

**POSSIBLE
RESIDENTIAL
DEVELOPMENT ON
LAND NORTH OF THE
GRANGE,
LETCHWORTH**

TRANSPORT REPORT

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EXECUTIVE SUMMARY

1. This transport report has been prepared to consider the implications of potential residential development of 1000 dwellings on land north of the Grange Estate as part of a site selection process for North Hertfordshire District Council's Local Plan.
2. Extensive traffic surveys have been undertaken in order to assess the traffic impact of the proposals and these surveys have enabled an assessment to be made of both the traffic generation and traffic distribution of the proposed development.
3. Should a development proceed it will need to include an internal network of pedestrian and cycle routes which link to existing external routes through the Grange Estate and The Garden City Greenway.
4. The National Cycle Route 12 passes through the site into the Grange Estate and southwards to the town centre. A number of improvements on this route would make it more attractive.
5. In addition there would be merit in providing a new cycle route from Route 12 in Norton Common eastwards to the main employment area of Letchworth.
6. There is one regular bus service (55) and one intermittent bus service (625) running through the Grange Estate. A bus service (possibly the 55) will be need to be extended into the development to ensure every dwelling is within a 400m walk of the service.
7. The bus service will need to be improved with additional buses being used and the potential for improved frequencies will be considered. There may be further services dependent on which access option is selected.
8. Funding will need to be provided for improved infrastructure such as shelters, seating and real time information displays, all features which encourage a shift to public transport. These improvements will benefit the Grange Estate and all residents in the catchment of the service.
9. The following access options have been considered:
 - **Option 1** – using the existing accesses into the estate at Eastholm and Grange Road;
 - **Option 2** - constructing a route northwards across farmland to Norton Road in addition to using the existing accesses; and
 - **Option 3** – constructing a route westwards across farmland to Stotfold Road in addition to using the existing accesses.

10. In terms of traffic impact, there will need to be improvements to at least 3 junctions namely:
 - Green Lane/ Norton Road;
 - Eastholm/Norton Road/ Wilbury Road;and
 - Stotfold Road/ Wilbury Road/Bedford Road;
11. Within the estate the existing roads have capacity to cater for the additional traffic under the worst case Option 1. The design capacity of the roads is substantially higher than the predicted traffic flows. However when predicted traffic flows are considered in terms of the environmental capacity of streets, a measure which takes into account environmental factors, the main access routes of Eastholm and Grange Road exceed the guidance.
12. The Personal Injury Accident Data does not identify any particular areas or locations which could be considered to have a highway safety issue. Vehicle speeds within the estate are reasonable.
13. There would be merit in providing parking laybys in certain locations within the estate to reduce any delays to bus services in particular which may be caused by on-street parking.
14. In addition, improvements to the School Safety Zone on Northfields will ensure vehicle speeds remain low.
15. Hertfordshire County Council have provided initial comments on potential public transport improvements and indicated a second access should be considered for a development of 1000 dwellings.
16. Having undertaken this assessment it is considered that, provided junction and highway improvements are undertaken in the areas identified, should a development proceed it can be accommodated on the highway network for any of the options considered.
17. Some sections of the main access routes in the estate exceed environmental capacity guidelines and therefore it may be necessary to undertake more detailed assessments of environmental impacts to determine the suitability to accommodate additional traffic in those locations. Options 2 and 3 will reduce these impacts by a proportion of traffic using a separate access.

1. INTRODUCTION

- 1.1 COTTEE Transport Planning are instructed by the Letchworth Garden City Heritage Foundation (LGCHF) to report on the transport implications of land north of The Grange Estate being considered for residential development as part of the Local Plan process for North Hertfordshire District Council (NHDC).
- 1.2 LGCHF are consulting local residents and the public during November 2013 regarding this proposal. The consultation will include an exhibition where the public will be able to offer their views on the scheme and these views will be part of the decision-making process as to whether the site could be considered for inclusion in the Local Plan.
- 1.3 The purpose of this report is to provide some guidance on the potential traffic impact of the proposals and consider the implications of access by all modes of travel.
- 1.4 The report reviews the existing road network and transport provision in the area. Extensive traffic surveys have been commissioned and form the basis of the traffic analysis which assesses the traffic impact.
- 1.5 The report also advises on the potential transport improvements which could arise from a development of this scale.
- 1.6 There have been initial discussions with Hertfordshire County Council (HCC) who are the Highway Authority for the area.

2. SITE LOCATION AND THE LOCAL TRANSPORT NETWORK

- 2.1 The land being considered for residential development is to the west and north of the Grange Estate in Letchworth and is identified on a site location plan at **Appendix A** and a site context plan at **Appendix B**.

Road Network

- 2.2 The Grange Estate has two points of vehicular access namely;
- Eastholm at the junction with Wilbury Road/ Norton Way North/ Norton Road; and
 - Grange Road at its junction with Wilbury Road.
- 2.3 Both these junctions are in the form of mini-roundabouts.
- 2.4 Wilbury Road and Norton Road provide an east-west route across the north of Letchworth with Norton Road continuing in a northerly direction towards Stotfold and the A507. This provides an access from the north into Letchworth. Both these roads are categorised as local distributors in the HCC document, The Letchworth and Baldock Urban Transport Plan (L&BUTP).
- 2.5 Norton Way North provides a north-south route passing the town centre and connecting with the A505 to the south and is also categorised as a local distributor.
- 2.6 The internal road system of the Grange Estate is illustrated at **Appendix C** where the different carriageway widths highlight the road hierarchy.
- 2.7 Eastern Way and the loop road of Northfields, Western Way and Southfields form the main routes in the estate with a standard carriageway width of 7.3m, wide verges and footways.
- 2.8 Grange Road, with a 6.1m carriageway, forms a secondary access from the estate.

Traffic Surveys

- 2.9 An extensive traffic survey exercise was commissioned in the Grange Estate and on the road network nearby. The survey locations are illustrated on the plan at **Appendix D**.
- 2.10 Junction surveys were undertaken on Tuesday 8th October 2013, a typically representative weekday. The Automatic Traffic Counters (ATC) were placed for one week and recorded traffic flows and speeds.
- 2.11 An analysis of the surveys indicates the peak hours for traffic flow are 0800-0900 and 1700-1800 during the week.

2.12 The ATC data indicates the following traffic flows and vehicle speeds:

Road	Average Weekday Traffic flow (vehicles)			Average Speeds
	0800 - 0900	1700 - 1800	Daily (24hr)	
Northfields	306	303	2790	E/B 24mph W/B 25mph
Eastholm	668	690	8500	S/B 29mph N/B 29mph
Grange Road	472	419	5124	S/B 24mph N/B 22mph
Norton Road	1226	973	11014	S/B 46mph N/B 48mph
Stotfold Road	1057	1051	10477	S/B 43mph N/B 41mph

2.13 The results confirm the relatively light traffic flows on the estate where average speeds are below the 30mph speed limit.

2.14 The total daily flows to and from the estate (2480 dwellings) are about 13,600 two-way vehicle movements or about 5.5 daily vehicle movements per dwelling – a relatively typical value for a residential estate.

2.15 Norton Road and Stotfold Road are much busier routes with higher traffic speeds where the speed limit is 60mph.

Public Transport - Bus

2.16 The following bus services serve the estate:

Service	Route	Daytime Frequency in one direction
55	Grange Estate –Letchworth Town Centre - Stevenage	3 buses per hour
625	Stevenage – Hitchin - Letchworth	6 journeys per day

2.17 The routes operate clockwise through the estate as indicated on the plan at **Appendix E**.

Public Transport - Rail

- 2.18 Letchworth Station is about 3 km from the most northerly point of the estate. All the bus services into the estate pass near the station.
- 2.19 The station provides regular services on the Cambridge – London Kings Cross line.

Pedestrian and Cycle Routes

- 2.20 There is a network of pedestrian routes through the estate with each road having a footway each side.
- 2.21 In addition there are some public footpaths on the proposed development land providing walking routes to the east, north and west of the Grange Estate.
- 2.22 National Cycle Route 12 passes through the Grange Estate from Stotfold to the north, across farmland, through the Grange Estate and southwards through Letchworth town centre as illustrated on the site context plan.
- 2.23 These routes are incorporated in the Garden City Greenway as indicated on the extract from The Greenway leaflet included at **Appendix F**.

Personal Injury Accident Information

- 2.24 Personal Injury Accident Information has been obtained from HCC for the most recent 5 year period available (01/07/08 – 30/06/13). The results indicate:
- 2 serious and 7 slight accidents within the estate;
 - 2 slight accidents at the Eastholm/Norton Road mini-roundabout junction; and
 - 1 slight accident at Grange Road/Wilbury Road mini-roundabout junction.
- 2.25 The accidents within the estate are spread across a number of roads. There is no location which would indicate a particular safety issue.
- 2.26 In regard to the access points into the estate, the number of accidents is low and would not be at a level which HCC would consider necessary for accident remedial measures.
- 2.27 A plan is included at **Appendix G**.

3. DEVELOPMENT PROPOSALS AND SCOPE OF THE STUDY

3.1 Land to the north and west of the Grange Estate is being considered for potential residential development of up to 1,000 units. The extent of the land is illustrated on the site context plan at **Appendix B**.

3.2 The area is currently farmland abutting the existing estate and contained within land bounded by the valley of Pix Brook to the west and Norton Road to the north.

3.3 Should a development of this site proceed, it is envisaged that it would be developed on the principles established for the development of Letchworth as a Garden City. In terms of the main road layout this will comprise streets with footways and wide verges on both sides planted with trees.

Access Options

3.4 There are three access options being considered in this current exercise namely:

- **Option 1** – using the existing accesses into the estate at Eastholm and Grange Road;
- **Option 2** - constructing a route northwards across farmland to Norton Road in addition to using the existing accesses; and
- **Option 3** – constructing a route westwards across farmland to Stotfold Road in addition to using the existing accesses.

3.5 The connection into the estate from the site is likely to be through the car park on Western Way near the junction with Northfields.

3.6 A plan illustrating these options is included at **Appendix H**.

Existing Travel Characteristics

3.7 The 2011 Census data has been used to ascertain the travel characteristics of the Grange Estate. Details are included in **Appendix I**.

3.8 In terms of car ownership nearly 28% of households do not own a car. This compares with nearly 17% across North Hertfordshire and 19% for the East of England. This may reflect a higher proportion of people on lower incomes living on the estate.

3.9 Of people who travel to work the mode proportions are as follows;

- Car Driver 69%
- Car Passenger 6%
- Walk 11%
- Train 6%
- Bus 4%
- Cycle 3%
- Motorcycle 1%

3.10 In terms of distance travelled to work, the 2011 Census data has not been completed so the information has been derived from the 2001 Census data. This indicates that 59% of people work within a 5km distance (Letchworth and Baldock), a further 13% within a 10km distance (Hitchin) and 11% within a 20km distance (Stevenage). This reflects a high proportion of people working locally.

Traffic Generation

3.11 The most accurate method of deriving a traffic generation in these circumstances is to use the information derived from the traffic surveys at the two access points to the estate.

3.12 The peak hour traffic information is as follows:

Peak Hour	Arrivals	Departures	Total
0800 – 0900 vehicles	442	702	1144
Trip Rate Vehs/dwelling	0.178	0.283	0.461
1700-1800 vehicles	695	424	1119
Trip Rate Vehs/dwelling	0.280	0.171	0.451

3.13 The TRICS database provides surveys of many land uses including residential estates and so for comparison purposes an extract from a survey of a 1000 dwelling estate is included at **Appendix J**. This is the only survey of this size of scheme which is a reasonable comparison to the proposal. This indicates a two-way trip rate during the morning peak hour of 0.474 vehs/dwelling and for the evening peak hour 0.539 vehs/dwelling.

3.14 This confirms the figures derived from the survey of the Grange Estate are reasonable to apply to a possible scheme to the north.

3.15 For 1000 dwellings the traffic flows will be:

Peak Hour	Arrivals	Departures	Total
0800-0900	178	283	461
1700-1800	280	171	451

Traffic Distribution

3.16 The surveys are also helpful in deriving a distribution of traffic from the Grange Estate. The directions of vehicle movements at the two accesses have been recorded and this enables an overall distribution around the network to be determined.

