Hereford Multi-Modal Transport Model

Hereford Local Plan Core Strategy Modelling Specification

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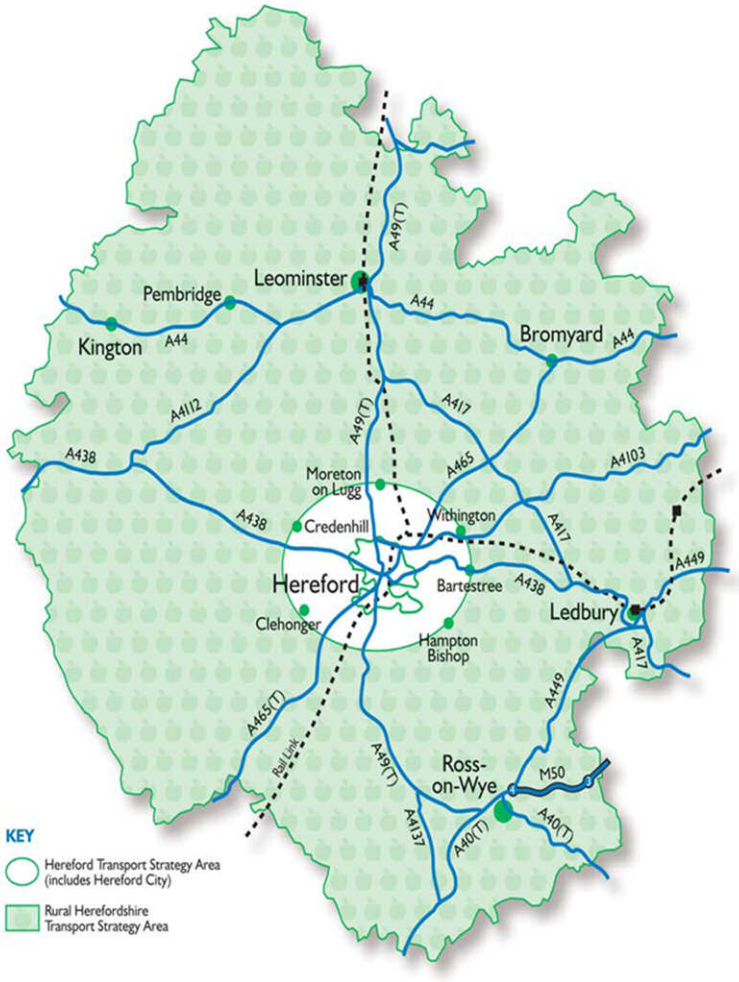

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Document Control Sheet

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Issue Status/Amendment	Prepared	Reviewed	Approved
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1. Introduction

1.1. Overview

1.1.1. Herefordshire Council (HC) is seeking to assess the transport impacts of their Local Plan Core Strategy (LPCS) for land-use development, using the upgraded Hereford multi-modal transport model (HMMTM). The purpose of the assessment will be, first, to identify the scale and focus of LPCS impacts upon the Hereford transport network and, second, to determine the need for and potential of various transport interventions to mitigate these impacts.

1.1.2. The required outcomes from the modelling appraisal will be as follows:

- Confirmation of whether or not the LPCS can be accommodated satisfactorily, in terms of local and national transport objectives;
- Clearer understanding of the optimum transport package to facilitate the LPCS;
- Statement from the Highways Agency (HA), as to whether or not the model gives a robust and dependable indication of LPCS outcomes;
- Acceptance from HA that a preferred LPCS mitigation package can be implemented, which results in no worsening of journey times along A49 than in base year 2012; and
- Components of modelled trip demands and transport interventions for use in subsequent land-use and transport assessments, e.g. Hereford Enterprise Zone and Belmont Transport Package.

1.1.3. This Amey project specification outlines our proposed approach, cost and timeframe for tackling the HC brief.

1.2. Scope of Proposed Modelling Specification

1.2.1. In terms of its scope, this specification is governed by the short timeframe available to achieve initial modelling appraisal outcomes and consideration by the HA, in time for the HC cabinet members meeting on LPCS on 17th June 2013. It is also constrained by the transport model scenarios that were requested by JMP (as advisers to the HA), in order to give a reliable picture of possible LPCS outcomes. Finally, the specification is limited to only those aspects of LPCS land-use and transport intervention that can be accurately represented in the multi-modal model and which are agreed with HC and HA prior to finalising this work proposal.

