Lower Thames Crossing

Working on behalf of highways england

Lower Thames Crossing

Task Force Update – Landscape Design, Green Infrastructure and WCHs

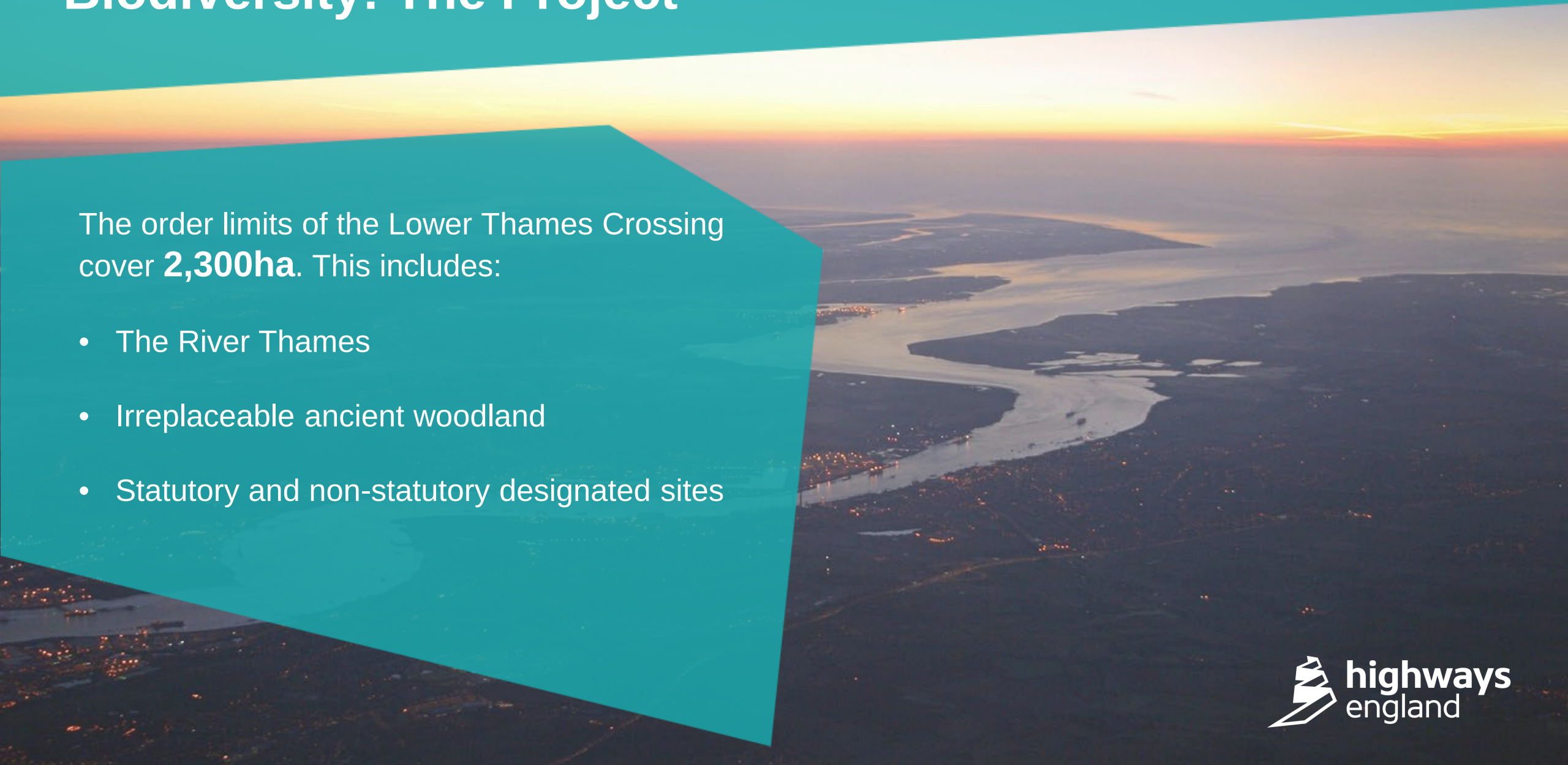
Clare Donnelly, Ben Craggs, Andrew Kay

15th February 2021

Agenda

- Summary Principles
- Landscape Integration: Combining mitigation, GI, WCH and Engineering Requirements
- Previous DCO Application Landscape & WCH Proposals :
  - Ockendon Link
  - A13 Junction
  - Chadwell Link

Biodiversity: The Project



The order limits of the Lower Thames Crossing cover **2,300ha**. This includes:

- The River Thames
- Irreplaceable ancient woodland
- Statutory and non-statutory designated sites

highways england

Biodiversity: The Project

Habitats within the order limits are predominantly arable and species-poor grassland.

The Project would have adverse effects on habitats, designated sites, and the range of species they support.

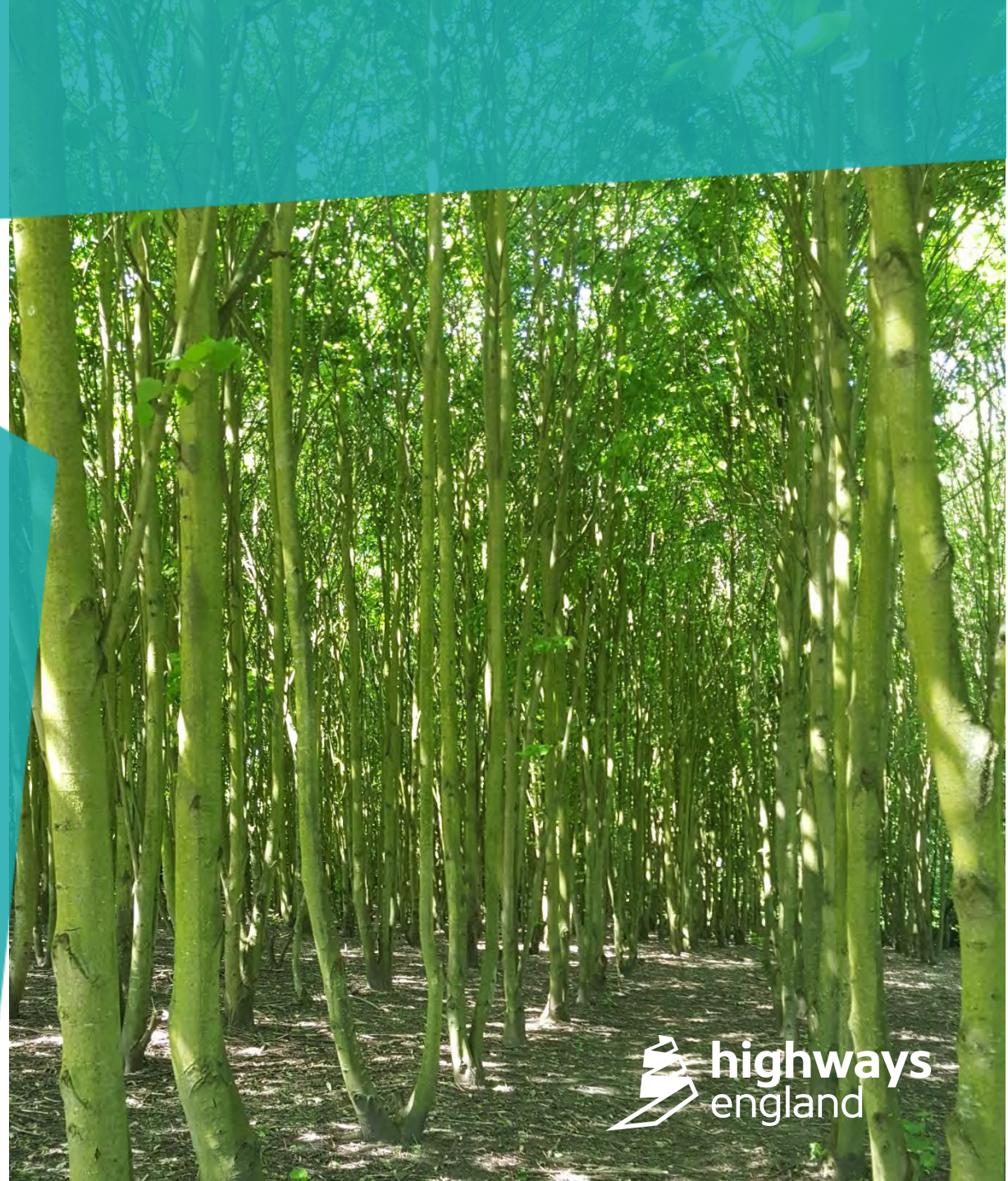
Biodiversity: Habitat creation

Replace what is lost with better

- Less arable land; more diverse grassland and woodland

Strengthen existing links and create new

- Building resilience within the landscape
- Forging new green corridors joining habitats along the project



Biodiversity: Offsetting

LTC has a requirement and responsibility to address adverse effects. To that end:

- Strategies addressing effects on designated sites have been developed
- Mitigation has been designed for protected species
- Landscape-scale habitat creation

highways england

Biodiversity: Net gain

LTC would affect designated and irreplaceable habitats. However, landscape design would lead to:

- Twice as much woodland created than lost
- Over 400ha arable land converted to semi-natural habitats
- Over twice as much hedgerow created than lost
- Increases in watercourses and wildlife ponds

LTC enhancements in non-designated habitats increases biodiversity value by
15% from baseline

Biodiversity: Legacy

Benefits Steering Group

- Includes Local Authorities and stakeholders
- To develop and deliver projects in the region, notably habitat enhancements across Natural Character Areas
- LTC has committed funding to engage with stakeholders and communities to develop projects
- Expected to bid for £1M delivery funding FY21

Already underway

- Engagement with Essex Wildlife Trust on Project mitigation delivering regional conservation benefit for water vole

highways england

Tree and Woodland Planting North of the Thames

- A number of planting Pallets specific to the North are secured in the application (as an appendix to the Design Principles).
  - Woodland
  - Woodland in areas highly impacted by construction works
  - Woodland Edge
  - Green Bridge
  - Linear belts of shrubs and trees
  - Scattered trees
  - Scrub
  - Native Hedgerow
  - Species rich grassland
  - Banks and ditches

- Final densities and mix will be determined at detailed design shall be of similar mix to the surrounding woodland and comprise local provenance stock
- Our work at Rainbow Shaw Ancient Woodland will include salvage of soils planting to translocate, seed bank, rhizomes, and fungi in addition to tree planting

North

Nurse species	Ultimate canopy	Sub dominant canopy	Smaller trees	Understorey shrubs
 Alnus cordata 7.5%	 Fagus sylvatica 7.5%	 Carpinus betulus 5%	 Acer campestre 3%	 Corylus avellana 15%
 Betula pendula 12.5%	 Quercus robur 7.5%	 Pinus nigra 5%	 Sorbus torminalis 4%	 Crataegus monogyna 7.5%
Offering soil conditioning and quickly established shelter. To be gradually reduced in number as the plantation matures.	 Tilia tomentosa 5%	 Prunus avium 5%	 Taxus baccata 3%	 Euonymus europaeus 2.5%

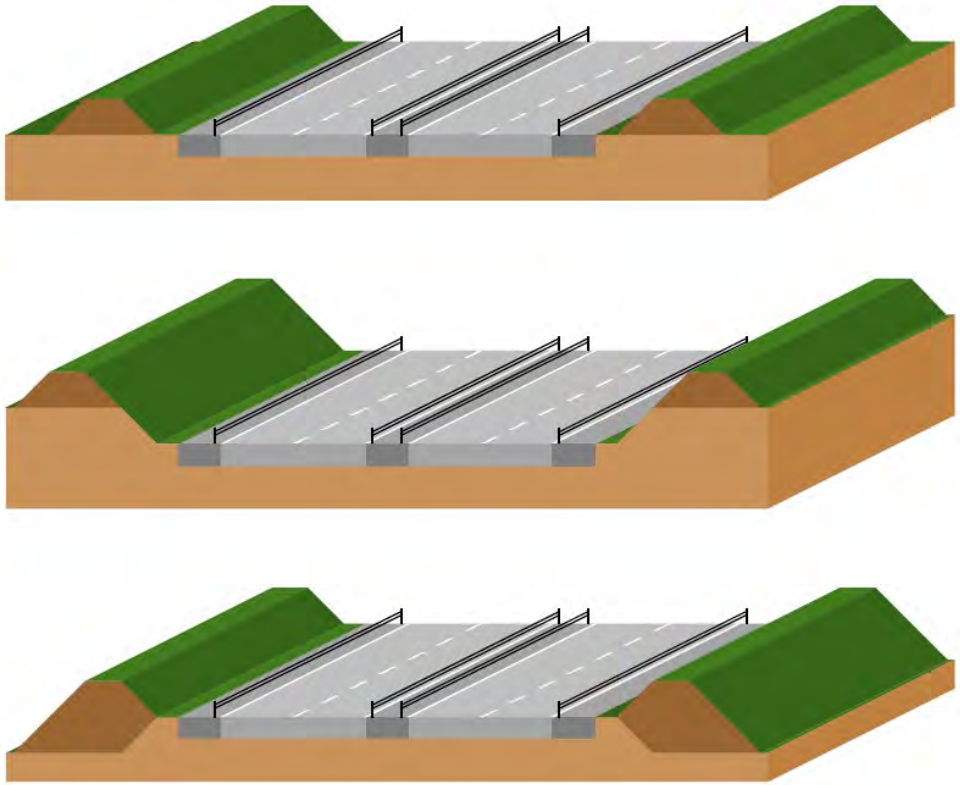
Table 8.33 Habitat losses and gains associated with the Project to the north of the River Thames

