Habitat & Land Use Tool

Project Plan

October 2013

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Description | Author |
| 1.0 | 30 Aug 2013 | First draft of project plan | Andy Foy |
| 1.1 | 30 Sep 2012 | Revisions following feedback from CB | Andy Foy |
| 1.2 | 03 Oct 2012 | Added milestone dates and 3rd party costs | Andy Foy |

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# Aims

To allow south-east Local Record Centres (LRCs) to more easily and efficiently manage their Habitat and Land Use (HLU) data. Habitat and land use data maintained by LRCs, together with species data, underpins the identification and designation of Local Wildlife Sites and is a key component in Habitat Suitability Mapping, Green Infrastructure planning and EcoSystem Services modelling. It is often also a key deliverable by LRCs to their funding partners. It is therefore critical to be able to maintain habitat and land use data in order to continue to be able to support these processes and to provide agreed deliverables to partners.

# Objectives

* Amend and develop the existing HLU GIS tool by resolving the known issues and implementing a number of change request enhancements.
* Create a more comprehensive and user-friendly set of technical and user-manuals.
* Upload and maintain the tool source code and documentation in suitable internet-based repositories.
* Provide on-going technical support to LRC staff as necessary.

# Roles and Responsibilities

## Project Group

It is proposed that the following people form the project group to ensure the objectives are delivered to timescale and budget.

|  |  |  |  |
| --- | --- | --- | --- |
| **LRC** | **Geographic coverage** | **Contact** | **Role** |
| HBIC | Hampshire | Becky Coneybeer | User Representative |
| IoWRC | Isle of Wight | Anne Marston | User Representative |
| SBIC | Surrey | Rose Parker | User Representative |
| SxBRC | Sussex | Henri Brocklebank | Budget holder |
| Charles Roper | Technical Support |
| Andrew Lawson | Project Co-ordinator / User Representative |
| TVERC | Oxfordshire & Berkshire | Camilla Burrow | Project Manager |
| Graham Hawker | User Representative |
| BMERC | Buckinghamshire & Milton Keynes | Julia Carey | User Representative |

## Project Manager

The Project Manager will be expected to perform the following tasks:

* Give the initial go-ahead to start the project.
* Agree the payment of invoices following the successful achievement of payment related milestones.
* Agree any proposed changes to the project plan, timescales or costs.

## Project Co-ordinator

The Project Co-ordinator will be expected to perform the following tasks:

* Oversee the work programme of the developer on a day-to-day basis.
* Co-ordinate the LRCs user acceptance testing and issue logging.
* Ensure that the LRCs log any new testing issues or queries on the GitHub project website against the relevant known issue or change request.
* Facilitate discussions over design considerations and project priorities between the LRCs and the developer.
* Provide input to, and make final decisions on, the priorities and proposed solutions to the known issues and change requests.

## Technical Support

Technical support will be required from LRC staff by the developer for the following tasks:

* Installation and basic instructions for using ‘Git for Windows’ and ‘GitHub for Windows’ (or alternatives such as SmartGit and TortoiseGit).
* Installation and basic instructions for using Python with Windows.
* Assistance with installing Sphinx (or an alternative such as AsciiDoc) and starting to create documentation.
* Assistance setting up a ReadTheDocs project website.

## User Representatives

The User Representatives will be required to perform the following tasks:

* Install each release of the relevant application version (ArcGIS or MapInfo) of the HLU Tool at the end of each batch/portion.
* Test each release of the tool to determine if the associated known issues no longer occur and/or the change request enhancements work as intended.
* Provide feedback on the success or failure of any changes relating to known issues and change requests in each release using the GitHub project website issues log.
* Provide input to the Project Co-ordinator on the priorities and proposed solutions to the known issues and change requests.

## Budget Holder

The budget holder will release the funds to the developer following receipt of an invoice and approval of the relevant milestone(s) having been met from the Project Manager.

# Work Programme

There are 3 recognised elements of the work programme:

* GIS Tool Enhancement
* User and Technical Manuals
* User Support

## GIS Tool Enhancement

The Provider is required to fix the current issues with the GIS tool which are detailed at Appendix 2 – Known Issues and Change Requests. The issues and changes have been put into batches and portions of work based on the importance of the fix and any related fixes are also categorised in the same batch.

