed as barrier junctions.
- 13.1.7 A number of the proposed road intersections with CGB are busy, especially at peak hours. As a minimum requirement, buses should be required to come to a complete stop at all junctions before proceeding at a green light. For busier junctions, barrier junctions should be required. Where congestion at nearby intersections makes traffic liable to back up across the junction, manually controlled barrier junctions (e.g. using CCTV monitoring) should be required.
- 13.1.8 CCC has proposed a road/guideway intersection at Holywell Ferry Road with Give Way signs rather than a signalled junction. As a minimum buses should be required to come to a complete stop at this junction before proceeding. Since it is proposed to run 12 guideway vehicles across this junction per hour, it should be questioned whether Give Way signs provide an adequate level of safety.

- 13.1.9 The following restrictions are placed on signalled open rail/road crossings. Where any of these conditions are not met, barrier crossings are required:
- o Road vehicle trips over the crossing not to exceed 2,000 per day;
 - o Multiple of road vehicle trips over the crossing per day and trains over the crossing not to exceed 40,000 per day;
 - o Multiple of road vehicle trips over the crossing per day and trains over the crossing not to exceed 600 in any one hour.
- 13.1.10 These restrictions should be applied to signalled open guideway/road crossings. The accident history in Adelaide should be heeded.
- 13.1.11 CCC should be required to demonstrate that each of the proposed signalled open guideway/road crossings will meet these restrictions. Otherwise barrier crossings should be required.
- 13.1.12 The system in Adelaide has experienced a number of collisions because it had a variable signalling system and what appears to be an inadequate control system. Factors such as fog, night operation and restricted visibility due to other factors should be taken into account in the safety case for CGB.
- 13.1.13 Difficulties surround night operation, with a driver relying solely on the observation of the tail light of the vehicle in front.
- 13.1.14 Difficulties surround operation during fog or falling snow. The fenland area where CGB construction is proposed is particularly prone to patchy fog. Hence a safe running speed for the whole system cannot be determined by observing conditions at the point where a driver is currently driving a vehicle along the guideway, or from any fixed point such as a control centre.
- 13.1.15 During conditions of fog, or of forecast fog, speed restrictions must therefore be placed on all guideway movements to minimise risk of collisions.
- 13.1.16 A bus being driven along the guided busway will be unable to compensate for wind pressure on the side of the bus in the way that the driver of a normally steered bus would be able to, i.e. by using the steering to compensate for wind pressure. The fenland area of proposed CGB operation experiences frequent high winds. There is substantial risk of buses being blown over. Furthermore wind pressure on the guidewheels may lead to mechanical failure of these wheels, resulting in impact between the bus and guideway walls. These problems will be increased particularly in the case of double deck vehicles proposed for operation on CGB north of Cambridge.
- 13.1.17 During conditions of high winds, or of forecast high winds, speed restrictions must therefore be placed on all guideway movements to minimise risk of these occurrences.
- 13.1.18 The fenland area where CGB construction is proposed runs is liable to flooding for substantial parts of the year. In general the guideway is proposed to run at the level of the former trackbed, which runs on embankments to avoid it being under water.
- 13.1.19 However the concrete guideway tracks as proposed in [17] are liable to attract surface water. This will lead to aqua-planing. This will affect the stability of moving buses, their tendency to respond smoothly to steering via the guidewheels and their ability to brake at a normal rate and in a controlled manner.
- 13.1.20 During conditions of rain, or of forecast rain, or after rain has fallen, speed restrictions must therefore be placed on all guideway movements to mitigate these effects.
- 13.1.21 A form of control to prevent other road users getting onto the busway must be an operating requirement for CGB.
- 13.1.22 A form of control to prevent buses from entering the 'wrong way' guideway must be an operating requirement of CGB. Otherwise head-on collisions may occur. A bus that has entered the wrong guideway will be unable to reverse out of the busway.
- 13.1.23 Functioning radio communications must be made a mandatory requirement for every bus each time before it is permitted to enter a guideway section.

- 13.1.24 Consideration must be given to the physiological effects upon bus drivers from switching between ordinary road driving and high speed guided driving on significant lengths of former railway routes. CGB north of Cambridge would be the longest guideway ever constructed (18km compared with Adelaide at 12km) so that allowance must be made for effects greater than any previously observed on guideway systems.
- 13.1.25 Consideration must be given to the need for more careful selection for Bus Driving on Busways over and above the holding of a PSV Licence; psychometric testing of trainee train drivers is part of railway safety Group Standards and this needs to be considered.
- 13.1.26 Road drivers control their buses by using brakes and by steering to avoid hazards and thus follow a safe track. There is very restricted scope to steer away from hazards on a single track dedicated roadway and consideration needs to be given how to maintain safety.
- 13.1.27 As drivers will be driving within the limits of their vision and without guidance other than steering, due allowance must be made to maintain safety by restricting speed wherever vision is limited and consideration should be given to what signs or signalling systems are needed.
- 13.1.28 The HSE statement of 10 December 1998 indicates that rail travel is 15 times safer than travelling by car and five times safer than travelling by coach. These statistics, given the very differing sets of circumstances that will apply on a high speed busway, need reviewing before any steps can be taken to put the public further at risk by the construction of CGB.
- 13.1.29 The standard of maintenance has been a factor in a significant number of coach accidents, since the introduction of the present arrangements whereby responsibility for maintenance of PSVs lies with designated persons within operating companies. In order to avoid putting the public further at risk by the construction of CGB, an alternative regime of maintenance accountability should be put in place and incorporated into the safety case for CGB.
- 13.1.30 Consideration must be given to the following remarks of Mr SSJ Robertson, Chief Inspecting Officer of the HSE: *"Guided busways tend to form only part of the route of a guided bus. Invariably, for example, in city centres guided buses would have to use the highway with other road users. For this reason the construction of guided busways would have to conform to the current Road Vehicle Construction & Use Regulations 1996"*.
- 13.1.31 Also, due to the risks associated with guided bus operation at speed over longer distances and in open country, compliance with Light Rail vehicle standards should be required for CGB.
- 13.1.32 Experience of guided bus operation in Crawley indicates kerb clipping on public roads to be a problem, whereby drivers come too close to a kerb and a guidewheel is snapped off.
- 13.1.33 This problem leads to the need for more highly skilled drivers on guided buses negotiating streets than for ordinary buses negotiating the same streets.
- 13.1.34 The problem will be substantial in Cambridge due to many tight corners. Examples include Bridge St/Round Church St, Drummer St/Emmanuel St, Hobson St/King St, King St/Manor St.
- 13.1.35 The problem will be substantial in Cambridge due to congestion. As well as general traffic congestion, there are specific problems of bus congestion. The illustration below shows a typical scene in Emmanuel St.



- 13.1.36 Hazards will also occur due to pedestrians and obstructions adjacent to the road. This brings problems both of damage to guidewheels and injury/damage claims against bus operators.
- 13.1.37 A bus that is missing one or more guidewheels must not be allowed to enter the guideway. A safety procedure must be implemented to ensure that drivers check the integrity of their guidewheels before attempting to drive onto the guideway. This will require a suitable vision or other optical system to allow an inspection to be carried out. It should be required that the driver to stop the bus for the inspection, to avoid the driver's attention to the road conditions being put at risk by trying to carry out an inspection while moving.
- 13.1.38 Experience of guided bus operation in Crawley indicates that stresses on guidewheels as a bus enters a guided section also lead to guidewheels being snapped off at the time of entry to the guideway.
- 13.1.39 Risk of failures of this kind is increased on CGB by the large number of breaks in the guideway. Risk of a failure will occur at every break in the guideway.
- 13.1.40 Risk of failures of this kind is increased on CGB in cases where a bus enters the guideway from a turn. This occurs at a number of locations. An example is the Addenbrookes Spur junction.
- 13.1.41 A bus without a guidewheel must be brought to a halt as soon as possible in the event of such a failure. A procedure for inspecting guidewheels once the bus has entered a guideway section must be followed. The procedure must ensure that the speed of the bus is limited until the driver has been able to determine that both wheels are intact.
- 13.1.42 Since the proposed height of the guideway wall is 180mm, an object such as a brick placed in the guideway may cause a guidewheel to ride up above the top of the wall, causing the bus to veer into the guideway wall, the wheel to snap off or both.
- 13.1.43 Frequent maintenance/cleaning/inspection of the guideway should therefore be required as a condition of operation of CGB. Driver procedures should also include continual observation of the guideway and standing instructions to brake in the event that any obstruction is detected in the guideway.
- 13.1.44 Snow can also lead to the same problems. The guideway in Essen has to close every time snow falls. Snow is likely to compact into individual mounds large enough to cause a guidewheel to ride up above the top of the wall. Therefore in the event of snow a procedure is required to stop services, clear to the guideway and to ensure it is kept clear as a condition for resuming service again.