3.17 Broadly the traffic flows indicate the following overall distribution from the Grange Estate:

- North-east 15% Norton Road
- North-west 5 % Stotfold Road
- East 21% Wilbury Hill Road/ Arlesey New Road
- South 55% Norton Way North / Cowslip Hill
- South-east 4% Green Lane

3.18 This generally conforms to the 'distance travelled to work' (para 3.10) information where about 84% travel south and east.

Design Years and Traffic Growth Factors

3.19 As a general timescale, it is anticipated that, if approved, construction could begin in 2018 and completed by 2023. The road network should therefore be tested for 2023.

3.20 During this time there will be some traffic growth on the base network and so traffic growth factors are applied to predict traffic flows in 2023. These factors are included in **Appendix K**.

3.21 The traffic flow diagrams for the network illustrating existing flows, traffic distribution and future flows with and without the development are included at **Appendix L**.

4. PEDESTRIAN AND CYCLE ACCESS

Pedestrian Access

- 4.1 Current transport policy encourages sustainable modes of travel and places priority on pedestrian and cycle access.
- 4.2 It is generally considered that walking should be the predominant mode of travel for distances under 2km. This equates to about a 25 minute journey.
- 4.3 The development will need to include certain facilities, the details of which will need to be decided at a later stage. However the facilities on the Grange Estate are well within this guidance:
- Neighbourhood shopping centre – 1km (12.5 mins)
 - Grange School – 600m (7.5 mins)
 - Northfields Infant – 750m (9 mins)
 - Stonehill School – 1km (12.5 mins)
 - Sports facilities – 350m (4 mins)
- 4.4 The existing estate has a well established network of footways and safe crossing points. The development will be able to link in with these routes on Western Way and Gaunts Way through the sports facilities.
- 4.5 The footpaths associated with The Garden City Greenway run through the development land and these routes should be preserved and enhanced if the development comes forward. These paths provide connections northwards to Norton Road, westwards to Stotfold Road and southwards through Standalone Farm to Wilbury Road.
- 4.6 Letchworth town centre is about 3km walk (40 mins) which, although outside standard walking distances, is not unreasonable as a walk to work for an adult or college student.

Cycle access

- 4.7 Cycling journeys are generally considered suitable for distances up to 5km although there are many cyclists who regularly cycle beyond this distance.
- 4.8 LGCHF have emphasised their commitment to a sustainable development and part of this will be to encourage cycling and enhance the cycle network in Letchworth. The topography of the town is conducive to cycling but the infrastructure needs to be improved.
- 4.9 As part of this commitment it is intended that every dwelling built in this development should be provided with a minimum of one covered cycle parking space.
- 4.10 There is one established cycle route in the area namely National Cycle Route 12 which runs from North London through Hertfordshire and north to Peterborough.

- 4.11 In the vicinity of the site the route runs from Norton Road southwards across farmland and enters the Grange Estate near the sportsfield. It follows quiet residential streets through the estate till it reaches Grange Road. On Grange Road it becomes a shared route with the footway, crosses Wilbury Road and heads south through Norton Common.
- 4.12 It crosses Icknield Way into The Quadrant, then Nevells Road before crossing the rail line on Bridge Road and then into the town centre.
- 4.13 The route forms a good connection with the town centre but could be significantly improved in certain locations such as:
- The junction of Pelican Way, Southfields and The Grange;
 - Improved crossing on Wilbury Road;
 - Improved crossing on Icknield Way; and
 - Improved crossing over the railway.
- 4.14 The last improvement could be achieved either by widening the footway and narrowing the carriageway on Bridge Road or by constructing a separate pedestrian bridge across the railway adjacent to the existing bridge to provide more width.
- 4.15 These improvements would provide an excellent cycle link to the town centre in order to encourage this mode of travel.
- 4.16 In addition there would be merit in establishing a cycle route to the employment area of Letchworth, east of the town centre. A possible route is illustrated on the plan at **Appendix M** and takes the following route:
- From Cycle Route 12 on Norton Common, a route eastwards to Norton Way North (subject to approval by NHDC and an acceptable impact on the local nature reserve);
 - Along Glebe Road to Green Lane; and
 - South along Green Lane across the railway into the employment area.
- 4.17 The bridge across the railway at Green Lane is a constraint and it may be appropriate to consider the construction of an adjacent pedestrian/cycle bridge to ensure good pedestrian and cycle access across the railway is achieved.
- 4.18 The high proportion of people who live and work in Letchworth suggests that pedestrian and cycle modes of travel should be encouraged in order to lower the reliance on travelling by car.

5. PUBLIC TRANSPORT ACCESS

- 5.1 Current transport policy also encourages the use of public transport. It follows pedestrian and cycle access as a high priority in transport planning.
- 5.2 There are two bus services which currently travel through the estate. The 55 service takes the following route from the Grange Estate:
- Letchworth Station and town centre (13 minutes);
 - Works Road (employment area) (18minutes); and
 - Stevenage (50 minutes).
- 5.3 It has a frequency of 3 buses an hour on weekdays between 0600 and 1900. On Saturdays the service is 2 buses per hour between 0730 and 1845. On Sundays there is a two-hourly frequency between 0940 and 1940. The current catchment of the 55 service is illustrated on the plan at **Appendix N**.
- 5.4 The 625 service run by the University bus service UNO and operates 6 journeys a day around peak times from the Grange Estate. It is coordinated with the 635 service which travels from Baldock, through Letchworth, Hitchin and Stevenage to Hatfield.
- 5.5 HCC requirements for new residential developments are to ensure all dwellings are within a 400m walk of a bus route.
- 5.6 In order to comply with this requirement it will be necessary to extend the 55 service into the development or introduce a new service which would also serve the Grange Estate. The detail of this will be a matter for discussion at the planning stage and will depend on which access option is considered appropriate for this scheme.
- 5.7 The factors which encourage use of public transport are:
- Frequency of service – a 10 minute frequency is ideal;
 - Type of buses – modern, low-floor, comfortable vehicles are needed;
 - Bus infrastructure – comfortable seats and shelters, real-time information systems;and
 - Minimal congestion on routes.
- 5.8 LGCHF has indicated that there may be an opportunity to invest funds as part of a development to the north of the Grange Estate to improve bus connections from the development to the town centre and employment areas in Letchworth, which will also benefit the Grange Estate and other parts of the town.

6. VEHICLE ACCESS

Access Options

- 6.1 There are 3 access options being considered for this development;
- **Option 1** – using the existing accesses into the estate at Eastholm and Grange Road;
 - **Option 2** - constructing a route northwards across farmland to Norton Road in addition to using the existing accesses; and
 - **Option 3** – constructing a route westwards across farmland to Stotfold Road in addition to using the existing accesses.
- 6.2 In all these options there will be a vehicle access from the development into the Grange Estate through the car park on Western Way to a new junction at Northfields and Western Way so a proportion of development traffic will travel through the estate. The car park could be relocated into land behind the flats.
- 6.3 The distribution of traffic from the Grange Estate as mentioned in Section 3 indicates that most traffic travels south with some travelling east and a smaller proportion travelling north. This conforms to other data which confirms a significant proportion of people live and work in Letchworth, while Hitchin and Stevenage are other local destinations.
- 6.4 As a consequence of this, Option 2 (access to Norton Road) provides a relatively small benefit with about 20% of development traffic using this route. It may also draw some residents from the Grange Estate who travel north but these numbers will be low.
- 6.5 It is anticipated that Option 3 (access to Stotfold Road) provides a greater benefit in taking over 40% of development traffic that travels to the south-west and to the north. Again there will be a small number of residents on the Grange Estate who will make use of this route rather than using the existing access points at Eastholm and Grange Road although at this stage these have not been accounted for in the capacity analysis work.

Junction Assessments

- 6.6 The plan at **Appendix O** indicates the junctions which have been analysed on the local network using standard computer programs ARCADY for roundabouts and PICADY for priority junctions.
- 6.7 The results of the junction capacity analysis are included at **Appendix P** and a summary of the results indicates the following;

- **Junction 1 – Norton Road / Green Lane** – the junction is currently at capacity with queues developing on Green Lane in particular and so this junction will require improvements to cater for any additional traffic from any of the access options. A mini-roundabout may be a possible solution.
- **Junction 2 – Wilbury Road/Eastholm/Norton Road** – This junction is in the form of a four arm mini-roundabout. At present some small queues develop on Eastholm during the morning peak hour but adding 10 years of traffic growth exacerbates the problem and it is worsened with any development traffic for any of the options. The junction operates satisfactorily in the evening peak hour for any of the options. This junction will need to be improved and a possible solution is traffic signal control which is designed to also provide safe crossing facilities for pedestrians.
- **Junction 3 – Wilbury Road / Grange Road** – This junction is a mini-roundabout. The capacity analysis indicates this junction will operate satisfactorily for all options.
- **Junction 4 – Eastern Way / Southfields** – This is a priority junction which has capacity for all options.
- **Junction 5 – Southfields /Grange Road/ Pelican Way** – This is a priority junction at the local centre. It has capacity to cater for traffic movements associated with all options.
- **Junction 6 – Southfields/ Western Way/ Southern Way** – This is a standard four arm roundabout which has capacity to cater for all options.
- **Junction 7 - Stotfold Road/ Wilbury Road/ Bedford Road/Arlesey New Road** – This is a triple mini-roundabout junction. The capacity analysis and site observations indicate that queuing already occurs during morning and evening peak hours and therefore this junction will need to have significant improvements.
- **Junction 8 – Dickens Boulevard/Stotfold Road/ Hitchin Road** – This is a three arm standard roundabout which would be enlarged for a fourth arm if Option 3 is considered to be the approved access solution. The junction in its current form has capacity for Option 1 and 2 and will be designed to have sufficient capacity if Option 3 is selected.
- **Junction 9 – Hitchin Road / A507-** This is a large four arm roundabout which has capacity for all options.
- **Junction 10 – A507/Norton Road** – This is a large five arm roundabout which has capacity for all options.

6.8 This junction capacity analysis therefore confirms that Junction 1, Junction 2 and Junction 7 will need to be improved should the development proposals for land north of the Grange Estate proceed as indicated on the plan at **Appendix Q**.

6.9 In addition there will need to be an assessment of junctions along Norton Way North towards the town centre as this route will carry a significant proportion of development traffic.

Impact on Roads within the Grange Estate

6.10 It is important to understand the effect of the development proposals on roads within the estate and therefore some analysis has been undertaken for the worst case option, namely Option 1, where all the development traffic will feed through the estate to the existing access points at Eastholm and Grange Road.

6.11 The diagrams at **Appendix R** illustrate the change in traffic flow on various links arising from the following traffic conditions:

- 2013 peak hour traffic flows
- 2023 peak hour traffic flows
- 2023 peak hour traffic flows plus development flows.

6.12 In assessing the impact of the flows, it is necessary to understand the capacity of roads in carrying traffic. The Highways Agency have produced the Design Manual for Roads and Bridges (DMRB) to provide guidance for road design. Their document TA 79/99 Traffic Capacity of Urban Roads sets out the capacities of particular types of road and in summary the capacity of the main routes on the estate are as follows:

- Road width 6.1m – capacity is 1500 vehs/hr
- Road width 7.3m – capacity is 2100 vehs/hr

6.13 These capacities allow for on-street parking and bus stops.

6.14 The predicted traffic flows on the estate if all development traffic feeds through the estate is substantially below these levels.

6.15 However, another useful measure, particularly for residential areas, is known as environmental capacity. This takes into account environmental factors such as traffic noise, safety and pedestrian delay in crossing. It is suggested that the environmental capacity for an access road or local distributor road is of the order of 300 – 600 vehicles per hour. This is used simply as guidance and is not a definitive standard.

6.16 The diagrams illustrate the change in traffic flows arising from the development traffic based on Option 1. Eastholm is already above that level and will therefore increase

further whilst Grange Road is currently within that level but will rise above it with development flows.