1.2.2. In the remainder of the specification, section 2 contains an outline methodology for undertaking the commission. Section 3 gives a breakdown of proposed costs. Section 4 contains an outline work programme and Section 5 summarises Amey's project management procedure.

2. Modelling Appraisal Method

2.1. Introduction

2.1.1. This section describes our proposed approach to undertaking the required tasks.

2.2. Methodology Overview

2.2.1. The Hereford multi-modal model has been assembled and validated to base year 2012 transport conditions for highway, public transport (PT), cycling and walking modes. It covers three representative weekday periods, namely AM peak, Inter peak and PM peak hours. Highway movements are modelled in SATURN, whilst PT, walk and cycle movements are modelled in CUBE.

2.2.2. Future year travel demand decisions are predicted through a variable demand and mode choice model in CUBE, consistent with DfT guidelines in WebTAG.

2.2.3. The base year multi-modal elements will be projected to an agreed future year of 2032, to include the Local Plan Core Strategy horizon and a feasible opening year for a Hereford Western Relief Road.

2.2.4. Forecast model scenarios will incorporate changes from base year 2012, to correspond with the following outcomes:

- Changes to trip demand matrices: –
  - Background trip end growth, in accordance with National Trip End Model (NTEM 6.2) predictions for non-freight, highway, PT, walk and cycle movements and National Transport Model (NTM RTF11) forecasts for road freight traffic; and
  - Site-specific land-use development trip arrivals and departures, allocated to appropriate origin and destination (O-D) zones in the model; these developments include committed, likely and LPCS core strategy sites;
- Changes to transport interventions: –
  - Local behaviour-change interventions for highway, PT, walk and cycle modes;
  - Local highway interventions; and
  - Strategic highway interventions.

2.2.5. Each multi-modal forecast scenario will entail a combination of trip demands and transport interventions. It will also represent a level of 'uncertainty', depending upon the particular components of trip demands and transport interventions that are selected.

2.2.6. The forecast scenarios will be tested in the model, for AM and PM peak periods at 2032, using the 'variable demand' mechanisms to represent the following future travel decisions:

- Trip frequency;
- Trip destination;

- Travel mode; and
- Timing of journey.

2.2.7. Outcomes from the model assignments will be checked and analysed to determine the effect of each demand / intervention scenario upon network performance, relative to base year 2012 conditions.

2.2.8. The network performance criteria are to be agreed with HC and HA, for the local highway network and A49 trunk road respectively, but will be chosen to give a reliable, overall, estimate of whether or not each scenario will cause 'nil detriment' to the highway network (i.e. travellers will be no-worse-off than at base year 2012). The performance criteria are likely to include the following:

- Travel mode share;
- Pattern and volume of O-D movements using particular parts of the network;
- Flow movement volumes on highway and transit links;
- Route journey times and speeds by travel mode;
- Travel distances on preferred routes between origin and destination zones;
- Road junction ratios of flow to capacity (RFC), on most congested approaches;
- Road junction delays, on most congested approaches; and
- Number of junctions where RFCs become unacceptably high.

2.2.9. Data for the above criteria will be extracted from each forecast scenario and compared with the base year 2012 situation, by travel mode and time period.

2.3. Model Scenarios

2.3.1. After discussion with HC and HA, it has been agreed that only a limited selection of forecast model scenarios will be assessed, for AM and PM peak periods at 2032. The agreed scenarios are summarised in Table 1.

2.3.2. The precise details of the trip demands and transport interventions to be tested in the model and the content of each scenario package are still to be agreed with HC and HA. However, Table 1 gives a broad indication of the types of initiative that will be grouped under each scenario.

