

# Proposed Changes – An Appraisal

Prepared by a member of the Chiltern Society Planning Team, who is an ex air traffic controller, this document summarises how the route changes may affect our “area of interest” (defined as the Chiltern Society area illustrated on the “about-Chilterns” page of the Society website). It seeks to add value to the consultation material by describing how the current theoretical routes and procedures are modified by operational practice; and to assess, similarly, how the future routes may be thus modified. Clearly, any forecast of future operational practice is necessarily speculative to some degree. Italics are used where there is the greatest degree of uncertainty.

Sections 1 to 6 summarise each airfield, runway direction, and route in turn. Section 7 highlights those geographical areas where it is considered the most significant changes will occur. Section 8 covers some general considerations.

## Explanatory notes for Sections 1-7

Runway direction: aircraft normally take off and land into wind; the Luton, Heathrow and Northolt runways are aligned approximately east-west; “easterly” / “westerly” operation refers to taking off / landing towards east / west respectively; historical data is given for the proportion of time that each occurs. Wind patterns may of course be different in the future.

Route: “departures to such-and-such direction” denotes the direction of the route after the initial manoeuvres have been made; for each airport, historical data is given for what proportion of departures from each airfield use each route; this is chiefly determined by the destination, and the distribution of destinations may of course be different in the future.

Where altitudes are mentioned, these are in relation to sea level. (Section 8.4 expands on the issue of heights, particularly in relation to the design of departure routes and the implications for the interpretation of the maps in the NATS consultation).

Where references are made to “quiet” and “busy” times, these refer to the number of other aircraft around in the immediate area, which has a bearing on how much flexibility exists to give aircraft shorter routings. Although there is a loose pattern to quiet and busy periods, for example the middle of the night is predictably very quiet, quiet times can occur at any time of day.

## 1. Luton departures

### 1.1 Easterly operation (c33% of time)

#### 1.1.1 Departures to East and South East

Approx. 40% of Luton departures go this way.

#### Present theory and practice

Route affects areas between Luton and Stevenage, and south of Stevenage. Most aircraft follow route, a few go east early.

### **Future theory**

Route will go ENE skirting Stevenage to north, then east. Areas to south of Stevenage will thus be relieved.

### **Future practice**

Believe almost all will follow route until out-of-area.

## **1.1.2 Departures to West**

Approx. 50% of Luton departures go this way

### **Present theory and practice**

Turn right after departure, overflying Codicote. Route then overflies Harpenden and Wendover, (thereby crossing AONB), then slight left turn to fly very close to AONB boundary (partly in, partly out) close to Princes Risborough, and just north of Stokenchurch. In practice, almost all get put on headings to south of this route to remain clear of inbound traffic on centreline, thus overflying more of AONB, and probably affecting Berkhamsted. At very quiet times, aircraft will go south before Harpenden. Initial altitude is 4000ft, 5000ft after abeam Leighton Buzzard, but most are climbed to 5000ft at earlier stage, and some to higher levels.

### **Future theory**

Right turn will occur earlier, to stay west of Codicote, but wider to stay south of Harpenden and Wheathampstead; then NW to join a track 1-3 miles south of present one, taking it closer to Berkhamsted, south of Wendover, overhead Stokenchurch, thus overflying more of north-western edge of AONB. Initial altitude 4000 feet, 5000ft only after abeam Wendover. This is to provide absolute certainty of vertical separation against slow-climbing northbound departures from the westerly runway at Heathrow.

### **Future practice**

New track is specifically designed to provide separation against inbound traffic on centreline, thus allowing them to be left on route. *However it is possible that there may still be some circumstances when aircraft are put on headings just as now.* At very quiet times, aircraft will still turn south early.

*Because the lower altitude is only to provide separation against slow-climbing Heathrow departures off the westerly runway, these are relatively few in number, and on many occasions Heathrow will not be using the westerly runway, in practice early climb will occur to at least 5000ft fairly frequently, albeit not as much as now.*

## **1.1.3 Departures to north**

Approximately 10% of Luton departures go this way

### **Present theory and practice**

Affect areas west of Hitchin. Almost all are taken off route when they turn left, spreading tracks.