- 6.17 Apart from these two main access roads and a short section on Northfields which will be just above the 600 vehicles marker, the rest of the estate will remain below or within those figures.
- 6.18 The traffic flows can therefore be accommodated based on the technical guidance within the DMRB but when compared to the environmental capacity guidance, the main access routes of Eastholm and The Grange, together with a section of Northfields exceed the recommended values. In these locations it may be necessary to undertake more detailed assessments of environmental impacts to determine the suitability to accommodate additional traffic.
- 6.19 Clearly Options 2 and 3, which have a separate access solution, will reduce these impacts by taking a proportion of traffic on the new access.

Parking

- 6.20 There is a significant amount of on-street parking on the estate particularly where properties have no off-street provision and there may be certain occasions where this can cause delays, particularly for buses.
- 6.21 The estate is characterised by wide verges and footways in front of properties and so a solution could be to improve these locations by providing parking laybys within the verges to allow on-street parking to continue and also reduce delays for buses.
- 6.22 The locations and detail of these measures would be considered at the design stage in consultation with local residents.

Northfields School

- 6.23 There is a School Safety Zone along Northfields characterised by signs, road markings, speed cushions, a raised zebra crossing and waiting restrictions.
- 6.24 The development could fund significant improvements to this safety zone by improving and enhancing the features to ensure vehicle speeds remain low. The ATC on Northfields east of the safety zone recorded average speeds of about 25mph through the week so current speeds are reasonable.

7. HERTFORDSHIRE COUNTY COUNCIL COMMENTS

7.1 Initial comments from HCC have been requested particularly in regard to public transport provision.

7.2 Their comments are as follows:

Currently the closest bus services run along Northfields which would be over the 400m accessibility criteria for significant parts of the new development. We would therefore need to consider bus service diversion. The bus routes running along Northfields include the 55 and 625. The 625 is an inter-urban route that does not run as far as the Grange Estate very often so we would likely look to the 55 in terms of possibilities to divert. The 55 is currently Mon-Fri x3/hr, Sat half hrly, Sun 2 hrly. Looking at the 55 timetable, there is not a lot of spare time available between each journey to add in a diversion. Should this site come forward for development we would need to discuss with the operator the feasibility of improvement to this route. It may mean adding a vehicle and doing short runnings on the route between the site, town centre and possibly the industrial/business park in order to provide a satisfactory frequency (say every 20-30 mins Mon-Fri). We would look to obtain S106 contributions to fund this.

Northfields is subject to on street parking but the road width is probably sufficient for the bus services to operate OK. However Western Way north of its junction with Northfields, Gaunts Way and Eastern Way look narrower and again subject to on street parking to an extent that would make bus services along this route problematic. We would therefore favour an access to the new development which would enable bus services to enter the development without having to pass a significant distance along these roads. The other option would be to put parking restrictions in although this may be unpopular. The point where Option 2 and 3 connect at the junction of Western Way/Northfields is likely to be OK. For a development of 1000 units you would need to consider more than one access point. In relation to bus services all dwellings should be within 400m of a bus stop and this is likely to mean some form of loop road suitable for bus operation is required around the area in order that this criteria is met. Carriageway width and alignment should be conducive to bus operation and pedestrian/cycle routes should be of good quality and enable direct access to bus stops (and other key destinations) to minimise distances involved. Bus stops should be designed so as to enable disabled access and have shelters where possible. We have a countywide programme of real time information provision and operators have been taking up the technology on their vehicles so we may also look towards the provision of screens at key bus stops.

I think it unlikely that bus services will wish to divert from Fairfield Park as these are interurban services.

You have not indicated when this development may be coming forward but I assume it is not for a few years yet given your work is in relation to the site's inclusion in the Local Plan. The bus network is subject to change and my assessment is based on current routes/services - we would not usually go into this level of detail at this stage because of this. Should this development come forward as a planning application we would obviously need to consider what was possible with more certainty and discuss with relevant operators as necessary.

8. POTENTIAL TRANSPORT IMPROVEMENTS

8.1 This section summarises the potential transport improvements which could arise from development of land north of the Grange Estate.

Access

8.2 Three options for access have been considered. Dependent on the wider consultation with Letchworth residents, councillors and District Council and Highway Authority officers, if a development proceeds, there may be a new access either northwards to Norton Road (Option 2) or westwards to Stotfold Road (Option 3), or use only of the existing accesses on Eastholm and Grange Road (Option1).

8.3 Each option will include a new junction at Western Way/Northfields to provide access into the development.

Pedestrian and Cycle Routes

8.4 Extensive network of internal pedestrian and cycle routes linked to existing routes such as the Garden City Greenway and routes in the Grange Estate.

8.5 Improvements to National Cycle Route 12 through the estate and into the town centre.

8.6 A new cycle route from Route 12 across Norton Common towards Green Lane and the employment area in Letchworth.

8.7 Provision of a minimum of one covered cycle parking space with each dwelling.

Bus Services

8.8 Enhancement to bus services to provide increased frequency with connections to the town centre and employment area.

8.9 Improved infrastructure such as shelters and seating together with the introduction of real time information displays at key bus stops.

Roads

8.10 Junction improvements at:

- Green Lane/ Norton Road;
- Eastholm/Norton Road/ Wilbury Road;and
- Stotfold Road/ Wilbury Road/Bedford Road.

8.11 Provision of parking laybys at certain locations on the estate in order to reduce potential delays to bus services.

8.12 Improved School Safety Zone on Northfields.

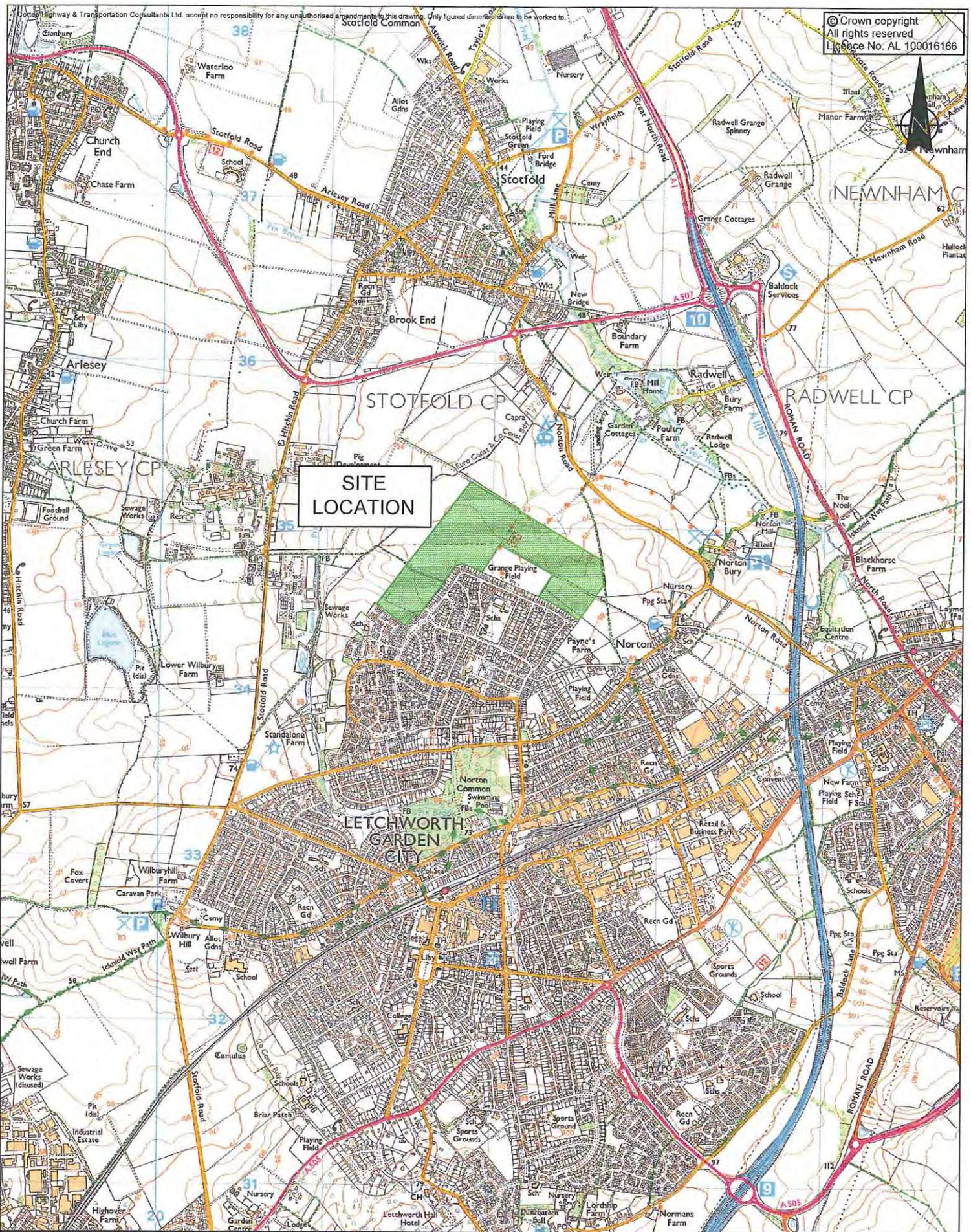
9. CONCLUSIONS

- 9.1 This transport report has been prepared to consider the implications of potential residential development of 1000 dwellings on land north of the Grange Estate to assist the LGCHF consultation exercise, as part of a site selection process for North Hertfordshire District Council's Local Plan.
- 9.2 Extensive traffic surveys have been undertaken in order to assess the traffic impact of the proposals and these surveys have enabled an assessment to be made of both the traffic generation of the development and the traffic distribution.
- 9.3 Should development proceed it will need to include an internal network of pedestrian and cycle routes which link to existing external routes through the Grange Estate and The Garden City Greenway.
- 9.4 The National Cycle Route 12 passes through the site into the Grange Estate and southwards to the town centre. A number of improvements on this route would make it more attractive.
- 9.5 In addition, there would be merit in providing a new cycle route from Route 12 in Norton Common eastwards to the main employment area of Letchworth.
- 9.6 There is one regular bus service (55) and one intermittent bus service (625) running through the Grange Estate. A bus service will be need to be extended into the development to ensure every dwelling is within a 400m walk of the service.
- 9.7 The bus service will need to be improved with the potential for improved frequencies and consideration will be given to other services dependent on which access option is selected.
- 9.8 Funding will be provided for improved infrastructure such as shelters, seating and real time information displays at key bus stops, linked to a development of this site.
- 9.9 Three access options have been considered;
- **Option 1** – using the existing accesses into the estate at Eastholm and Grange Road;
 - **Option 2** - constructing a route northwards across farmland to Norton Road in addition to using the existing accesses; and
 - **Option 3** – constructing a route westwards across farmland to Stotfold Road in addition to using the existing accesses.

- 9.10 In terms of traffic impact, each of these options will need improvements to at least 3 junctions namely:
- Green Lane/ Norton Road;
 - Eastholm/Norton Road/ Wilbury Road;and
 - Stotfold Road/ Wilbury Road/Bedford Road.
- 9.11 Within the estate the existing roads have capacity to cater for the additional traffic even under the worst case Option 1 based on the technical guidance within the Design Manual for Roads and Bridges.
- 9.12 However when the environmental capacity is considered, which takes into account factors such as noise, pedestrian delay and safety, the traffic flows for Option 1 exceed the guidance on the main access routes of Eastholm and The Grange and a section of Northfields. Options 2 and 3, which have separate access arrangements will reduce these impacts by taking a proportion of traffic on the new access.
- 9.13 The Personal Injury Accident Data does not identify any particular areas or locations which could be considered to have a highway safety issue. Average vehicle speeds within the estate are within the 30mph speed limit.
- 9.14 There would be merit in providing parking laybys in certain locations within the estate to reduce any delays to bus services in particular which may be caused by on-street parking. This will need to be in consultation with local residents as well as the district and county council.
- 9.15 In addition, improvements to the School Safety Zone on Northfields will ensure vehicle speeds remain low.
- 9.16 HCC have provided initial comments on potential public transport improvements and indicated a second access should be considered for a development of 1000 dwellings.
- 9.17 Having undertaken this assessment it is considered that, provided junction and highway improvements are undertaken in the areas identified, the development can be accommodated on the highway network for any of the options considered in terms of technical capacity.
- 9.18 Some sections of the main access routes in the estate exceed environmental capacity guidelines and therefore it may be necessary to undertake more detailed assessments of environmental impacts to determine the suitability to accommodate additional traffic in those locations.

