

Lincolnshire County Council

Boston – Distributor Road
Constraints Study
Stage 1 Review

Boston – Distributor Road Constraints Study

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Appendix A: Commission Brief

Appendix B: Major Constraints Plan

Boston – Distributor Road Constraints Study

1.0 Introduction

- 1.1 Technical Services Partnership of Lincolnshire County Council has been commissioned to undertake a study reviewing the constraints that will impact on the choice of the route for a distributor road around the west and north of Boston. The route would link the A16 to the south of the town to the A16 to the north. It does not address the need for a distributor road or the impact that this would have on traffic within the town.
- 1.2 The study consists of a desk top exercise to identify and the review potential constraints and land use.
- 1.3 A copy of the scheme brief is set out in Appendix 1 and attached to this report.

2.0 Background

- 2.1 Boston is an important sub-regional centre of this part of the East Midlands. It performs an important economic role in support of the industrial and commercial businesses of the area. As such it is the principal centre for employment, education and health.
- 2.2 Although the town has done reasonably well over the past few years it faces a number of challenges to its prosperity, with transport (and congestion) being cited as a particular problem affecting the performance of all sectors of the community.
- 2.3 The limited road crossings of the Haven river and the poorly developed road network of the town contribute to the frustration felt by the towns population in general, and by business in particular. Poor access to the Principal road network of the county and to the markets beyond, together with the additional costs caused by congestion, are cited by industry and commerce as major factors impacting on the sustainability of the town's economy and their willingness to invest in future expansion.
- 2.4 In recognition of the importance of the role of transport in supporting corporate initiatives at a local and regional level, the County Council and its partner (the Boston Borough Council) commissioned a multi-modal transportation study for the Boston area. The conclusion of the study, endorsed by the County Council and Boston Borough Council in January 2007, has proposed an integrated transport strategy, known as "The Transport Strategy for Boston 2006 to 2021 and Beyond". The study will be an important policy that will be used to inform other key transport documents, such as the Local Transport Plan (LTP).

- 2.5 The Strategy recognises that there is a need for additional road infrastructure to provide traffic with an alternative route to travelling through the town centre.
- 2.6 A Distributor Road would aim to remove as much traffic as possible that starts or finishes (or both) in Boston, as well as removing some or all of the through traffic. It would achieve this by having a number of junctions and links back into Boston, thereby maximising the number of opportunities that Boston traffic would have to access the Distributor Road as an alternative to travelling through the town centre. The Distributor Road would be brought forward in a manner which would seek to maximise private sector contributions, and potential may exist for the Road to be constructed in sections, as funding opportunities arise.
- 2.7 The output from the constraints study will help to inform Boston Borough Council as it continues to develop its Local Development Framework.

3.0 Regional Context

- 3.1 Boston sits within the coastal margins of eastern Lincolnshire, being approximately 8km from the Wash. The area surrounding Boston can be best described as an artificial or managed landscape consisting mainly of arable land of varying quality, predominantly Agricultural Land Classification Grade 2 to the north of the town and Grade 1 to the south, created by the draining of the coastal margins, a typical Fen Land picture.
- 3.2 Much of the land around the western corridor is low lying sitting within the range of 1.5 to 3.0m AOD. There is one main river, the River Witham, and a number of main drains radiating from Boston. All of the drains outfall into the Wash via the Haven, the tidal extent of the River Witham.
- 3.3 The geology of the area consists largely of drift deposits, with younger marine deposits of Terrington beds at Boston and older Barroway Drove Beds south of the town.
- 3.4 The town developed in the early middle ages as a port, with nationally important trading links to Europe. As a consequence of this the radiating road network had Boston as their primary focus. This early development of the road network has hindered the development potential of the current road network being constrained by historic development along the various corridors. The decline of the railways (post war) and the increasing reliance on the motor car has led to an increase in traffic. Even so through traffic, that is traffic that has its origins outside of the town and its destination beyond the town, still remains a relatively low proportion (less than 20 %) of the town's total traffic.

- 3.5 The road network consists of a number of roads of varying hierarchy radiating from the town into the surrounding hinterland. There are two Principal roads, the A16 linking the south west of the county to Boston and onward to Louth and Grimsby, and the A52 linking the west of the county to Boston and the coastal towns of Skegness and Mablethorpe beyond. Of the minor roads only two are classified, the B1183 to the north of the town and the B1391 (which was formally the A16 Trunk Road prior to 1991/2) to the south.