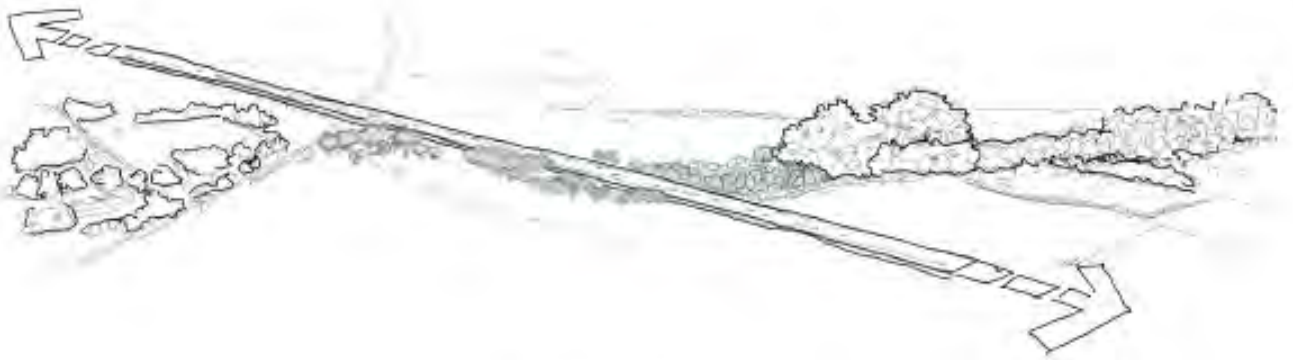
Existing habitat	Importance	Habitat loss (ha)	New semi-natural habitat (from EMP)	Habitat permanent gain (ha)	Net permanent gain (ha) (gain – loss)
Ancient woodland	National	4.35ha	Ancient woodland replacement (LE3.2)	18.39ha	14.04ha
Ancient and veteran trees	National	Five veteran trees lost. No loss of ancient trees. See Figure 8.2 (Application Document 6.2) for locations	Scattered Trees (LE2.7)	1.38ha	1.38ha
Semi-natural broadleaved and mixed woodland	County	12.64ha	Native Woodland (LE2.1), woodland with non-native species (LE2.11), Agroforestry mix (LE2.12), wet/carr woodland (LE2.14), Woodland edge (LE2.2), scrub woodland (LE2.22), linear belts of shrubs and trees (LE2.4)	134.22ha	60.16ha
Plantation woodland	Local	61.42ha			

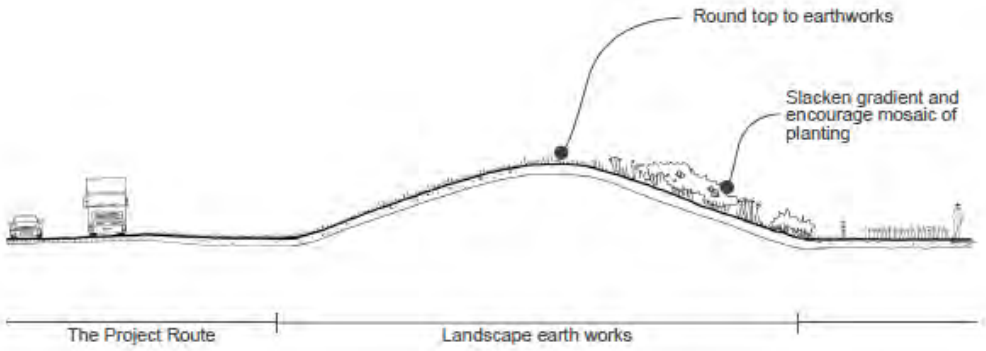

Ilex aquifolium 5%


Sambucus nigra 5%

Example Principles of Landscape Integration







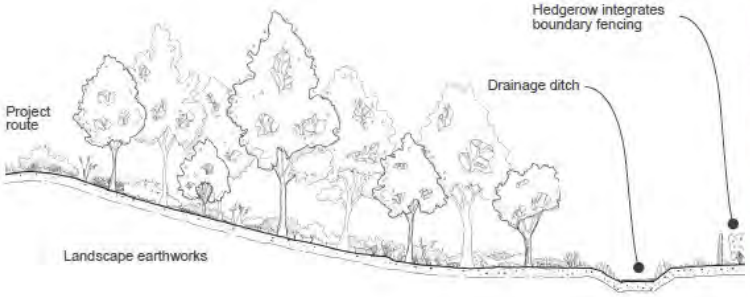


Fig 3–35 Hedgerow planting should allow for future maintenance routes and access to highways assests such as fencing

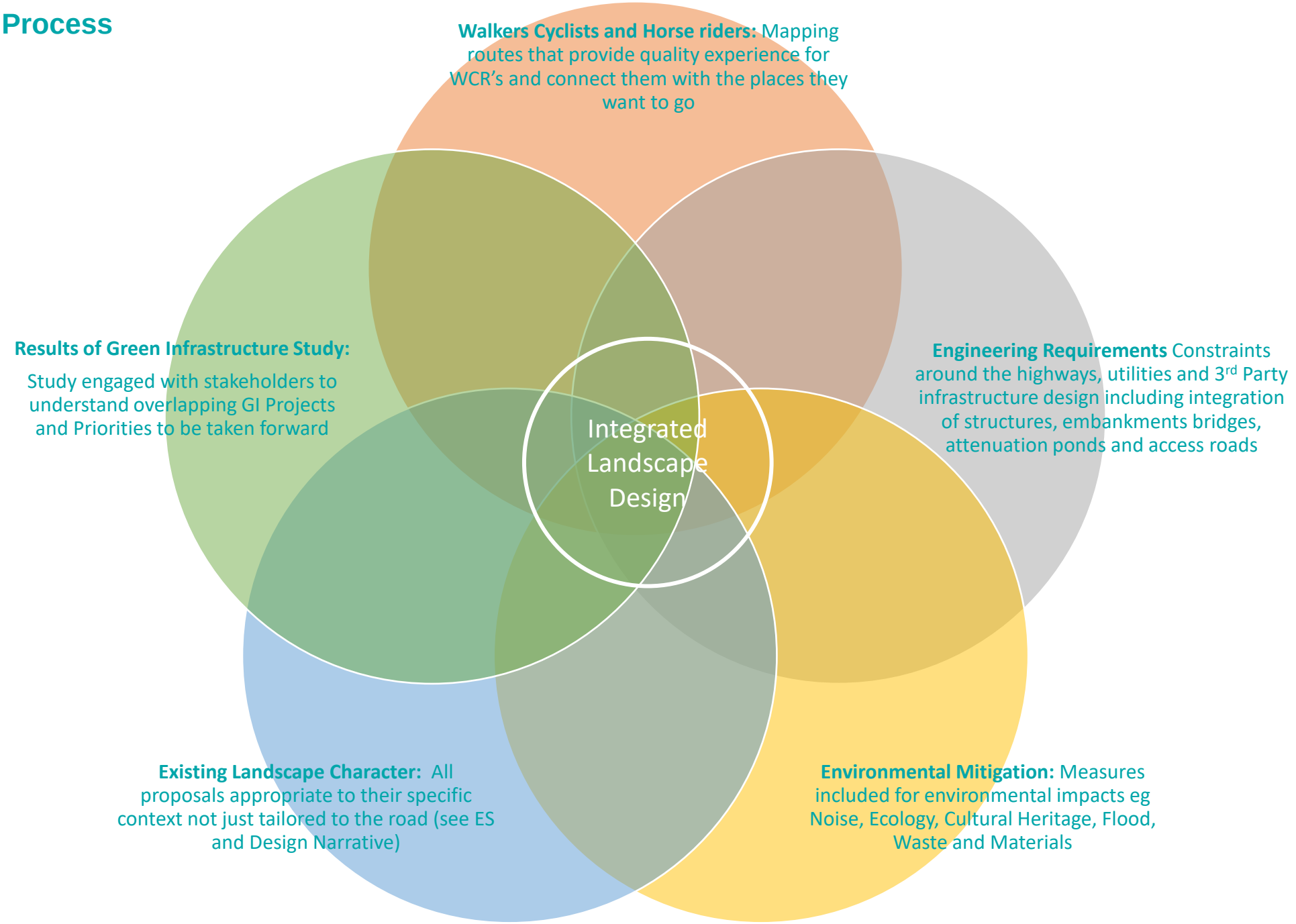
Lower Thames Crossing

Working on behalf of highways england

Landscape Integration

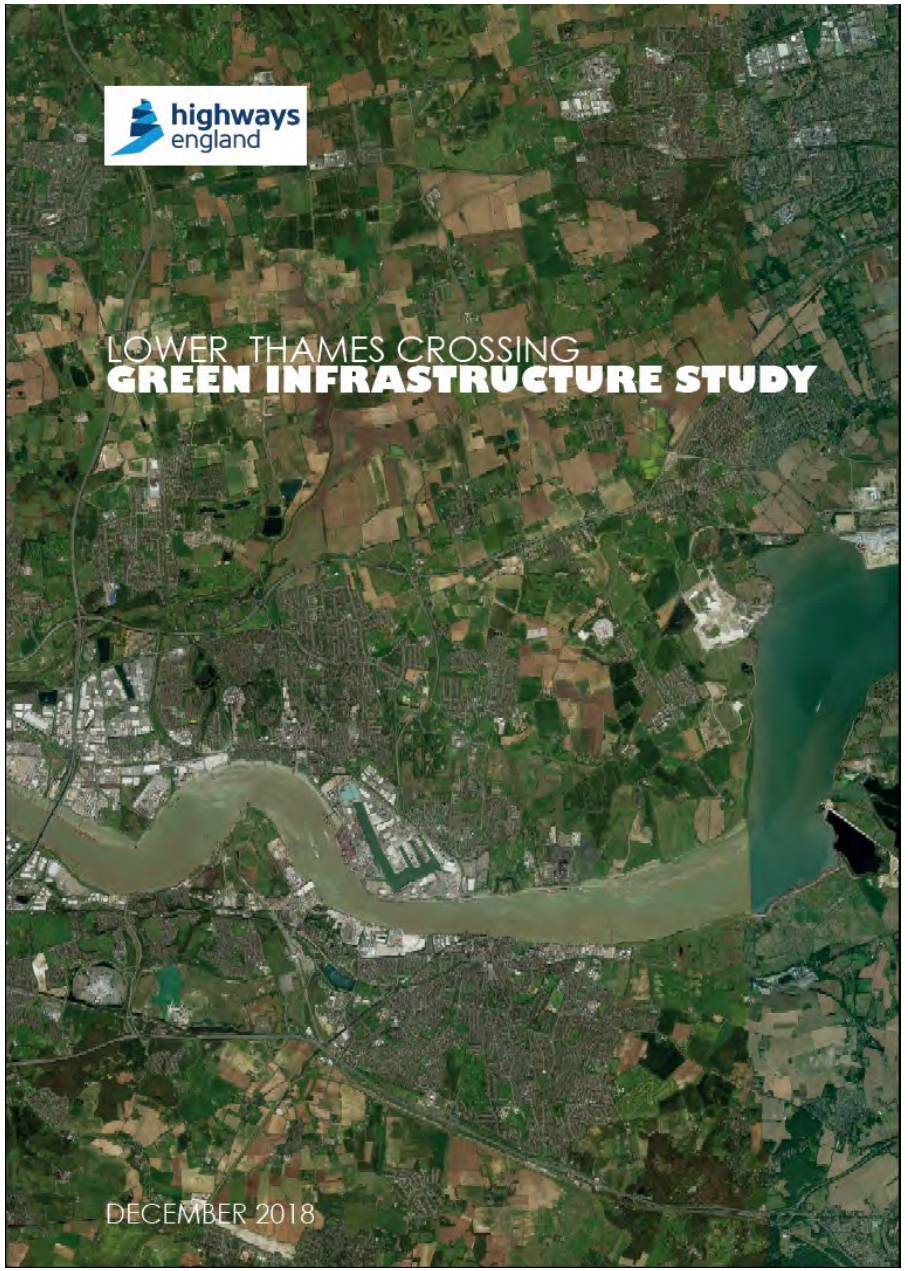
Elements influencing the design

Landscape Design Process



Key Strategies Green Infrastructure Study

- Study objectives:
  - To understand the existing function, quality and value of existing GI within the LTC GI Study Area
  - To identify GI issues, needs and opportunity projects through stakeholder engagement
  - To assess the direct and indirect impacts on identified existing and aspirational GI
  - To identify priority mitigation to meet requirements of the NPS and to identify compensation measures
  - To embed GI protection, enhancement and compensation within the Environmental Master Plan.
- Conducted in 3 Stages
  - Identifying and mapping existing green infrastructure
  - Identifying green infrastructure needs and opportunities
  - Incorporating proposals in the scheme design
- 16 GI groups engaged in stages 1& 2 in addition to local authorities
- Projects directly impacted by LTC prioritized