APPENDIX A

SITE LOCATION PLAN



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**SITE
LOCATION**

Drawn	DH	Checked	GJK
Scale	NTS	Date	OCT 2013
Drawing No.	1284/4A		
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Project
**LETCHWORTH GARDEN CITY
HERITAGE FOUNDATION
LAND NORTH OF THE GRANGE,
LETCHWORTH**

SITE LOCATION PLAN

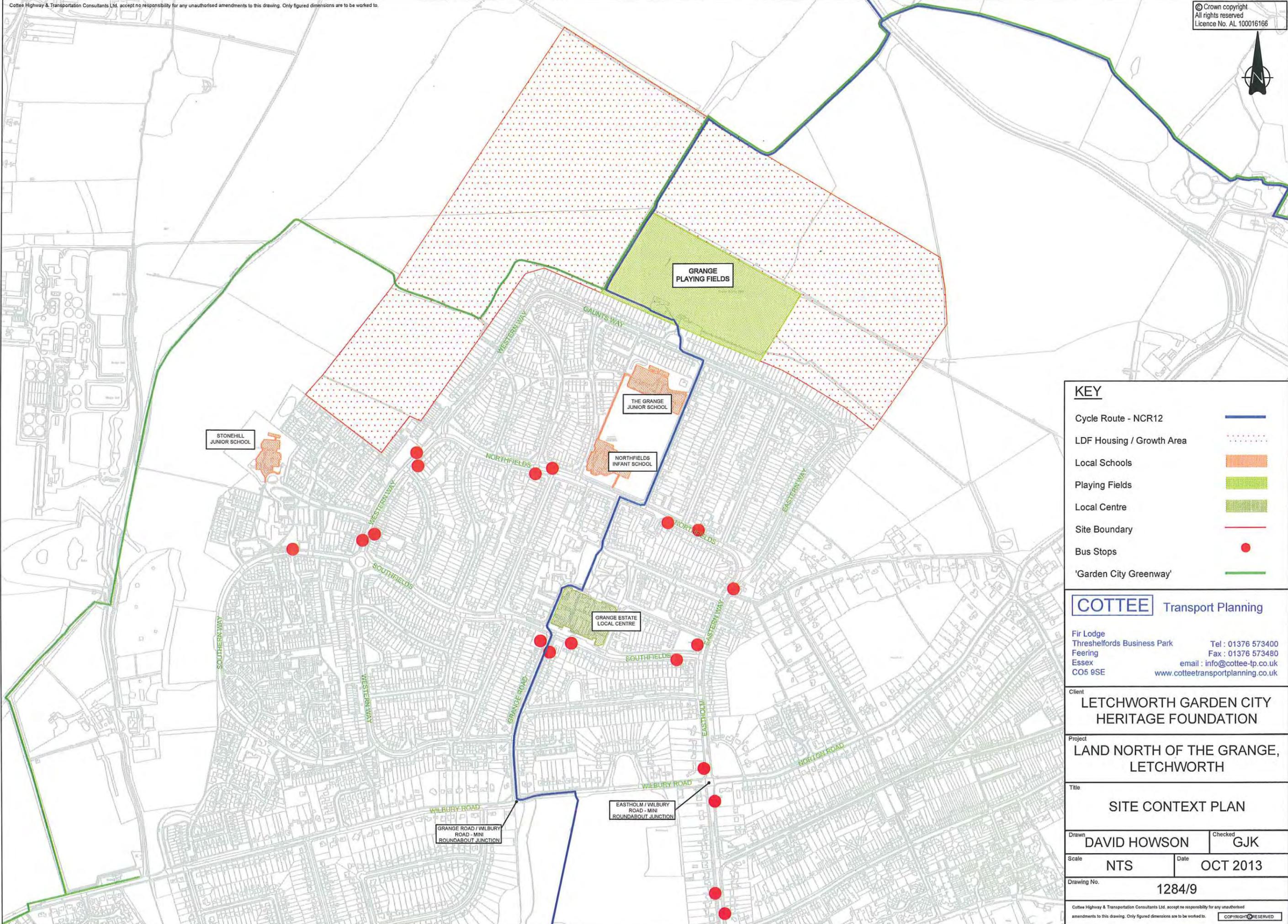
COTTEE Transport Planning

Fir Lodge
Threshfelds Business Park
Feering
Essex
CO5 9SE

Tel : 01376 573400
Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk

APPENDIX B

SITE CONTEXT PLAN



KEY

- Cycle Route - NCR12 —
- LDF Housing / Growth Area ⋯
- Local Schools ▭
- Playing Fields ▨
- Local Centre ▨
- Site Boundary —
- Bus Stops ●
- 'Garden City Greenway' —

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www.cottee-transportplanning.co.uk

Client
**LETCHWORTH GARDEN CITY
HERITAGE FOUNDATION**

Project
**LAND NORTH OF THE GRANGE,
LETCHWORTH**

Title
SITE CONTEXT PLAN

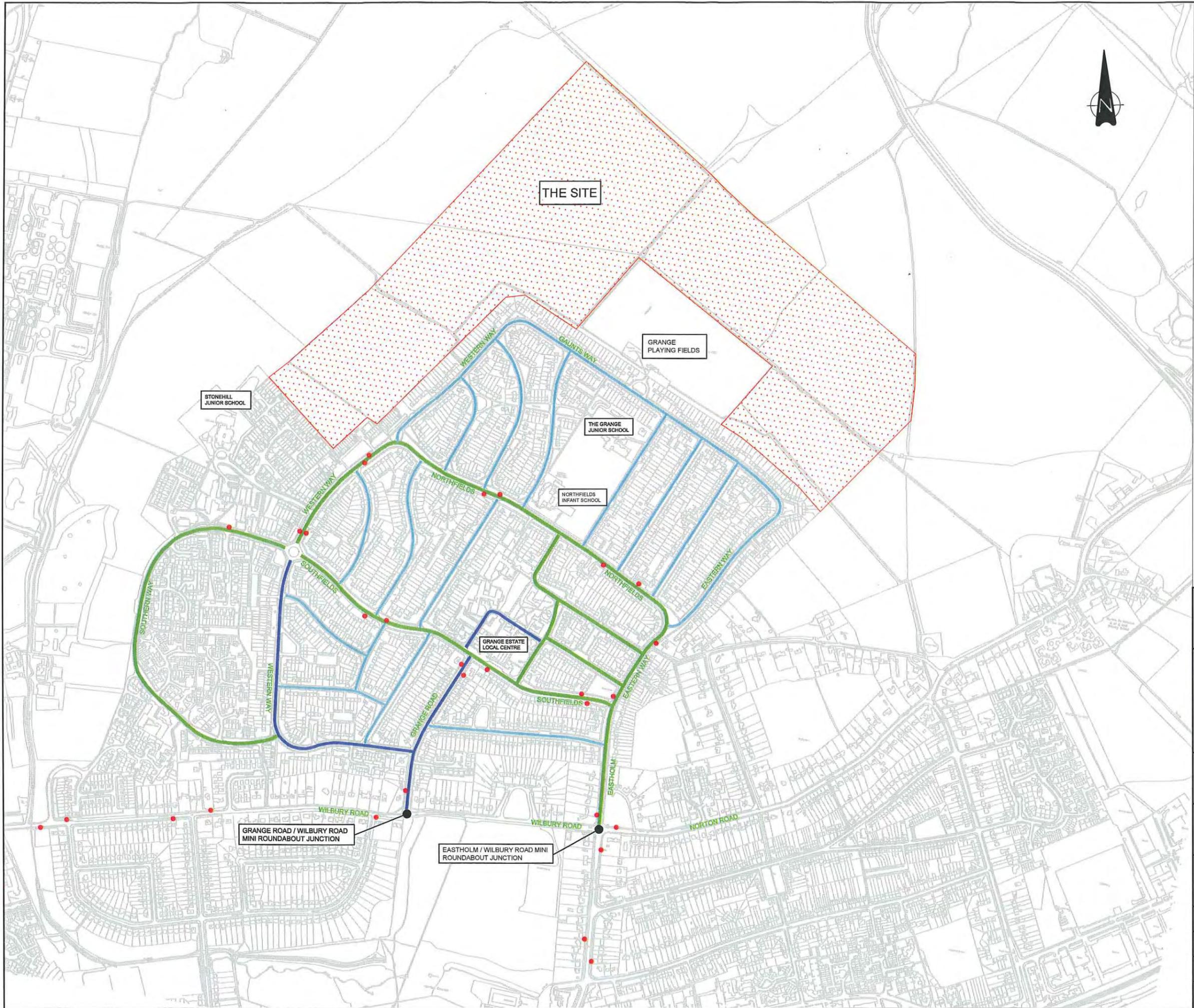
Drawn **DAVID HOWSON** Checked **GJK**

Scale **NTS** Date **OCT 2013**

Drawing No. **1284/9**

APPENDIX C

GRANGE ESTATE HEIRARCHY



KEY

Site Boundary	
7.3m Road Width	
6.1m Road Width	
4.8m Road Width	
Bus Stops	

PRELIMINARY

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Client
**LETCWORTH GARDEN CITY
 HERITAGE FOUNDATION**

Project
**LAND NORTH OF THE GRANGE,
 LETCWORTH**

Title
**LOCAL NETWORK
 HIERARCHY PLAN**

Drawn DH	Checked GJK
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Scale 1:7500@A3	Date OCT 2013
--------------------	------------------