The Provider will be required to deliver new versions of the GIS tool for each batch and portion within a rolling programme. The Provider will be commissioned to do this by the Project Manager and will be required to compete the Services for each batch and portion within a defined period of time as designated by the Project Manager. Once the Service Provider releases a new version for a given batch or portion to the Project Co-ordinator and User Representatives user acceptance testing shall take place. The user acceptance testing will be run in parallel with the Service Provider working to complete the Services for the next batch or portion. A cycle of delivering new versions of the GIS tool whilst the previous batch or portion undergoes user acceptance testing will continue until all issues required by the Project Manager have been delivered.

Where further work is required to pass user acceptance testing of a batch or portion, as determined by the Project Co-ordinator, the Provider shall undertake any further work to complete the batch or portion during development of the next batch or portion or, if appropriate and agreed by the Project Manager, during the final ‘mop-up’ portion of the batch. Section 4.1 ‘GIS Tools Enhancements’ provides detail how this process shall operate.

### Batches

The following table outlines the batches of known issues and change requests required to allow LRCs to use the GIS tool to its full capability; full details will be available on the GitHub project website.

|  |  |
| --- | --- |
| **Batch** | **Known Issues/Change Requests** |
| 1. Known Issues | KI57, KI94, KI96, KI97, KI98, KI99, KI100, KI101, KI102, KI103, KI104, KI105, KI106, KI107, KI108, KI109, KI110, CR1, CR3, CR4, CR9, CR19, CR23, CR26, CR30 |
| 1. User Functionality | CR7, CR10, CR21, CR29, CR31, CR32, CR38, CR39, CR40 |
| 1. User Interface | KI15, CR2, CR6, CR8, CR11, CR20, CR22, CR25, CR27, CR28, CR41 |
| 1. Select by Attributes | CR5, CR12 |
| 1. Points & Lines Functionality | CR33, CR24 |
| 1. National Inventory Format Compatibility | CR34, CR35, CR36, CR37 |
| 1. Export Functionality | KI88, KI95, CR13, CR14, CR15, CR16, CR17, CR18 |

### Repositories

The GitHub project website (<https://github.com/HabitatFramework>) houses two main repositories:

1. Habitat Framework Tool <https://github.com/HabitatFramework/HLUTool> where the source code, issues and change requests for the framework tool will be hosted.
   * The source code will be uploaded at the start of the project.
   * Full details of the existing known issues and change request enhancements have already been uploaded.
2. Assets <https://github.com/HabitatFramework/Assets> where documentation, logos, testing guides, project plans (including a copy of this document), etc can be hosted.

A separate documentation project website will be setup to house the user and technical manuals and any other project related documentation.

### Deliverables

In addition to attempting to fix the known issues and incorporating enhancements for the above change requests, the project will include the following:

* Upload and maintain the source code for the GIS tool in the GitHub repository at the end of each batch and portion.
* Undertake initial testing to ensure each released version of the tool is stable, resolves the known issues (where possible) and/or provides the enhanced functionality outlined in the change request, and does not knowingly affect other existing functionality.
* Ensure the GIS tool is compatible with ArcGIS versions 9.3 and 10.1 and MapInfo versions 8 and 11.5.
* Release compiled installation versions of the GIS tool in formats compatible with ArcGIS 10.1 and MapInfo 11.5.
* Include with the compiled installation versions of the GIS tool, when required in order to completely implement a resolution to a known issue or apply a change request enhancement, any scripts and/or routines to update any existing HLU Tool Access and SQL Server databases used by the LRCs.
* Insert appropriate GNU General Public License (GPL) text into each of the source code files and to the tool installation setup screen.
* Include a standard GPL ReadMe or licence text file bundled with the compiled version installation setup files.

### Completion Criteria

Each batch or portion will be considered complete by the Project Manager when:

* The source code for the GIS tool has been uploaded to the GitHub repository with appropriate version control numbering.
* A compiled installation version for ArcGIS v10.1 and MapInfo v11.5 has been supplied to the LRCs.
* Any scripts and/or routines required to implement the known issues and/or change requests have been supplied to the LRCs.
* The UAT by the LRCs confirms that any known issues for that batch/portion have been resolved (where possible) and the tool has been enhanced to implement the requirements of the relevant change requests without affecting any other aspects or functionality of the tool.
* Notes have been added to each of the relevant known issues and/or change requests on the GitHub project website to indicate they have been fixed/implemented and the version number they relate to.