- 13.1.45 Where a guideway runs parallel to a bridleway, bolting horses will be a hazard. Horses are likely to bolt when scared by the approach of a bus. They are likely to stray into the guideway. A sufficiently sturdy and high fence should be required between guideway and bridleway to mitigate this hazard.
- 13.1.46 A strategy for the prevention of incidents due to vandalism should be required as a condition of operation of CGB. As the guideway will run parallel to a bridleway or cycleway, vandals will be able to encroach quickly onto the guideway, cause damage or a safety hazard and then return to a right of way quickly with minimal risk of being detected and caught for trespass. Furthermore the size of object required to derail a bus is small. A piece of wood with protruding nails would be hard to see but could be used to puncture a tyre, while three bricks at the guideway edge would be sufficient to cause a bus to veer out of the guideway and into the face of oncoming buses.
- 13.1.47 The adaptation of a busway solution to the needs of Cambridge City and the surrounding areas will thus create safety risks, which must be addressed. Examination of this and other busway schemes reveals a need for rationalisation of the standards for operation and safety of guided busways and the development of suitable safety requirements that will recognise the risks attendant on their use.
- 13.1.48 Furthermore the nature of CGB – long sections of rural guideway plus running of CGB buses through the congested City centre - is such as to raise safety issues that have not required consideration for any other guided bus system sanctioned for use in the UK.
- 13.1.49 An independent inquiry should therefore be set up to review the regulations applicable for such a transport scheme as CGB and whether these need to be strengthened to ensure safe operation of guided busways such as CGB. Particular reference should be made to the cost and benefits of safety controls set against the cost of accidents and deaths without such developments.
- 13.1.50 These costs of appropriate safety controls, when fully evaluated, should be set against similar cost ratios for Light and Heavy rail operation.
- 13.1.51 The CGB scheme should not be allowed to proceed until a full determination of the safety practices and controls appropriate to CGB has been made and their costs factored in to the economic case for CGB.
- 13.1.52 The following aspects of the case for CGB need particularly to be reassessed in the light of measures that are required to mitigate the safety risks inherent in the CGB proposal:
- o Journey time increases and increases in journey time unreliability, due to required safety precautions and procedure, and their effect on the economic case for CGB;
 - o Capital cost increases both for construction of CGB and for purchase of vehicles and other operating equipment;
 - o Operating cost increases due to increased supervision, increased staff skill levels required and poorer utilisation/running time of services.

14 Technical and Planning Issues Regarding CGB

This section sets out a number of issues relating to the TWA Order application [17]. Considerably more detail is contained in the appendix to this document.

14.1 Park and Ride Facilities

- 14.1.1 The proposals include two Park and Ride sites; the original proposal for 1,000 spaces at Northstowe has been modified in response to SCDC concerns and it is now proposed that it should be only 700 spaces, of which 350 would be in the first stage.
- 14.1.2 Measures are needed to ensure that the Northstowe Park and Ride serves to provide a facility for local villagers rather than longer distance travellers along the A14. At the same time

measures are needed to ensure that longer distance travellers along the A14 do not increase congestion on the St Ives bypass.

- 14.1.3 There is also the problem that Northstowe Park and Ride will serve as a facility for those travelling from East Cambridgeshire and Fenland, thus perpetuating traffic problems through Willingham.
- 14.1.4 The scheme locates the Northstowe Park and Ride site to the east of the junction of the B1050 and to the south of the guideway; it thus impinges on the land available for the new settlement. The following concerns about the site require resolution.
- 14.1.5 The design shows a large land take (it appears to be as large/larger than St Ives) ostensibly for additional landscaping (mostly grassland), which still retains enough land for 1,000 spaces.
- 14.1.6 Access is by means of two large roundabouts which take considerable land. Traffic signals would be more appropriate, as used in existing Park and Ride sites such as Madingley Road. Traffic signals could be linked in timing to be compatible with guideway lights and would also be less of a barrier to cycle movements than a roundabout.
- 14.1.7 Considerable land is taken by two large balancing ponds for drainage. In view of the competing land-use requirements to develop the town satisfactorily, it seems a missed opportunity to reduce land take by storing some of the drainage water in tanks beneath the site and/or directing the water to the balancing ponds for the guideway itself which are proposed to run parallel to the guideway.
- 14.1.8 The conventional semi-circular or fan-shape design is not the most efficient in land-take terms and CCC has not offered an explanation as to why it wishes to adhere to this approach.
- 14.1.9 It is a poor layout for movements around site – e.g. pedestrians need to cross bus drop-off loop, cyclists mix with traffic etc.
- 14.1.10 There is little use for a waiting room except as office for site manager/info point/toilets. Passengers will wait at stops/on platforms which are proposed to include passenger shelters.
- 14.1.11 The site should be redesigned at a reduced size that caters for a maximum of 700 spaces arranged for the most efficient land-take. Land shown in [17] that becomes surplus under such a design should be released for general use in the new settlement.
- 14.1.12 There is no apparent provision for cycle parking, which given its relationship with Northstowe and neighbouring villages seems a missed opportunity.
- 14.1.13 CCC modelling appears not to recognise any queuing as vehicles exit the site at peak times which seems contrary to what might be expected from experience at other, albeit larger, Park and Ride sites. Has adequate provision therefore been made?
- 14.1.14 Given the operating hours for Guided Bus are to be from 06.00 to 24.00, it is assumed that the Park and Ride may also be operational for the same period. This will need to be considered against the impact on future residents of Northstowe.

14.2 Car Parking and Guided Bus Stops

- 14.2.1 At Histon it is proposed to provide a small car park of up to 40 spaces. This entails demolishing the historic station building. It also raises the following additional concerns.
- 14.2.2 There is no pedestrian facility for crossing the guideway from the car park and no break in the (illustrated) row of car-parking spaces to access the platform on the south side.
- 14.2.3 There is no direct pedestrian link to platform on north side stop from car park – whilst there is the option to cross at the guideway/road junction, to do so would mean missing the bus!
- 14.2.4 It is not clear whether any cycle parking will be provided at the platform.
- 14.2.5 If the car park is managed as limited stay, this will limit the extent to which local people can use it. On the other hand, to open it up as a long-stay car park could lead to it being perceived as a “Park and Ride” attracting car commuters from further afield resulting in additional traffic and, given the small size of the car park could result in exacerbating on-street parking problems in the vicinity. CCC has merely made the commitment to monitor the situation.

- 14.2.6 It is not clear by whom or how the site will be managed/enforced – SCDC is not willing to take up this responsibility.
- 14.2.7 At Swavesey no car parking is proposed and instead a drop-off point or “Kiss and Ride” is put proposed. This is a unlikely to be a worthwhile facility for local villages. Not many households in those villages (Swavesey/Over) are likely to require it given the rural nature of the area with a high car ownership level and a high proportion of households where both partners are in employment. This is a sensitive site in terms of landscape and archaeological interest and the land use is hard to justify.
- 14.2.8 The impact of the proposals on the hedgerow along the north side of Kings Hedges Road is a matter of great concern. This hedgerow is probably the most important along the whole length of the guideway. It is important that this matter be revisited to adjust the proposals to do much less damage to this important historic feature and that it is also considered in the context of the current planning application for Arbury Park.
- 14.2.9 At the Arbury Park (South) stop there are no pedestrian crossings to access platforms from south of King’s Hedges Road which means pedestrians having to cross 4 lanes of traffic to cross at a busy junction.
- 14.2.10 At the Regional College stop there is no connecting footpath into the adjacent Science Park development.
- 14.2.11 It is not clear how the guided bus crosses King’s Hedges Road heading westwards - there appear to be no signals or priority measures.
- 14.2.12 There is no footpath at all on the north side of Kings Hedges Road.