Drawing No. **1284/2A**

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APPENDIX D

TRAFFIC SURVEY LOCATIONS



HITCHIN ROAD / A507 -
ROUNDBOUT JUNCTION

NORTON ROAD / TANSY
AVENUE / A507 -
ROUNDBOUT JUNCTION

NORTHFIELDS
AUTOMATED TRAFFIC
COUNTER SURVEY

NORTON ROAD
AUTOMATED TRAFFIC
COUNTER SURVEY

SOUTHFIELDS / GRANGE
ROAD / PELICAN WAY -
STAGGERED
CROSSROADS JUNCTION

EASTERN WAY /
NORTHFIELDS - PRIORITY
JUNCTION

NORTON ROAD / GREEN
LANE - PRIORITY JUNCTION

EASTERN WAY /
SOUTHFIELDS / WESTERN
WAY - PRIORITY JUNCTION

EASTHOLM
AUTOMATED TRAFFIC
COUNTER SURVEY

DICKENS BOULEVARD /
HITCHIN ROAD / STOTFOLD
ROAD - ROUNDBOUT
JUNCTION

WESTERN WAY /
NORTHFIELDS - PRIORITY
JUNCTION

STOTFOLD ROAD
AUTOMATED TRAFFIC
COUNTER SURVEY

SOUTHERN WAY /
SOUTHFIELDS / WESTERN
WAY - ROUNDBOUT
JUNCTION

GRANGE ROAD / ORCHARD
WAY - PRIORITY JUNCTION

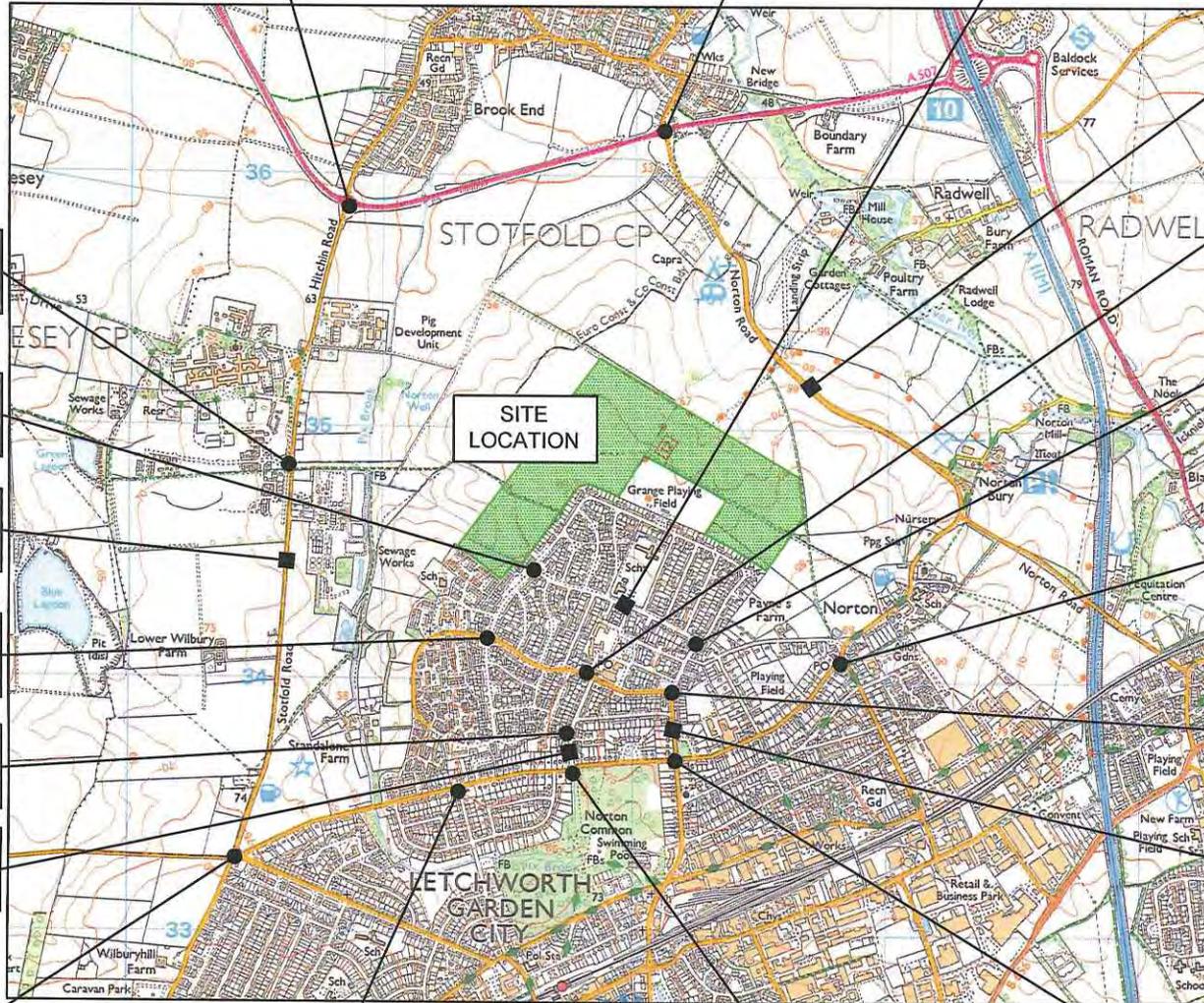
GRANGE ROAD
AUTOMATED TRAFFIC
COUNTER

STOTFOLD ROAD / BEDFORD
ROAD / WILBURY HILL /
ARLESEY NEW ROAD / WILBURY
HILLS ROAD - TRIPPLE MINI
ROUNDBOUT JUNCTION

COWSLIP HILL / WILBURY
ROAD - PRIORITY
JUNCTION

WILBURY ROAD / GRANGE
ROAD - MINI ROUNDBOUT
JUNCTION

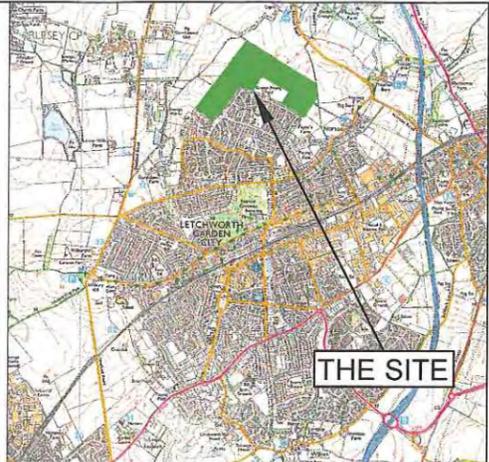
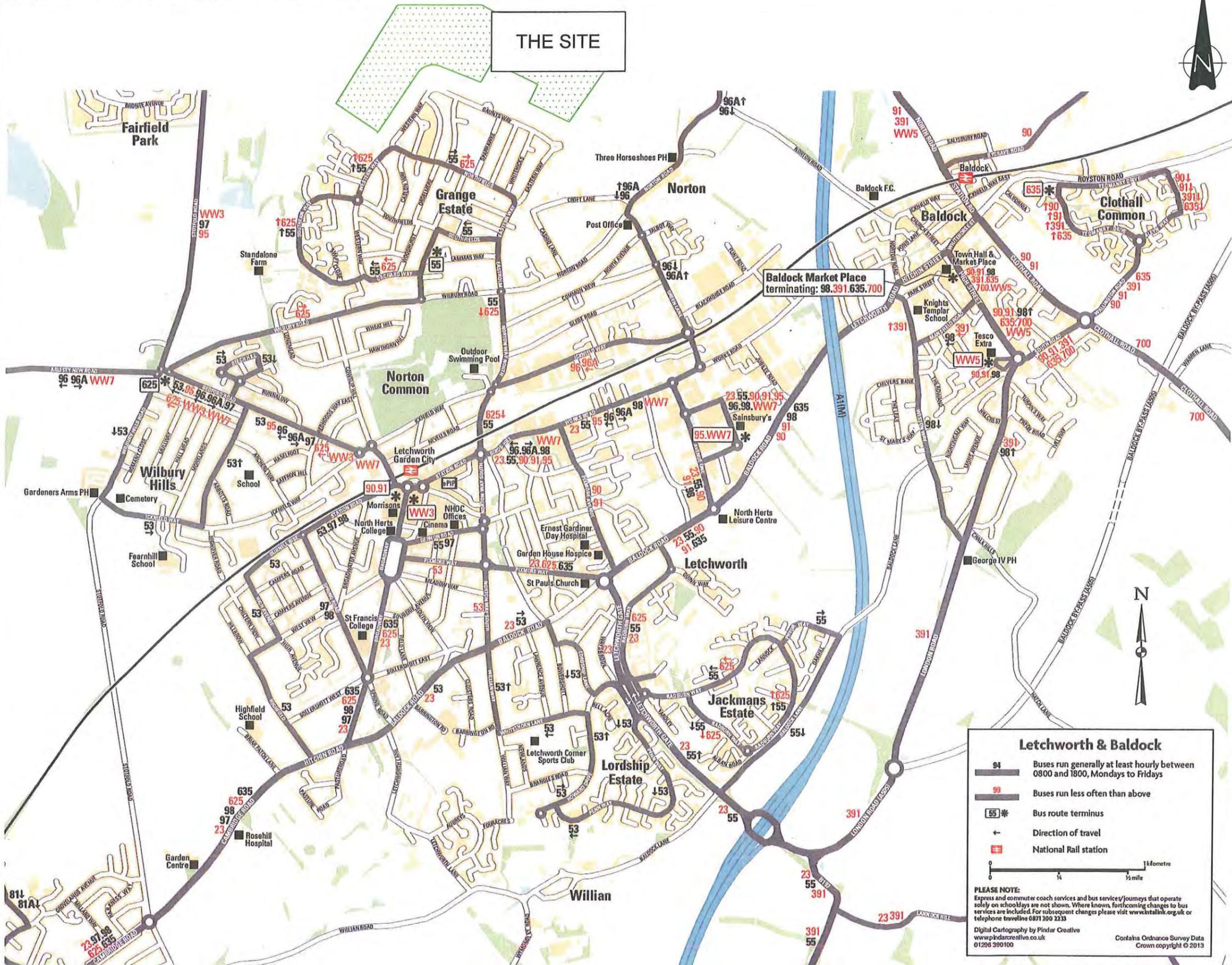
WILBURY ROAD / NORTON
WAY NORTH / NORTON
ROAD / EASTHOLM - MINI
ROUNDBOUT JUNCTION



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Client LETCWORTH GARDEN CITY HERITAGE FOUNDATION	
Project LAND NORTH OF THE GRANGE, LETCWORTH	
Title SURVEYED JUNCTION LOCATIONS	
Drawn DAVID HOWSON	Checked GJK
Scale NTS	Date OCT 2013
Drawing No. 1284/20	
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APPENDIX E

PUBLIC TRANSPORT INFORMATION



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SERVICE FREQUENCY

The Grange

Service	Mon-Fri	Sat	Sun
55	3/hour	2/hour	6/day
625	6/day	-	-

Stotfold Road

Service	Mon-Fri	Sat	Sun
95	1/day	-	-
97	2/hour	2/hour	6/day
WW3	1/day*	-	-

*Third Wednesday of each month only.

Norton Road

Service	Mon-Fri	Sat	Sun
96	1/hour	5/day	-
96A	1/hour	5/day	-

SOURCE: www.intalink.org.uk

Letchworth & Baldock

- 94 Buses run generally at least hourly between 0800 and 1800, Mondays to Fridays
- 99 Buses run less often than above
- 55* Bus route terminus
- ← Direction of travel
- E National Rail station

PLEASE NOTE:
Express and commuter coach services and bus services/journeys that operate solely on schooldays are not shown. Where known, forthcoming changes to bus services are included. For subsequent changes please visit www.intalink.org.uk or telephone traveline 0871 200 2233

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Client
LETCHWORTH GARDEN CITY HERITAGE FOUNDATION

Project
LAND NORTH OF THE GRANGE, LETCHWORTH

Title
BUS ROUTE PLAN

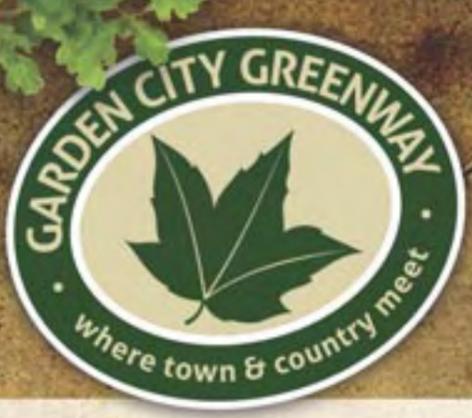
Drawn **DAVID HOWSON** Checked **GJK**

Scale **NTS** Date **OCT 2013**

Drawing No. **1284/5A**

APPENDIX F

GARDEN CITY GREENWAY



Letchworth Garden City's 13.6 mile Country Trail

www.greenway.org.uk

Get in touch: 01462 476007
or response@letchworth.com



Download our FREE App

- Plan your journey before you go
- Track down the best spots to explore
- Seven suggested routes to follow
- Pinpoint where you are on route*
*GPS connectivity required.



Scan the code to download for FREE



heritage foundation
Letchworth Garden City

The Garden City Greenway is maintained and managed by

Design www.handsome.design.co.uk

Letchworth GC's 13.6 mile Country Trail

Family Fun

Get Active

Relax

Fold-out map & guide



Town & Country Trails
Enjoy a walk or cycle ride from the town centre, along many tree lined streets, past prominent landmarks and green open spaces on your way to the countryside. Download from our website or pick up a printed copy at Tourist Information Centre, 33-35 Station Road or call 01462 487868.



Get in touch!

If you have any queries, would like more maps or are interested in using the Greenway for a charity event, please email response@letchworth.com or call 01462 476007

Get the latest news

Discover our short walks

Activities for kids

Explore our nature guides

See stunning photos



Welcome to the Greenway – a 13.6 mile circular trail surrounding the Garden City estate allowing you to discover Letchworth's beautiful countryside.
Launched as a rural landscape design competition and funded by the Letchworth Garden City Heritage Foundation, the Greenway was officially opened by pop star and avid gardener Kim Wilde in 2003 celebrating Letchworth Garden City's first centenary. Since 1998, the Foundation's forestry team has planted over 37,000 trees, eight miles of hedges and 13 miles of grass margins for wildlife!



Where town & country meet



Wymondley Wood

www.greenway.org.uk



Letchworth's Great Outdoors

Family Fun

Look no further for great family activities...

