



Route 16 Chilterns

The line has been used as a strategic diversionary route for the WCML and has accommodated freight diversions and additional passenger services during recent West Coast blockades. The route also serves the waste disposal site at Calvert.

This route will be addressed via a RUS, which is scheduled to start in autumn 2007.

Today's route

The route has two main corridors from London Marylebone (dividing at Neasden South Junction) which are described below. The relevant Strategic Route Section is shown in brackets:

- one branch runs via High Wycombe, Princes Risborough and Bicester to Aynho Junction (just south of Banbury (16.01));
- the other branch runs via Amersham to Aylesbury (16.02 & 16.03), where the passenger service currently terminates, then on to Claydon Junction. The latter route runs parallel to the LUL Metropolitan and Jubilee Lines as far as Harrow-on-the-Hill. From just south of Harrow-on-the-Hill station extending as far as Amersham, (where LUL trains terminate) all tracks become LUL property, with shared running between main line and underground trains. North of Amersham, the main line trains re-enter Network Rail infrastructure; and
- a branch links Princes Risborough and Aylesbury (16.04). There are also two freight branches from Bicester Town to Claydon LNE Junction and Aylesbury to Claydon LNE Junction. The route between Claydon LNE Junction and Bletchley is currently out of use.

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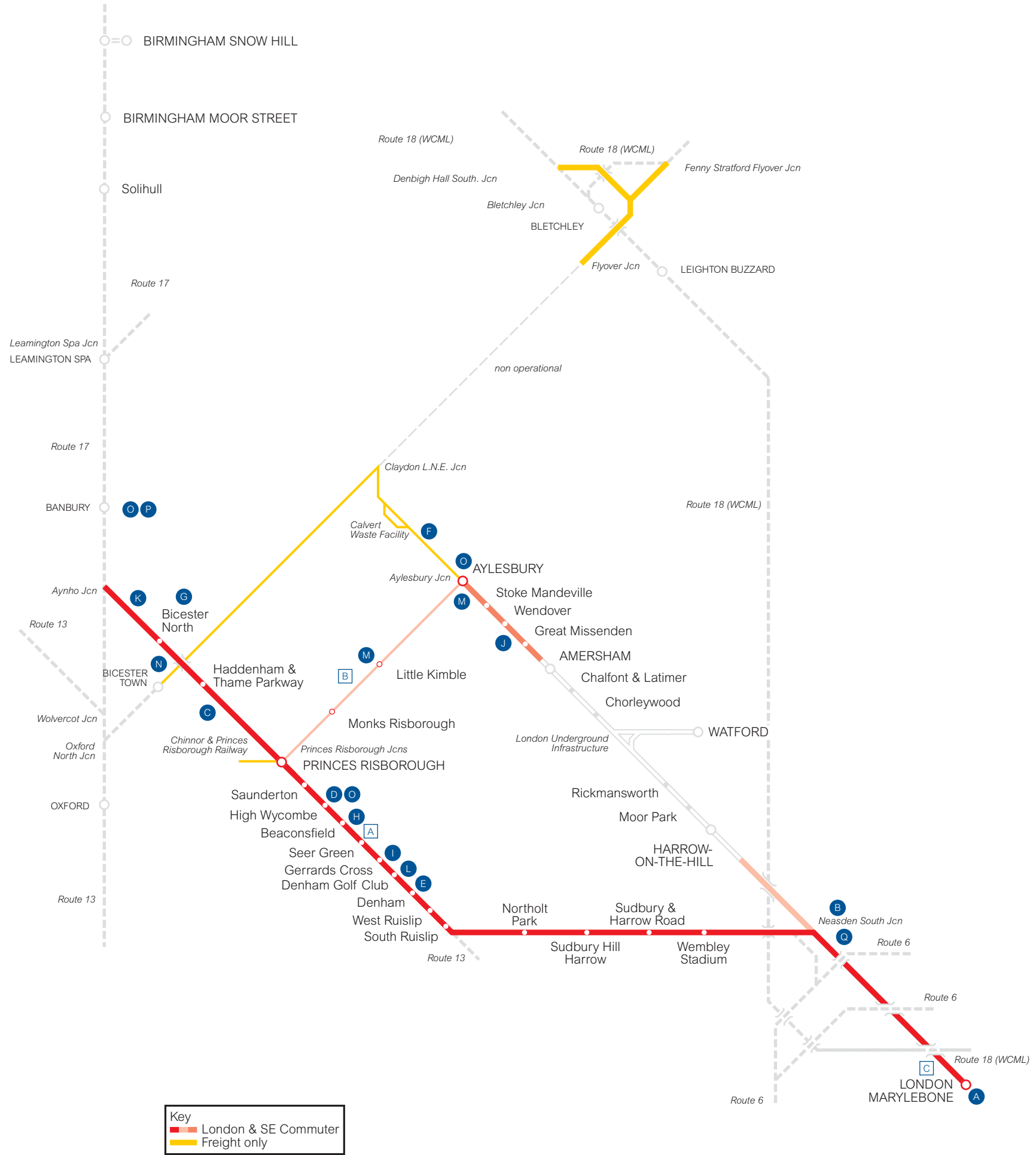
Route context