### **Future theory**

Unchanged

### **Future practice**

Unchanged

## **1.2 Westerly operation (c66% of the time)**

### **1.2.1 Departures to east and south east (c40% of Luton departures)**

#### **Present theory and practice**

Turn SE after departure, affecting Flamstead. All follow route until out-of-area.

#### **Future theory**

Totally changed. Will track SW until near Aldbury, then right turn to head NE (south of Leighton Buzzard, north of Houghton Regis), then east to just south of Hitchin.

*Altitude 5000ft, then 6000ft after abeam Luton.* [The initial route until turn NE is identical to proposed route for northbounds]

#### **Future practice**

*Anticipate all will follow full route, unless climbed to higher levels early, which may be possible for a few, at any time, but for most at quiet times.*

### **1.2.2 Departures to west (Approx. 50% of Luton departures)**

#### **Present theory and practice**

SW to pass west of Flamstead and Harpenden, then similar WSWly track as easterlies to overfly AONB to Wendover, then SW to north of Stokenchurch. Almost all follow route. At quiet times, some are turned south early.

Initial altitude 5000ft. Some get continuous climb to higher levels.

#### **Future theory**

Initial route will be straighter, initially further north (north of Markyate), intercepting present route in Little Gaddesden area, then diverging to south of present route by 1-3 miles to go south of Wendover and overhead Stokenchurch.

Initial altitude 4000ft with climb not until abeam Wendover. This is to provide absolute certainty of vertical separation against slow-climbing northbound departures from Heathrow.

#### **Future practice**

Almost all will follow full route, although at very quiet times will turn south early.

*Because the lower altitude is only to provide separation against the very slowest-climbing Heathrow departures, and the number of these is relatively few, in practice early climb will often occur to at least 5000ft, but it is likely that a brief levelling-off at 4000ft will be the norm.* Some will get early climb to higher levels.

### **1.2.3 Departures to north (Approximately 10% of Luton departures)**

### **Present theory and practice**

SW between Markyate and Flamstead, then West to circa Little Gaddesden, then NNW over eastern edge of Leighton Buzzard and Milton Keynes. Most get turned north early, and on to headings, creating spread of tracks.

Initial altitude 5000ft.

### **Future theory**

Initial route will be straighter, initially further north (north of Markyate), intercepting present route in Little Gaddesden area. Turn to north will occur c2miles further west, and then will head NE and N staying east of Leighton Buzzard and Milton Keynes.

Initial altitude 5000ft.

### **Future practice**

Opportunities to turn north will be greatly reduced by preceding E/SEbound departures on same track; spread of headings **after** turn will still occur.

## **2. Luton arrivals**

### **2.1 Easterly (c33% of time)**

#### **Present theory and practice**

From (out-of-area) holding stack, enter our area of interest north of Hitchin, heading west then south and east onto final approach. There is no set route, just a corridor of airspace, so tracks are spread. Overflying of Leighton Buzzard is not permitted, although delineated area on radar map doesn't include some of its northern outskirts; some turn south "inside" (i.e. south and east of Leighton Buzzard) to join final approach just to east of Ivinghoe, some stay north and west of Leighton Buzzard and join final approach to west of Ivinghoe. Aircraft are level at 5000ft for long period, descending at, or just before, the turn south.

In practice almost all arrivals from north and west (maybe 20% of Luton arrivals) don't go to holding stack, instead taking a direct route to join the centreline - only if Luton is very busy does this not happen. Additionally some (a very variable proportion – see below) arrivals from south (arrivals from south constitute maybe 50% of Luton arrivals) don't go to holding stack but are taken off route overhead or south of Heathrow, and given headings from there onto centreline. The proportion varies depending on busyness of non-Luton traffic (for example Heathrow holding traffic), busyness of Luton traffic, mood / "habit" / competence of the particular team of controllers on at the time; but certainly from mid-evening onwards and at night, most arrivals will get this short cut. For all these short cuts the particular tracks taken are widely spread, and often join the centreline a long way out, even west of Aylesbury; and they usually get continuous descent from higher levels.

