

# The Feasibility of Updating of the Black Country Historic Landscape Characterisation Using Online Photography<sup>1</sup>



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## 1. Introduction

The Black Country Historic Landscape Characterisation (BCHLC) is a record of the inherited character of the area within the boundaries of the local authorities of Dudley, Sandwell, Walsall and Wolverhampton<sup>2</sup>. It takes the form of a spatial database, derived from a sequence of historic maps, aerial photography, and other documentary sources. Although assembled over a period between 2004 and 2006, it used the landscape as it was in 2000 as the basis of its geography (i.e. the parcels of land used within the record) and as the descriptions of its 'current' character.

A basic character of the landscape of the Black Country is its dynamic ever-changing nature. Accordingly in 2010 the HLC database is already out of date for some areas, affecting its use particularly in describing modern character and distinctiveness. At the same time, the extent to which the landscape is represented elsewhere by web-based photography is increasing rapidly, and this trend is starting to be employed to improve records of the historic environment<sup>3</sup>.

This report examines the feasibility of updating the BCHLC using this online resource. It should be read in conjunction with the recent report by the Black Country Archaeology Service which considered whether the BCHLC could be updated using the output of the series of more local HLC studies<sup>4</sup>.

In particular, the questions which are discussed in this document relate to the advantages of updating (sections 2 & 3) and the practicalities of using online photographic sources to modify the existing BCHLC (sections 4, 5, 6 and 7).

## 2. What evidence do we have of unrecorded change?

Evidence exists, both direct and circumstantial, that the local landscape has undergone significant change in the last 10 years. It comes from a number of sources:-

### *a) Observations made while using HLC data*

A number of sites which had been recorded by the HLC (as they stood in 2000) were re-examined during 2008 as part of a project to describe current landscape character. Among the categories of landscape which were re-assessed (housing, industry and open land), three in particular showed a relatively high degree of change in the period 2000-2008. These were post-war high density housing, pre-war

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<sup>1</sup> This report has been made possible by the support of English Heritage West Midlands Region.

<sup>2</sup> The reports of the Black Country Historic Landscape Characterisation project are available to view or download from: [http://ads.ahds.ac.uk/catalogue/archive/blackcountry\\_hlc\\_2009](http://ads.ahds.ac.uk/catalogue/archive/blackcountry_hlc_2009).

<sup>3</sup> One example of this is Essex County Council's 2008 report, *Online Aerial Reconnaissance in Essex*. Online aerial photography has also been used to supplement other sources in the historic characterisation of Worcestershire for example.

<sup>4</sup> 'Detailed Historic Landscape Characterisation Studies In The Black Country: A Review Of Their Value To The Black Country Historic Landscape Characterisation' Black Country Archaeology Service.

industrial sites, and the entire category of open land. Together these represent about 15% of all the records in the HLC and 12% of its total land area.

While even in these categories only a proportion of records would require a change over their 2000 status, this proportion could nevertheless be important. In the case of pre-war industry for example our re-assessments showed that it is likely that the records for at least a third of sites have become out of date in the last 10 years.

#### *b) The continuation of local trends*

The database of the Black Country HLC records more than 25,000 previous land uses of the existing 'modern' polygons. Each one of these represents a recorded change in character and we can use this fact to draw logical conclusions about the trend in changing land use.

In order for the BCHLC to record 25,000 changes of use in the 250 years it represents, for example, there would need to be about 100 polygons which changed their use every year. This would mean that about 8% of polygons (i.e. around 1,000) could be expected to change their use every decade (assuming there were no polygons which experience more than one change of use in this period).

#### *c) National evidence of change*

We can infer from trends in England and in the UK more generally that change in the Black Country in the first decade of the 21<sup>st</sup> century is likely to have been significant. This is illustrated by the example of change in the housing sector where we know that, of the development which has taken place in the last 10 years, much of it has been in urban areas such as the Black Country. One report published this year has commented that "*in the last decade, nearly all residential development has been concentrated in or near urban areas*"<sup>5</sup>.