The Chilterns route consists of a main line from London Marylebone which divides into two at Neasden South junction. One line goes to Banbury and the other to Aylesbury/Claydon, with associated branches and freight lines.

In the 1970s the section of the route from Princes Risborough to Aynho Junction was singled. Since then the route has increased in importance, with growing levels of traffic and considerable investment. Shortly before privatisation the route benefited from full modernisation, with renewed signalling and rolling stock. Since Chiltern Railways acquired the franchise, there has been further significant investment in infrastructure, including redoubling

of the singled Princes Risborough to Aynho Junction section, new depots and operational facilities and improved passenger facilities at stations. Currently, the Evergreen 2 project is being developed by Chiltern Railways using an innovative commercial funding framework. This project will involve Laing Rail delivering a number of infrastructure improvements to increase capacity, predominantly between Bicester North and London Marylebone. Network Rail will purchase the new assets on completion and assume the responsibility for operations, maintenance and renewal. Remuneration will be through increased access charges.

Route 16 Chilterns



Passenger and freight demand

There is significant commuter and suburban traffic into London from locations along the line of route. Traffic on the route has grown considerably since 1994, particularly in the commuter market from as far north as Solihull, helped by a high level of performance and reliability. The West Midlands services have experienced considerable development and following the implementation of Cherwell Valley resignalling (Route 17), have now attained a 2 tph frequency throughout the day. It was largely to serve this market that Chiltern Railways funded and constructed the 'park and ride' station at Warwick Parkway on Route 17. The West Midlands services are increasingly regarded as a viable alternative to the WCML – although journey times are longer, fares are generally lower.

The Route has proved popular with passengers to and from the West Midlands during disruption caused by West Coast Main Line upgrade works, although, because of capacity constraints, most were accommodated on existing timetabled services rather than trains diverted from the West Coast.

Freight demand includes significant domestic waste traffic to the landfill site at Calvert. Waste Recycling Group (WRG) continues to seek further business in both domestic and industrial waste. Overnight demand is constrained by operating hours at the landfill site.

Current services

The operators on this route are Chiltern Railways, LUL, Freightliner Heavy Haul Ltd. and EWS. The majority of the Chiltern Railways fleet, the Class 165 DMUs, date from the late 1980s. Since privatisation, Chiltern has invested in additional rolling stock in the shape of the Class 168 Clubman DMUs, introduced in 1996, which are progressively being lengthened from three cars to four.