Table 1: 2032 AM / PM Hereford Model Scenarios to Assess Local Plan Core Strategy

	Multi Modal Transport intervention Components								
	Local Behaviour Change Initiatives						Local Highway Improvements		Strategic Highway Schemes
Trip Demand Components	Travel Planning and Awareness	Walk and Cycle	Bus Priority	Park and Ride	Car Parking	Highway Capacity Constraint	Link and Junction Capacity Enhancement	Traffic Management and Signal Optimisation	Hereford Relief Road (with Belmont Link)
Do Minimum (Central Growth) 2032									
Low Background Growth									
Central Background Growth	●	●					●		
High Background Growth									
Committed Developments, HEZ & LPCS Sites	●	●					●		
Do Something 1 (High Growth) 2032									
Low Background Growth									
Central Background Growth									
High Background Growth	●	●			●	●	●	●	
Committed Developments, HEZ & LPCS Sites	●	●			●	●	●	●	
Do Something 2 (High Growth) 2032									
Low Background Growth									
Central Background Growth									
High Background Growth	●	●	●	●	●	●	●	●	●
Committed Developments, HEZ & LPCS Sites	●	●	●	●	●	●	●	●	●
Do Something 1 (Low Growth) 2032									
Low Background Growth	●	●			●	●	●	●	
Central Background Growth									
High Background Growth									
Committed Developments, HEZ & LPCS Sites	●	●			●	●	●	●	

2.3.3. The types of transport intervention to be tested under each of the four scenarios in Table 1 are likely to be composed from the following elements:

- Local behaviour change initiatives:

- Travel planning and awareness – this cannot be modelled explicitly, but will entail a change in the pattern and proportion of car availability for particular O-D movements in the trip matrices;
- Walk and cycle – this will be modelled as specified network links for pedestrians and cyclists;
- Bus priority – this will only be modelled in terms of such physical network interventions as bus lanes, bus gates, improvements to service routing, travel time, frequency, capacity and stop locations and bus fares, not as bus-responsive signal timings or bus quality / reliability improvements;
- Park and Ride (P&R) – this cannot be directly modelled, but will be represented as a 'composite' journey, whereby a highway O-D trip can be split into two journeys via an intermediate P&R site, if travel cost savings (i.e. reductions in journey time and distance) are favourable; P&R will be considered for bus and cycle trips;
- Car parking – this will be modelled as long stay price changes and capacity limitations for public off-street car parks only, which are modelled as distinct zones, not for private car parks and on-street, shorter-stay, public spaces;
- Highway capacity constraint – this will be modelled as 20mph speed limit areas, carriageway and junction constrictions and banned movements;

- Local highway improvements:

- Link and junction capacity enhancement – this will entail on-line widening of carriageways and junction approaches, where feasible;
- Traffic management and signal optimisation – this will focus on rationalising traffic circulation in Hereford city centre and improving co-ordination of linked traffic signals, together with revising traffic and pedestrian green splits;
- Intelligent transport systems – this cannot be modelled in a meaningful way; impacts of ITS enhancements will be approximated in terms of e.g. bus journey time savings / increased speeds where SCOOT signals are configured to prioritise approaching buses;

- Strategic highway schemes:

- Hereford Relief Road (Western alignment, incorporating A465 – A49 Belmont Link) – this will comprise the preferred western route, at single carriageway standard; with roundabout junctions at all major intersections; and no direct access to / from proposed land-use developments; connecting A49 North, with A465 Belmont Link, A49 South and B4399 Rotherwas Access Road;

2.3.4. The agreed, future year, demand / intervention scenarios to be tested for the LPCS at 2032, during AM and PM peaks, are as follows:

- Do Minimum, central growth:

- This includes all committed developments, HEZ and LPCS allocations;
- It also includes committed transport interventions, only, e.g. Local Sustainable Transport Fund funding (LSTF) walk and cycle schemes, Edgar Street Grid Link Road and HA A49 pinch point programme;
- This scenario is 'near certain / more than likely'; it is intended to show if full development commitments and HC targets can be delivered within the existing transport network with committed interventions only;

- Do Something 1, high growth:
- This includes all committed developments, HEZ and LPCS allocations;
- It also entails committed transport interventions, plus new interventions for changing travel behaviour towards active modes and PT and including localised highway improvements;
- This scenario is 'hypothetical'; it is intended to show if full development commitments and HC targets can be delivered under maximum growth conditions, with committed interventions and mitigation schemes that exclude a strategic relief road;

- Do Something 2, high growth:
- This includes all committed developments, HEZ and LPCS allocations;
- It also entails committed transport interventions, plus new interventions for changing travel behaviour towards active modes and PT, plus localised highway improvements and a strategic western relief road;
- This scenario is 'hypothetical'; it is intended to show if full development commitments and HC targets can only be delivered under maximum growth conditions, if committed interventions are accompanied by mitigation schemes that include a strategic relief road;

- Do Something 1, low growth:
- This includes all committed developments, HEZ and LPCS allocations;
- It also entails committed transport interventions, plus new interventions for changing travel behaviour towards active modes and PT and including localised highway improvements;
- This scenario is 'reasonably foreseeable'; it is intended to show if full development commitments and HC targets can be delivered under minimum growth conditions, with committed interventions and mitigation schemes that exclude a strategic relief road.