### **3. What would be the advantages of updating?**

A primary purpose of the Black Country HLC is to inform the planning process as it is regulated by the four local authorities. Although there are clear strategic landmarks in this process (such as the recent publication of the Core Strategy for the area), planning is clearly an ongoing procedure which relates to the urban environment *as it exists today*. The HLC provides an almost unique historical perspective to this activity, but in order to maintain its relevance it needs to be able to relate to the contemporary environment, showing the survival or otherwise of historic character in the landscape. The indications of more rapid change in urban areas (than might be recorded by a largely rural, county-based HLC project) serve to emphasise this particular need in conurbations such as the Black Country.

Updating the BCHLC would not only provide the ability to assess change in the 21<sup>st</sup> century, it would also ensure the continuing relevance to future planning of the historical analysis embodied in the HLC, including the preservation and/or management of historic assets.

### **4. What online photographic sources are available?**

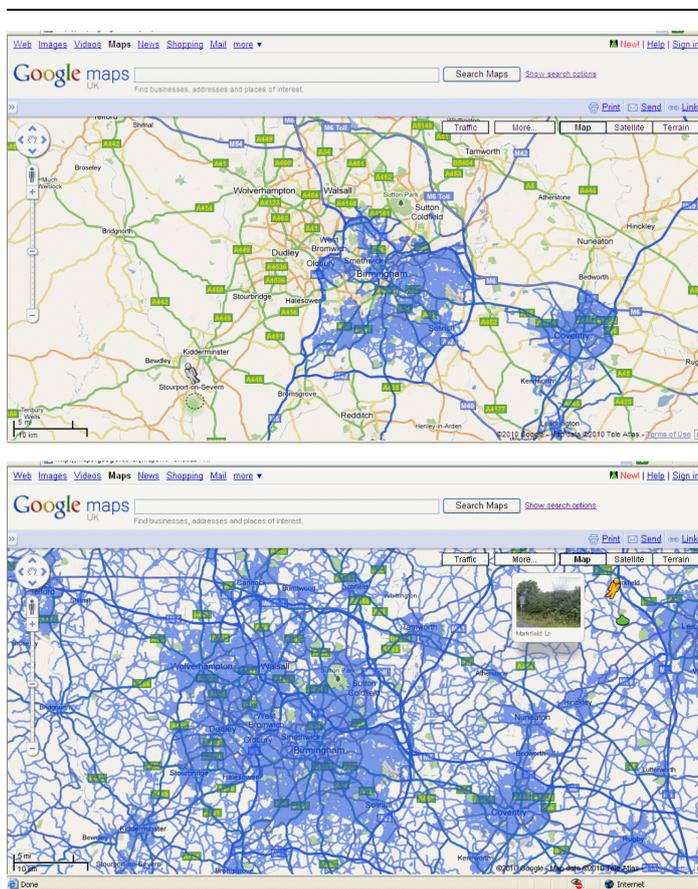
The availability of free-to-view, online sources of landscape imagery has expanded rapidly since 2000. In the middle of the last decade the desktop applications *Google Earth* and its Microsoft equivalent, *Virtual Earth*, were launched. Soon after the websites *Google Maps* and *Windows Live Local* (which became *Bing Maps*) started

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<sup>5</sup> Foresight Land Use Futures Project (2010) Final Project Report. The Government Office for Science, London. Available from: <http://www.foresight.gov.uk/OurWork/ActiveProjects/LandUse/lufoutputs.asp>.

to show satellite images. Using a different approach to representing the landscape, *Google Street View* was launched in 2007 and, as shown by Figure 1, expanded its coverage very considerably in 2010. Importantly from our point of view this expansion covered most of the Black Country for the first time.

FIGURE 1:  
**THE EXPANSION OF GOOGLE STREET VIEW COVERAGE IN 2010**



The top image, which shows the *Street View* coverage (in blue) as it was before 2010, illustrates that the Black Country to the west of the M5 motorway was not represented at that time. Below is the coverage over the same area after March 2010.