Standalone Farm

- Explore the 170 acre working farm
- Interact with farm animals
- Relax in the café
- Tractor-trailer rides
- Play areas for kids
- Indoor picnic barn

Open daily 10am – 5pm,
March to October
Wilbury Road, SG6 4JN
01462 686775
www.standalonefarm.com



Radwell Meadows Country Park



- Award-winning play area
- Grass areas for fun and games

Wymondley Wood

- Explore wildlife areas
- Enjoy a family picnic

Activities for kids
Download our nature education packs at
www.greenway.org.uk/education-packs

Relax

Enjoy a peaceful countryside setting...

Willian Arboretum

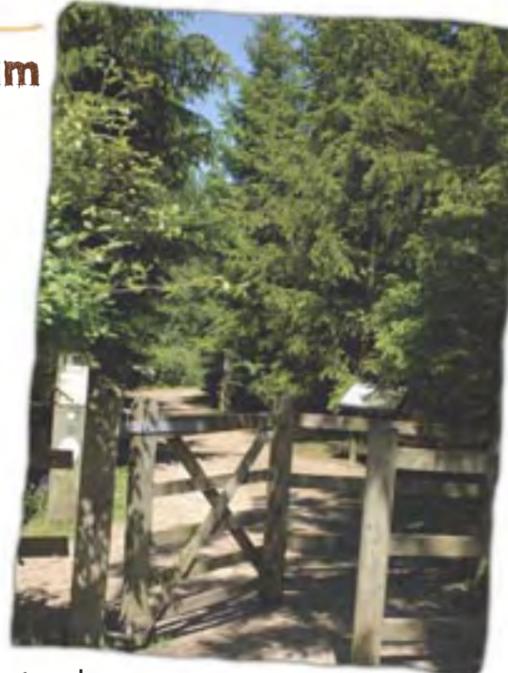
- Stroll through the rural enclosure
- Discover over 30 different tree varieties

Manor Wood

- Picnic in natural surroundings
- Pick apples during the harvest season

Norton Pond

- Spot dragonflies, frogs, toads, damselflies and more
- Popular watering hole for many bird species



Don't Forget Your Camera



With so many spectacular shots to capture around the Greenway, send your favourite snaps to response@letchworth.com and see them appear on the Greenway website.

Get Active

- 13.6 miles of stunning nature trails, perfect for brisk walks or jogging
- Fancy an energetic cycle or steady horse ride? There are parts of the circular route for you to take on.

North Herts Road Runners regularly use the Greenway for training.
www.nhrr.org.uk



NORTH HERTS ROAD RUNNERS



Looking for a shorter route?

Visit www.greenway.org.uk/short-walks for alternative trails for you to explore.





Letchworth Garden City's 13.6 mile Country Trail

Map key

- Main 13.6 mile Greenway route
- New / improved stone surfaced access routes (suitable for cyclists and wheelchairs)
- Pavements suitable for wheelchairs
- Places to visit / things to do
- Car parks
- Historic buildings and features
- Pub
- ▲ School
- Footpaths and permissive paths
- Numbered way markers
- Town Centre NCN Route 12
- Slight gradient incline or decline
- Community Orchard
- Nature spot
- Recommended photo point
- Public & Permissive Bridleways

Way markers 60

Want to know how far you've walked; need to locate yourself on the map? 60 way markers have been positioned around the Greenway, allowing you to easily find out where you are. The markers are numbered circular discs located on wooden posts, clearly visible from the Greenway path.

Parking restrictions

Radwell Meadows and Wymondley Wood
Please be aware the Radwell Meadows and Wymondley Wood car parks are only open from 8am to 9pm between 31 March & 31 October and 8am to 8pm between 1 November & 30 March. Outside of these times an automatic barrier is raised preventing entry to or exit from the car park.



The perfect route for a charity walk

The 13.6 mile (21.8km) Greenway is perfect for fundraising walks and cycle rides. Previously used by the MS Trust and the Rotary Club, the Greenway provides an interesting route for walkers, and a number of open spaces for organisers and refreshments. To find out more about using the Greenway for charitable activities, please email response@letchworth.com or call 01462 476007.

The Great North Way Cycle Route runs for approximately 50 miles (80 km) from Hadley Wood in the south to Letchworth Garden City and the Bedfordshire cycle network.

Places of interest

- A Radwell Meadows, Nortonbury
- B Standalone Farm
- C Willian Arboretum
- D Norton Pond
- E Wymondley Wood

www.greenway.org.uk



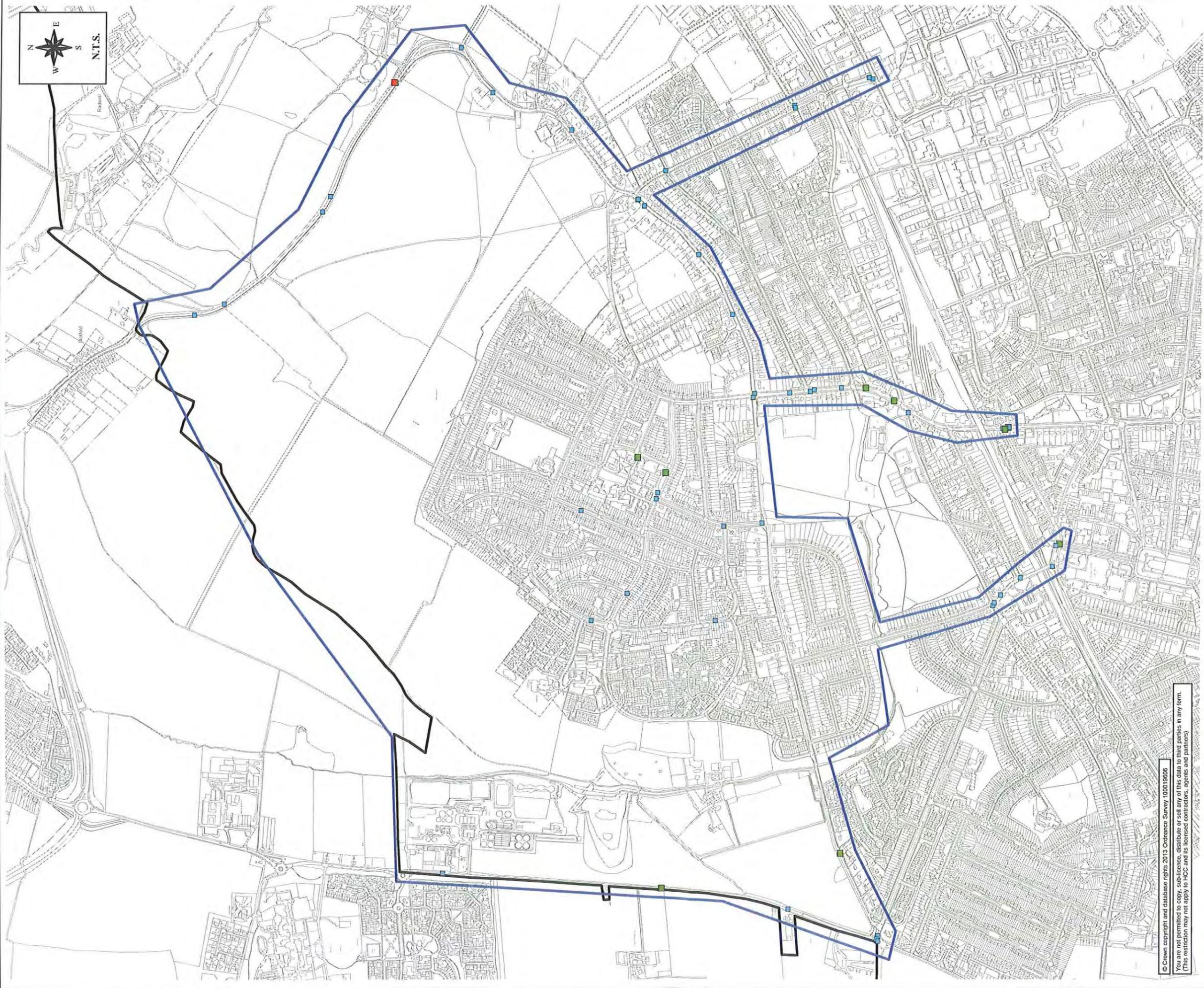
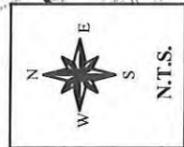
The Garden City Greenway was the single largest investment delivered by Letchworth Garden City Heritage Foundation in celebration of Letchworth Garden City's Centenary in 2003.

Wildlife information featured on site boards around the Greenway is written by Brian Sawford and is reproduced with his kind permission. All drawings shown are for illustrative purposes only and are intended as a guide to the development of the Greenway project as at June 2010. This map and route is subject to change. Letchworth Garden City Heritage Foundation invites the public to use and enjoy all the areas of the Garden City identified in this brochure at its permission. By doing so, it does not purport to create any public right of way under Section 31 of the Highways Act 1980. Letchworth Garden City Heritage Foundation reserves the right to withdraw its permission at any time.



APPENDIX G

PERSONAL INJURY ACCIDENT DATA



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Transport Planning Data Team
 Hertfordshire County Council
 County Hall
 Pegs Lane
 Hertford SG13 8DN

Postat-Point CHN204
 Tel 01992 658339

Drwg No.
G-52028.Y1/001/18205

Drawing Title,
**Area bounded by Stofold Road, Scale, N.T.S.,
 Wibury Way, Norton Road & County Boundary -
 Cowslip Hill, Norton Way South & Green Lane
 Letchworth Garden City**

Sheet No. 1 of 1

Project Title,
Accidents from 1 Jul 2008 to 30 Jun 2013

Project No. G-520 .Y1

Data Services - Accident Data Supply

Legend.

Accidents by Maximum Severity

- Fatal ■
- Serious ■
- Slight ■
- Selection boundary
- County boundary

Client Org.