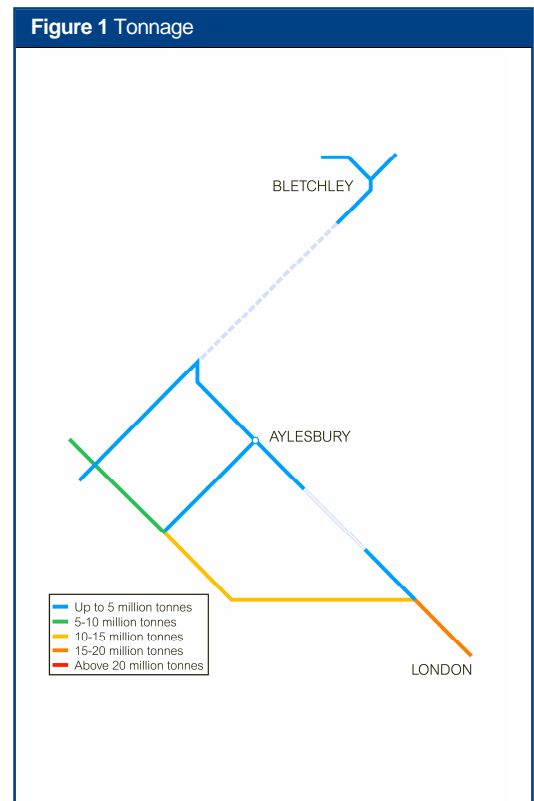
Current traffic

There is significant suburban traffic into London from locations along the line of route, and a growing commuter market from as far north as Solihull, helped by a high level of performance reliability. It was largely to serve this market that Chiltern Railways funded and constructed Warwick Parkway station. The basic off-peak service pattern in Winter 2005/06 consists of the following stopping services from Marylebone: half hourly to High Wycombe or Princes Risborough, hourly to Bicester or Stratford-upon-Avon, half hourly to Birmingham Snow Hill and half hourly to Aylesbury. This basic pattern is enhanced at peak times with additional trains and altered and extended stopping patterns.

Four loaded domestic waste services run per day to the Calvert disposal site from Cricklewood, Dagenham, Bristol and Northolt. Services from the London area route via High Wycombe and Aylesbury. Services from Bristol route via Oxford and Bicester.

The Calvert site has capacity to accept similar levels of waste for at least the next 20 years. A new freight flow commenced in January 2005, with up to two trains per day conveying fill and construction materials from Acton to the site of the new Tesco development at Gerrards Cross.

Figure 1 shows the tonnage levels on the route.



Traffic volumes are summarised in Figure 2.

Figure 2 Current use

	Passenger	Freight	Total
Train km per year (millions)	6	0	6
Train tonne km per year (millions)	1,067	151	1,217

Current infrastructure capability

The following maps set out the capability of the current network.