In general these developments represent a radical change in the ability of both professional and lay audiences to visualise their local landscape. *Google Street View* has had a particular impact on our ability to scrutinise the urban environment as the density of available images of any location is clearly related to the density of roads and streets.

Table 1 summarises the online photographic resources as they are currently available. In general they provide vertical satellite imagery, with the exception of the oblique images available as the 'birds eye' feature of *Bing Maps* and the photography used for *Google Street View*. The *Bing Maps* website provides four different oblique views (nominally north, south, east, and west) of each location which together representing a powerful way of viewing and analysing landscape features. *Google Street View* meanwhile offers 360° images of the landscape acquired by a vehicle-mounted camera.

TABLE 1:  
**POTENTIAL ONLINE PHOTOGRAPHIC SOURCES FOR UPDATING**

Source:	Type of image	Available coverage	Date of material <sup>6</sup>	Notes
<b>192.com</b>	aerial, vertical	100%	~2005/6	<a href="http://www.192.com/places/aerial-photos/">www.192.com/places/aerial-photos/</a> ; No associated dates or metadata; uses <i>Getmapping</i> data.
<b>Google Earth</b>	aerial, vertical; 3D buildings.	100% (vertical)	2007	<a href="http://www.earth.google.com">www.earth.google.com</a> ; Date of source imagery date included at bottom of screen
<b>Google Maps</b>	aerial, vertical	100%	2007	<a href="http://maps.google.com">http://maps.google.com</a> ; No associated dates or metadata
<b>Google Street View</b>	360° street level	~95%	~2008	<a href="http://maps.google.com">http://maps.google.com</a> ; No associated precise dates <sup>7</sup> or metadata
<b>Microsoft Bing Maps<sup>8</sup></b>	aerial, oblique	100%	~2006/8	<a href="http://www.bing.com/maps">www.bing.com/maps</a> - 'birds eye'; No associated dates or metadata
<b>Microsoft Bing Maps</b>	aerial, vertical	100%	~2005/6	<a href="http://www.bing.com/maps">www.bing.com/maps</a> - 'aerial'; No associated dates or metadata

Clearly, from an archaeological point of view, if the images are to be used to inform a record of the landscape an important consideration would be our ability to establish the dates on which the images were acquired. Unfortunately, with the exception of *Google Earth*, the sources in Table 1 do not provide details of the dates on which individual images were captured. An additional complication is that (ostensibly continuous) images available on the same website at the same time (and sometimes of the same location) may have been captured on different dates. Figure 2 illustrates this point in respect of *Google Street View*.

In respect of providing dates on which images were acquired, the current version of *Google Earth*<sup>9</sup> offers much more information than other online sources. Not only is the 'current' image dated (in most if not all cases in the Black Country this is a date in 2007), but by using a 'time slider' feature, illustrated in Figure 3, previously acquired images of the same location (all dated) can be viewed. For most parts of the Black Country there are six images, the oldest being from 1999.

This clearly provides an opportunity to track changes in the landscape in the first years of the 21<sup>st</sup> century. However, in the case of those sources which do not provide a date associated with each image, any use of them as an archaeological

<sup>6</sup> With the exception of *Google Earth / Maps* (*Google Earth* provides dates and *Google Maps* appears to use the same imagery), dates have been inferred from the following corroborating evidence: Princes Cinema on Smethwick High Street (B66 3AP) was demolished in June 2008 but is included on 192.com, most of *Street View*, *Bing* (vertical), and three out of four images provided by *Bing* (oblique); Bearwood House flats (B66 4HN) were demolished in August 2008 but appear on 192.com, *Street View*, *Bing* (vertical) and three out of four images provided by *Bing* (oblique); Shannon's Mill on George Street, Walsall was burnt out and then demolished in August 2007 but appears on 192.com, *Bing* (vertical), one of the four images provided by *Bing* (oblique), but does not appear on *Street View*; The Italian Pentecostal Evangelical Church on Gorsebrook Road Wolverhampton was demolished in 2006 ([www.localhistory.scit.wlv.ac.uk/articles/electronic/roots/roots.htm](http://www.localhistory.scit.wlv.ac.uk/articles/electronic/roots/roots.htm)) but appears on 192.com, *Bing* (vertical) and one of three images provided by *Bing* (oblique); The Crown and Cushion public house on Gospel Oak Road, Tipton, was demolished in 2005 and the cleared site appears on both 192.com and *Bing* (vertical).