4.0 Area of the Study

4.1 The brief has defined the study area as that shown in Appendix 1 of “The Transport Strategy for Boston 2006 to 2021 and Beyond”. However previous work associated with the Boston Southern Link Road scheme has identified issues with termination of a road within this area. The study area has been extended to the south of Wyberton to accommodate the possibility of a direct link with the A16 Spalding Road. It is sufficient to investigate a corridor which would link the A16 to the south of the town to the A16 to the north. The corridor will cross the A52 and the A1121 to the west. The study area does not extend to include the A52 to the east of Boston.

5.0 Methodology.

- 5.1 The study will draw on previous work undertaken for the Boston Southern Link Road and the Boston Dock Link road. The initial work included a walk through survey of the area to identify and record the main physical constraints that may influence the routing of a road corridor.
- 5.2 Physical factors include existing roads, railways, water courses and physical development.
- 5.3 The study is primarily desk top based and has drawn on existing record bases held by various statutory bodies such as the Environment Agency and Utilities.

6.0 Constraints

6.1 There are two broad headings of constraints, physical and environmental. Both of these will impact on cost.

6.2 Physical constraints can be defined as: -

- Above ground obstructions such as buildings, roads, water courses, overhead power lines and the like.
- Below ground features such as underground services, poor/weak underlying ground, buried contaminates (e.g. anthrax burial pits) and the like.

6.3 Environmental Constraints¹ fall under a number of headings: -

- Local Air Quality
- Climate Change
- Landscape/Townscape (Visual impact)
- Biodiversity
- Heritage
- Water

6.4 In addition factors such as accessibility (severance) will need to be taken into account.

¹ See Environmental Constraints Study (Jacobs 2008).

7.0 Physical Constraints

7.1 Figure 1 shows the broad corridor of interest.

7.2 See drawing numbers A/HCZZZ0037/P/0000 and A/HCZZZ0037/P/0001.

7.3 A16 Spalding Road to A52 Swineshead Road

7.3.1 The village of Wyberton forms a barrier to the development of a corridor for the distributor road between the A16 and the A52. Earlier work on the now abandoned Southern Link Road² identified a single east-west route that would avoid costly demolition of housing. It would, however, pass through industrial land owned by Calders and Grandage, part of which is also tenanted by another manufacturer, Guildway. The cost of relocation and compensation was assessed in 2003 to be in the order of £9 million.

7.3.2 An alternative route³ linking the A16 Spalding Road at the Redstone Industrial Estate Access to the A52 Chainbridge Roundabout was also considered as part of the Southern Economic Corridor studies. This route would follow the line of the South Forty Foot drain, crossing it on a lengthy skew bridge midway along its length. This route would be costly to build and would also have a significant environmental impact on adjacent housing.

7.3.3 Other east west routes were considered as part of the SEC route selection, but all would have required significant demolition of existing housing.

² See Environmental impact study for the Southern Link Road for detailed description of the route and the environmental constraints. A plan of the Route is shown in Appendix 1.

³ See Southern Link Road Environmental study for this route.

- 7.3.4 The cost of compensation arising from passing through the Calders and Grandage site is prohibitive. Termination of the Southern Link Road at the B1398 London Road junction was investigated. Analysis of the traffic figures indicated that such an option would be viable. There would be a need, though, to consider improvements to the A16 Spalding Road/B1398 London Road Junction.
- 7.3.5 The earlier studies concluded that whilst it is possible to provide an east west link between the A16 and the A52 any route would be costly and if not constructed though the Calders and Grandage site would result in extensive demolition of properties.
- 7.3.6 In order to avoid these constraints the distributor road would have to be built from a point to the south of the village and then follow a route close to and broadly parallel to the existing Wyberton West Road, terminating at the A52 Swineshead Road (TESCO) roundabout. It will still be challenging to find a gap in the ribbon development along London Road and Ralphs Lane sufficient to thread a road through without demolition of small number of properties.
- 7.3.7 Alternative terminations at the northern end of this part of the distributor road have been considered. The ribbon development along the A52 Swineshead Road provides a barrier that limits the location of the termination of this section of the distributor road to this junction.