Figure 3 Linespeed

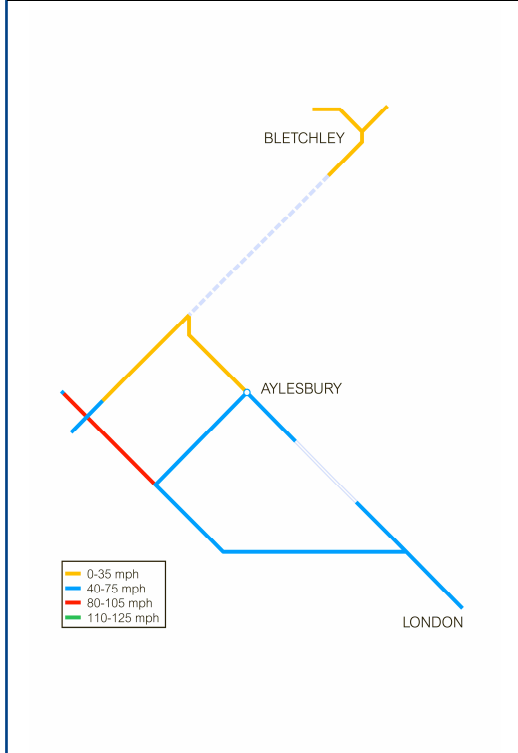


Figure 4 Electrification

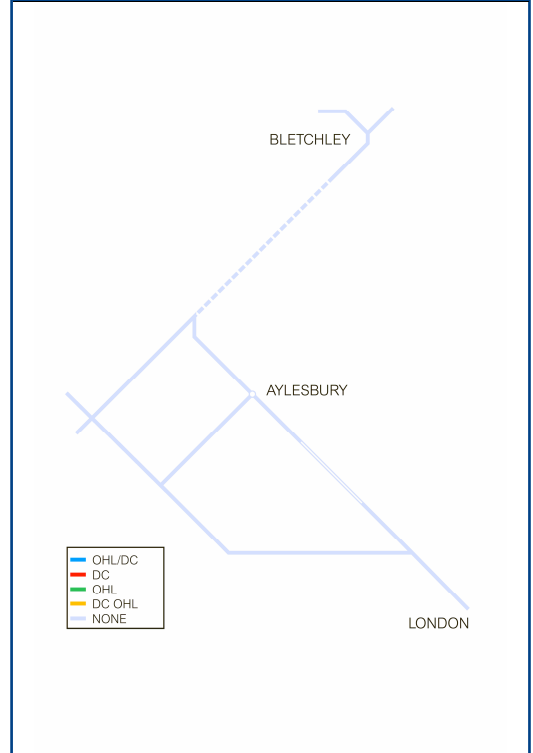


Figure 5 Route availability

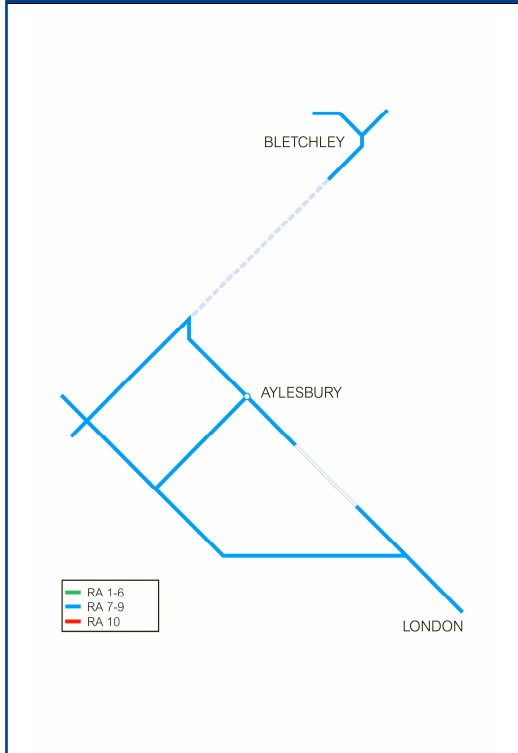
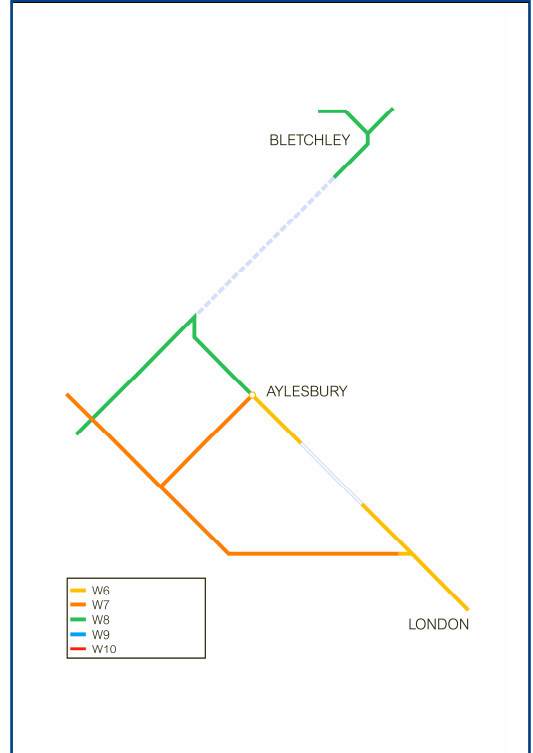


Figure 6 Gauge



Current capacity

Redoubling of the Princes Risborough – Bicester – Aynho section resulted in a significant improvement in capacity which, along with the Cherwell Valley resignalling on Route 17, has allowed the frequency of London – West Midlands services to be doubled to two trains per hour. The requirement to share tracks with the frequent Metropolitan Line services between Amersham and Harrow on the Hill imposes constraints and risks to performance on Aylesbury line services.

Chiltern Railways have undertaken a programme of selective platform lengthening, including most recently extension to 7-car length at Beaconsfield, Gerrards Cross, High Wycombe, Princes Risborough and Wembley Stadium stations.

Figure 7 represents numbers of trains in the morning peak hour.

Current performance

Figure 8 shows the current PPM on the route.

The route is one of the best performing in the country, helping Chiltern Railways to maintain their position amongst the top performing train operators with a moving annual average of trains arriving on time (PPM) at 92% in February 2006. Underlying infrastructure performance has remained good, with both summer and autumn seasonal issues showing further year-on-year improvements. Recent performance has been boosted by close attention to the detail of track maintenance, in particular the management of conditions that can lead to the imposition of speed restrictions during hot weather. Continuing track re-railing programmes have meant that there is no significant jointed track left on the Marylebone to Aynho and Aylesbury route sections and cascaded rail has been eradicated between Marylebone and Aylesbury, both leading to performance and reliability improvements.

Performance was hit badly in July 2005, however,

when severe disruption was caused to services by the collapse of the 'Tesco tunnel' at Gerrards Cross. This had a serious detrimental effect on performance for a total of 57 days. A reduced service ran during this time, either running down the Metropolitan line or via Aylesbury, as did a shuttle service between Marylebone and Denham.