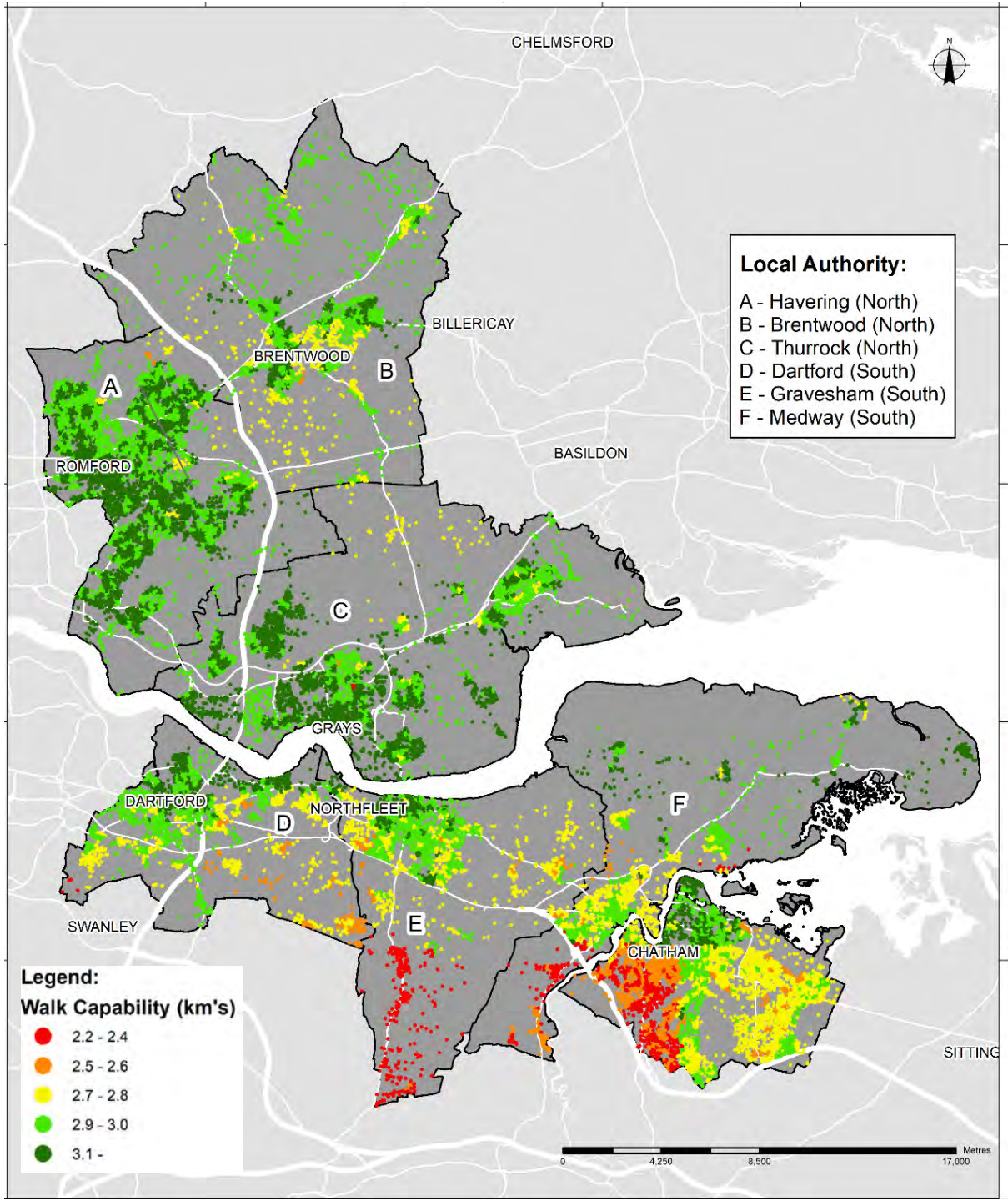
Key Documents: Walkers Cyclist Horse Rider Assessment

This assessment collated and distilled information relating to:

- Local policies and objectives
- Capability to walk and cycle
- Trip generators
- Existing severance
- Existing WCH routes

Key Conclusions in Thurrock:

- North of the A13 large inter-urban distances foster high levels of containment, and are an impediment to WCH travel for those commuting. Here WCH mainly use network for leisure trips to country parks or for weekend rambles.
- South of the A13 there is potential demand for east-west commuter routes connecting East Tilbury, Linford and Chadwell to Employment and services in Gray and Tilbury)



Key Documents: Walkers Cyclist Horse Rider Assessment

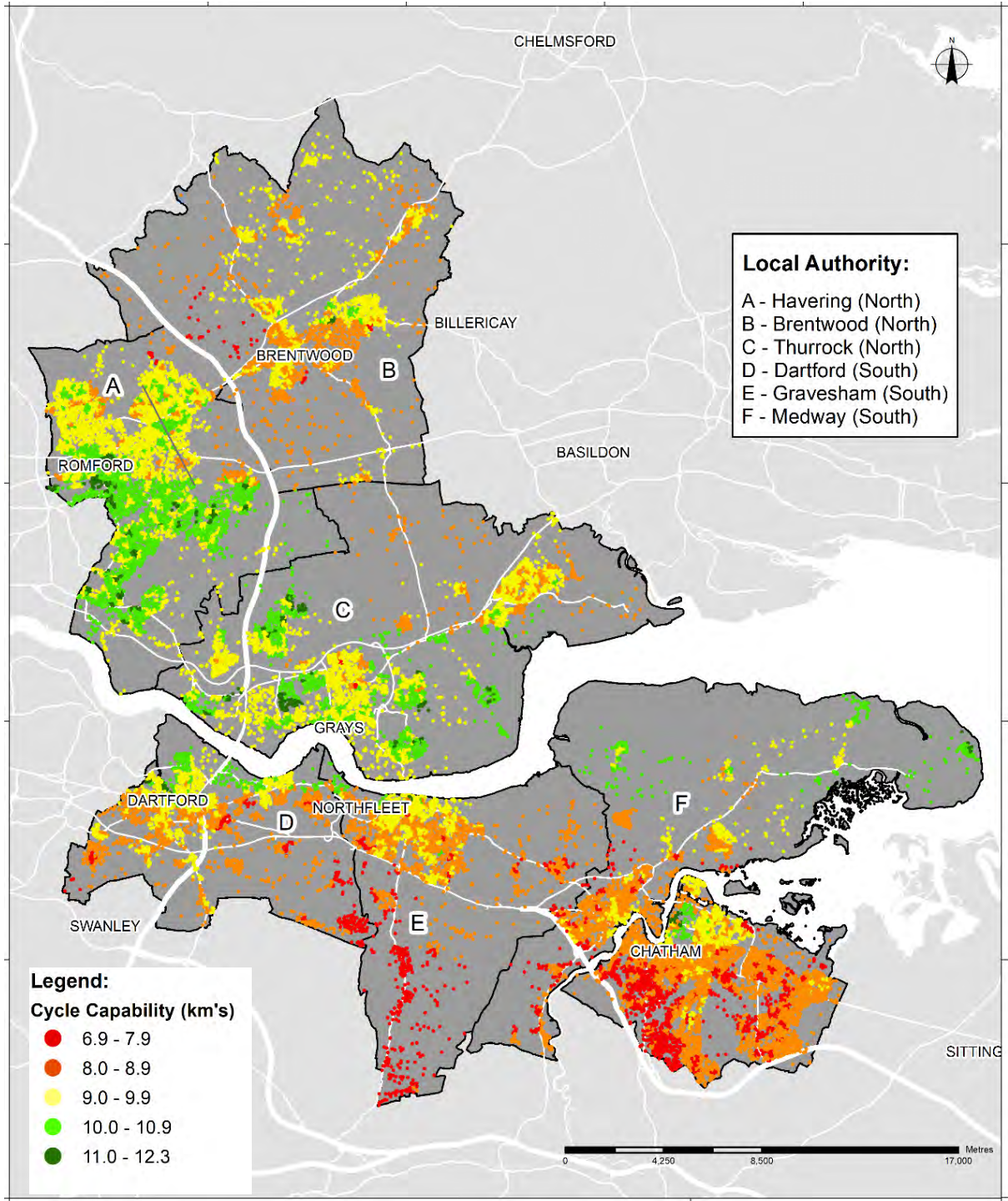
This assessment collated and distilled information relating to:

- Local policies and objectives
- Capability to walk and cycle
- Trip generators
- Existing severance
- Existing WCH routes

The assessment, combined with Stat Con responses, identified over 60 separate WCH projects in Thurrock

Key Conclusions in Thurrock:

- North of the A13 large inter-urban distances foster high levels of containment, and are an impediment to WCH travel for those commuting. Here WCH mainly use network for leisure trips to country parks or for weekend rambles.
- South of the A13 there is potential demand for east-west commuter routes connecting East Tilbury, Linford and Chadwell to Employment and services in Gray and Tilbury)



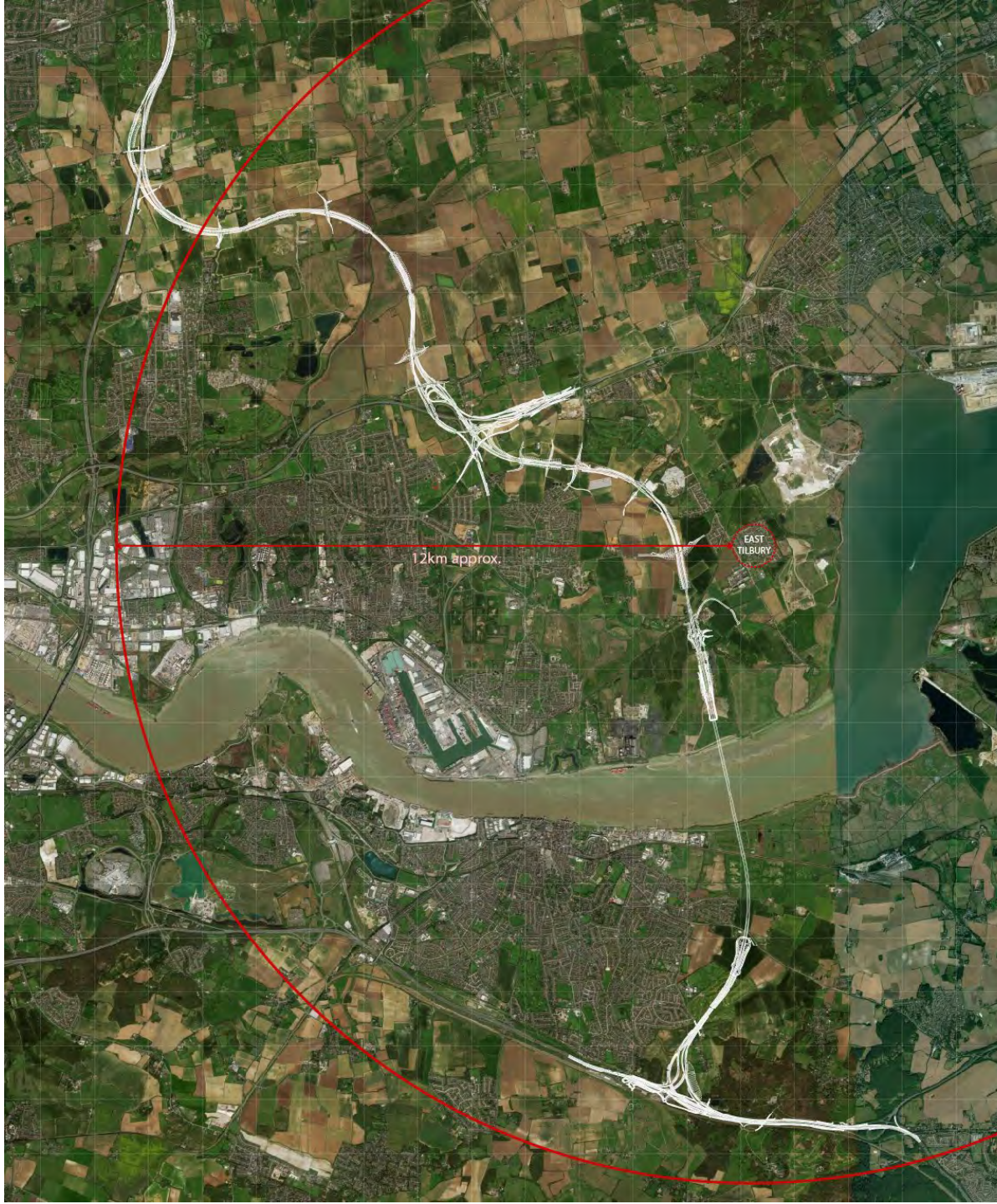
Key Documents: Walkers Cyclist Horse Rider Assessment