14.3 Impact on Landscape and Village Character of South Cambridgeshire

- 14.3.1 Much of the land in this part of South Cambridgeshire north west of Cambridge is very open, so features related to the guideway and associated infrastructure and buses will be very visible. It is not so much about views from the Guided Bus but views to the guideway and buses from the countryside. The openness of the landscape and associated farming, much of which is arable, also makes the existing vegetation along the route particularly valuable as a resource for ecology and biodiversity.
- 14.3.2 Reports of the engineering consultants for the project show that the construction of the guideway will have a significant impact on the wider landscape as it will create a visual scar which will take many years to mitigate. This is greater than previously indicated by CCC as the engineers’ findings are that much of the track bed and associated drainage culverts have to be rebuilt. These findings came very late in the application process. The TWA Order application does not make it clear whether the vegetation to be removed is from the original railway-track land or the land enclosed within the wider limits of deviation – if it is the latter there is obviously an even greater impact. This needs to be clarified by CCC.
- 14.3.3 It is a concern of principle that the references to Landscape Character areas and local distinctiveness make no reference to the impact on the existing vegetation and that there is no over-arching principle to the need to retain existing vegetation wherever possible.
- 14.3.4 All existing vegetation alongside the line (i.e. the trees and hedgerows on both sides) as well as that which has grown up on the track-bed will have to be removed. It is therefore essential that there is adequate mitigation in the form of replanting and sufficient land allowed for this purpose (as the defined “limits of deviation”). This does not appear to have been adequately achieved in all locations.
- 14.3.5 However, the assessment of loss is difficult to establish since there is no plan detailing all the vegetation to be lost – only statements stating all vegetation will be lost; much clearer detail is needed. Similarly there should be sample full specifications for replacement in some areas to allow a judgement to be made of the adequacy/appropriateness of replanting.
- 14.3.6 There are areas along the route where trees are being removed as well as scrub, but it appears that proportionally less tree replanting is proposed. Of particular concern is the loss of major trees at Impington, predominantly the area of the stop between Station Road and Bridge

Road, but despite many requests for detailed information it has never been provided, only assurances that platforms have been reduced as far as possible to reduce impact.

- 14.3.7 The proposals, whilst referring to tree protection by Tree Preservation Orders and in Conservation Areas, make no mention of the protection afforded to hedges under the Hedgerow Regulations. There should be an overall principle that any hedgerow removed should be replaced. Similarly other trees, not specifically covered by Tree Preservation Orders, may also be worthy of retention and special consideration.
- 14.3.8 The appendix to this document includes a list of the areas where there are specific concerns about the loss of existing vegetation, and the limitations of some of the proposed mitigation/replacement.
- 14.3.9 There is also the impact of the stops and the impact on the rural street scene of associated street clutter, additional signage, road widening and lighting. The wide turning areas required for bus access onto and off the guideway will also significantly affect the character of key village roads. This is of particular concern with the proposed location of the Oakington stop in relation to the village, the turning requirements for buses, lighting and the likely parking on street changing the very pleasant rural character of the area.
- 14.3.10 In some cases there is a lack of space for mitigation planting at key points e.g. Swavesey and Oakington stop areas. It is therefore difficult to see how adequate mitigation can be achieved. In many areas works appear to be at existing ground level and therefore it would seem possible to retain some of the vegetation. Vegetation protection will be required along the length of the track to ensure that adjacent boundary vegetation is not lost, damaged or removed. Even if the vegetation within the guideway area and on the boundary is to be removed it is essential that any trees and hedges immediately adjacent to the boundaries to the north and south be fully protected during construction, to avoid any further environmental damage. It is also unclear which areas of mitigation are to be used as storage during construction; many have trees/vegetation of value either in them or adjacent, so should not be used for temporary storage.
- 14.3.11 The extent of spoil resultant from the digging out of the maintenance track in many parts of the Fen Drayton to Longstanton section is significant but unquantified and there are no proposals for its satisfactory disposal.
- 14.3.12 In the Cambridge Northern Fringe, Arbury Hedge along Kings Hedges Road is visually and ecologically significant and must be retained. The Arbury North stop as proposed appears to impinge on an ancient section of this important feature. Not only is this hedgerow important to retain in its own right but also for the setting of the new development of Arbury Park. The proposals are not clear on the relationship between the proposed development and the guideway infrastructure.

14.4 Biodiversity

- 14.4.1 The Environmental Statement accompanying the application is not rigorous enough in its assessment of ecology for such a significant construction project. Considerable further detail is essential in order to evaluate the impact properly. As an example, it proposes further surveys, such as completing those for Great Crested Newts and to undertake spring and summer bat surveys; until these are done the Environmental Statement itself cannot be considered as complete or satisfactory.
- 14.4.2 Similarly, the mitigation measures put forward for a range of protected species do not contain adequate detail. For example, it recognises that common lizards are likely to occur along much of the route but only a number of selected sites were surveyed in greater detail; no details of how the lizards would be caught and then excluded for the construction period are given. Furthermore, the proposal to translocate lizards and Great Crested Newts to newly created receptor sites causes concern as the sites may not have developed the invertebrate populations required to support them. There needs to be detail of suitable sites to which they can be moved which are capable of supporting them but which do not contain them at the moment.

14.5 Rights of Way and Disabled Access

- 14.5.1 CCC should be required to make a declaration regarding the CGB proposal, stating all non-compliances with current disability legislation.
- 14.5.2 There are many respects in which the system is not fully accessible by disabled people. A number of the stop platforms are not accessible using wheelchairs, which would seem to negate the point of using fully accessible vehicles. Wherever access has to be achieved by crossing the guideway kerbs there is a very real difficulty for wheelchair users as well as a trip hazard for others with mobility problems and those who have sight disability. This is because the guideway kerbs form a significant change in level of 180mm (7 inches), with another step down in between the guide kerbs for planting.
- 14.5.3 Given this nature of the guideway it also has the potential to disrupt quite severely any Rights of Way across it. Unless specific provision in the guideway is made, people crossing it where there is a public footpath or bridleway will have to negotiate making it particularly impassable for the disabled. This would be especially limiting for those sections of Rights of Way close to settlements where there is a reasonable expectation that all people should be able to access the countryside.
- 14.5.4 At some points the maintenance track is well below the guideway which raises concerns over the practical treatment of the bank area and impact on walkers and cyclists users. This is compounded by the maintenance track frequently rising and falling with quite steep gradients, usually in order to cross culverts.
- 14.5.5 There is a lack of crossing points which imposes restrictions on links to the countryside. It appears that cyclists and pedestrians can only easily access the route at the stops and at a limited number of Rights of Way across the guideway. There would be considerable advantage if additional points could enable access to the cycleway as, for example, at points along the Northstowe section, from Bridge Road Histon and from Over Road at Longstanton.
- 14.5.6 There is also a fundamental problem in that the cycle/maintenance track crosses the guideway from one side to another rather than consistently being on one side of the guideway. This causes obvious difficulties for pedestrians (especially the disabled) and cyclists who have to negotiate the guideway and road crossings each time. Such crossings should be kept to an absolute minimum and it is not clear from the TWA Order application why this has not been possible.
- 14.5.7 There is a need to provide lighting for safety purposes along the maintenance track/footpath/cycleway which will have an unfortunate visual impact on the countryside. The benefit of having a secure and safe route for cyclists outweighs the impact on the countryside as long as lighting is contained and the light pollution is minimised. However, at present [17] make limited reference to the need to minimise light pollution and avoid light spillage.

15 Other Issues

- 15.1.1 CGB would result in a loss of short term parking at Cambridge Station. This would have a negative impact on usage of Cambridge Station. CCC claims [1:s16.5.122] that this impact can be ignored due to a planned redevelopment of the station. In the absence of a firm agreement to proceed with such redevelopment in accordance with agreed plan, this claim cannot be accepted.
- 15.1.2 CCC now claims [1:p442] that the capital cost indicated to government in its Annex E submission [2] for CGB was £86.5 million. In fact the total costs disclosed in [2] were £73.8 million.
- 15.1.3 In 2001 the Ipswich bus guideway had to be rebuilt, since it was unable to accommodate the widths of the new buses that the operator was able to buy for it. guideways have a low tolerance on the width of bus that they can accommodate. This is a risk factor that promoters of a guideway system must take into account, as widths of commercially available buses may change. Since the Ipswich guideway is 200 metres long, this was not a major expense. The same could not be said for CGB.

- 15.1.4 54 of [10] imposes duties of non-disclosure. CCC should provide specific justification for this provision, including circumstances under which it would be required, or the section should be removed.