7.3.8 The route will need to be close to the boundary of the existing development to avoid enclosing an excessively large area of land that would be too great to be attractive to potential developers. The land to the east of Wyberton West Road would be sufficient to meet the housing allocation for Boston over the next 20 to 30 years (based on the constraints at the time of the development of proposals for the Southern Link Road)⁴.

7.3.9 The route would pass through an area of largely arable land. From the A16 Spalding Road it would cross the B1398 London Road and B1391 Ralphs Lane before heading north crossing a number of field drains and two minor roads. It would, towards its northern limit, cross the Old Hammond Beck (still classified as navigable).

7.3.10 To understand the impact upon farms and the potential for severance a more detailed study of land holding/interests will be required. It is likely, though, that a number of farms would be affected by a distributor road.

⁴ The Boston Local plan (c2006) has not been adopted and will be superseded by the Local Development Framework. The framework is currently being developed and will reflect in more detail the predicted housing allocations for the Borough.

7.3.11 The distributor road will impact on a number of items of utility plant and other infrastructure along this section of the corridor: -

Description	Number
Water mains (>300mm diameter)	3
Foul Sewer	2
11Kv cables	1
33Kv cables (o/h)	1
Low pressure gas mains	2
High pressure gas mains	1
Minor water courses	2
Major water courses	1
Fields drains (approximately)	30
Roads (A and B)	4
Roads (C and u/c)	2
Railway	-

7.3.12 It should be possible to cross a number of the affected items of plant without major alterations, although where the distributor road forms junctions with other roads more major diversions will be required. Approximately half of the items of utility plant will require diversion.

7.3.13 The item of greatest concern is the high pressure gas main. This would lie under the route of the distributor road where it joins the A52 Swineshead Road at the 'Tesco' junction. Although it may be possible to protect the main, it is more likely that diversion would be required. This would be extremely costly.

7.3.14 The whole area lies within a flood risk zone. The risk arises from both fluvial and tidal (inundation) flooding. The design of the distributor road will need to ensure that the existing flood paths are maintained to avoid creating new areas at greater risk of flooding. There are some particularly low lying areas of land bounding the Town Drain, to the east of Wyberton West Road.

7.3.15 It is envisaged that the whole of this section of the route would be built at or near existing ground level with the exception of route in the vicinity of the Old Hammond Beck. Although the ground undulates gently overall there is little significant variation in ground level and it is unlikely that any substantial earthworks will be required.

7.3.16 The road is unlikely to substantially intrusive visually. However the need to construct the road close to residential properties will result in intrusion from noise. However some mitigation measures could be put into place in the form of screening. Care will need to be taken with the design as physical features such as bunds and noise fencing which can be very intrusive in the landscape, especially the flat fenland typical of this area.

7.3.17 There will need to be careful assessment of the balance between the cost of environmental mitigation work and the cost of meeting part 1 claims arising from the development. It may be possible to tie in some of the mitigation works with the future development of the woodland belt being developed by the woodland trust around Boston. Such a screen wood help to reduce the impact of airborne pollution from the new road.

7.3.18 It is envisaged that the majority of this section of the new route would be drained by ditches out falling into the existing drainage network. The ditches would have to provide sufficient storage capacity so that flows into the existing network does not exceed the limits that may be imposed by the drainage boards/environment agency. It will also be important to avoid creating new paths for flood water that would result in creating new areas of flooding.

7.4 A52 Swineshead Road to A1121 Boardsides.

7.4.1 This is a particularly difficult section of the route, with a number of major constraints. Work on Southern Link Road originally envisaged passing through the TESCO/B & Q site before passing over the South Forty Foot Drain, the Sleaford to Boston railway and the A1121 Boardsides. A detailed engineering study was undertaken. It concluded that the existing constraints imposed by the access to the retail outlets and the need to cross the drain and railway at a high level whilst achievable would entail a high degree of engineering risk (cost). Both TESCO and B & Q were concerned about the potential impact on their businesses and the possible loss of some car parking. A detailed review of possible compensation claims from these businesses indicated that such claims were likely to be significant. The substantial engineering risks and the high cost of compensation ruled out this option.