2.3.5. It is assumed that, if the model outcomes show that Do Something 2 will be required with high growth and that Do Something 1 will not be satisfactory at low growth, then Do Something 2 will therefore be needed at low growth, also.

2.4. Modelling Appraisal Tasks

2.4.1. We have identified a number of key tasks that will be undertaken as part of the specification. These are as follows:

- (1) Prepare reference and alternative demand forecasts by mode;
- (2) Develop future year travel demand options for all modes;
- (3) Develop future year transport intervention packages for all modes;
- (4) Test variable demand and mode choice model;
- (5) Run forecast model to produce final multi-modal assignments;
- (6) Analyse and interpret model outputs;
- (7) Project management and client / stakeholder liaison;

3. Assumptions and Queries

3.1. Assumptions

3.1.1. The Project Quality Plan and associated costs have been based on the following assumptions:

- The Local Plan Core Strategy appraisal will be carried out in line with the guidance contained:
  - DfT – Guidance on Transport Assessment;
  - DfT WebTAG (Transport Appraisal Guidance) (Updated 2012);
  - The Design Manual for Roads and Bridges;
  - Amey Integrated Management System.

4. Constraints & Restraints

4.1. Constraints & Restraints

4.1.1. The constraints and restraints relating to the work are considered to include the following:

- Specification is governed by the short timeframe available to achieve initial modelling appraisal outcomes and consideration by the HA, in time for the HC cabinet members meeting on LPCS around mid-June 2013.
- The specification is limited to only those aspects of LPCS land-use and transport intervention which will be prior agreed by HC that can be accurately represented in the multi-modal model.
- Agreement of local planning data and site specific developments for inclusion in the forecast model.
- Agreement of future transport intervention schemes for inclusion in the model.
- Awaiting HA response to LPCS modelling appraisal report.
- Sign off of the 2012 Hereford Multi Modal Model by the Highways Agency.
- Early agreement from HC / HA on components of travel demand and network interventions to be included in forecast scenarios;
- Confirmation by HC / HA of four model scenarios for testing;
- Confirmation from HC / HA of analysis outputs to be extracted from model;
- Absence of unexpected or illogical outcomes from forecast model runs;
- Positive response from HA to base year 2012 multi-modal model validation report; and
- Willingness by HA to respond to LPCS modelling appraisal report within two weeks of receipt.
- Agreement from HC on proposed fees;

4.2. Deliverables

4.2.1. The specific output documents associated with this commission are as follows:

- Project Quality Plan – This document outlines the work required, the team assembled to the deliver the same and the associated costs.
- Scoping Note – This document outlines the demand forecast and transport intervention packages.

- Local Plan Core Strategy Appraisal Report – This report will summarise transport impacts of Herefordshire Councils Local Plan Core Strategy (LPCS) for land-use development in Hereford.
- Project Specification – This document is based upon the PQP.

4.2.2. The Local Plan Core Strategy Appraisal Report will be issued in draft format and formally presented to Herefordshire Council Officers. Following feedback on the draft report, a final report will be produced and it is anticipated that this will be presented to the Highways Agency for assessment.

5. Project Management

5.1. Professional Standards

5.1.1. The project will be undertaken in accordance with the Amey Integrated Management System (IMS) and associated Quality Procedures (QP). The relevant technical QP's for this commission have been identified by the Project Manager and will be implemented by the Project Team.

5.2. Programme / Plan

5.2.1. A programme outlining the main tasks and milestones has been prepared and included in Appendix A of this report.

The key dates for programme delivery are as follows:

- Start: On acceptance of PQP
- Issue of Local Plan Core Strategy Appraisal Report 03rd June 2013

5.2.2. The Amey Project Manager will monitor the progress of the Project Quality Plan as an on-going process. Progress is to be monitored against the task programme, key dates and fee estimates. The project will contribute to the Amey Herefordshire Partnership Performance Indicators (PPI) for delivery against programme dates and accuracy of scheme cost estimation.