16 References

This reference list constitutes a list of documents that CAST.IRON intends to refer to or put in evidence at the inquiry.

- [1] TWA Order application for CGB– Environmental Statement
- [2] CCC Annex E submission for CGB 2002
- [3] CHUMMS study report
- [4] CCC ‘Guided Bus Newsletter’ 2003
- [5] CCC Local Transport Plan report and budget June 2003
- [6] Letter from CCC Cabinet Member Cllr Johnstone to Cambridge Evening News 17/11/03
- [7] CCC presentation to St Ives Civic Society 2004 (video transcript on file)
- [8] Local Transport Capital Expenditure Settlement 2004/2005 for CCC
- [9] Cllr Johnstone on BBC Radio Cambridgeshire 2004 (audio transcript on file)
- [10] TWA Order application for CGB– Draft Order
- [11] Communication to Hunts Post 2004
- [12] CCC presentation to Longstanton PC (minutes on file)
- [13] TWA Order application for CGB – Cost Schedule
- [14] TWA Order application for CGB – Right Of Way Plans
- [15] CCC ‘Guided Bus Newsletter 2’ 2004
- [16] CCC Public exhibition printed display material for CGB Exhibitions – March 2004
- [17] TWA Order application for CGB – complete documentation, including [1], [10], [13], [14], [21]
- [18] CCC ‘Guided Bus Newsletter 4’ 2004
- [19] Letter from Secretary of State Darling 2004
- [20] Comparative TWA Sections for a Rail Option including Example Works and Land Plan Drawings
- [21] TWA Order application for CGB– Works and Land Plans
- [22] Paper on alternative rail routes of Huntingdon – Mouchell 2004
- [23] Laing Rail proposal for a Luton-Dunstable fast transit link
- [24] Cambridge Evening News, December 2003
- [25] SCDC Analysis of CGB 2004
- [26] CCC Analysis of 2003 consultation responses
- [27] London-South Midlands Multi-modal Study
- [28] Spatial strategy for the Milton Keynes-South Midlands growth area.

Statement of Case: Appendix

The following comments relate to specific parts of [17]. Italicised references to *paragraphs x.y(a)* in this appendix denote references to other paragraphs of this appendix. References in **bold** denote sections within [17].

1. Illustrative Technical Development Drawings
 - 1.1. Various Drawings - Bridleways and footpaths are shown to cross the guideway with no break in guideway, which means there is a step of 180mm to negotiate.
 - a) Question whether this is this likely to create problems with safety and/or disabled access?
 - b) Question whether it is compliant with the latest Disability legislation?
 - c) It is also unclear whether there will be a break in vegetation to provide a clear path across? (refer to the contradiction highlighted at paragraph 6.3) – if there is no break in vegetation this will pose a trip risk.
(See also comments at paragraphs 2.2(b), 2.9(c), 2.9(h), 3.2, 6.3)
 - 1.2. Various Drawings – At various points along the route additional access tracks are proposed (e.g. for farm access and haul routes), which have an additional impact on the landscape as additional land beyond the track bed is required.
 - a) Question whether these new access tracks are necessary, given the different approach at Holywell Ferry Road, and the retention of existing access points would create better countryside access for all users. (For example Drawings 7-9)
 - b) Question whether all the proposed farm accesses and haul routes can be justified where there will be a significant impact on the landscape.
(See also comments at paragraphs 1.3, 1.4, 2.2(g), 2.2(j), 3.9, 5.1, 5.2, 5.4, 7.1, 7.5)
 - 1.3. Various Drawings - There are a number of footpaths and other types of Rights of Way which are proposed to be stopped-up or redirected in order to minimise the number of crossing points across the guideway. This is contrary to the aims of improving access and will be detrimental to the existing network providing countryside access.
(See also comments at paragraphs 1.2, 1.4, 2.2(g), 2.2(j), 3.9, 5.1, 5.2, 5.4, 7.1, 7.5)
 - 1.4. Various Drawings – At various points along the guideway there has been no provision made for existing pedestrians/cyclists routes to connect with the maintenance track. For example, where an existing route passes over the guideway there is no link down onto the maintenance track. This is a missed opportunity to improve countryside access. Examples include: from Shelford Road into the city, and at various points within the rural stretch, such as from Longstanton Road. (For example, Drawings 8-9)
(See also comments at paragraphs 1.2, 1.3, 2.2(g), 3.9, 5.1, 5.2, 5.4, 7.1, 7.5)
 - 1.5. Various Drawings – The maintenance track switches from the south to north side of the guideway at several points – It is unclear how pedestrians/cyclists can continue along the route as they need to cross both the guideway traffic and traffic on the road. (For example, Drawings 11, 16, 21)
(See also comments at paragraphs 4.31, 5.2)
 - 1.6. Various Drawings – At many of the stops, there are apparently no direct footpath connections into the existing footpath network. It is unclear how people will be able to access the stops, particularly the less able. Examples include:
 - a) Cambridge Regional College (Drawing 23) there are no footpaths linking with the science park or to development south of Kings Hedges Road.
 - b) Cambridge Science Park (Drawing 24) – there are no links other than directly into the Science Park, which excludes people from Milton Road using the stops. There

should be better provision for pedestrians at Milton Road, perhaps by way of a pedestrian crossing at the Milton Road junction to allow pedestrian access onto the maintenance track.

- c) Arbury Park (South) Stop (Drawing 26) – there are no footpath links to platforms, and there is a lack of pedestrian crossing facilities to enable pedestrians approaching from south of King's Hedges Road to cross 4 lanes of traffic in safety
- d) Arbury Park (North) Stop (Drawing 27) – no footpath links & has to cross maintenance track to north

(See also comments at paragraph 1.7)

- 1.7. Inconsistency - Oakington Stop (Drawing 16) – There is no car park or Kiss & Ride proposed, which is inconsistent with approach adopted at Swavesey. Given the substantial impact on the adjacent environment and the unlikely use of the stop by pedestrians and cyclists from the villages, the stop should be removed. However, if the stop is retained, there is a need to address the lack of a continuous footpath northwards on east side of Oakington Road to ensure the safety of pedestrians.

(See also comments at paragraph 1.6)

- 1.8. Inconsistency - Drawing 30 -- Shows the maintenance track on south side of guideway but the Environmental Statement Appendix 13E (Figure 49) shows it on the north side. Some clarification is needed as to which side of the guideway the maintenance track runs at Trumpington.
- 1.9. Inconsistency - Drawing 32 – The maintenance track appears to disappear immediately prior to Hauxton Road, although Rights of Way Sheet 33 shows it as a continuous route. Some clarification is needed as to whether there is a complete route for the maintenance track.
- 1.10. Addenbrooke's Rail Crossing - Drawing 33 – The land take and design of the bridge may need to change in order to reduce the impact of the crossing in the wider landscape.

2. Environmental Statement Volume 1

2.1. Chapter 2 – ES & Assessment Methodology

- a) **2.7.6** – States that there has been clarification of the cycle parking provision at the stops following public consultation. This is not apparent – question where this detail is provided.

(See also comments at paragraph 2.9(e))

2.2. Chapter 4 – Scheme Description

- a) **4.2.15** – It is unclear what measures will be used to prevent unauthorised vehicles using the guideway. This needs clarification, as these measures will need to be location sensitive.
- b) **4.2.17** – Question whether it is a reasonable assumption that the 180mm kerb can be negotiated without difficulty. What about use by the less able, push chairs, and cyclists?
(See also comments at paragraphs 1.1, 2.9(c), 2.9(h), 3.2, 6.3)
- c) **4.2.21** – “Services expected to operate between the hours of 0600–2400” – Question whether this is an aspiration on the part of the operators, or the operational control which will be put in place by CCC?
- d) **4.2.22** – It is unclear how the controls on the use of the guideway will work. For example, will this involved the use of technology such as satellite navigation or radio links?
- e) **4.2.25** – It is unclear how the maintenance works (such as grass cutting or hedge trimming) will be able to be undertaken during operational hours without

disrupting services, particularly when trimming the inside of the hedges alongside the guideway.