This assessment collated and distilled information relating to:

- Local policies and objectives
- Capability to walk and cycle
- Trip generators
- Existing severance
- Existing WCH routes

Key Conclusions in Thurrock:

- North of the A13 large inter-urban distances foster high levels of containment, and are an impediment to WCH travel for those commuting. Here WCH mainly use network for leisure trips to country parks or for weekend rambles.
- South of the A13 there is potential demand for east-west commuter routes connecting East Tilbury, Linford and Chadwell to Employment and services in Gray and Tilbury)



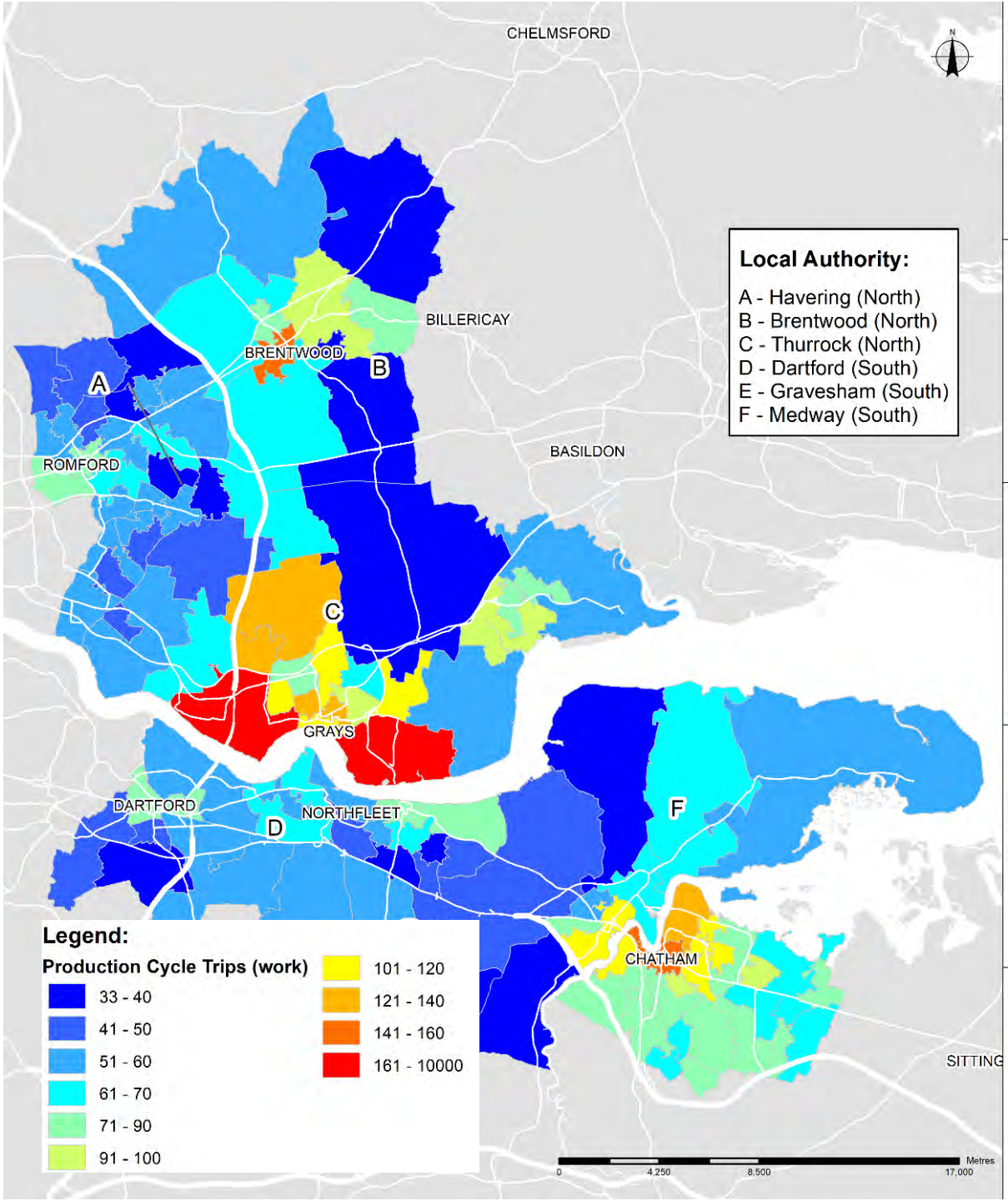
Key Documents: Walkers Cyclist Horse Rider Assessment

This assessment collated and distilled information relating to:

- Local policies and objectives
- Capability to walk and cycle
- Trip generators
- Existing severance
- Existing WCH routes

Key Conclusions in Thurrock:

- North of the A13 large inter-urban distances foster high levels of containment, and are an impediment to WCH travel for those commuting. Here WCH mainly use network for leisure trips to country parks or for weekend rambles.
- South of the A13 there is potential demand for east-west commuter routes connecting East Tilbury, Linford and Chadwell to Employment and services in Gray and Tilbury)



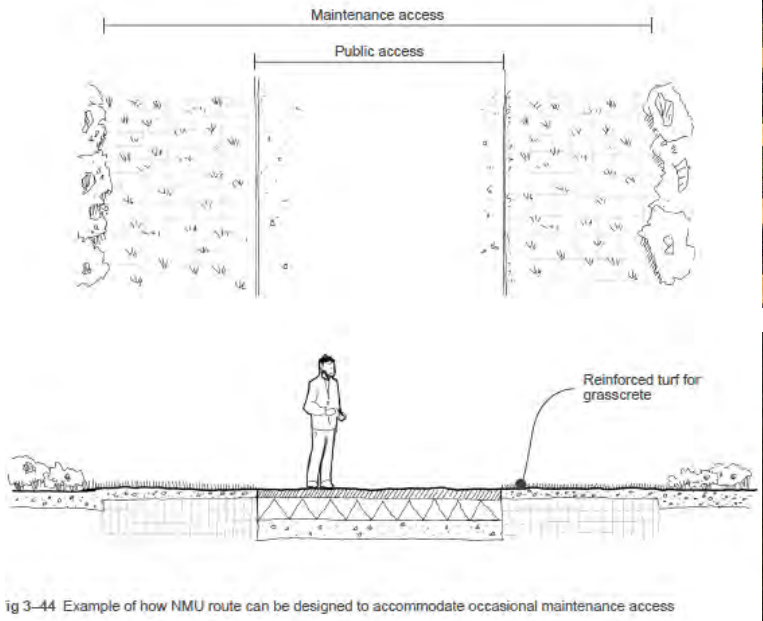
Walkers Cyclists and Horse Riders (WCH) in Numbers

- The DCO secures the location and alignment of routes for WCHs. Further detailed design will be required on surfacing, access controls (fences and stiles) and signage.
- We have set out principles to inform this detailed design in the Design Principles Document
- Our proposals in Thurrock represent a mix of routes for accessing the countryside (mainly to the North of the Borough) and for active travel/commuting (mainly to the south).

Our WCH Proposals in Thurrock include:

- 4.5 km Footpaths upgraded to bridleway
- 8.9 km New or improved ped-cycle roadside tracks
- 3.2 km New bridleways
- 2.1 km Realigned bridleways
- 0.8 km Improved bridleways
- 0.6 km New ped-cycle route away from road
- 1.6 km New footpath
- 0.4 km Realigned footpath

Total 22.1 km new or upgraded routes in Thurrock



ig 3–44 Example of how NMU route can be designed to accommodate occasional maintenance access

Key Documents: Existing Landscape Character

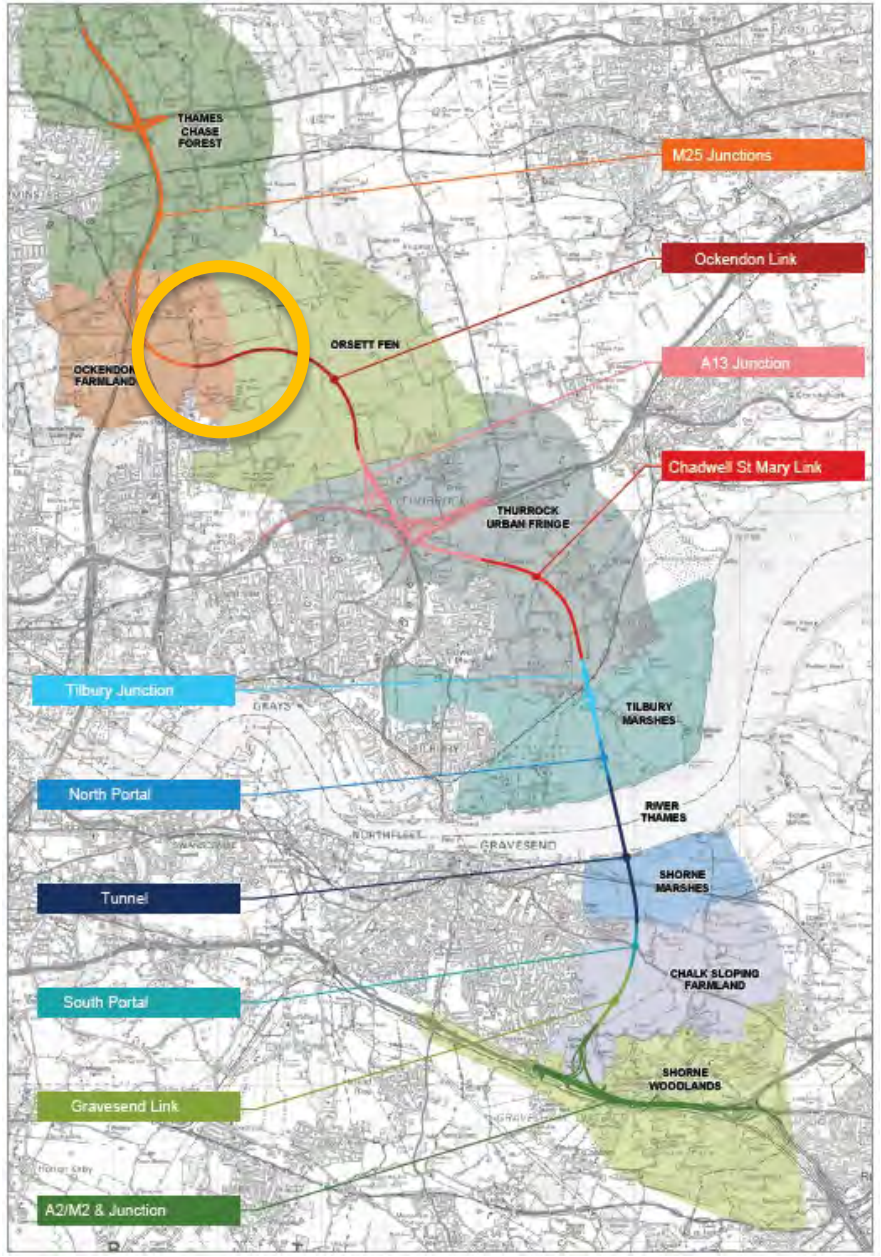
- Review of existing character assessments, policy and guidance
- Site visits and desktop analysis to investigate key landscape character and patterns along the LTC Route – including historic or lost patterns
- Suggested design approaches that would be appropriate to landscape character

CHARACTER SECTORS

To enable more detailed consideration, the route of the Lower Thames Crossing has been divided into eight character area sectors, which are derived from variations in landscape character along the course of the route. The way the design will respond to its context and enhance the experience of users reflects the considerations relating to each sector, as described on the following pages. The sectors are (from south to north):

1. **Shorne Woodlands** - Wooded ridge of the North Downs, where the LTC will have its junction with the A2.
2. **Chalk Sloping Farmland** - Arable landscape sloping down towards the Thames, including the south tunnel portal.
3. **Shorne Marshes and River Thames** - The river and the marshland area along its south bank. The LTC will tunnel beneath this entire sector.
4. **Tilbury Marshes** - Flat, open marshland on the north bank of the river, including the north tunnel portal and a potential rest and service area (RaSA).
5. **Thurrock Urban Fringe** - Farmland close to the edge of Chadwell St Mary and Grays. The LTC will have a junction with the A13, which runs along a low ridge within this area.
6. **Orsett Fen** - Flat, open fenland north of Orsett, including a viaduct crossing the Mar Dyke and floodplain.
7. **Ockendon Farmland** - Farmland west of Orsett Fen and elevated slightly above it; the LTC will have its junction with the M25 in this area.
8. **Thames Chase Forest** - Undulating, predominantly rural landscape; the M25 within this area will be widened as part of the project.