### Issue Management

Unless otherwise agreed between the Project Co-ordinator and the developer, any new issues or queries arising during UAT, as a result of changes made by the developer, that have been logged on the GitHub project website by the Project Co-ordinator or LRC Reps will either be:

* Scheduled for resolution during the following batch or portion.
* Scheduled for resolution within the final ‘mop-up’ portion of a batch (or a later batch if there is no mop-up portion).

Issues that the Project Co-ordinator and the developer agree are existing ‘unknown’ issues (i.e. are latent issues that were not caused during the project) will not be part of this project. If any such issues are identified they should be prioritised by the Project Co-ordinator and the developer may then be asked to estimate the cost of resolution. If the costs are subsequently agreed by the Project Manager they may then be added in to the most appropriate outstanding batch/portion for resolution.

## User and Technical Manuals

The GIS tool provides an essential user interface for working effectively with Habitat and Land Use datasets. However, the complexity of the tool and the associated habitat data requires comprehensive documentation in order to ensure that users conducting day-to-day tasks as well as administrators responsible for more technical maintenance issues are working with the GIS tool and database in the correct manner.

Whilst a user and installation guide was supplied by exeGesIS with delivery of v1.0.1.0 of the HLU Tool in March 2011, experience gained by the SE LRCs since this time has identified a requirement for more comprehensive and user-friendly documentation. Specifically, a revised and expanded User Manual and a more comprehensive Technical Manual are required in order that LRCs are able to implement the tool in the most appropriate way for their current infrastructure and user requirements and to enable them to use the GIS tool to its full capacity. These may build upon (and carry over where appropriate) much of the contents of the current documentation, but must subsequently meet the following requirements.

### Requirements common to all manuals:

* The developer will set out to the Project Co-ordinator how he intends to develop the manuals to ensure they are user friendly and meets the requirements of the LRCs. This shall include but not be limited to the contents, layout, formatting and sections.
* The developer will write the documentation and circulate drafts to the Project Co-ordinator and LRCs for feedback by the Project Co-ordinator and LRC representatives.
* The manuals will be written using a suitable markdown syntax and uploaded to an online documentation repository for either online viewing or downloading as a PDF or similar format. All graphics within the manuals will be retained and uploaded at full resolution.
* Where appropriate, the manuals will include distinctly separate sections for instructions that are specific to a particular GIS application and/or version.

### User Manual

The user manual will be sufficiently comprehensive to allow non-specialist users familiar with the basic day-to-day principles of GIS and database, editing, querying and exporting data to work confidently with the HLU Tool. The manual will include, but not be limited to, the following:

* A function-by-function explanation of the HLU Tool interface.
* An explanation of key concepts such as ‘logical merge’ ‘physical split’ etc.
* A tutorial section featuring examples of common tasks likely to be undertaken by users. Examples may be supported by flow diagrams showing the series of steps required to achieve the desired outcome.
* A ‘what not to do’ section highlighting actions to be avoided (for example where they may lead to a loss of integrity in the data).
* A Frequently Asked Questions (FAQs) section listing questions and answers to questions likely to be commonly asked or scenarios likely to be most commonly encountered by users.
* Links to other sources of information, such as the technical manual, online documentation repository, GitHub project website and ALERC forum.

### Technical Manual

The technical manual is aimed at those users who are likely to install the HLU Tool or administer the database. The manual will include but not be limited to, the following:

* HLU Tool installation instructions, including instructions on linking the HLU Tool to an existing Access/SQL Server database and GIS workspace/document or layer.
* Instructions on how to re-direct the HLU Tool to a different data source or GIS layer.
* Instructions on how to link a user-designed front end Access database to an existing SQL Server or MS Access database (to allow the user to run their own queries, macros and reports against the HLU Tool data).
* A description of the role of each table within the database, and the role of relevant fields of which the user should be particularly aware, including information on any conventions which should be respected regarding the format of data entered within particular fields.
* A data model diagram to assist users when writing queries.
* A set of sample queries supplied in an Access database.

### Developer Manual

The developer manual is an essential element to an open source software project, specifically aimed at users that wish to either re-compile the HLU Tool source code for use with a new version of ArcGIS or MapInfo, or wish to make their own changes to the open-source code before re-compiling the code. The manual will include, but not be limited, to the following:

* Details of the programming languages and technology used to develop the HLU Tool.
* Details of what software was used to write and package the source code.
* A basic overview of the main source code components.
* A link to the location of the source code on the GitHub repository.