- f) **4.3.5** – States that feeder services can access the guideway at most road crossing points. Question whether this is this right, given that several junctions only have splays in certain directions?
- g) **4.4.34** – There appears to be an inconsistent approach to the treatment of existing access points where they cross the guideway. For example, at Holywell Ferry Road it is proposed to use Give Way signs, while farm tracks are often diverted considerable distances to the main road junctions where they can cross the guideway.
 - i. Question whether Give Way signs adequate to ensure safe crossing? If so,
 - ii. Question why farm access tracks need to be diverted and not treated in the same way as Holywell Ferry Road?

(See also comments at paragraphs 1.2, 1.3, 1.4, 2.2(j), 3.9, 5.1, 5.2, 5.4, 7.1, 7.5)

- h) **4.4.49** – Question whether the new vehicular access at the front of Thoday's Cottage can be justified given the substantial impact on Thoday's Cottage, the wider streetscene and vegetation? No other new accesses are proposed to other properties in the immediate environs.
- i) **4.4.52** – There are no details provided on bridge design, which is of particular concern in sensitive locations, such as Cambridge Southern Fringe where the railway crossing could have a substantial impact on the wider landscape.
- j) **4.5.1** – Haul routes should not be justified on the basis of minimising the impact on villages and minimising vehicle mileage where there will be unacceptable or significant damage the local landscape.

(See also comments at paragraphs 1.2, 1.3, 1.4, 2.2(g), 3.9, 5.1, 5.2, 5.4, 7.1, 7.5)

2.3. Chapter 6 – Planning Policy Context

- a) **6.1.3** – The Structure Plan was adopted in October and not December as stated.
- b) **6.2.33** – There has been no reference made to PPG22 – Renewable Energy.
- c) **6.7.103** – This is paraphrasing of the policy and not a direct quote, as indicated.
- d) **6.7.105** – There is a slight misquote of policy ES2, which leaves out the word “ensures”.
- e) Appendix 6A – We remain to be convinced of the assessment of the guided bus scheme against planning policy. For example, the assessment states there are minor impacts on the landscape, when it is apparent that there will be significant impacts.

(See also comments at paragraphs 2.4(a), 2.5(h), 2.6(b))

2.4. Chapter 10 – Built Heritage

- a) **10.8.10-10.8.11 & 10.10.2-10.10.3** – Question the assessment of impact as “minor adverse”, when there is a significant impact on Swavesey Priory, Westwick Hall etc.

(See also comments at paragraphs 2.3(e), 2.5(h), 2.6(b))

2.5. Chapter 11 – Ecology

- a) The Environmental Statement should contain all the information necessary to allow the impact to be properly evaluated. For example:
 - i. **11.2.12, 11.2.14, 11.2.15, 11.2.24 & 11.7.58** – Further surveys are required to meet English Nature guidelines and all relevant raw data should be included in appendices (i.e. locations and dates of bat, water vole and lizard surveys). It appears that there is incomplete data – for example, surveys were undertaken

for emergence sites for bats, but appears to have overlooked a pill-box as a possibility.

- ii. **11.5.59, 11.7.61, 11.7.63 & 11.7.67** - There is insufficient detail regarding the mitigation of protected species. There are no details regarding how the species will be caught and then excluded for the construction period, thus is it not feasible to properly ascertain whether the species can be adequately mitigated for.
 - iii. **11.7.25** - There is a lack of detail regarding the translocation of lizards and great crested newts to newly created receptor sites – which may be a concern if the newly created sites do not have developed invertebrate populations necessary to support the animals.
 - iv. There are no details provided outlining the quantity of habitats that are due to be lost and those which will be created. These figures would enable the consideration of the “no net loss” principle. *(Note we have a similar concern in relation to the loss of hedgerow/tress etc in respect of landscape issues and mitigation – see comments at paragraph 2.5(d), 2.6(a), 2.6(e), 3.6, 4.1).*
- b) **11.6.24** - There is acknowledgement of the route as a wildlife corridor, however, concern remains that its importance may be greater than the ES has presented. For example, is it used as a navigation route by bats? Whilst effort has been placed upon the location of roost sites, not a great deal of consideration appears to have been given to this fact.
- c) **11.6.24 & 11.7.61** - Question whether there is sufficient land alongside the guideway to incorporate sufficient new wider and denser planting to serve as valued habitat features, without which inadequate mitigation will be possible. Alternatively, there should be an increase in the number of areas of habitat creation.
- (See also comments at paragraphs 2.6(a), 2.6 (e), 2.6(g), 4.12(b), 4.25)*
- d) **11.2.7-11.2.9 & Appendices 11A & 11B** – The Habitat Survey has unsatisfactory grouping of vegetation types, without further details provided about their composition. A selection of detailed target notes should be presented to illustrate the plant species composition. The trackbed vegetation constitutes a major part of the routeway, yet no detailed information has been presented about it. There may be species of particular interest associated with particular conditions along the trackbed.
- (See also comments at paragraphs 2.5(a) (iv), 3.6, 4.1)*
- e) **11.2.10** Question accuracy of Badger data – referred to as being contained in confidential Appendix X – in the light of inaccuracies highlighted above for other species.
- f) **11.6.74-11.6.76** recognise that without mitigation there would be “moderate adverse” impact on water voles. However there are no measures proposed in the mitigation strategy section. There is no mention of the likelihood to require a phasing approach to water vole conservation and there should be idealised bank profiles and plant lists of areas to be recreated.
- g) **11.7** – Provides information on mitigation during the construction phase, but question whether an ecologist will be appointed specifically to oversee the daily activities and to deal swiftly and directly with protected species issues as they arise.
- h) **Summary Table** – Question the assessment of the impacts. For example, the impact on lizard population should be given greater importance and assessed as “major adverse” as the translocation scheme together with the degradation of the habitat will remove lizards. The impact on the Over Cutting CWS should be reclassified as “major adverse”.

(See also comments at paragraphs 2.3(e), 2.4(a), 2.6(b))

2.6. Chapter 13 – Landscape and Visual Assessment

- a) There are many cases where there has been insufficient assessment of the landscape impacts. In many cases where mitigation is proposed, there appears to be insufficient space to put the proposed additional mitigation planting in. It should also be noted that mitigation planting is not always appropriate due to the sensitivity of the location, such is the case at Swavesey.
(See also comments at paras 2.5(c), 2.5(d), 2.6(e), 2.6(g), 3.6, 4.1, 4.12(b), 4.25)
- b) **13.2.14** – Inconsistency in the approach to rating the impacts. Paragraph 13.2.14 it states that the severity of impacts will be assessed from “low through to high”, yet later paragraphs assess the impacts as “negligible, slight, moderate, major or severe”. This needs to be clarified.
(See also comments at paragraphs 2.3(e), 2.4(a), 2.5(h))
- c) 13.2.37 – Inconsistency/contradiction in the approach to the “protection” of important vegetation in the document. Despite stating that important vegetation will be protected, there are a number of places where it will be lost (for example at Histon and Impington). For example Appendix 13E maps show as protected and yet sometimes suggests replacement.
(See also comments at paragraphs 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)
- d) **13.7.3** – Question how much additional boundary vegetation will be removed/affected outside of the trackbed? It is apparent that the lines of deviation exceed the outer boundary of the original trackbed and there is potential for considerable amounts of additional vegetation to be affected. It is important that there is no unnecessary removal of vegetation and that as much is protected and retained as possible.
(See also comments at paragraphs 2.6(c), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)
- e) **13.7.38-13.7.41, 13.7.49 & 13.7.86** – There is insufficient assessment of the landscape impacts and where mitigation is proposed, there appears to be insufficient space to put additional mitigation planting in. It should also be noted that mitigation planting is not always appropriate due to the sensitivity of the location, such is the case at Swavesey.
(See also comments at paragraphs 2.5(c), 2.5(d), 2.6(a), 2.6(g), 4.1, 4.12(b), 4.25)
- f) **13.7.238** – The summary of the key visual impacts omits general views from residents (other than those at Histon/Impington).
- g) **13.10.5** – Question where the tree planting will be located as there is insufficient space.
(See also comments at paragraph 2.5(c), 2.6(a), 2.6(e), 4.12(b), 4.25)
- h) **13.10.6** – Question the assessment that, with the exception of the bridge crossing the railway to Addenbrooke’s, none of the landscape effects of the proposals are of major significance in the long term. This is a visually sensitive area, and the stops and junctions are also likely have a permanent impact.