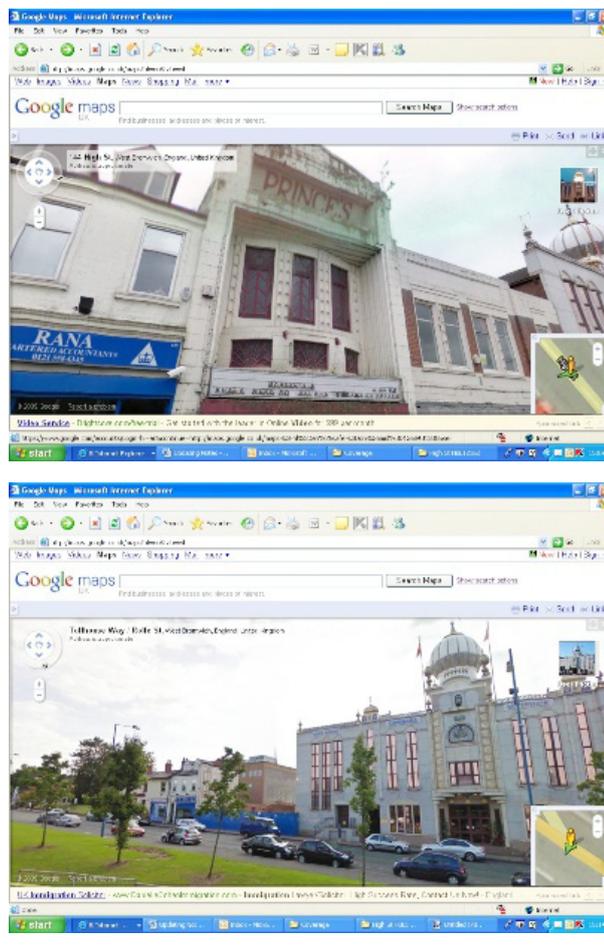
<sup>7</sup> The publication of dates and times for *Google Street View* Images has been debated on the following web page: [www.google.com/support/forum/p/maps/thread?tid=799353af462cc6bb&hl=en](http://www.google.com/support/forum/p/maps/thread?tid=799353af462cc6bb&hl=en)

<sup>8</sup> Previously <http://local.live.com>; <http://maps.live.com>; like *Google Earth*, *Bing Maps* can be viewed in '3D' draped over a terrain model <http://www.microsoft.com/downloads/details.aspx?FamilyID=e9298080-50c4-4f2e-9fc4-4009074996ba&DisplayLang=en>.

<sup>9</sup> Version 5.1.3533.1731, build date 12.11.2009

record will depend on being able to estimate the date of an image from corroborating sources<sup>10</sup>. Indeed, except in the case of *Google Earth* and *Google Maps* the dates shown in Table 1 have been inferred from known changes in the local landscape (in particular demolitions) and they make the assumption that images for our study area of the Black Country were taken at a similar time for each source.

**FIGURE 2:  
PROBLEMS IN DATING GOOGLE STREET VIEW IMAGES**



These two screen grab images were acquired at the same time and illustrate the inconsistency in the dates of *Google Street View* images. Both show views of the site of Princes Cinema in Smethwick High Street: in the top image the building is still standing (immediately adjacent to the Gurdwara with visible dome) while the second shows a vacant plot at the same location. The cinema was demolished in August 2008.

**FIGURE 3:  
THE GOOGLE EARTH 'TIME SLIDER'**



Based on the evidence in Table 1 we can conclude that *Google Street View* is currently<sup>11</sup> the most recent of the sources as it appears to use images acquired in

<sup>10</sup> Essex County Council has also used this approach in the investigation already referred to.