Hertfordshire County Council

Prepared

ACN

Checked

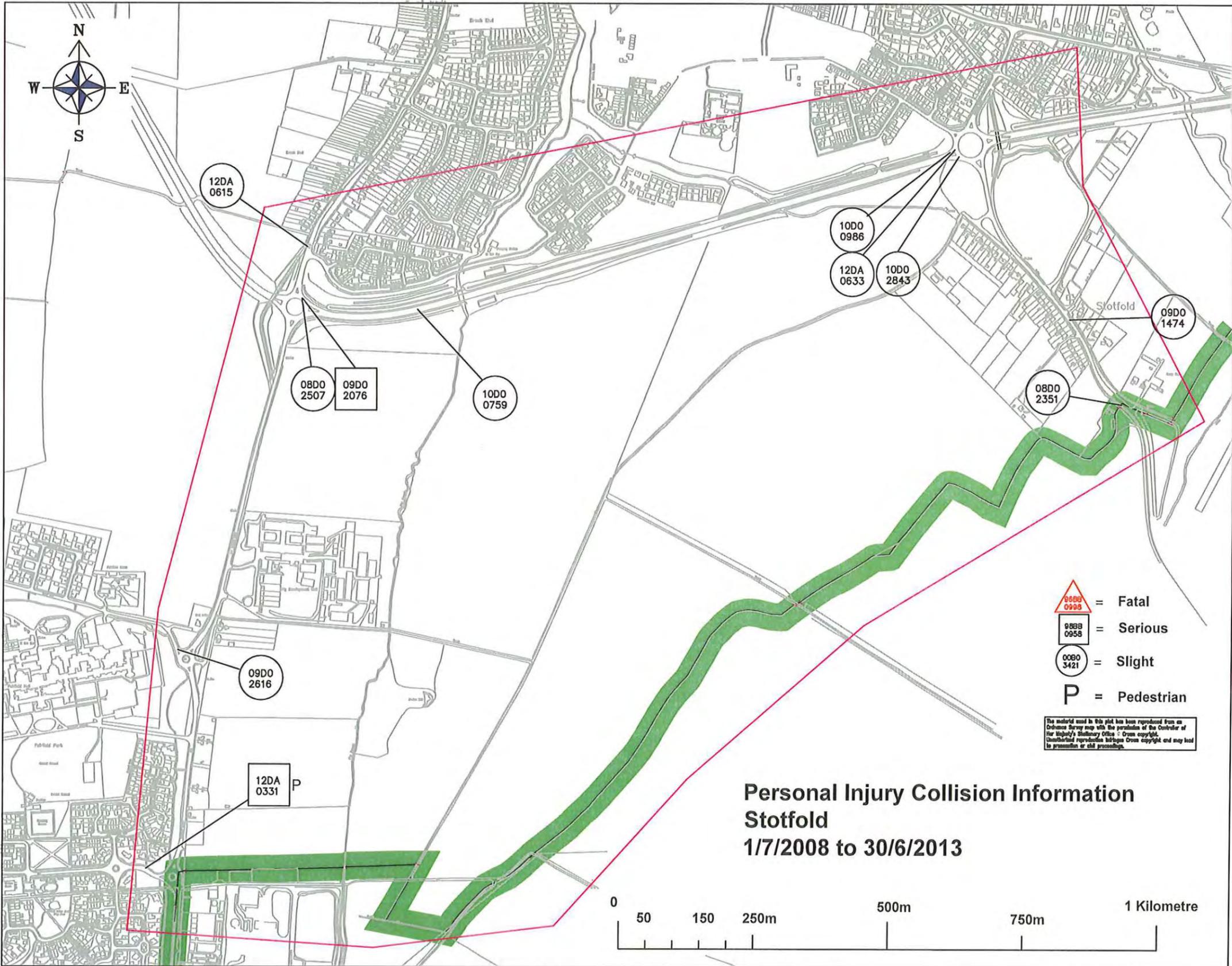
Approved

Date

Oct 2013

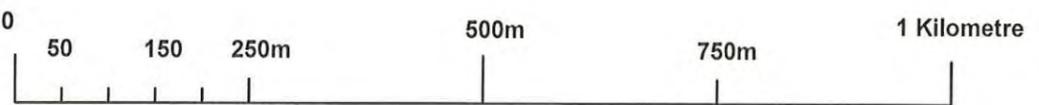
File.

Not Held



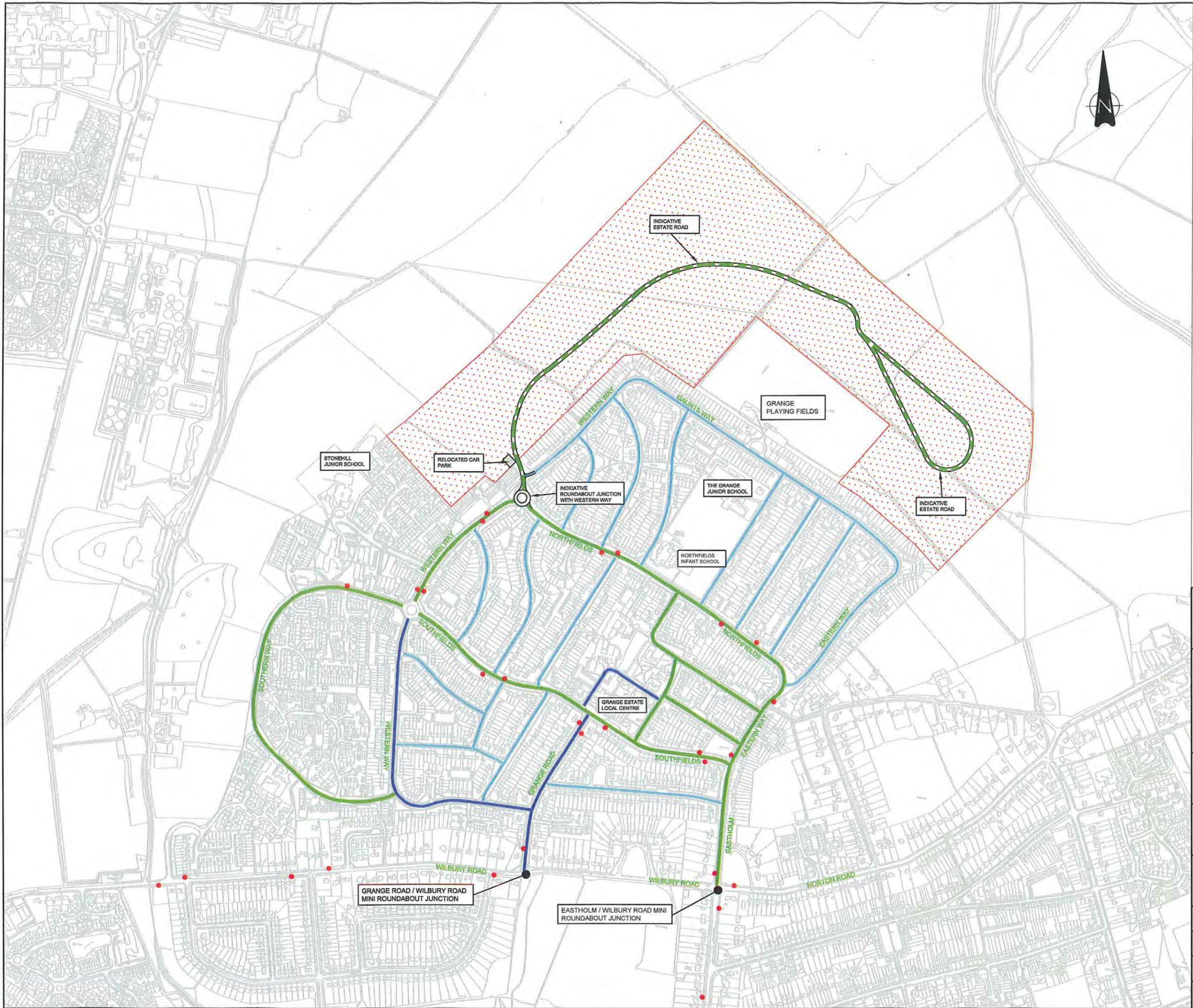
**Personal Injury Collision Information
Stotfold
1/7/2008 to 30/6/2013**

-  = Fatal
 -  = Serious
 -  = Slight
 - P** = Pedestrian
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APPENDIX H

ACCESS OPTIONS



- KEY**
- Site Boundary
 - 7.3m Road Width
 - 6.1m Road Width
 - 4.8m Road Width
 - Bus Stops
 - Indicative Proposed Access Road Alignment (7.3m Road Width)

PRELIMINARY

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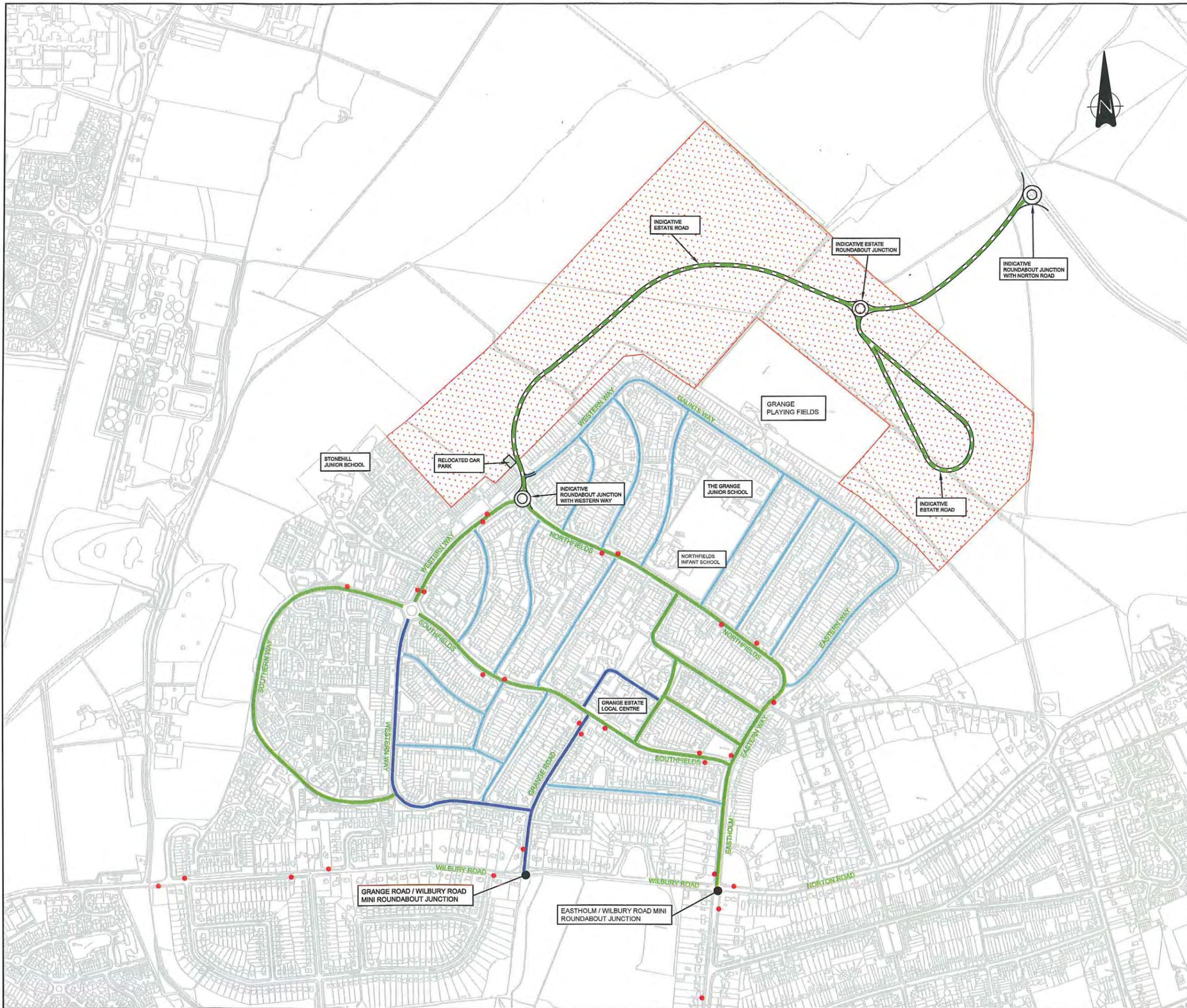
Client
**LETCWORTH GARDEN CITY
HERITAGE FOUNDATION**

Project
**LAND NORTH OF THE GRANGE,
LETCWORTH**

Title
PROPOSED ACCESS - OPTION 1

Drawn DH	Checked GJK
Scale 1:7500@A3	Date OCT 2013
Drawing No. 1284/14	

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- KEY**
- Site Boundary
 - 7.3m Road Width
 - 6.1m Road Width
 - 4.8m Road Width
 - Bus Stops
 - Indicative Proposed Access Road Alignment (7.3m Road Width)

PRELIMINARY

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CO5 9SE

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email : info@cottee-tp.co.uk
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Client
**LETCWORTH GARDEN CITY
HERITAGE FOUNDATION**