5.2.3. The programme will be reviewed on a weekly basis and any changes will be notified to the Client where necessary. The impact of change resulting from a Client instruction, design change or project development (during the design process and post-design) will be assessed by the Project Manager against the contract and programme. The outcomes will be discussed with the Client and raised as early warnings or confirmation of changes and issued to the Client for acceptance.

5.2.4. Amey will issue either a 'Change Request' or 'Early Warning' for requests for additional work which fall outside the agreed PQP.

5.3. Project Roles and Governance

5.3.1. The Project Team will consist of the following principal staff and will be assisted by other staff as appropriate as shown in Table 2:

Table 2: Amey Resources		
Position / Role	**Name**	**Address**
Client Project Manager	Jeremy Callard	Plough Lane Hereford
Tel: 01432 383437	e-mail: jcallard@herefordshire.gov.uk	
Amey Project Manager	Andrew Walford	Thorn Rotherwas
Tel: 01432 377180	e-mail: andrew.walford@amey.co.uk	
Amey Team Leader	Shaun Moore	Thorn Rotherwas
Tel: 0143 2845992	e-mail: shaun.moore@amey.co.uk	
Amey Technical Lead	Tim Lynn	IDH Leeds
Tel: 0113242 9990	e-mail: timothy.lynn@amey.co.uk	

5.3.2. The overall Project Management will be undertaken by the Transportation Team in the Hereford Office. This includes the preparation of project proposals, target fee, programme and the management of any changes to these through the life of the project.

5.3.3. Day to day contact relating to the implementation of the brief should be carried out between the Amey Team Leader & Technical Lead and the Client Project Manager. Communication relating to the Project Management process should generally be carried out by the Amey Project Manager and the Client Project Manager.

5.4. Construction (Design & Management) Regulations 2007

5.4.1. The CDM 2007 regulations do not apply to this commission.

5.5. Financial

5.5.1. The method by which the project finances are managed is defined below:

- Herefordshire Council's Professional Services Contract;
- NEC Option C (Target fee);
- Actual spend against forecast spend will be continually monitored and reported on a monthly basis in the MCPB dashboard report;
- The client will be notified when 2/3 of the project target fee is reached;
- The Project Manager will raise an Early Warning of any predicted overspend or underspend; and
- The Project Manager will issue a Confirmation of Change for instructed alteration to the methodology including any impacts upon cost or programme for acceptance prior to the change being made.

5.6. Environmental Consideration

5.6.1. The environmental impact associated with this project has been assessed in accordance with Amey Environmental Procedures CON-HW/Environment-03a. Reasonable measures such as car sharing will be implemented in order to mitigate against any adverse impact identified.

5.7. Outsourced Processes / Partners and Suppliers

5.7.1. Currently no works are anticipated to be outsourced. However if additional traffic surveys are required it is anticipated that sub consultants will be required. Should this be required a change notice will be issued highlighting any additional time and costs required.

5.8. Project Retention Period

5.8.1. Archived project records are to be retained electronically until the end of the Professional Services contract then handed to the Client.

5.9. Nonconformities

5.9.1. Potential nonconformities should be identified as part of the project verification and project management process prior to issue as deliverables such as design drawings. If nonconformities are identified, the Project Manager or Key Member of Staff shall undertake a review, establish an appropriate course of action and implement a resolution. This process will be documented on the project file. The Project Manager or Key Member of Staff shall cascade information on the unforeseen nonconformities to relevant members of the team. Team leaders will determine the appropriate course of action with respect to nonconformities and take appropriate action to prevent re-occurrence of the same nonconformity.