#### **Future theory**

Although a new holding stack is created for Luton, it is still outside our area of interest, and basic route and altitude unchanged. However, a set route is defined which controllers can opt to use (rather than giving headings) – this goes north of Hitchin and Leighton Buzzard then turns south and east to join centreline just west of Ivinghoe. Also more controlled airspace is created to make it easier to properly skirt Leighton Buzzard to north.

#### **Future practice**

Changes have no bearing on the opportunities for short cuts described under present theory and practice, so would apply to same proportion of traffic. **However, consultation specifically**

**asks for opinion on option to require all aircraft to route via holding stack – this would obviously alter position radically.** *For those aircraft routing via holding stack, it is hard to judge how frequently the set inbound route will be used: my judgement is that it may be regular practice for the first section of the route, but it will remain common for the turn south and east to be allocated by the controller, thus taking the aircraft off the set route at this point.*

## 2.2 Westerly (c66% of time)

### Present theory and practice

The final approach overflies Stevenage. Between the (out-of-area) holding stack and final approach, tracks are very varied, many not affecting our area of interest, but a few will involve S-shaped pattern in Barton-le-Clay area. There is no set route. Aircraft are normally kept at 5000ft or above until about 15 track miles from touchdown.

In practice most arrivals from north and west (maybe 20% of Luton arrivals) don't go to holding stack, instead passing east to the north of Luton then south and west onto centreline, thereby affecting areas around Barton-le-Clay and Hitchin. The proportion of this category getting this short-cut compared with easterly operation, is slightly less, but still the great majority. The scope for short-cuts for arrivals from south (arrivals from south constitute maybe 50% of Luton arrivals) is much less than for easterlies except at very quiet times, or in some special combinations of circumstances too complicated to easily explain, and can be discounted in the big picture.

### Future theory

Although a new holding stack is created for Luton, it is outside our area of interest, so aircraft may still affect our area of interest in a similar way. However, a set route is defined which controllers can opt to use (rather than giving headings) and this keeps aircraft east of our area of interest until on final approach.

### Future practice

*It is likely that the proportion of arrivals from the north and west getting short-cuts will be reduced, partly because of the proximity of new departure routes to east and south-east, but mainly because the future full route provides a more satisfactory arrival route than the existing full route, so the perceived pressure to depart from it is less. **Also note that the consultation specifically asks for opinion on option to require all aircraft to route via holding stack which would of course remove the option of short-cuts.** For those aircraft routing via holding stack, it is hard to judge how frequently the set inbound route would be used: it may become the default route, and only deviated from when a need to adjust spacing of inbound aircraft arises.*

## 3 London City

**Arrivals** from north and west (average 2-3 per hour): presently pass close to Luton altitudes 5000-7000 feet. Largely unchanged in future, *may tend towards higher end of this range due to new set of interactions with other routes.*

**Departures** to north and west (average 2-3 per hour): presently pass close to Luton, altitudes 5000-8000 feet. Future route takes these completely away from our area of interest.

## 4 Stansted

**Arrivals:** in present and future, too high to have significant impact on our area of interest.

**Departures to west and north:** current minor impact on extreme east of our area of interest. Future routes provide more track miles before entering our area, so aircraft may be slightly higher, lessening impact.

## **5 Northolt departures**

### **5.1 Easterly (c30% of time)**

#### **5.1.2 Departures to East and South East**

Approx. 20% of Northolt departures go this way (note this only amounts to 0.1-0.2 per hour on this route)

##### **Present theory and practice**

Route skirts our area of interest to east of Abbots Langley. Almost all aircraft follow route.

##### **Future theory**

Route will continue north from east of Abbots Langley, just outside area of interest, until entering it at East Hyde then turning northeast to Stevenage, at 5000-6000ft.

##### **Future practice**

Believe most will follow route.