Project
**LAND NORTH OF THE GRANGE,
LETCWORTH**

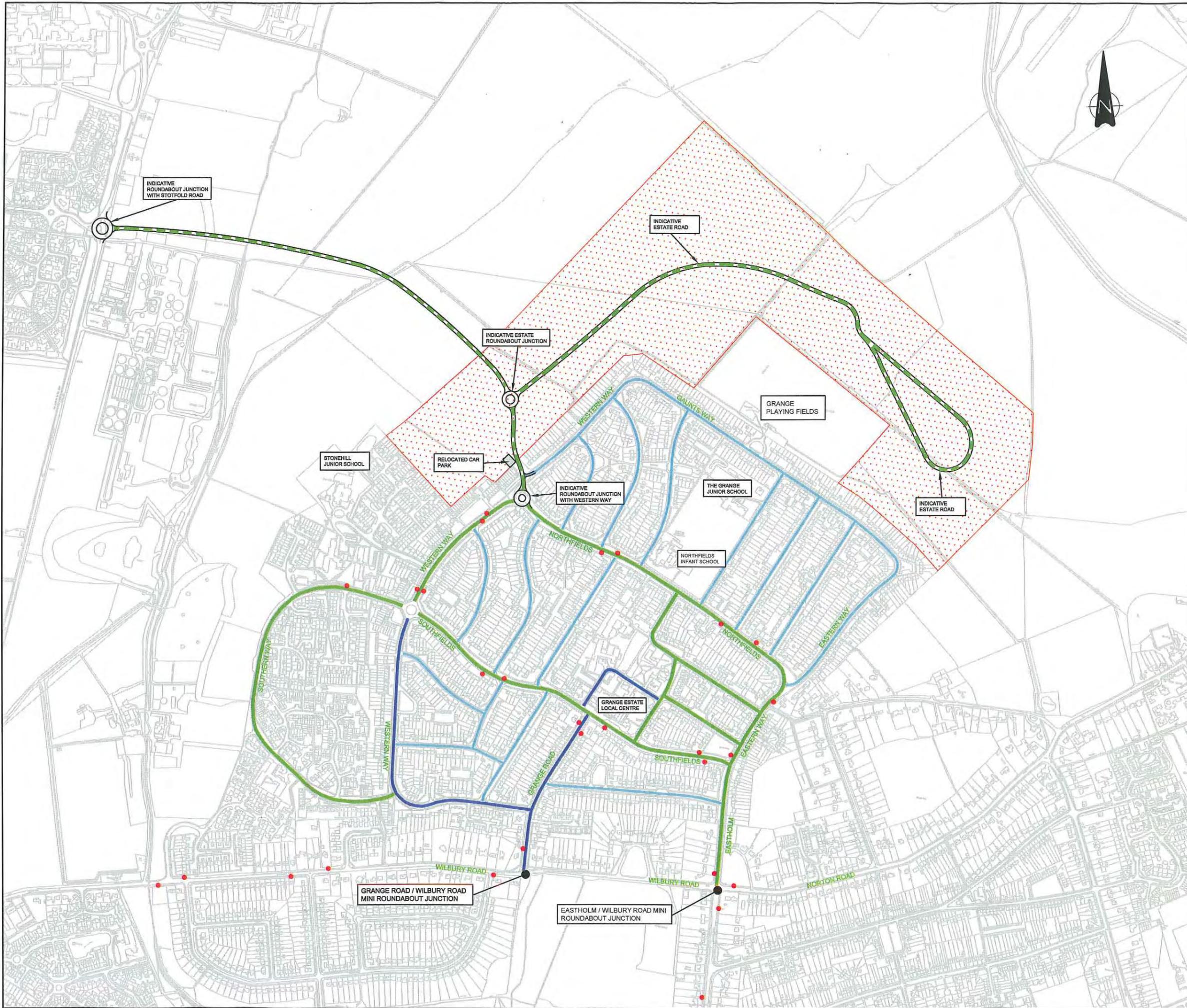
Title
PROPOSED ACCESS - OPTION 2

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Scale 1:7500@A3	Date OCT 2013
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KEY

- Site Boundary
- 7.3m Road Width
- 6.1m Road Width
- 4.8m Road Width
- Bus Stops
- Indicative Proposed Access Road Alignment (7.3m Road Width)

PRELIMINARY

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Threshelfords Business Park
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Essex
CO5 9SE

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Fax : 01376 573480
email : info@cottee-tp.co.uk
www.cotteetransportplanning.co.uk

Client
**LETCHWORTH GARDEN CITY
HERITAGE FOUNDATION**

Project
**LAND NORTH OF THE GRANGE,
LETCHWORTH**

Title
PROPOSED ACCESS - OPTION 3

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Scale 1:7500@A3	Date OCT 2013
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APPENDIX I

CENSUS DATA

Car or Van Availability (QS416EW)

	TOTAL		North Hertfordshire		East of England		England	
	Output Areas		Non-Metropolitan District		Region		Country	
All Households	2478		53426		2423035		22063368	
No Cars or Vans in Household	690	27.8%	8895	16.6%	449358	18.5%	5691251	25.8%
1 Car or Van in Household	1164	47.0%	22932	42.9%	1039677	42.9%	9301776	42.2%
2 Cars or Vans in Household	508	20.5%	16463	30.8%	703968	29.1%	5441593	24.7%
3 Cars or Vans in Household	92	3.7%	3787	7.1%	166426	6.9%	1203865	5.5%
4 or More Cars or Vans in Household	24	1.0%	1349	2.5%	63606	2.6%	424883	1.9%
All Cars or Vans in Area	2561		73212		3231763		25696833	

Distance Travelled to Work (UV35)

	E00120031 Output Area		North Hertfordshire Non-Metropolitan District		East of England Region		England Country	
All People	2438		56035		2441062		21376959	
Works mainly at or from home	191	7.8%	5797	10.3%	243485	10.0%	2055224	9.6%
Less than 2km	717	29.4%	12299	21.9%	517466	21.2%	4484082	21.0%
2km to less than 5km	529	21.7%	7254	12.9%	437395	17.9%	4510259	21.1%
5km to less than 10km	320	13.1%	9012	16.1%	354182	14.5%	4094614	19.2%
10km to less than 20km	255	10.5%	7424	13.2%	379857	15.6%	3412081	16.0%
20km to less than 30km	150	6.2%	4770	8.5%	201209	8.2%	1197605	5.6%
30km to less than 40km	86	3.5%	2788	5.0%	107616	4.4%	527840	2.5%
40km to less than 60km	122	5.0%	5133	9.2%	108875	4.5%	487683	2.3%
60km and over	68	2.8%	1558	2.8%	90977	3.7%	607571	2.8%

Note: Those who work outside of the UK or are not currently in employment have been excluded from this analysis.

Accommodation Type - Households (QS402EW)

	TOTAL Output Areas	North Hertfordshire Non-Metropolitan District	East of England Region	England Country
All Households	2478	53426	2423035	22063368
Unshared Dwelling; Total	2478	53396	2419377	21985413
Unshared Dwelling; Whole House or Bungalow; Total	1864	43406	2017702	17235610
Unshared Dwelling; Whole House or Bungalow; Detached	64	13158	716515	4949216
Unshared Dwelling; Whole House or Bungalow; Semi-Detached	667	16269	748242	6889935
Unshared Dwelling; Whole House or Bungalow; Terraced (Including End-Terrace)	1133	13979	552945	5396459
Unshared Dwelling; Flat, Maisonette or Apartment; Total	614	9655	388248	4668839
Unshared Dwelling; Flat, Maisonette or Apartment; Purpose-Built Block of Flats or Tenement	596	8466	326440	3624359
Unshared Dwelling; Flat, Maisonette or Apartment; Part of a Converted or Shared House (Including Bed-	11	736	43714	834083
Unshared Dwelling; Flat, Maisonette or Apartment; In Commercial Building	7	453	18094	210397
Unshared Dwelling; Caravan or Other Mobile or Temporary Structure	0	335	13427	80964
Shared Dwelling	0	30	3658	77955

Method of Travel to Work (QS701EW)

	E00120031 Output Area		North Hertfordshire Non-Metropolitan District		East of England Region		England Country	
All Usual Residents Aged 16 to 74	3707		91510		4245544		38881374	
Work Mainly at or From Home	81	2.2%	4422	4.8%	161428	3.8%	1349568	3.5%
Underground, Metro, Light Rail, Tram	6	0.2%	221	0.2%	33110	0.8%	1027625	2.6%
Train	141	3.8%	7794	8.5%	205077	4.8%	1343684	3.5%
Bus, Minibus or Coach	94	2.5%	1117	1.2%	106303	2.5%	1886539	4.9%
Taxi	5	0.1%	167	0.2%	13227	0.3%	131465	0.3%
Motorcycle, Scooter or Moped	21	0.6%	400	0.4%	22475	0.5%	206550	0.5%
Driving a Car or Van	1644	44.3%	40153	43.9%	1757121	41.4%	14345882	36.9%
Passenger in a Car or Van	146	3.9%	2809	3.1%	143749	3.4%	1264553	3.3%
Bicycle	82	2.2%	1240	1.4%	100651	2.4%	742675	1.9%
On Foot	252	6.8%	6364	7.0%	288663	6.8%	2701453	6.9%
Other Method of Travel to Work	7	0.2%	303	0.3%	17708	0.4%	162727	0.4%
Not in Employment	1228	33.1%	26520	29.0%	1396032	32.9%	13718653	35.3%

APPENDIX J

TRICS DATA

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : A - HOUSES PRIVATELY OWNED
 VEHICLES

Selected regions and areas:

02 SOUTH EAST
 HC HAMPSHIRE 8 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
 Actual Range: 1040 to 1040 (units:)
 Range Selected by User: 1000 to 4334 (units:)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/00 to 10/12/00

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Thursday 4 days
 Friday 4 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count 0 days
 Directional ATC Count 8 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Edge of Town 8

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone 8

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

C3 8 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Filtering Stage 3 selection (Cont.):

Population within 1 mile:

10,001 to 15,000 8 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

75,001 to 100,000 8 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

1.1 to 1.5 8 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Not Known 8 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00	8	1040	0.022	8	1040	0.012	8	1040	0.034
01:00 - 02:00	8	1040	0.006	8	1040	0.003	8	1040	0.009
02:00 - 03:00	8	1040	0.004	8	1040	0.003	8	1040	0.007
03:00 - 04:00	8	1040	0.001	8	1040	0.000	8	1040	0.001
04:00 - 05:00	8	1040	0.001	8	1040	0.005	8	1040	0.006
05:00 - 06:00	8	1040	0.006	8	1040	0.019	8	1040	0.025
06:00 - 07:00	8	1040	0.020	8	1040	0.094	8	1040	0.114
07:00 - 08:00	8	1040	0.073	8	1040	0.366	8	1040	0.439
08:00 - 09:00	8	1040	0.085	8	1040	0.389	8	1040	0.474
09:00 - 10:00	8	1040	0.102	8	1040	0.176	8	1040	0.278
10:00 - 11:00	8	1040	0.095	8	1040	0.124	8	1040	0.219
11:00 - 12:00	8	1040	0.112	8	1040	0.119	8	1040	0.231
12:00 - 13:00	8	1040	0.143	8	1040	0.122	8	1040	0.265
13:00 - 14:00	8	1040	0.129	8	1040	0.138	8	1040	0.267
14:00 - 15:00	8	1040	0.130	8	1040	0.125	8	1040	0.255
15:00 - 16:00	8	1040	0.202	8	1040	0.149	8	1040	0.351
16:00 - 17:00	8	1040	0.266	8	1040	0.150	8	1040	0.416
17:00 - 18:00	8	1040	0.376	8	1040	0.163	8	1040	0.539
18:00 - 19:00	8	1040	0.347	8	1040	0.203	8	1040	0.550
19:00 - 20:00	8	1040	0.252	8	1040	0.193	8	1040	0.445
20:00 - 21:00	8	1040	0.163	8	1040	0.121	8	1040	0.284
21:00 - 22:00	8	1040	0.123	8	1040	0.061	8	1040	0.184
22:00 - 23:00	8	1040	0.089	8	1040	0.047	8	1040	0.136
23:00 - 24:00	8	1040	0.077	8	1040	0.040	8	1040	0.117
Total Rates:			2.824			2.822			5.646

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected: 1040 - 1040 (units:)
 Survey date date range: 01/01/00 - 10/12/00
 Number of weekdays (Monday-Friday): 8
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys manually removed from selection: 0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

APPENDIX K

TRAFFIC GROWTH FACTORS

LETCWORTH LDF GROWTH FACTORS

In calculating future growth rates, the following TEMPRO growth factors have been extracted for the Letchworth area:

	Origin	Destination
2013 – 2018 Midweek AM Peak	1.0398	1.0448
2013 – 2018 Midweek PM Peak	1.0457	1.0428
2013 – 2023 Midweek AM Peak	1.0884	1.0778
2013 – 2023 Midweek PM Peak	1.0850	1.0937

TEMPRO growth factors are, however, unsuitable for direct application to traffic flows outside of a traffic model. Therefore, it is necessary to make adjustments to these figures by applying National Transport Model (NTM) growth forecasts.

Tempro 6.2 produces the NTM traffic growth calculations and calculates the adjusted local growth figure accordingly. The resulting growth factors are indicated below:

	Growth Factor
2013 – 2018 Midweek AM Peak	1.0536
2013 – 2018 Midweek PM Peak	1.0556
2013 – 2023 Midweek AM Peak	1.1393
2013 – 2023 Midweek PM Peak	1.1459