## User Support

LRCs are likely to require on-going technical and user support, both during the LRC user acceptance testing (UAT) phases of the work programme (following the release of each new version of the GIS tool) and also for a specified period following completion of the known issues and change requests. Support may be required for technical installation queries or issues relating to the existing user functionality or performance of the tool, or issues arising from changes following the resolution of existing known issues or implementation of change requests.

### Support during compiling, installation and testing

Before the start of the development phase the existing known issues and change requests will have been uploaded onto the GitHub project website. Problems identified during installation and user acceptance testing by the LRCs should be uploaded by the Project Co-ordinator or individual LRCs onto the GitHub project website as notes against the most relevant known issue/change request, or by raising a new issue, as appropriate. The developer will respond to these problems via GitHub within 5 working days to acknowledge the issue and to indicate that it has either already been resolved or to advise how it can be resolved. Issues that are proposed to be resolved during a later portion/batch must be brought to the attention of the developer (via email or phone) by the Project Co-ordinator for discussion and agreement.

### On-going user-support

* Technical support can be provided for an agreed period in the form of a call-off contract (see section 6.3 ‘Ongoing support’ for more information).
* It is anticipated that queries will be in the form of ‘how do I’, ‘why can’t I’, or ‘is this a bug’ questions. Support will not entail ongoing development of the system or implementation of bug fixes, enhancements or upgrades – these can be handled under a separate contract with the same or an alternative developer.
* This support would be in the form of responses to queries raised by the LRCs on the ALERC forum <http://forum.lrcs.org.uk/viewforum.php?id=24> or similar forum.
* The developer will monitor the forum digest emails and respond to queries by posting responses within 5 working days of the initial query being posted or follow-up queries.

# Project Management

## Work Units

Due to the amount of work which needs to be completed, and the on-going interaction required between the developer and the Project Co-ordinator and LRC Representatives the work has been broken down into five distinct units. The five units of work, in order of completion, are:

## Work Portions

For units 2 and 3 of the work (GIS tool enhancements and LRC user testing) the tasks will be broken down into smaller, more manageable and logically grouped, portions of work so that each portion can be more easily developed and tested by the LRCs. In addition:

* Each portion of work shall last 21 calendar days unless otherwise agreed between the developer and the Project Manager.
* The developer will complete each portion of work, upload the source code onto GitHub and send compiled MapInfo and ArcGIS versions to the Project Co-ordinator and LRC Representatives within the 21 calendar day window (or as otherwise agreed).
* Once received, the Project Co-ordinator and LRC Representatives will undertake user acceptance testing of the tool over the course of the following 21 calendar days (or for the duration of the following portion if different).
* Once LRC testing is complete, depending on the results of the user acceptance testing, the Project Co-ordinator will do one of the following:
  + No bugs – Inform the developer that the new version passed user acceptance testing and advise the Project Manager that payment or the batch/portion can be released.
  + Bugs found – Inform the developer that the portion did not pass user acceptance testing and notify the developer what areas require further work before payment can be made.
* If further work is required the developer shall then undertake the further work to complete the batch or portion during development of the following batch or portion or, if appropriate and agreed with the Project Manager, during the final ‘mop-up’ portion of the batch.

The following flow chart demonstrates how the 3 week process for work units 2 and 3 will operate for portion 1:

Source code uploaded onto GitHub

Payment for portion 1 approved

Portion 1 issues fixed and changes made by developer

No bugs

Project

Co-ordinator and LRC Reps perform user acceptance testing

Compiled MapInfo and ArcGIS versions sent to Project Co-ordinator and LRC Reps

Bugs found

Provider to fix in next or ‘mop-up’ portion

Notes added to relevant issues and change requests on GitHub

Developer moves onto portion 2

Portions 2 onwards will operate on a similar cycle.