2.7. Chapter 14 – Noise and Vibration

- a) **14.1.2 & 14.4.17 & 14.4.20** – Question the assumption that the only vehicles contributing to noise levels will be those on the guideway, and any noise from additional vehicles on the roads would be mixed with existing traffic flows. The assessment of a “negligible” noise impact at Swavesey “Kiss and Ride” and Longstanton Park and Ride sites seems unlikely given that there will be substantial additional vehicle movements and regular periods when vehicles will be idling at the traffic signals or at the Kiss and Ride site.
(See also comments a paragraph 2.7(b))

- b) Table 14.5 – Question the assessment of noise impact on the 3 properties listed. Question why is there only a predicted noise impact on Railway Cottages? Whilst it is closer to the guideway, Orchard Cottage and Thodays Cottage are located between the guideway and Park and Ride site, and will thus suffer the accumulated impact of the guideway, Park and Ride traffic and queuing traffic at the traffic signals.

(See also comments at paragraph 2.7(a))

- c) **14.4.24 & 14.6.4** – There are no details provided as to the type of noise barrier, which needs to be location sensitive.

2.8. Chapter 15 – Socio-economic Assessment

- a) **15.2.3–15.2.8** – Question whether the Steer Davis Gleave Report (2001) considers the impact of further development in the Cambridge Northern Fringe, Cambridge Southern Fringe or Cambridge East? (It only refers to Longstanton/Oakington, Addenbrooke's and West Cambridge.) These additional developments will have a significant impact on the predictions for a growth in supply of bus services (predicted to be up to 40%).

- b) **15.3.11** – The package of road schemes and list of suggested surface transport issues to be considered in order to allow Stansted airport to better cope with additional passenger numbers fails to consider the increased pressure on the A14. This was not considered as part of CHUMMS study.

2.9. Chapter 16 - Transport and Access

- a) **Table 16.1** – Question whether there has been adequate assessment of the impacts of the guideway on different users, as the table mainly focuses on the positive aspects. For example, it fails to consider the potential loss of bus services from some remoter areas, which may divert as a result of the guideway opening. Also, pedestrians, equestrians and cyclists will be affected by the loss or redirection of rights of way into a smaller number of crossings.

(See also comments at paragraphs 1.2, 1.3, 1.4, 2.9(i), 3.9, 5.1, 5.2, 5.4)

- b) **16.2.3–16.2.5** – The detailed results of the modelling should be made available, as it is important to be able to see what assumptions have been made to understand the outcomes.

- c) **16.2.18** – Inconsistency between this and other parts of the documentation. Here there is recognition for the physical difficulty faced by mobility impaired people crossing the guideway, whilst other sections state there is no difficulty. There needs to be clarification whether there is a problem for the mobility impaired and if there is, the issue needs to be adequately addressed. Question whether there is a legal requirement for all new development to be accessible friendly in accordance with Disability legislation?

(See also comments at paragraphs 1.1, 2.2(b), 2.9(h), 3.2, 6.3)

- d) **16.2.21** – Question whether there isn't also a severance issue from increased traffic using the car park in Histon or Kiss & Ride at Swavesey, as traffic will access these points by travelling through the villages, which will impact on local residents.

- e) **16.4.9 & 16.4.11** – Question the amount of cycle parking provision at Longstanton Park & Ride site and Histon car park? There do not appear to be any details.

(See also comments at paragraph 2.1(a))

- f) **16.5.13** – Question whether there wouldn't also be a negative impact on accessibility for villages more remote from the guideway as bus routes consolidate around the guideway.

- g) **16.5.25** – A careful balance needs to be struck between minimising the number of breaks in the guideway and providing adequate access onto/across the guideway, particularly for the less able.

(See also comments at paragraphs 1.1, 2.2(b), 2.9(c), 3.2, 6.3)

- h) **16.5.64** – Question whether Fen Drayton is likely to benefit from the guideway given its small population and distance from the guideway without a direct means of access (no access at Holywell Ferry Road).

(See also comments at paragraph 2.9(a))

- i) Tables 16.14 & 16.15
- i. Question the assumption that there will be no queuing traffic at the Park and Ride site, given that large numbers of people will be arriving on the buses/exiting the site at the same time.
 - ii. Question whether queuing vehicles at the entrance of the Park and Ride site will hinder the operation of the roundabout and whether traffic signals work better, as used at the Cambridge Park and Ride sites. The timing of the signals at the Park and Ride could be set to be compatible with the lights at the guideway crossing.
- j) 16.5.78 – Question whether there are adequate and direct footpath and cycleway links from the villages of Longstanton and Willingham, other than the use of the B1050?
- k) Tables 16.17–16.19 – Question the assumptions on delays to traffic crossing the guideway at various points given the different predicted traffic flows. For example, Oakington shows more delays per vehicle compared to Histon, yet traffic levels could be much higher at Histon (and there is also a car park at Histon, whereas there is no such provision at Oakington).

2.10. Chapter 17 – Water Resources

- a) The re-profiling of some ditches should be undertaken where possible retaining existing vegetation.

(See also comments at paragraphs 2.6(c), 2.6(d), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)

3. Environmental Statement Appendices

3.1. Appendix 1

- o Figure 4 – Question why Chesterton Sidings is only shown as an “interchange point” and not as a “CGB Stop” as well?

3.2. Appendix 4C

- o It is apparent from the cross section that it is not just the 180mm kerb to negotiate, but there is also another drop down in the middle of the guideway, which could add to the access problem.

(See also comments at paragraphs 1.1, 2.2(b), 2.9(c), 2.9(h), 6.3)

3.3. Appendix 6A

- o **Figure 4** – Question what the area of pale orange hatching shown on the map in the Trumpington area denotes? It is not annotated in the Key.

3.4. Appendix 8A

- o **Figure 3** – There are two number 25 receptors shown on the map, one of which is probably number 24 as there is no 24 shown.

3.5. Appendix 9B

- o **Figure 2** – Question whether there were any archaeological excavations in the vicinity of the Oakington or Histon stops? None are shown.

3.6. Appendix 11A

- o **Figure 16** – Question why the map doesn’t show the important hedge along Kings Hedges Road.

- The Habitat survey has unsatisfactory grouping of vegetation types, without further details provided about their composition.

(See also comments at paragraphs 2.5(a) (iv), 2.5(d), 4.1)

3.7. Appendix 13A

- **Figure 1c** – Question whether the broad character areas truly reflect the existing character areas on the ground.

3.8. Appendix 13B

- **Figure 2c** – Omits some of the key views – for example, from the guideway towards Cottenham.

3.9. Appendix 13C

- **Figures 3d, 3e and 3f** – Some of the crossing routes appear to be closed.
- **Figure 3i** – The lack of crossing points will affect permeability from the new development to access to the wider countryside, which is one of the key aims of the Landscape Strategy.

(See also comments at paras 1.2, 1.3, 1.4, 2.2(g), 2.2(j), 3.9, 5.1, 5.2, 5.4, 7.1, 7.5)

3.10. Appendix 13D

- Highlights the many cases where there is a lack of vegetation and the importance locally of the existing vegetation, both in terms of visual impact and wildlife, which will be lost.

3.11. Appendix 17F

- There appears to be significant implications on drainage, ecology, landscape and future mitigation possibilities, which SCDC should be considered in more detail.

4. Environmental Statement Appendix 13E Landscape and Ecological Mitigation Plans

- 4.1. There are no maps detailing the vegetation which will be removed, though in the text it seems that in all sections of the route vegetation is to be lost.

(See also comments at paragraphs 2.5(a) (iv), 2.5(d), 3.6)

- 4.2. There is very little “protection of existing planting” generally along the route within district. This is of particular concern in areas where good quality vegetation will be lost (for example, good thorn on Figure 5).

(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)

- 4.3. **Several Figures** – Where more than one type of vegetation proposed (eg L4 and L13) the second and subsequent annotations are not shown, which could cause confusion at a later date.

- 4.4. **Several Figures** – Several areas solely designated for L4 planting should be mixed with L2.

(See also comments at paragraphs 4.10, 4.14, 4.17)

- 4.5. **Several Figures** – Question the location of areas of natural regeneration – these should be located away from the main visual areas.