We continue to work together with Chiltern Railways to review the operational and inspection arrangements to be applied in the event of a road vehicle striking a rail bridge. Using a risk-based assessment process, many bridges can now be passed at line speed or 20 mph, following a visual inspection by a driver to confirm that the track has not been adversely impacted. We also continue to work with Chiltern Railways to increase the number of people trained to assess the effect of a bridge strike.

Future requirements

Strategic direction

The strategic projection for the route is for further modest growth in both passenger and freight demand, with pressure for additional capacity being met by longer passenger trains rather than major infrastructure enhancements.

There is currently only one freight train per day each way over the Bicester Town – Claydon section, but the line is of importance in the light of the long-term aspiration by Local Authorities and other bodies for reopening of an East-West route linking Oxford, Bletchley, Bedford and Cambridge. Significant upgrading would be necessary, but the line of route is intact between Bicester and Bletchley and it would be physically possible to reopen the railway, obviously subject to a robust business case and funding.

A new station is planned at Aylesbury Vale, about two miles north of the present terminus at Aylesbury Town on the freight route to Calvert.

Figure 7 Current train service level (peak trains per hour)

Route Section	Main Lines
Marylebone – Aylesbury	3
Marylebone – Princes Risborough	4
Marylebone – Banbury	2
Princes Risborough – Aylesbury	1

Figure 8 Current PPM MAA

TOC	MAA	As at period
Chiltern Railways	91.9%	10

Chiltern Railways is currently negotiating a funding package with the Office of the Deputy Prime Minister (ODPM), Local Authorities and other parties. The station is planned to serve both a developing community in the area, and to provide better access to rail services to London for commuters living in the area north of Aylesbury than can be provided at Aylesbury Town. The station would include extensive car parking and avoid the need for passengers to travel into Aylesbury itself, thereby relieving congestion in the town. Chiltern Railways are currently negotiating with Network Rail, the DfT and the Local Authorities over funding of the project, planning requirements and train timetabling issues.

The track renewals programme continues with its strategy of re-railing areas of cascaded rail from Marylebone to Aylesbury, in order to reduce rail defects before they become a significant issue.

Future demand

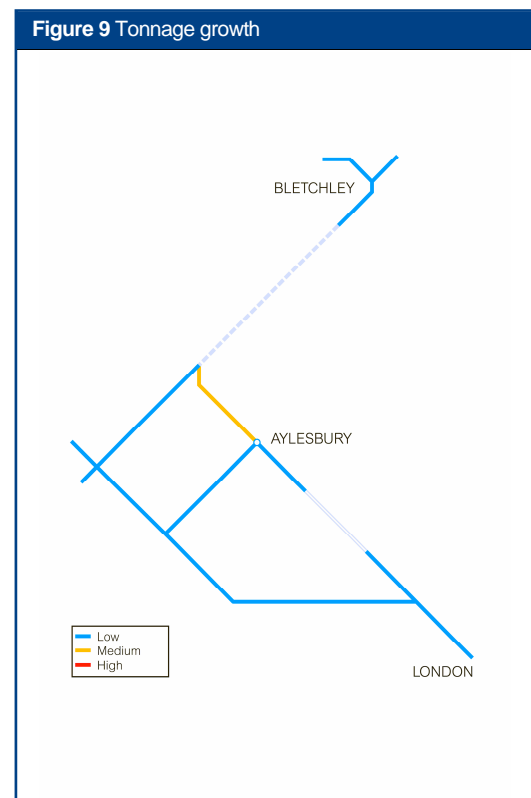
It is expected that there will be continued commuting growth into London from all parts of the route, following recent improvements in service frequency, which as already stated will be catered for mainly by means of longer trains. However, the disruption to services caused by the collapse of the tunnel at Gerrards Cross had a serious detrimental effect on passenger demand, and it is likely to take some time before passenger numbers recover to their former levels.

Freight traffic patterns are expected to remain largely unchanged for the foreseeable future, although the regular CTRL spoil traffic to Calvert has ended as construction of the link approaches completion. However, it is understood that opportunities to use the vacated train paths are being actively explored by other operators. Additionally, Freightliner is looking to expand the operation of aggregate services to a site at Neasden. GBRF have won a contract for infrastructure supply trains for LUL renewal works, being undertaken by Metronet. Weekend trains will access via Harrow-on-the-Hill from Autumn/Winter 2006.

Figure 9 indicates the forecast percentage change in tonnage to 2015.

Future capability

In the last 12 months, a new maintenance depot has been opened at Wembley Stadium, delivering additional capacity for maintaining Chiltern Railway's fleet, a reduction in empty stock mileage and capacity for expansion of the fleet in future.