5.10. Client Acceptance of Specification

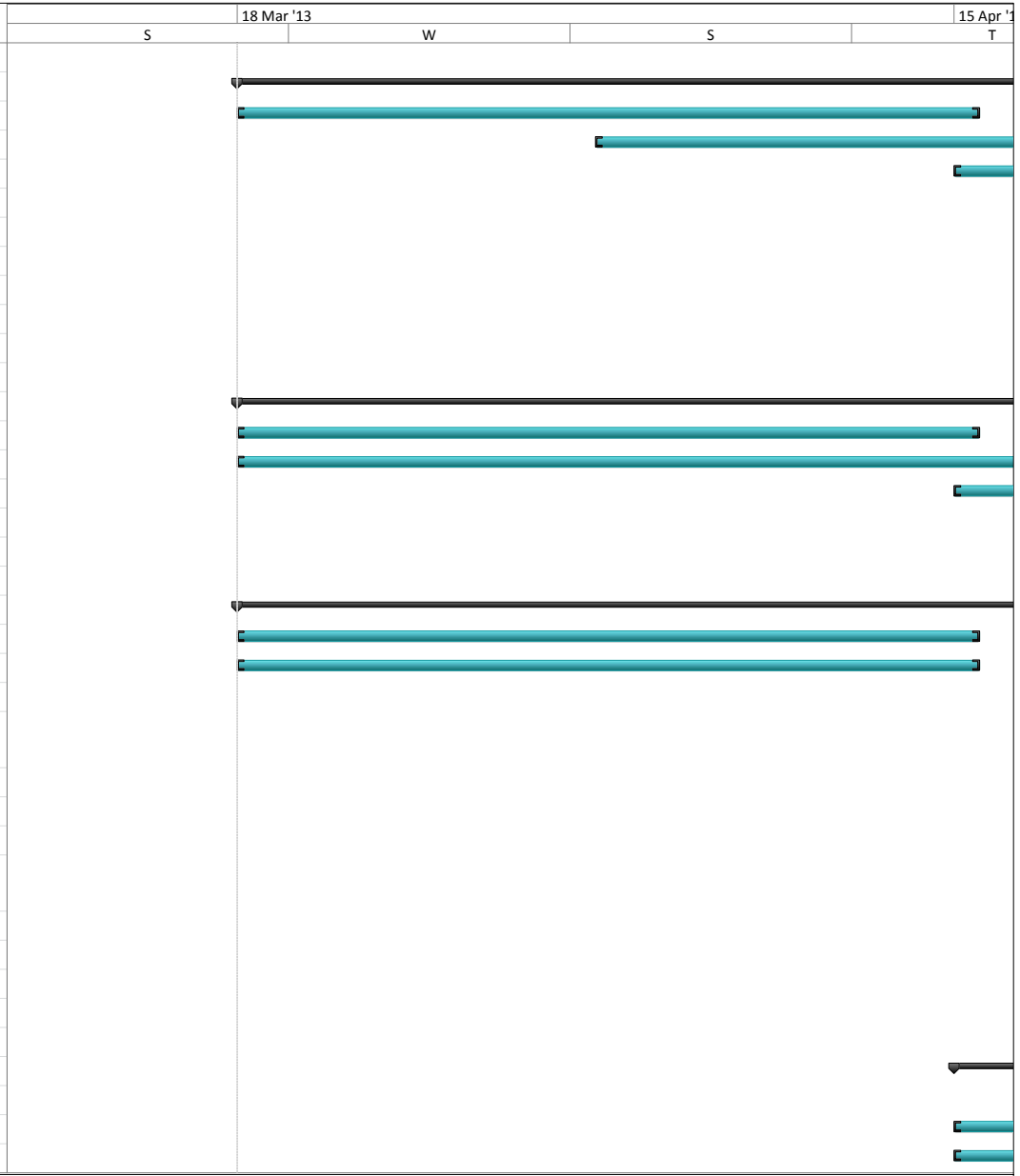
5.10.1. Once the commissioning meeting has been completed and the Client accepts the Project Quality Plan, the Client Manager is to sign below to signify that the details contained in the specification are agreed.