- 4.6. **Several Figures** – Inconsistency/Contradiction? - Question whether the maintenance track is wide enough to be safe for all potential users to pass as it appears to narrow considerably – or whether it is this wrongly illustrated on these plans as an overlap of vegetation on the maintenance track? (For example Figures 4–6, 8, 9 & 27)

(See also comments at paragraphs 4.8, 4.11, 4.20, 4.37, 4.42, 4.44)

- 4.7. **Several Figures** – There are several places where there is a loss of vegetation (for example, thorn) on the guideway and it is proposed to replace it with scrub planting. Question the practicality of scrub planting in narrow areas (less than 2m) between the guideway and maintenance track – ground cover may be more practical given the difference in levels, with tree planting in the outer boundary hedge.
(See also comments at paragraphs 4.8, 4.11, 4.12(f), 4.13, 4.18, 4.30, 7.2)
- 4.8. **Figure 6** – Inconsistency – This map shows “L4 planting” where bridle chicane is proposed on Illustrative Technical Drawings (Drawing 4).
(See also comments at paragraphs 4.6, 4.11, 4.20, 4.37, 4.42, 4.44)
- Vegetation is being lost from both sides of the guideway, especially from the northern side, but the only proposed replacement is grass (in the upper plan).
(See also comments at paragraphs 4.7, 4.11, 4.12(f), 4.13, 4.18, 4.30, 7.2)
- 4.9. **Figure 7** – Question which area of planting it is proposed to protect (L13) in the top plan, as it is not annotated. Extensive mixed vegetation is being lost around the stop (Oak and Birch), and there may be a requirement for further planting than just grassland depending upon the stop design.
- 4.10. **Figure 8** – Loss of thorn from both sides of guideway.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)
- Areas proposed as L4 planting should include L2.
(See comments at paragraphs 4.4, 4.14, 4.17)
- 4.11. Figure 9 – Inconsistency - “species rich grassland” overlaps the maintenance track.
(See also comments at paragraphs 4.6, 4.8, 4.20, 4.37, 4.42, 4.44)
- Tree/hedge protection is required here. Significant sized vegetation will be lost and replaced with narrow areas of scrub
(See also comments at paragraphs 2.6(c), 4.2, 4.7, 4.8, 4.10, 4.11, 4.12(d), 4.12(f), 4.13, 4.14, 4.18, 4.22-4.24, 4.27, 4.30, 7.2)
- 4.12. Figure 10 – Adjacent to the Priory is an area where mitigation is not possible as the use of extensive tree screening would change the character of the site.
- a) This is a rural road which will lose significant trees, for which there is insufficient space for mitigation.
 - b) There is insufficient land/mitigation at the stop, which is very important given the additional lighting and street furniture proposed.
(See also comments at paragraphs 2.5(c), 2.6(a), 2.6 (e), 2.6(g), 4.25)
 - c) Question the type of feature planting proposed at the Kiss and Ride as careful consideration is needed given its rural location.
 - d) Tree protection is needed to protect trees off site.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)
 - e) Question where the details are for the replacement/reinstatement of vegetation for the additional new access track north of the Kiss and Ride.
 - f) Proposed narrow areas of scrub.
(See also comments at paragraphs 4.7, 4.8, 4.10, 4.11, 4.13, 4.18, 4.30, 7.2)

- 4.13. **Figure 11** – Question the choice of grassland to replace the loss of vegetation in this location given the openness to the north.
- Question whether the grassland area to the south is practical given that it is very narrow.
- (See also comments at paragraphs 4.7, 4.8, 4.10, 4.11, 4.12(f), 4.18, 4.30, 7.2)*
- 4.14. **Figure 12** – All existing vegetation appears to be lost.
- The Area to the West of Swavesey drain should include tree protection and if vegetation is lost, replacement woodland should be included.
- (See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)*
- L4 vegetation should include L2.
- (See comments at paragraphs 4.4, 4.10, 4.17)*
- 4.15. **Figure 13** – It appears that large areas of thorn are removed, including vegetation from the track area, some of which should be retained.
- Existing vegetation not included within the area for works should be protected.
- (See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)*
- 4.16. **Figure 14** – None of the existing vegetation is to be retained and question whether grassland is sufficient planting to the north given the open views.
- 4.17. **Figure 15** – A wide area of vegetation is lost and some L2 should be included with L4 and some tree planting in L10.
- (See comments at paragraphs 4.4, 4.10, 4.14)*
- 4.18. **Figure 16** – See earlier comments regarding the loss of vegetation, change in levels of the track and treatment of the central areas.
- (See also comments at paragraphs 4.7, 4.8, 4.10, 4.11, 4.12(f), 4.13, 4.30, 7.2)*
- 4.19. **Figure 17** – Question whether there should be property boundary screening, suggest woodland block, on south east side at B1050 crossing (Gresley House/The Mount)?
- 4.20. **Figure 19** – Whilst open areas to the boundaries are potentially beneficial, it would be preferable given the large land take, to lose some of the area to the south of the Park and Ride.
- Unclear if sufficient space for maintenance track to north of guideway around platforms
- (See also comments at paragraphs 4.6, 4.8, 4.11, 4.37, 4.42, 4.44)*
- Significant area of hedge to be lost along B1050, which should be reinstated (dependent upon the edge of the new settlement) to retain street scene.
- (See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)*
- 4.21. **Figure 21** – Question what is proposed at “Area H” – is it mounding? This is very open to the north and therefore treatment is important to surrounding villages and the new settlement.
- 4.22. **Figure 22** – The vegetation to the north needs to be protected.
- (See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)*
- 4.23. **Figure 23** – The vegetation along Rampton Road needs to be protected.
- (See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)*

- 4.24. **Figure 24** – The hedge to the side of the balancing pond should be retained and protected.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)
- 4.25. **Figure 28** – The top plan needs to include tree planting in the hedge.
- There appears to be insufficient land at Westwick Hall for replacement planting, which is important for its setting.
(See also comments at paragraphs 2.5(c), 2.6(a), 2.6 (e), 2.6(g), 4.12(b))
 - Significant amounts of vegetation are being lost in this area which affects the street scene.
 - Concerned about siting the area of natural regeneration in a location close to roads and housing – this is not ideal and could potentially be used as a dump.
- 4.26. **Figure 29** – Inconsistency - “Area K” overlaps maintenance track
- The adjacent tree belts are likely to be affected – this is a prime area for woodland regeneration.
- 4.27. **Figure 31** – Retention of boundary trees should be actively encouraged in housing areas.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)
- 4.28. **Figure 32** – The fencing shown should be replaced with protection tree planting.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)
- 4.29. **Figures 32-34** – Question whether there should be property boundary screening on the north side of the guideway?
- 4.30. **Figure 33** – The species rich grassland is impractical.
(See also comments at paragraphs 4.7, 4.8, 4.10, 4.11, 4.12(f), 4.13, 4.18, 7.2)
- 4.31. **Figure 34** – Whilst woodland enhancement and protection is included, there needs to be a full schedule of the works before commencement. Need to ensure tree roots are not severed where trees are retained close to the boundary.
- Adjacent vegetation is important in this area.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.32, 4.33, 4.40, 5.5, 6.2, 7.7)
 - Question whether L9 and annotation about hedge and trees is on the trackside of the fence and why a fence is needed here.
 - Maintenance track switches to the other side of the guideway.
(See also comments at paragraphs 1.5, 5.2)
- 4.32. **Figure 35** – See above comments regarding tree protection areas and loss of vegetation.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.33, 4.40, 5.5, 6.2, 7.7)
- 4.33. **Figure 37** – The tree belt next to “Area L” should be protected.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.40, 5.5, 6.2, 7.7)
- 4.34. **Figures 37-41** – Question whether there should be property boundary screening to north/south of guideway