Future capacity

The Evergreen Phase 2 project will significantly improve capacity to allow additional services from High Wycombe southwards and greater reliability. The project involves enhancements to Neasden South Junction including signalling and track upgrades to improve marginal time between trains and an increase in flexibility. Evergreen Phase 2 also provides additional platforms at Marylebone station which will increase capacity and improve performance. The project involves platform 4 being shortened and provision of two new platforms (5&6) on the old stabling sidings site, which will increase capacity at the station.

Future performance

Figure 10 shows the forecast reduction in Network Rail delay minutes compared with 2005/06.

Figure 11 shows the forecast PPM for the main TOCs running along the route.

Agreement has been reached with Chiltern Railways to enable them to undertake improvements to the route south of Aynho Junctions as a third party – the 'Evergreen 2' project. This will see the introduction of new signals to reduce headways and improvements to power supplies for signalling equipment in the area. As network operator, Network Rail is responsible for ensuring that the enhanced assets are designed and delivered in a manner that supports the ongoing operation of the rail network. As a result of the innovative contractual framework for this project, Network Rail has neither specified the infrastructure enhancements nor the train service alterations. Consequently, we have agreed with Chiltern Railways a trial period of 12 months to monitor train performance and correct any resulting issues.

The planned re-signalling of the route between Leamington and south of Birmingham Snow Hill (on adjoining route 17), will see the introduction of 4 aspect signalling and creation of a new 60 mph junction at Tyseley North. This will give significant performance improvements, which will have a positive impact on this route.

Further track renewals and rail replacement activity will continue the improvement in track quality and

performance, through further reductions in rail defects and associated speed restrictions. These improvements will impact on performance when otherwise speed restrictions would be imposed, following inspections or reports from drivers. The clay embankments of the Chiltern's routes are particularly susceptible to shrinkage or expansion, leading to the imposition of speed restrictions. Work is planned on such embankments and earthworks, in particular at Bicester North, Blackthorn and Piddington in 2007/08. Significant work is also continuing at Ardley cutting until 2007/08, leading to a reduction in performance risk.

An extensive programme to remove line side vegetation will introduce a 6 metre 'flail strip' clearance on each side of the tracks over the next 2 years, leading to a reduction in delays due to leaf fall contamination.

Engineering access

Disruptive engineering access is planned on the route, and involves a mixture of all-weekend and all-day Sunday closures. This is primarily for the purposes of undertaking planned track and structures renewals.

Due to the lack of diversionary routes available to stations other than Aylesbury, the aim is to undertake works in longer possessions, but for fewer weeks in the year.

Possession Planning on Route 16 is carefully integrated with the Birmingham to Didcot and West Coast Main Line routes, to enable the increasing use of the route as an alternative for passengers from London to the West Midlands.

Disruptive engineering access is planned for enhancements on the route during 2006, specifically for the 'Evergreen Phase 2' works. This will involve either all-weekend or all-day Sunday closures. Where possible, these works have been optimised into access planned for renewal and/or maintenance works, with the Evergreen project planned for completion in late 2006.

Rules of the route ('no booked services') possessions and two all-day Sunday possessions are planned to undertake platform reconnection

Figure 10 Forecast reduction in delay minutes

	2006/07	2007/08	2008/09
% reduction in delay minutes	6%	8%	13%

Figure 11 Forecast PPM MAA

TOC	2006/07	2007/08	2008/09
Chiltern Railways	93.5%	93.8%	93.9%

works at Birmingham Moor Street station. This scheme is due for completion in early 2007.

Opportunities and challenges

The major opportunities on the route centre round the projected growth in passenger demand, particularly commuting into London. In the short- to medium-term the level of demand is being suppressed by the disruption to services caused during the tunnel collapse at Gerrards Cross, but it is expected that, over time, growth will recover to previous levels.

There are also growth opportunities through improving accessibility to the route from areas not currently directly served by the rail network, particularly in the area bounded by Aylesbury, Bicester and Bletchley.

This route was used as a tactical diversionary route for W9 traffic, throughout the work on the southern end of the West Coast Main Line. This was enabled by an enhanced inspection and maintenance regime. However since the work has been completed, this dispensation has now been removed. This route could be enhanced to W9 if significant work was carried out on the earthworks and structures currently limiting its capability.