PAGE: 14



Lower Thames Crossing

Working on behalf of highways england

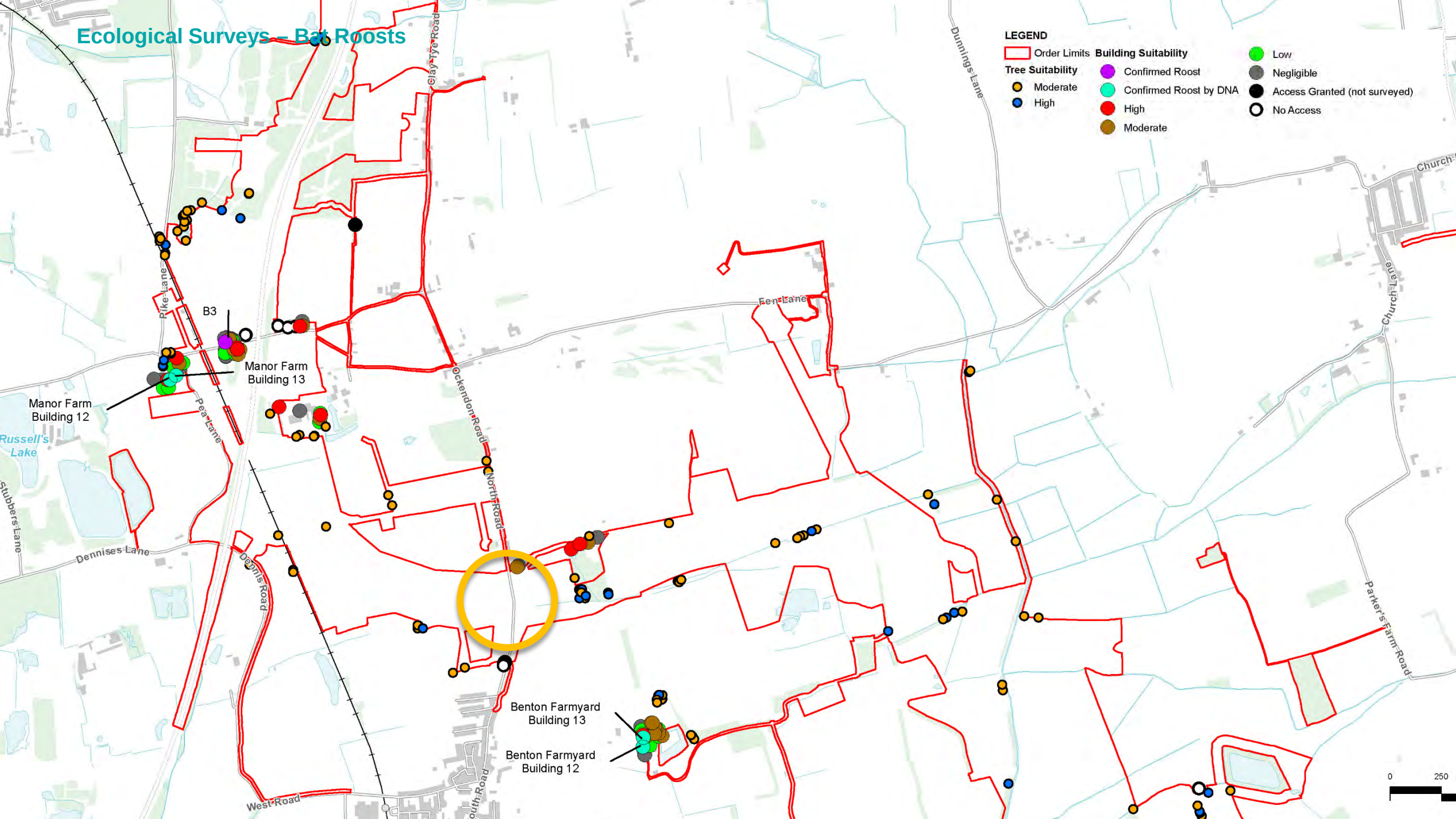
Proposals from the Previous DCO Application in Thurrock

Ockendon Link

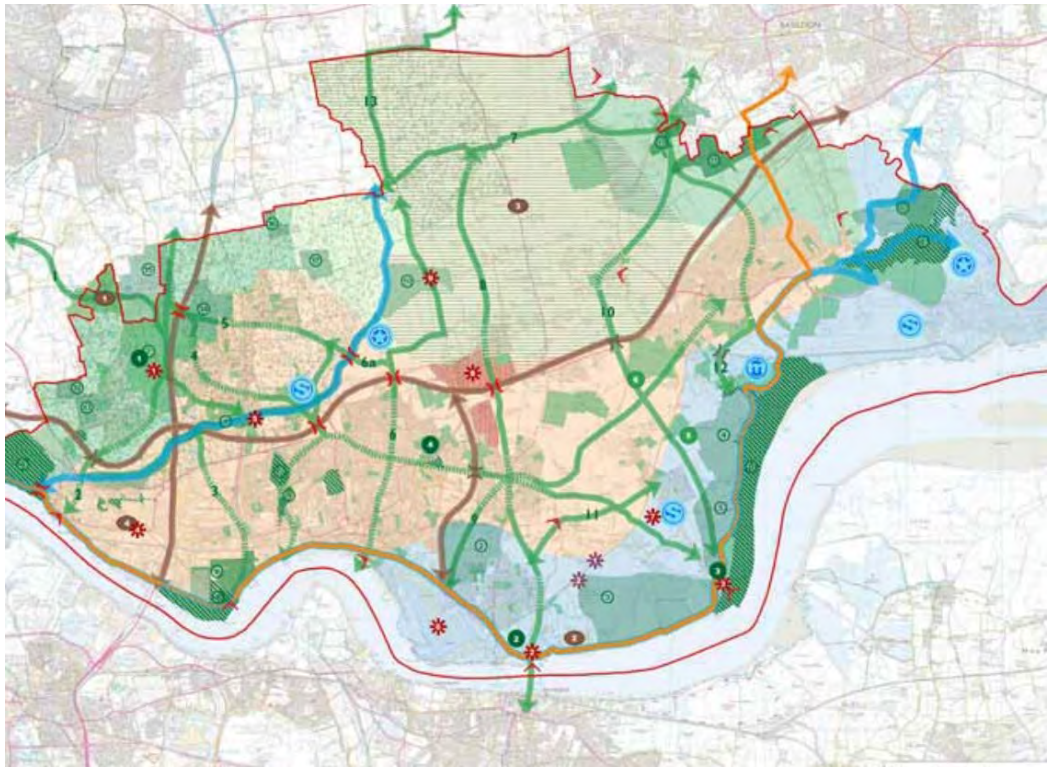
Landscape Character – Ockendon Farmland View from the East

- Gently rolling landscape with a low ridge rising to around 30 metres AOD with geology of sands and gravels
- Remainder of sector is arable farmland of large rectilinear fields with sparse hedgerows and occasional small woodland blocks
- Small, dispersed settlement of North Ockendon and larger, nucleated settlement of South Ockendon
- Numerous lakes and waterbodies associated with former sand and gravel quarries, along with some areas of landfill
- Urban edge condition especially along South Ockendon

Ecological Surveys – Bat Roosts



Example: Forest Circle /Green Grid



Thurrock Green Grid

Thames Chase Greenway routes

Thames Chase Forest circle

Identified key Green Infrastructure Projects

Existing PRoW Network

North Road – No foot or cycle way

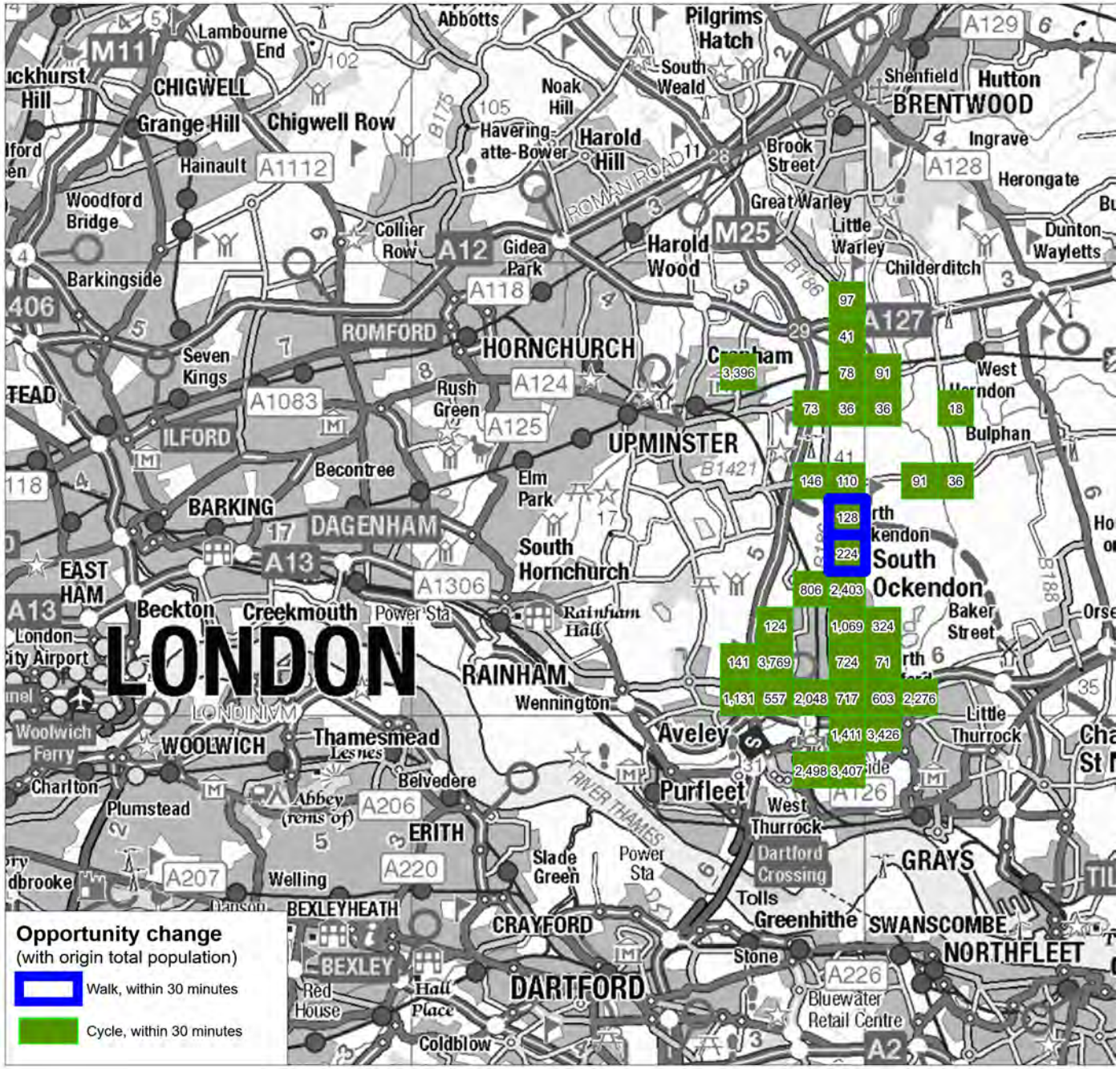
Dennis Road – No foot or cycle way

WCH Modelling of proposed links: North Road Only

The journey time benefit of each of these opportunities was analysed with particular journey types weighted more highly than others.