## Project Milestones

Below is a proposal of how the project could be broken down into work units, batches and portions.

| **Work unit** | **Description** | **Timescale (calendar days)** | **Success criteria** |
| --- | --- | --- | --- |
| 1. GPL licence and packager | Text of licence in source code | 14 | * The GPL licence has been included within source code and uploaded to GitHub * New install programs released for MapInfo and ArcGIS (using InstallShield) including ReadMe/licence file |
| Source code upload onto GitHub |
| ReadMe text/licence file with compiled version |
| Create packager using InstallShield Limited Edition |
| Release MapInfo and ArcGIS versions |
| 1. GIS tool enhancements | **Batch 1 (Known issues)** | | |
| Portion A – User interface (KI96, KI102, KI103, KI105, KI108, KI109, CR1) | 21 | * The following fixes and changes have been addressed by the contractor: KI57, KI94, KI96, KI97, KI98, KI99, KI100, KI101, KI102, KI103, KI104, KI105, KI106, KI107, KI108, KI109, KI110, CR1, CR3, CR4, CR9, CR19, CR23, CR26, CR30 * The code has been uploaded onto GitHub. * The HLU Tool released in formats compatible with ArcGIS 10.1 and MapInfo 11.5 |
| Portion B – GIS interaction (KI94, KI98, KI100, KI106, KI107, KI110, CR23) | 21 |
| Portion C – Data updates (KI97, KI99, KI104, CR3, CR4) | 21 |
| Portion D – Other (KI57, KI101, CR9, CR19, CR26, CR30) | 21 |
| Portion E – Mop up of minor bugs | 21 |
| **Batch 2 (User Functionality)** | | |
| Portion A – Lookups/cross-references (CR29, CR32) | tbc | * The following changes will have been addressed by the contractor: CR7, CR10, CR21, CR29, CR31, CR32, CR38, CR39, CR40 * The code has been uploaded onto GitHub. * The HLU Tool released in formats compatible with ArcGIS 10.1 and MapInfo 11.5 |
| Portion B – Split/Merge functions (CR7, CR10, CR38, CR39, CR40) | tbc |
| Portion C – GIS interaction (CR31) | tbc |
| Portion D – Filtering (CR21) | tbc |
| Portion E – Mop up of minor bugs | tbc |
| Batch 3 (User Interface) | tbc | * The following fixes and changes will have been addressed by the contractor: KI15, CR2, CR6, CR8, CR11, CR20, CR22, CR25, CR27, CR28, CR41 * The code has been uploaded onto GitHub. * The HLU Tool re-released, in formats compatible with ArcGIS 10.1 and MapInfo 11.5 |
| **Batch 4 (Select by Attributes)** | tbc | * The following changes will have been addressed by the contractor: CR5, CR12 * The code has been uploaded onto GitHub. * The HLU Tool re-released, in formats compatible with ArcGIS 10.1 and MapInfo 11.5 |
| **Batch 5 (Points & Lines Functionality)** | tbc | * The following changes will have been addressed by the contractor: CR33, CR24 * The code has been uploaded onto GitHub. * The HLU Tool re-released, in formats compatible with ArcGIS 10.1 and MapInfo 11.5 |
| **Batch 6 (National Inventory Format Compatibility)** | tbc | * The following changes will have been addressed by the contractor: CR34, CR35, CR36, CR37 * The code has been uploaded onto GitHub. * The HLU Tool re-released, in formats compatible with ArcGIS 10.1 and MapInfo 11.5 |
| **Batch 7 (Export Functionality)** | tbc | * The following fixes and changes will have been addressed by the contractor: KI88, KI95, CR13, CR14, CR15, CR16, CR17, CR18 * The code has been uploaded onto GitHub. * The HLU Tool re-released, in formats compatible with ArcGIS 10.1 and MapInfo 11.5 |
| 1. LRC user-testing (run in parallel with unit 2) | Project Co-ordinator and LRC Representatives will perform user acceptance testing and log all issues | 21 | * Bug fixes and change request enhancements meet specified requirements * No testing bugs have been identified or testing issues have been responded to and will be resolved in a later portion or batch |
| Provider will fix bugs and send final version to Project Co-ordinator and LRC Representatives (in later portion (or later batch if agreed) | 21 | * Final version released in formats compatible with ArcGIS 10.1 and MapInfo 11.5 * All bugs resolved * No further testing bugs have been identified |
| 1. Technical and User manuals | Update to include documented revisions plus any changes following tool enhancements and known issue corrections & circulate to Project Co-ordinator and LRC Reps for feedback | 21 | Project Co-ordinator and each LRC Rep has received a copy of the draft technical and user-manuals |
| Amend as required and produce final versions in markdown syntax | 7 | The final versions have been uploaded onto online repository |
| 1. Developer manual | Write first draft & circulate to LRCs for feedback | 14 | Each LRC has received a copy of the draft developer manual |
| Amend as requested and produce final version in markdown syntax | 7 | The final version has been uploaded onto online repository |

# Costs and timescales

## Day rate

Because of the time and effort already committed to build up sufficient knowledge and experience required to take on development and support work of this nature, and because of the financial commitment in professional training and development software needed, my rate for this project is £270/day (no VAT applicable).