Delivering future requirements

Summary

In the short-term, Chiltern Railways have embarked on a marketing campaign to win back custom lost during the disruption to services caused by the collapse of Gerrards Cross tunnel.

Over the medium to long-term, it is planned to deliver additional capacity for growth by a combination of measures including:

- Longer trains, facilitated by platform extensions at main stations and fleet expansion.
- Increased line capacity through headway improvements at key locations, signalling upgrades and the additional platforms at Marylebone; and
- Additional car parking spaces throughout the route.

A new station is proposed at Aylesbury Vale to serve a planned residential development in the area. This station will also improve access from those parts of Buckinghamshire not at present directly served by the rail network. This will be done by avoiding the need for prospective passengers to drive into Aylesbury town centre, which suffers from traffic congestion. In the long-term, Chiltern Railways is supporting the proposal by the East-West Rail Consortium to extend passenger services to Milton Keynes, which, although at a relatively early stage of development, would further encourage and support development in an area not currently directly served by rail services.

Looking longer-term (over the next 20 years), aspirations exist to increase the number of parkway stations on the route. Chiltern Railways also have aspirations to extend certain services to Milton Keynes and other areas, and to re-instate the fast lines through Beaconsfield.

Expenditure

Figure 12 shows the planned level of expenditure on renewals on this route over the next three years. However, the precise timing and scope of renewals remains subject to review to enable us to meet our overall obligations as efficiently as possible, in accordance with the plans of operators and other stakeholders.

Figure 12 Forecast expenditure

£m (05/06 prices)	2006/07	2007/08	2008/09
Renewals			
Track			
Plain line	1	1	1
S&C	0	0	0
Drainage	0	0	0
Track Total	2	2	2
Civils			
Underbridges	2	1	1
Overbridges	1	0	1
Bridgeguard 3	–	0	–
Footbridges	0	–	0
Earthworks	3	1	1
Culverts	–	0	–
Civils Total	6	2	2
Signalling			
Minor works/other	0	1	0
Signalling Total	0	1	0
Plant and machinery			
Fixed plant	0	–	–
Plant Total	0	–	–
Operational property			
Stations	1	0	0
Lineside buildings	–	0	0
Operational property Total	1	0	0
Total Renewals	9	5	5

Enhancements (funded by)			
.			
Network Rail (RAB)			
Evergreen 2 NR	70	–	–
Network Rail (RAB) Total	70	–	–
Other Third Party			
Other	1	0	–
Other Third Party Total	1	0	–
.			
Total Enhancements	71	0	–

Figure 13 Forecast volumes

	2006/07	2007/08	2008/09
Track			
Rail (km)	2	2	2
Sleepers (km)	1	1	1
Ballast (km)	3	3	3
Switches & crossings (no.)			
Complete renewal	2	2	2
Drainage (km)	0	0	0
.			
Civils			
Underbridges (square metres)	1881	426	–
Overbridges (square metres)	533	247	–
Footbridge (square metres)	90	–	–
Embankments (square metres)	2060	391	330
Culverts (square metres)	–	39	–

The planned volume of renewals is detailed in Figure 13. It should be noted that in order to manage the deliverability of our Civils, Signalling & Electrification plans we have included an element of overplanning in our work banks. As a consequence the sum of our route plans exceeds our plan for the network as a whole. It is likely that a

small proportion of the activities in these areas will slip to subsequent years.

Maintenance

Figure 14 shows the planned level of expenditure on maintenance on this route over the next three years.

Figure 14 Forecast expenditure

£m (05/06 prices)	2006/07	2007/08	2008/09
Maintenance	8	7	6

Infrastructure investment

Figure 15 highlights committed schemes that are planned for completion in the financial year shown.

Figure 15 Planned infrastructure investment						
Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year
A Evergreen Phase 2 (16.01)	Provision of additional platforms at Marylebone station	Increased capacity and improved performance: platforms for 41 vehicles to become 51, and 10 trains in the peak hour to become 20	Station	Chiltern Railways	5	2006
B Evergreen Phase 2(16.01)	Track and signalling improvements at Neasden South Junction	Improved performance. Headways improved from 8 minutes to 3	Track and Signalling	Chiltern Railways	5	2006
C Evergreen Phase 2 (16.01)	Signalling improvements between High Wycombe and Bicester	Increased capacity and improved performance. Headways improved from 8 minutes to 4	Signalling	Chiltern Railways	5	2007
D High Wycombe station (16.01)	Improve passenger and interchange facilities at High Wycombe station	Improved passenger flows and ambience at the station	Station	Chiltern Railways & High Wycombe District Council	2	2006/07
E Denham station (16.01)	Improve passenger facilities at Denham station	Improved passenger flows and ambience at the station	Station	Chiltern Railways & Network Rail	2	2006/07
F New Station (16.05)	Provision of new parkway station at Aylesbury Vale	Improved access to the rail network and capacity for growth	New asset	ODPM, Chiltern Railways, Bucks County Council	2	2007/08
G Car park extension	Extension to car park at	Improved access to the network and capacity for	Station	Chiltern Railways	6	2006