<sup>11</sup> As on 29<sup>th</sup> March 2010.

2008. *Google Earth* and *Google Maps* meanwhile provide the most recent aerial photography. The sources relying on the oldest data appear to be 192.com and *Bing Maps* which only provide images from sometime in 2005 or 2006.

**To conclude this section, we can say that a base of evidence such as the various online imagery provided by Google has the potential to be used to update the HLC.** This is because this particular group of sources provide near comprehensive coverage of our study area together with dateable aerial photography.

## 5. Copyright implications

In the case of the Essex investigation, screen grab images were archived for identified archaeological sites within the study area. Provided copyrights and attributions are preserved and the images are not used in commercial products, Google appears to allow this use. Their website explains for example that use of *Google Earth* imagery is acceptable for purposes other than commercial ones:

“You can personally use an image from the application (for example on your website, on a blog or in a word document) as long as you preserve the copyrights and attributions including the Google logo attribution. However, you cannot sell these to others, provide them as part of a service, or use them in a commercial product such as a book or TV show without first getting a rights clearance from Google”.<sup>12</sup>

## 6. Implications for the structure of the HLC database

As mentioned earlier in this document, the existing structure of the database of the Black Country HLC is based on the geography of the landscape as it existed in 2000. This means that each one of the nearly 13,000 polygons which represent the study area is drawn around a feature which existed at the time (often a single property boundary or grouping of similar houses or factories). While this database of the 2000 landscape can easily be preserved by archiving, the implications of producing an updated version of the HLC are that this geography, or GIS layer, will need to be modified. Indeed, any new database will be based on a new modern geography which will supersede the framework used for the landscape in 2000. This new geography will then be the basis for the organisation of information about previous uses for example.

In the majority of cases the polygon will either remain essentially unchanged since 2000 or those changes in its character which have taken place will not affected its perimeter. In this scenario any new use will prompt a reclassification of its current character and its classification in 2000 will be added to the list of previous landscape types.

There will be a minority of cases where the polygon has experienced encroachment (either partially or totally) by a neighbouring landscape type, has become divided between two or more types, or has become part of a larger area of a single landscape type. Any of these scenarios will not only necessitate the amendment of textual information but also an element of re-drawing of polygon boundaries.

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<sup>12</sup> <http://earth.google.co.uk/support/bin/answer.py?hl=en&answer=21422>.

## 7. What are the potential time and cost implications of updating?

Images provided by *Google Earth* and *Google Street View* are free to view. The alternative of buying a set of aerial images which cover the area of the Black Country could incur costs of between £2,000 and £3,000.

The Black Country HLC database is based on 12,682 polygons. On average it takes 30 seconds just to view each mapped polygon (without any editing). Thus it would take 106 hours or 14 days working continuously to view all the polygons in the database, and possibly 5 times as long (say, 4 months FTE) to edit all the polygons (this compares to 16 months to create the records in the first place).

## 8. Conclusions and recommendations

As a planning tool, the success of Historic Landscape Characterisation depends on its ability to describe the modern landscape in terms of the legacy of its historic development. Partly as a result of its largely urban nature, continuing change in the fabric of the area is likely to erode the ability of the HLC in the Black Country to make this link if it is not updated.

Online sources of free-to-view aerial and street-level photography have grown substantially in the last five years and are developing rapidly. *Google Earth* and *Google Street View* in particular provide the most recent on-line source of data on changes to the Black Country in the 21<sup>st</sup> century. Although the images they provide amount to a relatively comprehensive coverage of the area and are dateable, at the time of writing their imagery is approximately two years old.

Based on these conclusions, the recommendations of this investigation are that:

- a) the BCHLC should be updated on a regular basis in order to ensure its relevance to the planning process
- b) updating the BCHLC using the online images provided by *Google Earth* and *Google Street View* is a practical solution.
- c) if updating of the HLC is to be at an interval of approximately 10 years, any updating of the BCHLC based on online images should not start until 2012 when hopefully more timely information will be available.

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