## Phase1 proposal

It is proposed that an initial phase of development is undertaken comprising the following (in this order):

* Unit 1 : GPL licence and packager
* Unit 2 : GIS tool enhancements - batch 1 only
* Unit 3 : LRC user testing
* Unit 4 : Technical and user manuals
* Unit 5 : Developer manual

This will enable the developer to re-evaluate their knowledge and ability at the end of phase1 and hence be in a better position to analyse and cost the remaining batches of development. It will also allow the LRCs to evaluate the performance of the developer and consider any other potential solutions before continuing development (funds allowing).

### Phase1 costs and timescale

|  |  |  |
| --- | --- | --- |
| **Item** | **Cost** | **Elapsed Time** |
| **Unit 1 : GPL licence and packager** |  |  |
| Insert GPL licence text in source code, repackage tool installer, include ReadMe/licence file, upload source code to GitHub | £810 | 2 weeks |
|  |  |  |
| **Unit 2 : GIS tool enhancements** |  |  |
| Development and system testing of Batch 1 (portions A to E) known issues and change requests | £7,020 | 15 weeks |
|  |  |  |
| **Unit 3 : LRC user testing** |  |  |
| An element of support for LRC user testing (equivalent to 0.5 days per portion) is included in unit 2 - additional days would be charged at the standard daily rate | - | - |
|  |  |  |
| **Unit 4 : Technical and user manuals** |  |  |
| Convert technical and user manual to markdown syntax, draft and revise proposed changes to manual and upload to online repository | £1,890 | 4 weeks |
|  |  |  |
| **Unit 5 : Developer manual** |  |  |
| Draft and revise developer manual (using markdown syntax) and upload to online repository | £1,080 | 3 weeks |
|  |  |  |
| **Total (no VAT applicable)** | **£10,800** | **24 weeks** |

### Milestone dates

|  |  |
| --- | --- |
| **Milestone** | **Date** |
| Unit 1 : GPL licence and packager | 11 Oct 2013 |
| Unit 2 : GIS tool enhancements - batch 1 portion A | 01 Nov 2013 |
| Unit 2 : GIS tool enhancements - batch 1 portion B | 22 Nov 2013 |
| Unit 2 : GIS tool enhancements - batch 1 portion C | 13 Dec 2013 |
| Unit 2 : GIS tool enhancements - batch 1 portion D | 10 Jan 2013 |
| Unit 2 : GIS tool enhancements - batch 1 portion E | 31 Jan 2013 |
| Unit 3 : LRC user testing – unit 2 completion | 21 Feb 2013 |
| Unit 4 : Technical and user manuals | 28 Feb 2013 |
| Unit 5 : Developer manual | 21 Mar 2013 |
| **Project Completion** | **21 Mar 2013** |

The above dates reflect that existing work commitments, public holidays and leave have been incorporated into the elapsed time for each work unit, but due to the length of the project some flexibility may be required as the project progresses. Depending upon other work commitments there may also be an opportunity to partly overlap units 4 and 5 with unit 3 and deliver them earlier than indicated above. All changes to milestones will be discussed and agreed with the Project Coordinator.

### Additional costs

An additional element of support will be required from the GeoData Institute (subject to their agreement) and would be most appropriate for the project in the form of a call-off contract. It is envisaged that up to 2 days support may be initially appropriate for batch 1. For convenience it would be easiest if this was arranged directly between one of the LRCs and GeoData.

Further support may be required in subsequent phases of development as the proposed enhancements become more complex.

### Debugging

Some of the known issues (KI57, KI101, KI103, KI104, KI108 and KI109) describe intermitted behaviour which may not be reproducible during development and hence may be very difficult to fix. In these cases a reasonable attempt will be made to identify and resolve the underlying issues but it is assumed that the LRCs will accept that in some circumstances issues may have to remain unfixed until a scenario that reliably reproduces the problem is identified.