Figure 15 Planned infrastructure investment

Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year
(16.01)	Bicester North station	growth				
H Car park (16.01)	Beaconsfield car park	Improved access to network and capacity for growth	Station	Chiltern Railways	4	2006
I Car park (16.01)	Gerrards Cross car park	Improved access to network and capacity for growth	Station	Chiltern Railways	4	2006
I Turnback siding (16.01)	Provision of new turnback siding at Gerrards Cross	Increased capacity and improved performance	Track and Signalling	Chiltern Railways	3	2006/07
E Stations renewals (16.03)	Replacement of timber staircases and repairs to footbridge at Great Missenden Station	Renewals	Station	None	2	2006/07
E Stations renewals (16.01)	Repairs to steel on platform canopy at Denham station	Improvement to condition of canopy above platform	Station	None	2	2006/07
I Stations renewals (16.01)	Redecoration of platform canopy at Gerrards Cross	Improvement to appearance of platform canopy	Station	None	2	2006/07
G Civils renewals (16.01)	Earthworks at Bicester North	Renewals	Earthworks	None	2	2007/08

Figure 15 Planned infrastructure investment

Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year
K Civils renewals (16.01)	Significant work to continue at Ardley cutting	Improvements to embankments and earthworks	Earthworks	None	5	2007/08
L Civils renewals (16.01)	Brickwork repairs to Chalfont Viaduct	Improvements to condition of Chalfont Viaduct	Structures	None	3	2006/07
M Track renewals (16.03)	Plain lining works planned at Stoke Mandeville and Little Kimble	Renewals	Track	None	3	2007/08
N Civils renewals (16.01)	Earthworks at Blackthorn and Piddington	Renewals	Earthworks	None	2	2007/08
O Telecoms renewals	Customer Information Screens and renewal of central processes	Renewal of equipment but with passive provision for Chiltern Railways to upgrade as part of their wider area network at Banbury, High Wycombe and Aylesbury	Telecoms	None	4	2006/07

The following table highlights uncommitted schemes under development.

Figure 16 Infrastructure investment under consideration

Project	Scope	Enhancement or output change	Main asset type(s)	Status
<p>P Banbury Remodelling (17.07)</p>	Remodelling of Banbury station layout in conjunction with track and signalling renewals on Route 17, will increase capacity on this route	Improve operational flexibility and freight and passenger capacity, capability and performance	Track & Signalling	Scheme is under consideration
<p>C Neasden Aggregates (16.01 & 16.02)</p>	Conversion of the engineers' sidings at Neasden to aggregates siding	Improve operational flexibility	Track	Scheme is under consideration
Signalling Renewals	ATP life extension works	Renewals	Signalling	Scheme is in GRIP stage 0

Appendix

Figure 17 Strategic route section

Predominant aspect recorded (secondary aspects recorded in brackets) ELR is Engineers Line Reference and RA is Route Availability

SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway	No of Tracks
16.01	Marylebone – Aynho Jcn	NAJ2 & 3 MJC1	London & SE	DfT	No	W7 (W6)	8 (7)	100 (60)	none	TCB	3 (5) (7) (11)	2
16.02	Neasden South Jcn – Harrow	MJC 1	London & SE	DfT	No	W6	8 (7)	75 (60)	none	TCB	4	2
16.03	Aylesbury – Great Missenden	MJC 2	London & SE	DfT	No	W6	8	75	none	TCB	9	2
16.04	Princes Risborough Jcn – Aylesbury	PRA	London & SE	DfT	No	W7 (W6)	7	40	none	TCB	15	1
16.05	Freight Lines	OXD MJC3	Freight	DfT	No	W8	8 (7)	30	none	KT TB	various	1

Capacity and operational constraints

- A Beaconsfield station: no through fast lines
- B Aylesbury – Princes Risborough: single track section
- C Marylebone: throat capacity constraint