#### **5.1.3 Departures to West**

Approx. 60% of Northolt departures go this way (note this only amounts to 0.3-0.7 per hour on this route)

##### **Present theory and practice**

Enters area of interest near Abbots Langley, tracking WNW to just south of Wendover, then SW to fly close to Princes Risborough, and just north of Stokenchurch [same track as Luton westerly departure to west]. In practice, most follow this route. Altitudes 4000ft / 5000ft. In practice a few are climbed to higher levels at earlier stage.

##### **Future theory**

Route will turn SW slightly earlier, passing slightly further south of Wendover then tracking 1-3 miles south of present route, thus passing south of Princes Risborough and overhead Stokenchurch, thus overflying more of north-western edge of AONB. Altitudes similar.

##### **Future practice**

Believe most will follow route.

#### **5.1.4 Departures to North**

Approx. 20% of Northolt departures go this way (note this only amounts to 0.1-0.3 per hour on this route)

##### **Present theory and practice**

After skirting edge of area of interest to east of Abbots Langley and Hemel Hempstead, enters it to north-east of Hemel Hempstead, tracking NNW over Dunstable and Houghton Regis. In practice, most will be put on headings, spreading the tracks. Altitudes 5000-6000ft. In practice many are climbed to higher levels at earlier stage.

#### **Future theory**

Very minor change, passing slightly further east of Hemel Hempstead. Altitudes similar.

#### **Future practice**

Believe same spread of tracks and earlier climbs will continue.

## **5.2 Westerly (c70% of time)**

### **5.2.1 Departures to East and South East**

Approx. 20% of Northolt departures go this way (note this only amounts to 0.1-0.2 per hour on this route)

#### **Present theory and practice**

Route overflies Denham, and close to Chalfont St Peter and Rickmansworth before leaving our area of interest. Altitudes very low at Denham, 3000-4000ft near Rickmansworth. All aircraft follow route.

#### **Future theory**

Considerably changed. Route will continue north beyond Chalfont St Peter passing close to Little Chalfont to a point just east of Berkhamsted, then NE over Flamstead and northern edge of Stevenage. Altitudes very low at Denham, c4000ft by Little Chalfont, 5000-6000ft by abeam Berkhamsted.

#### **Future practice**

Believe most will follow route.

### **5.2.2 Departures to West**

Approx. 60% of Northolt departures go this way (note this only amounts to 0.3-0.7 per hour on this route)

#### **Present theory and practice**

Enters area of interest near Denham, tracking N to near Chalfont St Peter, then NW passing west of Amersham and Wendover, then SW to fly close to Princes Risborough, and just north of Stokenchurch [same track as Luton westerly departure to west]. In practice, many are turned off route to west, before Wendover.

Altitudes very low at Denham, 4000ft after Chalfont St Peter, 5000ft by Wendover. In practice if left on route, these altitudes normally also apply; if turned off route to west, may still be low at that point, but climb to 7000ft has to ensue quickly.

#### **Future theory**

Northbound section of route slightly longer, so that N/Werly section passes east of Amersham to point south-east of Wendover, then SW tracking 1-3 miles south of present route, thus passing south of Princes Risborough and overhead Stokenchurch, thus overflying more of north-western edge of AONB.

Altitudes similar.

### **Future practice**

Opportunities to take aircraft off route to west may be reduced because they will initially be under the control of Luton approach controllers [but still within the same operations room] who will have less scope to take aircraft off the route.

### **5.2.3 Departures to North**

Approx. 20% of Northolt departures go this way (note this only amounts to 0.1-0.3 per hour on this route)

### **Present theory and practice**

Enters area of interest near Denham, tracking N to pass near to Chalfont St Peter and Little Chalfont, then east of Chesham and Berkhamsted, and west of Dunstable and Houghton Regis. In practice, many will be put on headings, spreading the tracks.

Altitudes very low at Denham, 4000ft after Chalfont St Peter, 5000ft by abeam Berkhamsted, 6000ft shortly afterwards. In practice most continue climb to higher levels after abeam Berkhamsted.

### **Future theory**

Negligible change.

Altitudes similar.

### **Future practice**

Believe same spread of tracks and earlier climbs will continue.

## **6 Heathrow**

### **6.1 Easterly (c30% of time)**

Present and future routes will affect our area of interest in same way.