Methodology

- Create grid square system
- Calculate origin characteristics – population profile, Indices of Deprivation (Iod)
- Calculate destination characteristics – Number of school places, employment, centres, railway stations etc
- Develop networks for each option
- Calculate levels of opportunity for Origin-Destination with/without the option

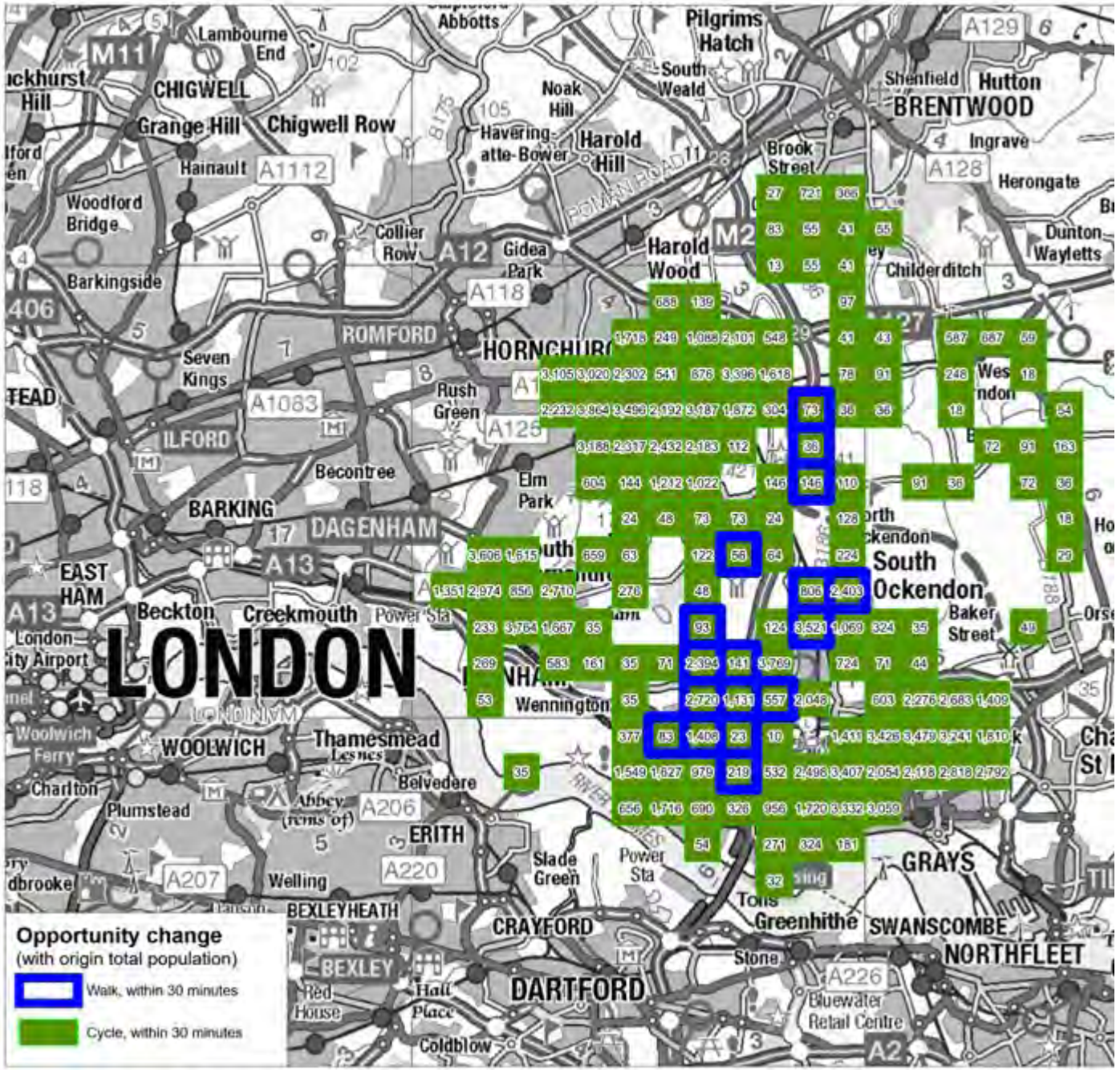


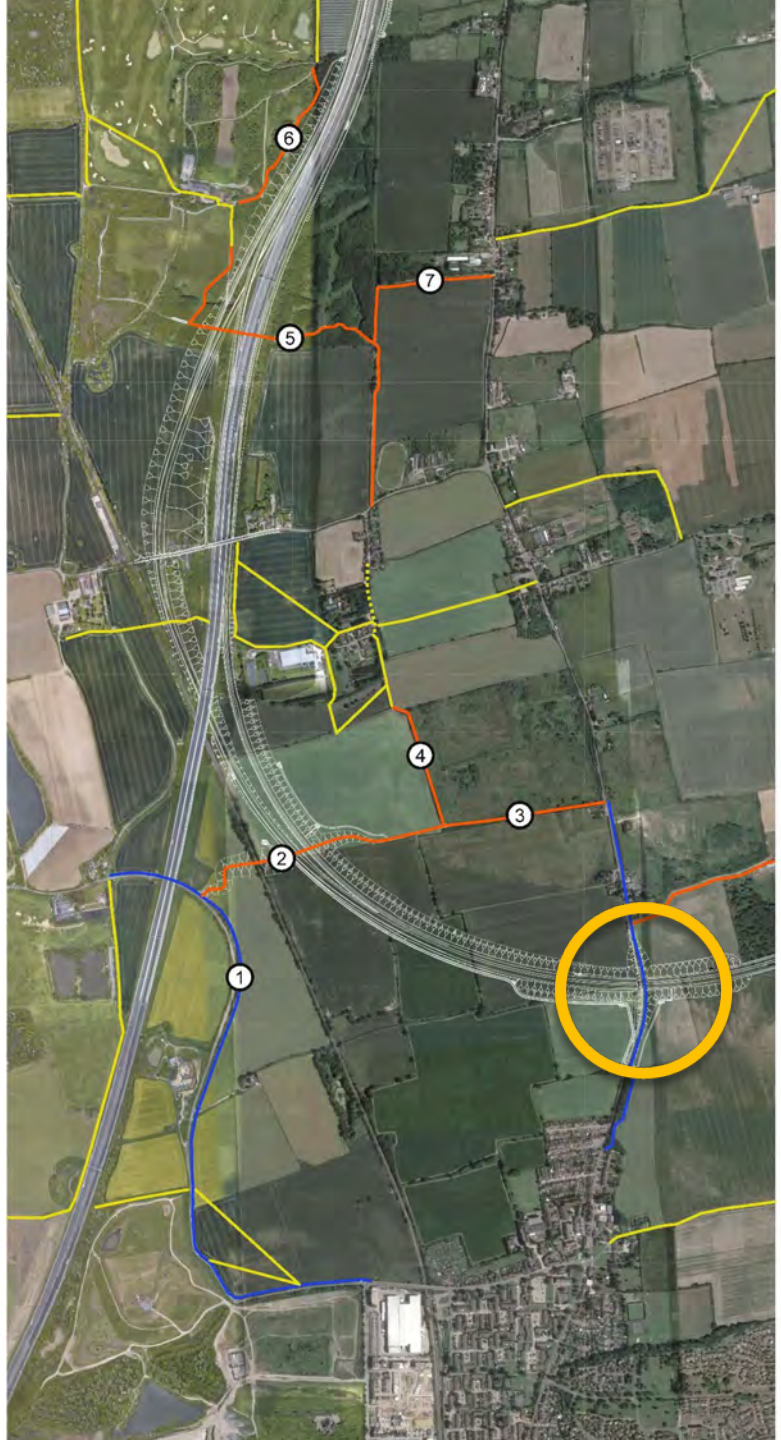
WCH Modelling of proposed links: With additional Links

The journey time benefit of each of these opportunities was analysed with particular journey types weighted more highly than others.

Methodology

- Create grid square system
- Calculate origin characteristics – population profile, Indices of Deprivation (Iod)
- Calculate destination characteristics – Number of school places, employment, centres, railway stations etc
- Develop networks for each option
- Calculate levels of opportunity for Origin-Destination with/without the option





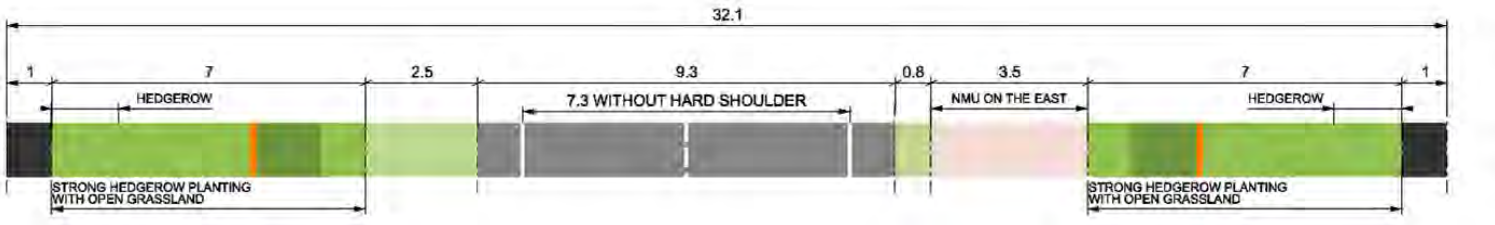
Proposed Improvements for WCHs

WCH connection from Thames Chase Forest Centre to FP135 and South Ockendon. Including:

- Dennis Road WCH track to eastern side of Dennis Road connect FP259, FP252 and South Ockendon
- FP252 realignment and upgrade to bridleway with new bridge over railway line
- FP151 & FP254 upgrade to bridleway
- FP230 realignment over new WCH to eastern side of the M25
- BR289 connection through Thames Chase Forest Centre
- New bridleway connection from Thames Chase Forest Centre to Clay Tye Road near FP232

North Road – Green Bridge

Precedent: Weymouth Relief Road Green Bridge



Landscape Character – Ockendon Farmland

Landscape Design Response

- Woodland planting alongside slip roads as far south as FP151 (chainage 20+600)
- Woodland planting to cutting slopes within this section
- Further woodland planting associated with field boundaries, particularly in field corners to emphasise the rectilinear field pattern between FP151 and North Road. Hedge planting alongside the road through this section
- Lower the LTC alignment in vicinity of North Road to reduce height of overbridge
- Minimise loss of woodland at The Wilderness and plant new woodland within the footprint of the existing wood
- Seek opportunities to improve recreational access to land affected by LTC works and to facilitate other objectives of Thames Chase Community Forest Plan