Signature…… Date……

Appendix A

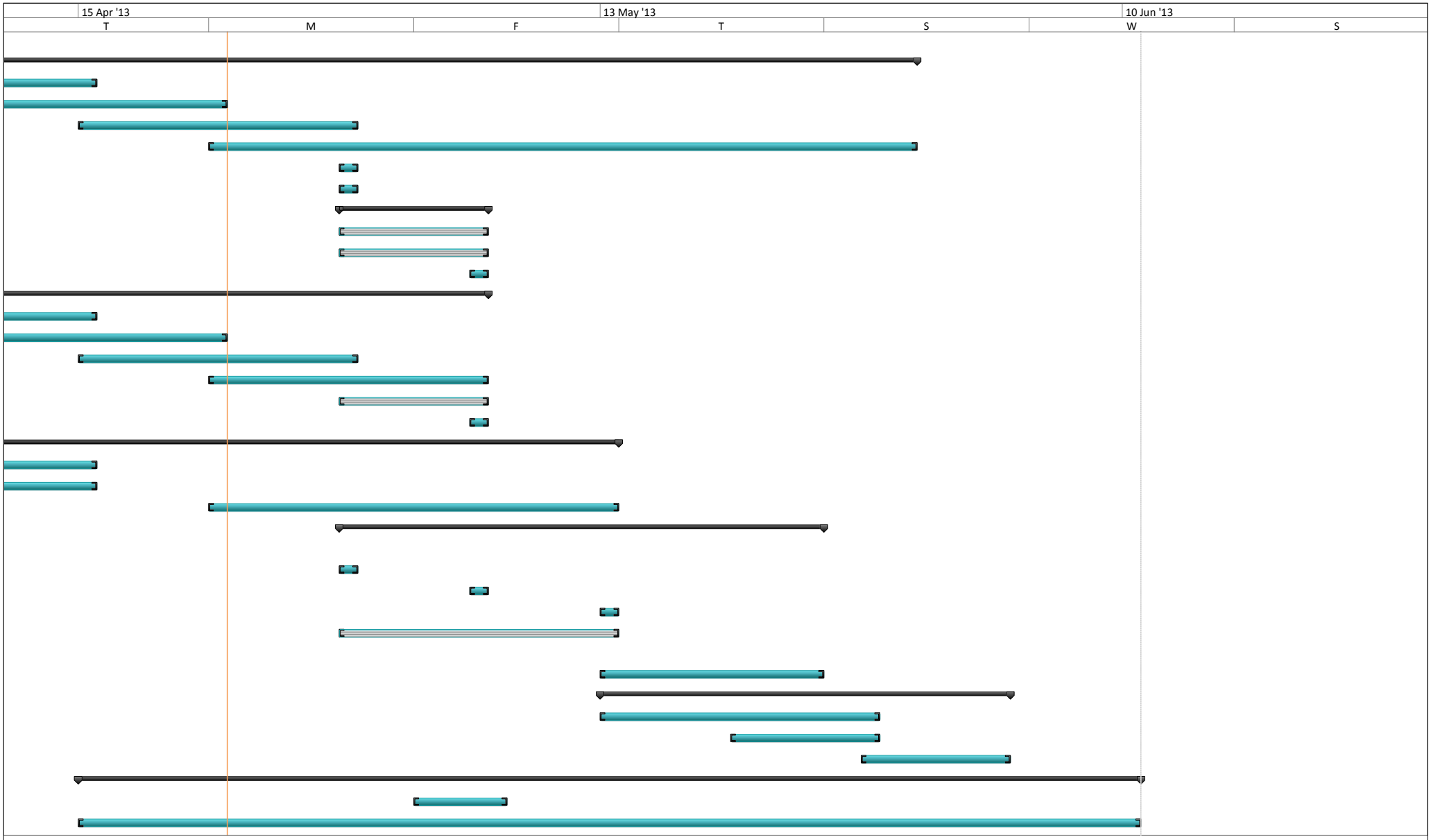
Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		Hereford Transport Model (Core Strategy)				
2		**Prepare reference and alternative demand forecasts by mode**	**53 day**	**Mon 18/03/13**	**Wed 29/05/13**	
3		Establish NTEM and NTM reliability against HC planning data	21 day	Mon 18/03/13	Mon 15/04/13	
4		Calculate NTEM and NTM trip growth factors	16 day	Mon 01/04/13	Mon 22/04/13	
5		Determine committed development trip patterns	11 day	Mon 15/04/13	Mon 29/04/13	
6		Determine allocated development trip patterns	28 day	Mon 22/04/13	Wed 29/05/13	
7		Compile central, low and high growth forecasts	1 day	Mon 29/04/13	Mon 29/04/13	
8		Consult with HC / HA on trip demand outcomes	1 day	Mon 29/04/13	Mon 29/04/13	
9		**Develop future year demand options by mode**	**6 days**	**Mon 29/04/13**	**Mon 06/05/13**	
10		Assemble do-minimum reference case trip matrices	6 days	Mon 29/04/13	Mon 06/05/13	
11		Assemble do-something scenario trip matrices	6 days	Mon 29/04/13	Mon 06/05/13	
12		Analysis of matrix content and contingency for modifying demand scena	1 day	Mon 06/05/13	Mon 06/05/13	
13		**Develop future year transport intervention packages by mode**	**36 day**	**Mon 18/03/13**	**Mon 06/05/13**	
14		Workshops to devise interventions	21 day	Mon 18/03/13	Mon 15/04/13	
15		Discuss and agree interventions with stakeholders	26 day	Mon 18/03/13	Mon 22/04/13	
16		Represent do minimum interventions	11 day	Mon 15/04/13	Mon 29/04/13	
17		represent do something interventions (without relief road)	11 day	Mon 22/04/13	Mon 06/05/13	
18		represent do something interventions (with relief road)	6 days	Mon 29/04/13	Mon 06/05/13	
19		Incorporate non-network interventions	1 day	Mon 06/05/13	Mon 06/05/13	
20		**Test variable demand and mode choice models**	**41 day**	**Mon 18/03/13**	**Mon 13/05/13**	
21		Test DIADEM VDM for realism	21 day	Mon 18/03/13	Mon 15/04/13	
22		Test CUBE mode choice model for realism	21 day	Mon 18/03/13	Mon 15/04/13	