- 4.35. Figure 38 – It is unclear what extent the impact of the stop will be on planting to the south of the science park phase 6 and it would be preferable for a hedge to be reinstated to the boundary as existing.
- 4.36. Figures 39-41 – See above comments on hedging on the southern side of the science park.
- It is difficult to comment on planting at the stop until detailed designs of the stops have been drawn up.
- 4.37. Inconsistency - Figures 41-45 – These maps do not show maintenance track.
(See also comments at paragraphs 4.6, 4.8, 4.11, 4.20, 4.42, 4.44)
- 4.38. Figure 42 – It is important that the Arbury north stop is situated outside of the ancient hedgerow as this area has the additional importance as a Local Nature Reserve.
- 4.39. Contradiction - Figures 42-44 – The legend for map shows L13 “protection of existing planting” but annotation of the maps states “where possible protection or replacement” & there is no planting proposed north of the guideway (Question whether this is to be provided by the Arbury Park development).
- 4.40. Figure 43 – The hedgerow along Kings Hedges Road is important and should be retained (it also has an important function in the setting of the new development).
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 5.5, 6.2, 7.7)
- 4.41. Figures 45-48 – Question whether there should be some screening and/or planting from Cambridge station to Trumpington stop.
- 4.42. Inconsistency - Figure 49 -- Shows maintenance track on north side of track but Illustrative Technical Development Drawings (Drawing 30) shows it on the south side & unclear whether there is enough space for maintenance track (no space given the proposed planting).
(See also comments at paragraphs 4.6, 4.8, 4.11, 4.20, 4.37, 4.44)
- 4.43. Figure 49 – The treatment of “Area P” should be tied in with the Southern Fringe Landscape Strategy.
- 4.44. Inconsistency - Figures 50-51 – There is no maintenance track shown, yet it is shown on the Illustrative Technical Drawings (Drawing 32).
(See also comments at paragraphs 4.6, 4.8, 4.11, 4.20, 4.37, 4.42, 4.44)
- 4.45. Figure 52 – Addenbrooke’s spur proposes urban screening alongside, where guideway crosses railway – is rural, or a mixture more appropriate? - adjacent to open area and proposed development.
5. Rights of Way Plans
- 5.1. There are a number of places where there are missed opportunities to maximise access onto the maintenance track from the wider rights of way network, for example where roads cross beneath the guideway (for example, Sheet 10 from Longstanton Road).
(See also comments at paragraphs 1.2, 1.3, 1.4, 2.2(g), 2.2(j), 3.9, 5.2, 5.4, 7.1, 7.5)
- 5.2. At 3 points the maintenance track switches sides of the guideway, which creates a physical barrier to users along the route as they will be unable to cross both the junctions diagonally against both guided bus and traffic flows.
- **Sheet 12** – Longstanton – maintenance track switches from south to north side of guideway
 - **Sheet 17** – Oakington – maintenance track switches from north to south side of guideway

- **Sheet 22** – Histon – maintenance track switches from south to north side of guideway
(See also comments at paragraphs 1.2, 1.3, 1.4, 2.2(g), 2.2(j), 3.9, 5.1, 5.4, 7.1, 7.5)
 - 5.3. **Sheet 18** – Bridleway B4 Oakington does not appear to be connected to anything/the rest of the network – it is not shown on Sheet 17.
(See also comments at paragraphs 1.2, 1.4, 2.2(g), 2.2(j), 3.9, 5.1, 5.2, 5.4, 7.1, 7.5)
 - 5.4. **Sheet 22** – Question where there will be access onto Bridge Road from the guideway.
(See also comments at paragraphs 1.2, 1.3, 1.4, 2.2(g), 2.2(j), 3.9, 5.1, 5.2, 7.1, 7.5)
 - 5.5. **Sheet 24** – It is important to avoid any impact to the hedge.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 6.2, 7.7)
6. Draft Visual Design Guidance
- 6.1. **2** – The sections on Landscape Character Areas and Local Distinctiveness make no reference to the impact of the existing vegetation.
 - 6.2. **3.1** – There is no reference to retention of vegetation, and this puts the proposed mitigation measures in a misleading light.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5)
 - 6.3. Contradiction - **3.2** – “At crossings and stops ornamental ground cover species could be used along the central reservation to discourage people from crossing” – but this contradicts with the need for people to be able to cross at the crossing points – and the Environmental Statement Volume 1 paragraph 4.2.17 states that the line of the path would be delineated through incorporation of a solid, hard or special grip surface.
(See also comments at paragraphs 1.1, 2.2(b), 2.9(c), 2.9(h), 3.2)
 - 6.4. **3.2** - Ornamental ground cover would not be appropriate in rural crossings.
 - 6.5. **3.3** - Bullet point 1 – the boundary treatments should be consistent high quality at all times, therefore the words “wherever possible” should be deleted.
 - 6.6. **3.4** – There is still concern about the potentially significant impact of junctions and crossings in rural locations.
 - 6.7. **3.5** – There needs to be greater detail regarding design and impact on the landscape provided where the “positive landmark” bridges are proposed.
 - 6.8. **3.6** – Question what is the extent of the area to have Highway Lighting Standards.
 - Minimisation of light pollution – there is no mention of the need for downward facing lights.
 - 6.9. **3.7** – There needs to be regard had to the existing network of cycle signs for the district/county and ensure new signs are consistent with them.
 - There are no details regarding the locations for the cycle signs.
 - 6.10. **4** – Landscape considerations – whilst some trees are afforded statutory protection and some hedges are covered under the hedgerow legislation, others may be worthy of retention and special consideration even if they are not formally protected at this time.
 - Paving and lighting – these should be to a high standard regardless of the existing.

- Lighting should not necessarily match existing if it is poor standard – i.e. light polluting etc.
- 6.11. **5.2** – Stop design should maximise ease of movement on/along the platform – few people would use enclosed areas (unless shelter is of poor design offering little protection from wind/rain), especially if there is a frequent service and glass enclosed areas may be difficult for visually impaired.
 - “Stop design could possibly include an element of renewable energy generation” – this should be a requirement as it is easy to incorporate solar panels/wind turbine.
 - Contradiction – The design of the stops is very vague and contradicts itself –it should reduce clutter (5.2) but may possibly allow advertising, which would create clutter (5.5).
- 6.12. **5.3** – Illustrative city stop layout – Question why the ticket machine is shown imposing into the walkable area when it could be flush with the seating – this goes against the principles of removing clutter and ease of movement.
 - Illustrative guideway stop layout – Question why the sheltered areas are so imposing onto the platform when they could be more flush along the platform to ease movement on the platform.
- 6.13. **5** – Contradiction - Advertising will add clutter – signs should be kept to a minimum (5.2).
- 6.14. **5.7** – Renewable energy “may be incorporated in certain locations” – this should be a requirement for all stops – part of the high quality image.
- 6.15. **5.8** – Sponsorship of stops – if the sponsor wants their name/logo incorporated onto stop it should be designed in at the start/restricted in size.
- 6.16. **6.1** – Park & Ride car parks need careful designing in terms of layout – for example, planting along footpaths can obscure pedestrians from drivers’ view (c.f. Madingley) and the design should avoid conflicting movements between pedestrians, cyclists and vehicles.
- 6.17. **6.2** –The internal planting for Park and Ride sites as they are effectively in rural locations should be predominantly native species.

7. Works and Land Plans

- 7.1. There are several sites off the main route for which mitigation does not appear to have been included – for example, on new tracks where existing crossing points are lost, or for haul routes.
(See also comments at paragraphs 1.2, 1.3, 1.4, 2.2(g), 2.2(j), 3.9, 5.1, 5.2, 5.4, 7.5)
- 7.2. **Several sheets** – The maintenance track is considerably lower than the guideway in a number of places, up to 2.5m at most.
(See also comments at paragraphs 4.7, 4.8, 4.10, 4.11, 4.12(f), 4.13, 4.18, 4.30)
- 7.3. Several sheets – Question the considerable number of changes in gradient along the maintenance track and the apparently steep gradients where the maintenance track goes over culverts.
- 7.4. Sheet 5B – Question whether there are any details of reinstatement of lost scrub.
- 7.5. Sheet 5C – Question the justification for haul routes across open countryside for temporary use. There are no details relating to the reinstatement of hedgerows/mitigation despite the large impact, particularly at access points on Over Road and Station Road. The route should be required to use the line of the Longstanton bypass to avoid the excessive number of entrances onto these roads.
(See also comments at paragraphs 1.2, 1.3, 2.2(g), 2.2(j), 3.9, 5.1, 5.2, 7.1)
- 7.6. Sheet 14A – The haul road is already in place for Phase 1 Longstanton.

- 7.7. Sheet 14B – Existing boundary hedges will need protection. Question whether the track will be upgraded and if so, whether there will be any further impacts.
(See also comments at paragraphs 2.6(c), 2.6(d), 2.10(a), 4.2, 4.10, 4.12(d), 4.14, 4.15, 4.20, 4.22-4.24, 4.27, 4.28, 4.31, 4.32, 4.33, 4.40, 5.5, 6.2)
- 7.8. Sheet 43 – The design of the bridge in the Southern Fringe will need to relate to the overall strategy and there are currently concerns regarding the engineered 10m design on the indicative drawing.