## Ongoing support

This can be provided for a period of 12 months in the form on a call-off contract with a minimum of 2 days. Each additional day of support effort would be charged at the standard daily date of £270.

|  |  |
| --- | --- |
| **Item** | **Cost** |
| **Ongoing support** |  |
| Initial block of 2 days support effort | £540 |

## Invoicing

Invoices will be submitted upon successful completion of work units 1, 4 and 5, and following completion of LRC user testing for each portion of batch 1 in unit 2.

## Insurance

My services are covered by a public liability and professional indemnity insurance policy. This policy is with Hiscox Insurance Company Limited, policy number HU PI6 1886859, and has a limit of public liability of £5 million and professional indemnity of £100,000.

## Total costs to LRCs for Phase 1 of project

|  |  |
| --- | --- |
| **Item** | **Cost** |
| Phase 1 costs | £10,800 |
| 2 days ongoing support | £540 |
| 2 days GeoData support/training | £938 |
| 2 days attending project meetings (plus expenses) | £540 |
| **Total** | **£12,818** |

# Technical considerations

## Digital certification

Code signing certificates are digital certificates that will help protect users from downloading compromised files or applications. Any developer who plans to distribute code or content over the internet or over corporate extranets risks impersonation and tampering. When a file or application signed by a developer is modified or compromised after publication, a popup warning will appear to let users know that the origin of the file or application cannot be verified.

The original release of the HLU GIS Tool was digitally signed by exeGesIS. However, it can be difficult and expensive for individual developers who are not affiliated with an incorporated business to be authorized. And as there is no requirement for the application to be distributed over the internet there is no plan for future releases of the application to have a digitally certificate. However, if this is likely to cause problems for any LRCs, or does prove to cause problems during the LRC user testing, then options for obtaining a digital certificate for the code with be investigated.

## Source language

Originally the source code for the application was written in C#, one of a number of object-oriented programming languages from Microsoft. As C# is very complex and syntactically hard to understand and write the code has been converted to VB.Net which is equivalent in most respects but much more approachable as a programming language. However, this conversion has introduced some bugs into the application that need to be identified and fixed.

Therefore, it is planned that the initial releases of the GIS tool for batch 1 will continue to be based on C# as the changes to the source code is limited to bug fixes and minor enhancements. However, if/when more significant changes are required it may be appropriate for the latest code to be reconverted to VB.Net and any conversion errors fixed before continuing with the redevelopment. Note, however, that whilst this would make further development easier there is a chance that some bugs relating to the conversion to VB.Net initially go un-noticed and may appear during LRC testing or following subsequent deployment.

## GIS compatibility

### ArcGIS v10.1

A beta-version of the GIS tool has been released that will install on computers with ArcGIS v10.1 and provisional testing by HBIC and SxBRC suggests that the tool works as expected. However, any development effort required to resolve previously undocumented issues relating to the compatibility of the tool with ArcGIS 10.1 are not included in this project plan and will involve an additional cost.

### MapInfo v10+

There are currently a couple of known issues with the GIS tool (KI94, KI98) that are thought to relate directly to the way the tool starts MapInfo versions 10+. These are currently scheduled to be addressed in batch 1 portion b. However, if GeoData are engaged to provide support to the developer and are available early enough in the project schedule, then an attempt will be made to start MapInfo in a different way. If successful this would mean that the first new release of the tool at the end of work unit 1 would be suitable for both ArcGIS 10.1 and MapInfo 10+ and that these issues have been resolved in advance.

## Installation and configuration

Some LRCs may have installed, or wish to install, the GIS tool on an enterprise server or virtual server or may store their relational or GIS data in an enterprise-wide database system such as Oracle. Such configurations are beyond the capacity and cost of most small to medium development consultancies to use and hence it will not be possible to test or ensure that the tool is compatible with all potential installation or configuration scenarios.

In the event that any of the existing known issues, or any new issues that arise during the LRC user testing or afterwards, are thought to relate to how the tool is installed or configured by an LRC then the developer will provide assistance under an ongoing support agreement or separate support arrangement to help identify and resolve the problem. This may require the LRC to install debug versions of the GIS tool to help determine the cause of the issue and test potential solutions.