23		Variable demand modelling report	16 day	Mon 22/04/13	Mon 13/05/13	
24		**Run forecast VDM and mode choice model and final multi-modal assignments**	**20 days**	**Mon 29/04/13**	**Fri 24/05/13**	
25		Do-minimum reference case without mode choice or VDM	1 day	Mon 29/04/13	Mon 29/04/13	
26		Do-minimum with mode choice and VDM	1 day	Mon 06/05/13	Mon 06/05/13	
27		Do-something options with mode choice and VDM	1 day	Mon 13/05/13	Mon 13/05/13	
28		Sense check on assignment outcomes and contingency for unexpected alterations	11 days	Mon 29/04/13	Mon 13/05/13	
29		Forecasting Report	10 day	Mon 13/05/13	Fri 24/05/13	
30		**Analyse and interpret model outputs**	**16 day**	**Mon 13/05/13**	**Mon 03/06/13**	
31		Analyse forecast scenario outcomes	11 day	Mon 13/05/13	Mon 27/05/13	
32		Contingency for handling unexpected outcomes	6 days	Mon 20/05/13	Mon 27/05/13	
33		Scenario appraisal report	6 days	Mon 27/05/13	Mon 03/06/13	
34		**Project management**	**41 day**	**Mon 15/04/13**	**Mon 10/06/13**	
35		Client and stakeholder meetings x3	3 days	Fri 03/05/13	Tue 07/05/13	
36		Quality procedures	41 day	Mon 15/04/13	Mon 10/06/13	
37		Financial monitoring	41 day	Mon 15/04/13	Mon 10/06/13	



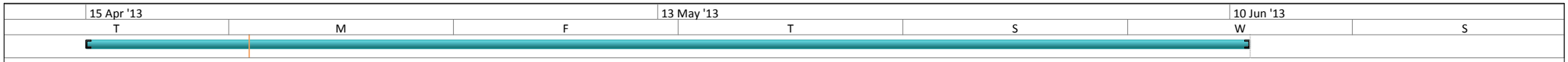
Project: Programme - Hereford Tr
Date: Tue 23/04/13

Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Deadline
Progress



Project: Programme - Hereford Tr
Date: Tue 23/04/13

Task	Project Summary	Inactive Milestone		Manual Summary Rollup		Deadline	
Split	External Tasks	Inactive Summary		Manual Summary		Progress	
Milestone	External Milestone	Manual Task		Start-only			
Summary	Inactive Task	Duration-only		Finish-only			



Project: Programme - Hereford Tr
Date: Tue 23/04/13

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline	
Split	External Tasks	Inactive Summary	Manual Summary	Progress	
Milestone	External Milestone	Manual Task	Start-only		
Summary	Inactive Task	Duration-only	Finish-only		