Landscape Design Response – Environmental Barriers

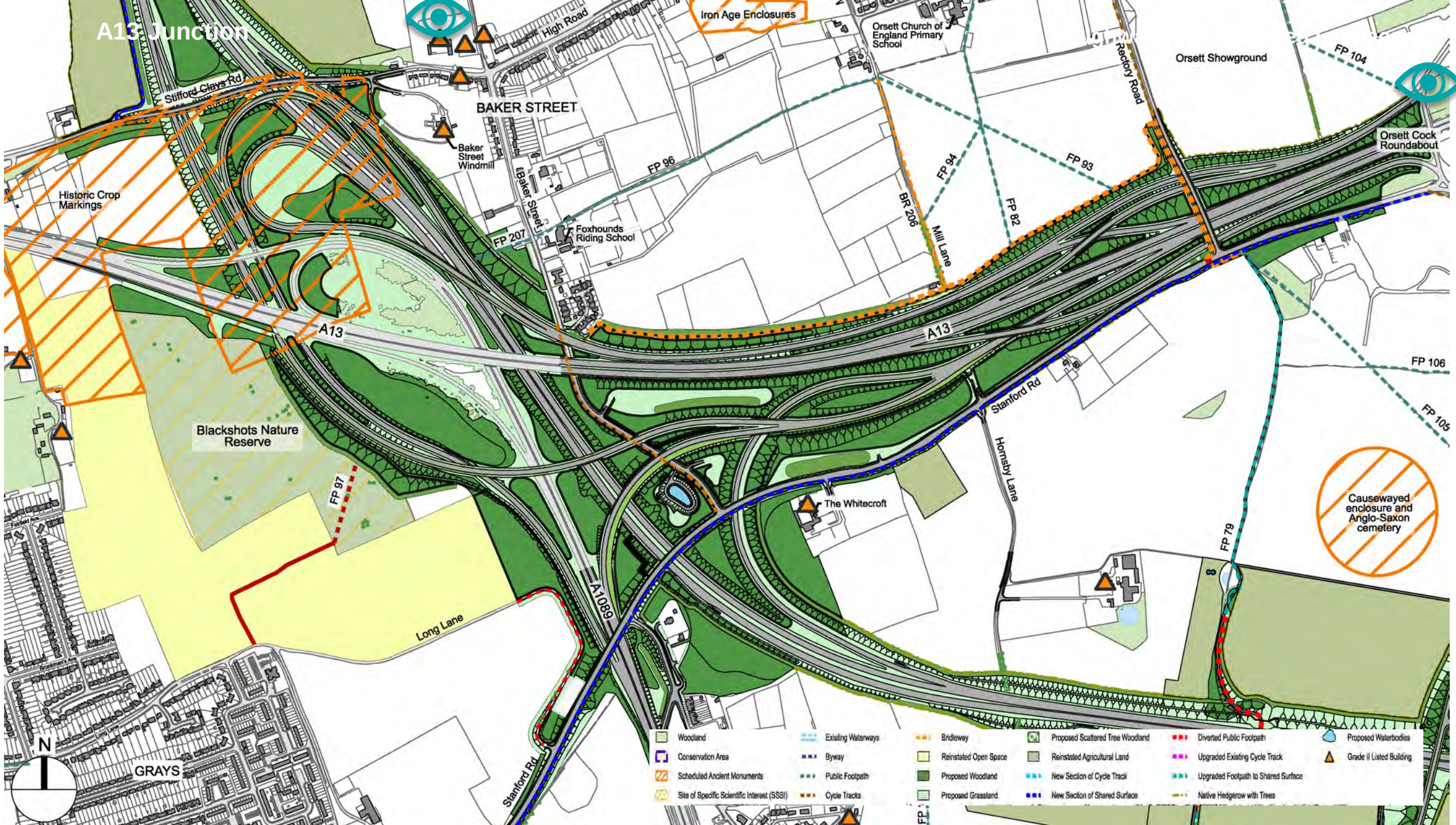
Ockendon Link

Lower Thames Crossing

Working on behalf of highways england

Proposals from the Previous DCO Application in Thurrock

The A13 Junction


A13 Junction
Iron Age Enclosures
Orsett Church of England Primary School
Orsett Showground
Rectory Road
FP 104
Orsett Cock Roundabout
High Road
Stifford Clays Rd
BAKER STREET
Baker Street Windmill
Baker Street
FP 96
FP 207
Foxhounds Riding School
FP 94
FP 93
BR 206
Mill Lane
FP 82
Historic Crop Markings
A13
A13
FP 106
FP 105
Stanford Rd
Hornsby Lane
Blackshots Nature Reserve
FP 97
The Whitecroft
Causewayed enclosure and Anglo-Saxon cemetery
FP 79
A1089
Long Lane
Stanford Rd
GRAYS
N
Woodland
Conservation Area
Scheduled Ancient Monuments
Site of Specific Scientific Interest (SSSI)
Existing Waterways
Byway
Public Footpath
Cycle Tracks
Bridleway
Reinstated Open Space
Proposed Woodland
Proposed Grassland
Proposed Scattered Tree Woodland
Reinstated Agricultural Land
New Section of Cycle Track
New Section of Shared Surface
Diverted Public Footpath
Upgraded Existing Cycle Track
Upgraded Footpath to Shared Surface
Native Hedgerow with Trees
Proposed Waterbodies
Grade II Listed Building

Landscape Character Ockendon Farmland - A13 Junction

Highways & Associated Landscape

- Gently undulating farmland on sands, clays and gravels, slightly elevated above adjacent areas
- Arable landscape of medium sized, irregularly shaped fields divided by hedgerows with occasional woodland blocks
- Exposed urban edges of Grays, Chadwell St Mary and Linford significantly influence the landscape, giving it an urban edge character
- Five lines of pylons carrying high voltage overhead powerlines running north from Tilbury Power Station are dominant features
- A13 dual carriageway runs south-west to north-east along a low ridge across the area
- Existing planting associated with and close to the A13 gives it the appearance of a wooded ridge as seen from the north and south, although passing traffic is frequently visible.
- North of the A13, urban influences reduce and the landscape has a more rural character and open views north towards Orsett Fen. Orsett village is on the north edge of this area

A13 Junction from the North

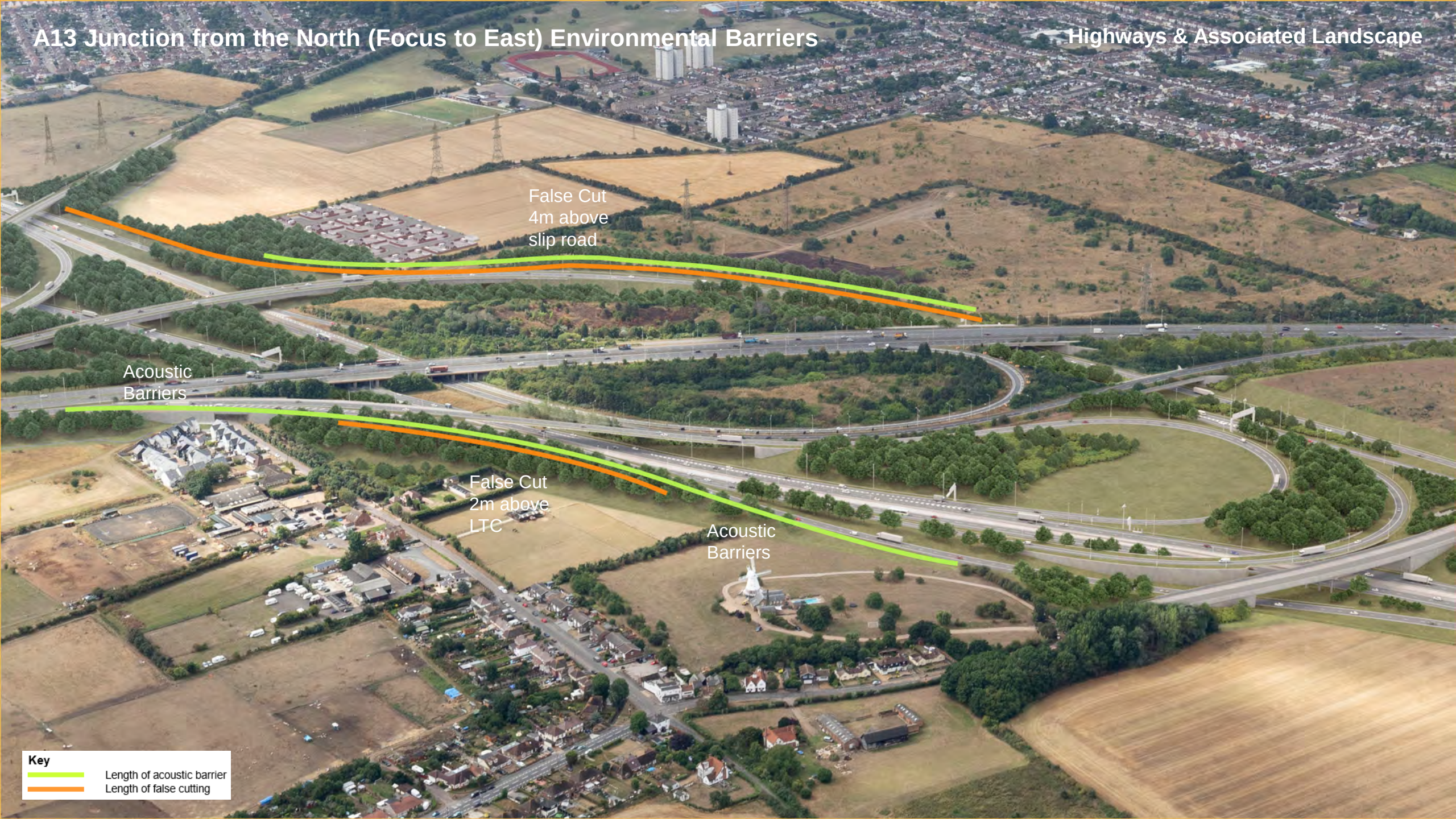
Highways & Associated Landscape

A13 Junction from the North (Focus to East)

Highways & Associated Landscape

A13 Junction from the North (Focus to East) Environmental Barriers

Highways & Associated Landscape



A13 Junction from the North (Focus to West)

Highways & Associated Landscape

A13 Junction from the North (Focus to West)

Highways & Associated Landscape

A13 junction

- FP79 and FP95 diversion, resurface and upgrade to bridleway
- A1013 Ped/cycle track – improved facility along the southern side of A1013 and WCH provision over replacement Rectory Road bridge
- Baker Street cycle track
- BR206 diversion and extension to Rectory Road
- BR223 realignment
- Stifford Clays Road cycle track extension to connect Baker Street with local secondary school.
- Stifford Clays Road to Green Lane ped/cycle track
- Green Lane realignment and green bridge