### **6.2 Westerly (c70% of time)**

#### **6.2.1 Departures to North-East**

Average of 9 flights per hour on this route.

### **Present theory and practice**

Enter area of interest at Burnham, as they turn towards NE, then passing between Beaconsfield and Gerrards Cross, close to the Chalfonts, and south of Rickmansworth. In practice, a few are taken off route to north or south after Burnham, but usually only if also given climb to higher levels.

Altitudes: all climb straight to 6000ft: heaviest traffic will only be 3000ft by Burnham, but lightest can be level 6000ft by that point. If there is no inbound Heathrow traffic holding at Bovingdon, continuous climb will be given to a higher level.

### **Future theory**

Route will enter area of interest further west to west of Burnham, and turn towards NE will take route much closer to Taplow and Cookham and slightly closer to Beaconsfield; portion of route over Chalfonts very similar; but before Rickmansworth turns more towards north to pass north of Rickmansworth and then between Kings Langley and Abbots Langley. Altitudes similar, although extra track distance caused by shift of route to west may result in aircraft being slightly higher.

### **Future practice**

Believe most aircraft will follow full route.

As now, if there is no inbound Heathrow traffic holding at Bovingdon, continuous climb will be given to a higher level, sometimes in conjunction with taking aircraft off route to north or south.

## **6.2.2 Departures to North**

Average of 8 flights per hour on this route (can vary a lot from this average because of the component of transatlantic flights, which congregate around particular times of day, and take different initial routings from day to day depending on high-level wind patterns).

### **Present theory and practice**

Enter area of interest at Burnham then north passing close to Taplow and Cookham, overhead Wooburn Green, between Beaconsfield and Loudwater, overhead Great Missenden, and just east of Wendover. In practice, many are put on headings, mainly to east of route, but can be to west especially if combined with further climb – thus spreading tracks.

All climb straight to 6000ft: heaviest traffic will only be 3000ft by Burnham, but lightest can be level 6000ft by that point. Fast climbing traffic, especially in moderate or light traffic conditions, will be given continuous climb to higher level.

### **Future theory**

Route unchanged within area of interest.

### **Future practice**

Use of headings resulting in spread of tracks, and opportunities for continuous climb to higher levels unchanged.

## **7. Geographical areas where most significant changes will occur**

This section attempts to identify those places within our area of interest where increases or decreases of overflying aircraft due to route changes are likely to be most marked, with some indication of quantitative change. Please note that the quantitative change refers to aircraft **on the altered routes**, not all aircraft seen or heard, since overflights may also occur from other, unchanged, routes. Please also note that the estimated quantitative change refers to the “overnight” change which would occur as a direct result of the alteration to the route, and takes no account of any future change in total traffic from that airport.

### **7.1 More noise**

**7.1.1 Corridor between Markyate and Little Gaddesden: when Luton on westerly runway**, will be affected by all Luton departures, not just ones to west and north as now, representing a circa 60% increase in numbers.

**7.1.2 Corridor between Little Gaddesden, Ivinghoe and Edlesborough: when Luton on westerly runway**, will be affected by Luton departures to north and east, not just ones to north as now, representing about a sixfold increase (500%) in numbers.

**7.1.3 Marsworth: when Luton on westerly runway**, will be newly exposed to Luton departures passing close by (departures to north and east, representing about 25-30% of Luton departures).

**7.1.4 Corridor between Cholesbury, Little Hampden, Loosley Row, and Stokenchurch: when Luton on westerly runway**, southerly displacement of the route for departures to the west will bring aircraft closer, although no change in numbers. When **Luton on easterly runway**, although the route will be displaced in same way, current operational practice already brings aircraft into this area, so there will be no significant change in practice, except that aircraft are likely to be more concentrated on the centreline of the new route, rather than spread as now.

**7.1.5 Taplow, Cookham, eastern edge of Beaconsfield: when Heathrow on westerly runway**, will be affected by Heathrow departures to north-east, not just ones to north as now, representing about a doubling (100% increase) in numbers.

**7.1.6 Corridor between Little Chalfont, Latimer and Flaunden: when Northolt on westerly runway**, will be affected by all Northolt departures - currently, only ones to the north pass overhead, whilst ones to west pass close by. Although this represents an estimated fourfold increase (300%) in numbers, and aircraft will be at low altitudes, absolute numbers will be low (average of just over one per hour).

## **7.2 Less noise**

**7.2.1 Corridor between Wendover, Ellesborough, Princes Risborough and Chinnor: when Luton on westerly runway**, southerly displacement of the route for departures to the west will take aircraft further away, although no change in numbers. When Luton on easterly runway, although the route will be displaced in same way, my belief is that no significant change will occur in practice – current operational procedures mean that most departures are already displaced south of route.

**7.2.2 Hedgerley, Egypt: when Heathrow on westerly runway**, will no longer be directly overflown by Heathrow departures to north-east, due to displacement of route to west; average of 9 departures per hour on this route.

**7.2.3 environs of Flamstead: when Luton on westerly runway**, will no longer be overflowed by Luton departures to east and south-east (representing about 40% of Luton departures); furthermore will no longer be affected by London City northbound departures, many of which currently pass close by. However, slightly counter balanced by new route for Northolt departures to east which comes close, but these will be very infrequent, and higher.

## **7.3 More noise during one runway direction, less on other.**

### **7.3.1 environs of Meppershall:**

When Luton on westerly runway, may no longer be affected by as many Luton arrivals if the scope for short-cuts for arrivals from north and west is reduced by proximity of new departure routes, or by mooted new rules requiring all arrivals to route via holding stack; or if new set

route between holding stack and landing is routinely used. See 2.2 for more detail – **there are considerable unknowns here, so conclusions should be treated with particular caution.**

When Luton on easterly runway, **if mooted option of requiring all aircraft to route via holding stack is adopted**, will be overflowed by all, rather than a proportion (very approximately 50-80%) of arrivals as now. See 2.1 for more detail.

## **8. Other factors affecting spread of traffic**

### **8.1 Concentration of traffic due greater accuracy of P-RNAV**

To quote the consultation document, “P-RNAV will enable aircraft to fly a more consistent departure flight path than is possible using conventional navigation systems. This means the swathe of airspace in which aircraft are seen today will reduce in some places”. How precise the track-keeping will be is hard to judge, i.e. whether it will be more noticeable in practice. Track-keeping will be more precise on straight-line sections of routes than in turns.

### **8.2 Aircraft above 4000ft**

Also note, that unless extra rules are brought in (separate to what is covered in the consultation paper), aircraft will still be able to be taken off the routes after the end of the noise preferential route (normally 4000ft) creating the same sort of spread of tracks as now.

### **8.3 Thunderstorm activity**

For safety reasons aircraft need to avoid flying through or close to thunderstorms or similar very turbulent clouds. As a consequence, when there is such activity, aircraft may follow routes radically different from the normal ones

### **8.4 Heights of aircraft on departure routes**

Departure routes contain restrictions on the height that aircraft fly, all defined as altitudes (i.e. height above sea level). They are usually a mix of minima: “cross point x at 3000feet or above” (normally in order to remain inside controlled airspace), and maxima “cross point y not above 5000feet” (normally to provide separation against other routes above). It is also common for there to be steps, so that after a certain point, climb is allowed to a higher level. If you want to see the detailed design of the new routes depicted in this way, they are in Part J of the NATS consultation material.

This mix of minima and maxima effectively creates a band of altitudes within which aircraft may legitimately be, whilst still complying with the restrictions. So although some aircraft may only just meet the minimum restriction, most will exceed this and be (significantly?) higher. It is understood that the NATS maps **for the proposed routes** indicate the height of an aircraft just meeting the minimum restrictions, and so in practice many aircraft could well be higher. It is also thought that the maps **for the existing routes** indicate the actual heights of aircraft based on historical data, rendering direct comparison between the two maps impossible – this understandably has led to some confusion and misunderstanding.

There is also some uncertainty about how variation in ground level has been taken account of on the NATS maps – unfortunately I am unable to provide any explanation or clarification beyond what is set out in the consultation document.