A13 junction

A13 Junction from the East (Orsett Cock)- As existing

A13 Junction from the East (Orsett Cock)-

Highways & Associated Landscape

A13 Junction from the East (Orsett Cock)- Environmental Barriers

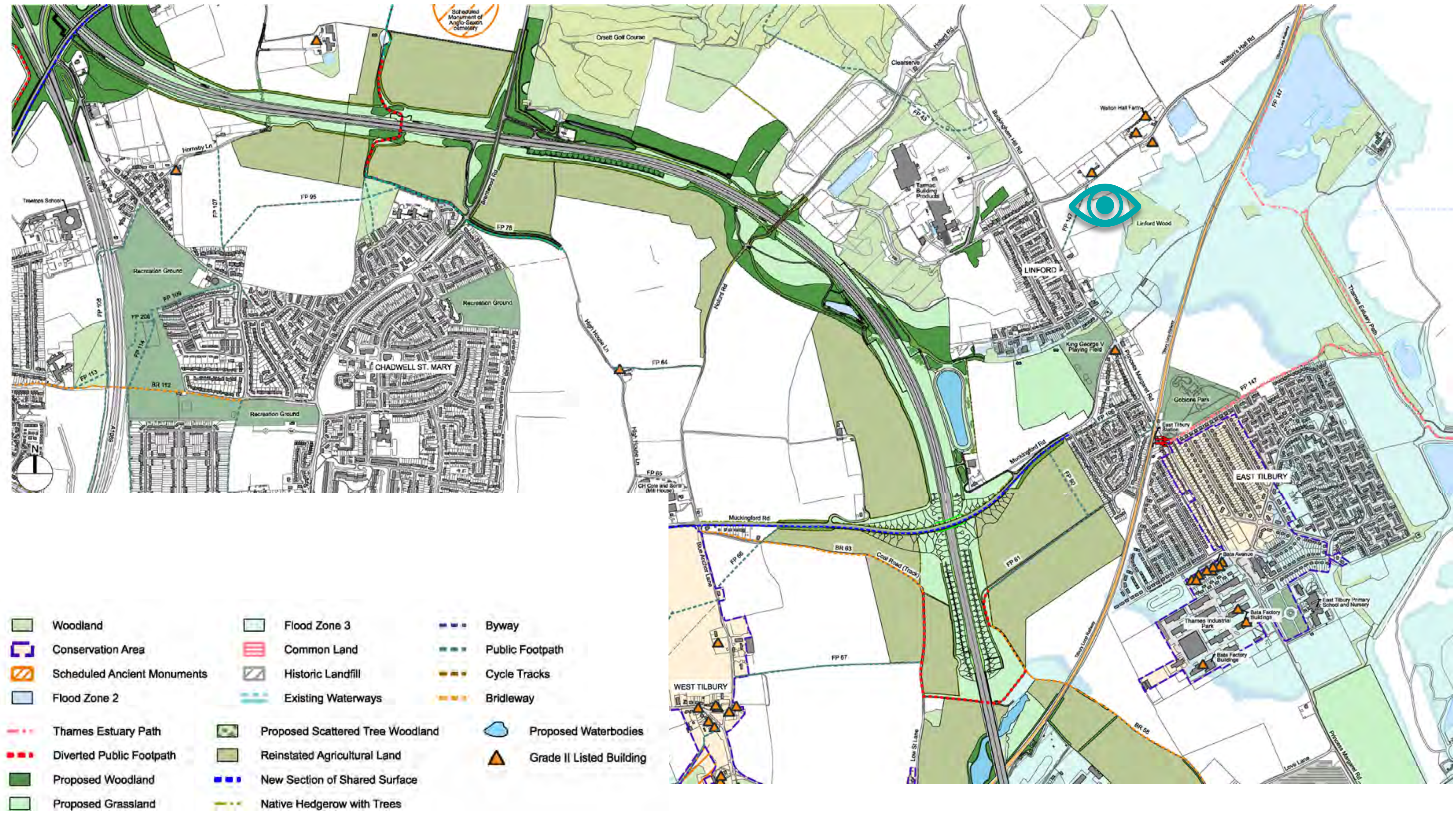
Highways & Associated Landscape

Lower Thames Crossing

Working on behalf of highways england

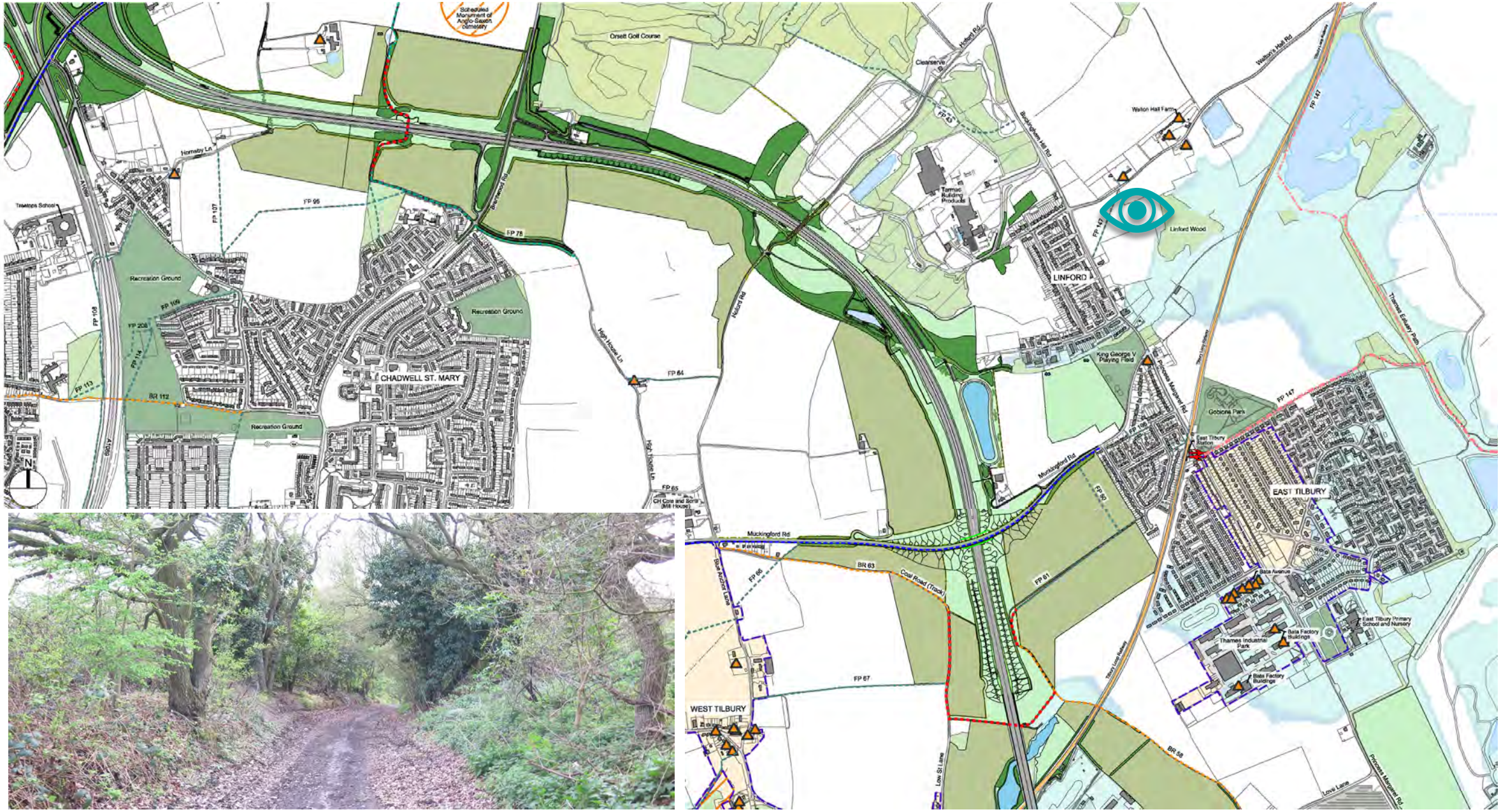
Proposals from the Previous DCO Application in Thurrock

The Chadwell Link


Scheduled Monument of Anglo-Saxon cemetery
Orsett Golf Course
Cleanserve
Walton's Hall Rd
Walton Hall Farm
Tarmac Building Products
Linford Wood
LINFORD
Hornsby Ln
Treetops School
FP 95
FP 107
FP 78
FP 64
FP 109
FP 208
FP 114
FP 113
FP 108
BR 112
Recreation Ground
CHADWELL ST. MARY
High House Ln
King George V Playing Field
Princess Margaret Rd
Gobions Park
FP 147
East Tilbury Station
EAST TILBURY
Muckingford Rd
FP 60
FP 61
BR 63
Coal Road (Track)
FP 66
Blue Anchor Lane
FP 67
WEST TILBURY
Bata Avenue
Thames Industrial Park
Bata Factory Buildings
East Tilbury Primary School and Nursery
BR 58
Love Lane
Low St Lane
Thames Estuary Path
Woodland
Conservation Area
Scheduled Ancient Monuments
Flood Zone 2
Flood Zone 3
Common Land
Historic Landfill
Existing Waterways
Byway
Public Footpath
Cycle Tracks
Bridleway
Thames Estuary Path
Diverted Public Footpath
Proposed Woodland
Proposed Grassland
Proposed Scattered Tree Woodland
Reinstated Agricultural Land
New Section of Shared Surface
Native Hedgerow with Trees
Proposed Waterbodies
Grade II Listed Building

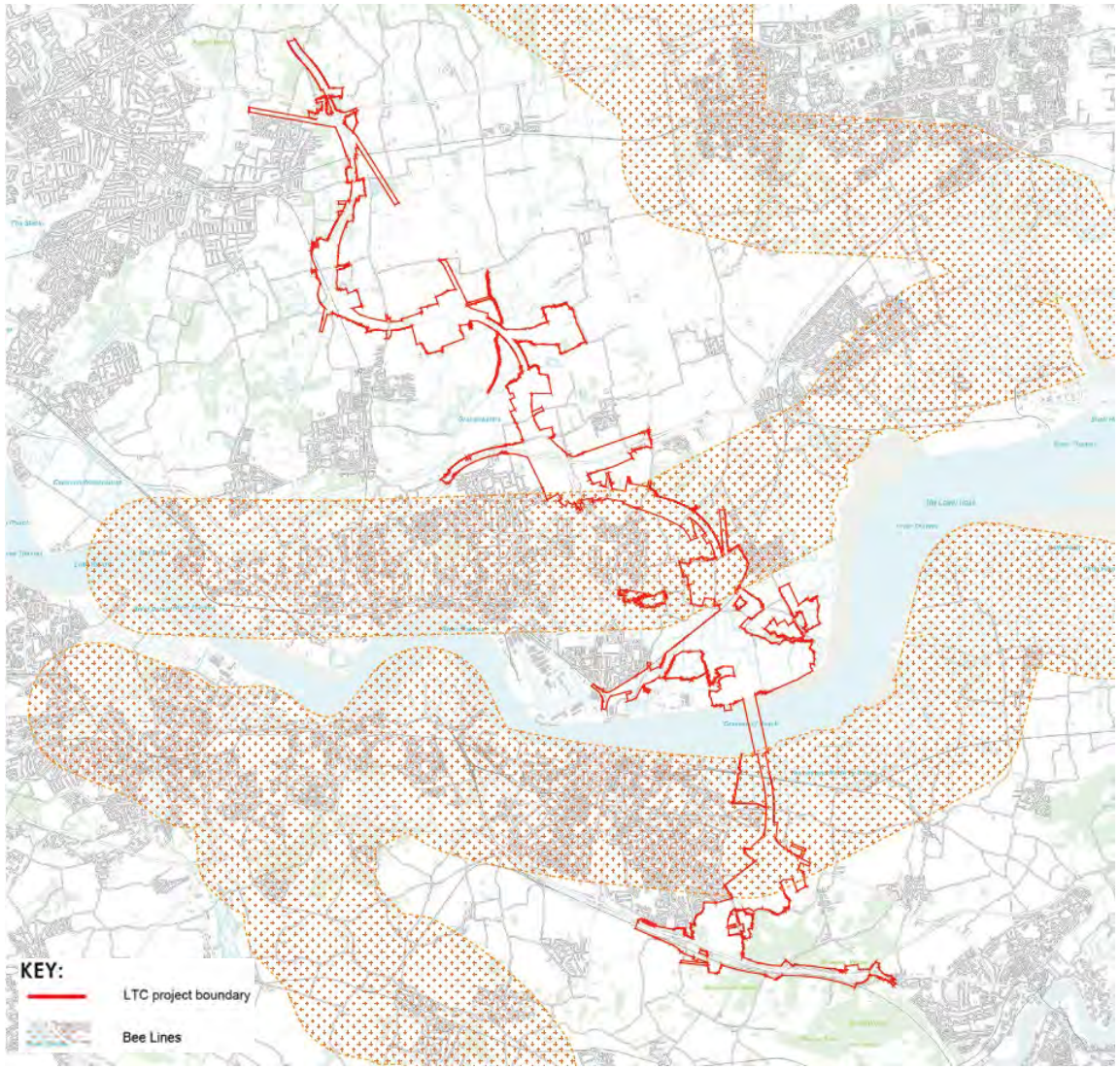
The Chadwell Link (Orsett Cock) – From Linford

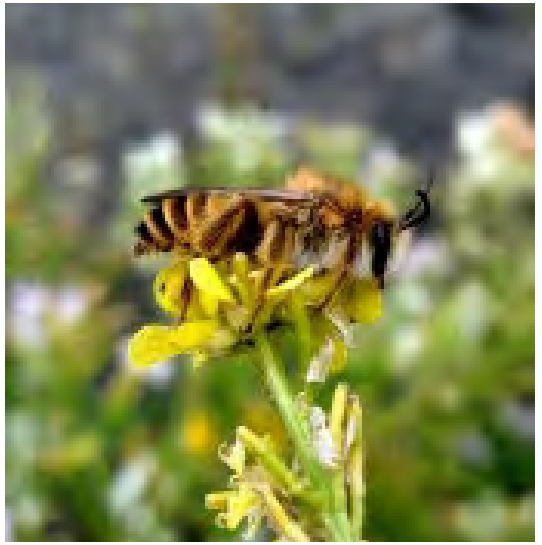
- Gently undulating farmland on sands, clays and gravels, slightly elevated above adjacent areas
- Arable landscape of medium sized, irregularly shaped fields divided by hedgerows with occasional woodland blocks
- Exposed urban edges of Grays, Chadwell St Mary and Linford significantly influence the landscape, giving it an urban edge character
- Five lines of pylons carrying high voltage overhead powerlines running north from Tilbury Power Station are dominant features
- South of the A13 ridge, LTC follows a small valley running north and north-west from Tilbury Marshes, following two lines of pylons



Rainbow Shaw Ancient Woodland

Green Infrastructure Example: Bug Life- B-Lines Project






Chadwell Link from the East (Over Linford)
Highways & Associated Landscape

Chadwell Link from the East (Over Linford)

Highways & Associated Landscape

1. Muckingford Road Green Bridge
2. Drainage attenuation pond
3. Hoford Road Green Bridge
4. Woodland swathe along valley
5. Species rich grassland for pollinators

Chadwell Link from the East (Over Linford) – Environmental Barriers

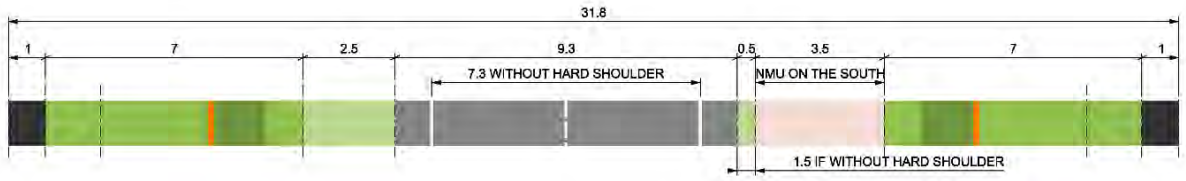
Chadwell link

Muckingford Road and Hoford Road

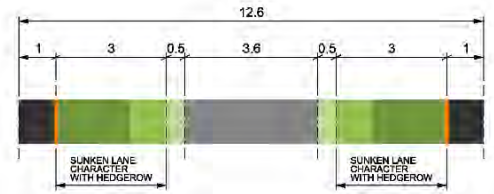
Muckingford Road

Hoford Road (protected lane)

Muckingford Road and Hoford Road Green Bridges



Muckingford Road



Hoford Road (protected lane)

Examples of GI WCH and landscape design Issues still under discussion with officers

- Potential additional WCH links based on WCHAR
- Hatch Report recommendations for Green Infrastructure and Open Space
- Additional Green Infrastructure proposals from Thurrock council
- Additional HRA mitigations measures including potential amendments to Tilbury Fields (within the context of Tilbury to Stanford-le-Hope Riverside legacy project)
- Open Space and design coordination around Blackshots Nature Reserve
- Outline Ecology and Landscape Management Plan (OLEMP)

Lower Thames Crossing

Working on behalf of highways england

Questions?