- 7.4.2 The route settled on as part of the Southern Link Road was to construct a link road parallel to the A52 taking the new road to the west of the retail area then heading north over the New Hammond Beck, South Forty Foot Drain, the Sleaford to Boston railway and the A1121 Boardsides, terminating at a new high level roundabout with a link westwards down to the A1121.
- 7.4.3 The close proximity of the South Forty Foot Drain, the railway and the A1121 make their crossing difficult. Previous discussions with Network Rail had ruled out the possibility of a level crossing at an early stage.
- 7.4.4 Various options for a bridge have been considered. It was envisaged that a two span bridge may be possible, with a central pier being provided between the railway and the South Forty Foot Drain. However the only access to the site would be via the drain. There was also a concern regarding the acceptability of a major bridge support so close to the railway. Such a support would be awkward to build without disruption to rail services and would have to be of substantial construction to meet current railway collision standards. The final design envisaged a single span, cable stayed bridge across the drain, railway and A1121. However English Heritage were concerned that the main support tower would compete with the visual presence of the Boston 'Stump', the tower of St Botolphs Church, one of the main features of the fen land landscape. The decision not to proceed with the SLR was taken before it had been possible to take this matter to a conclusion, however progress was such that it was likely that this would become a matter that would require the Planning Inspector to rule at a Public Inquiry.

7.4.5 The distributor road will impact on a number of items of utility plant and other infrastructure along this section of the corridor: -

Description	Number
Water mains (>300mm diameter)	-
Foul Sewer	-
11Kv cables	2
33Kv cables (o/h)	-
Low pressure gas mains	-
High pressure gas mains	1
Minor water courses	1
Major water courses	2
Fields drains (approximately)	6
Roads (A and B)	2
Roads (C and u/c)	1
Railway	1

7.4.6 The high pressure gas main would only be affected by the alterations to the TESCO roundabout.

7.4.7 The New Hammond Beck is one of the major drain internal drainage board drains for the area and together with the Old Hammond Beck is responsible for the drainage of area south of the South Forty Foot Drain. Both drains will need to be crossed by structures spanning in the order of 10 -15m. As both of the Hammond Becks and the South Forty Foot Drain are navigable it will be necessary to obtain authority through a S106(3) Bridge Scheme⁵. They would be subject to consultation and may lead to Public Inquiry. Both of the Hammond Becks now appear to be only navigable by small vessels such as a rowing boat.

⁵ S106(3) Highways Act 1980

7.4.8 The South Forty Foot Drain is a significant Navigation and is currently being further developed as part of the East Coast Waterway project, with a new Lock being created in to the Haven. This should not be a major problem as there are a significant number of existing structures that already constrain the headroom of vessels that can use the waterway. The new structure would not impact upon the navigation envelope.

7.4.9 The corridor east of the TESCO roundabout would be across a mixture of semi derelict and arable land It would have the advantage of moving traffic away from the immediate frontage of properties abutting the south side of the A52. The adoption of carefully designed screening/landscaping should lead to a reduction in noise levels for many properties, however a number in the vicinity of the a new roundabout that would connect the A52 Swineshead Road into the section of road leading on to the bridge crossing would be exposed significant impact. Detailed consideration of the siting of the new roundabout will be necessary to ensure that any impact is kept to a minimum.

7.4.10 The location of the section of road crossing the Drain, Railway and A1121 avoids most housing. The existing roads already create a measurable impact from traffic noise. It is unlikely that the traffic noise from the distributor road will lead to a significant increase in the noise above those levels currently experienced by properties fronting the A52 and A1121.

7.4.11 The embankments will have to be constructed on indifferent ground. It is likely that some form of ground reinforcement will be required. This may well be in the form of mini piles or similar.

7.4.12 Drainage will be an important consideration, with much of the drainage along the route of the embankments having to be via a positive drainage system, out falling into adjacent ditches. New ditches will have to provide sufficient storage so that discharges into the existing network can be limited to a level acceptable to the Internal Drainage Board/Environment Agency. The design of the network will have to maintain existing flood flows paths and care will have to be taken to ensure that no new areas of flood risk are created.

7.4.13 The visual impact of a large earthwork and structure on the fen land landscape is likely to be significant. However the landscape is largely a man made form. Much of the embankment will be part hidden by existing commercial development.

7.4.14 Alternative routes across the South Forty Foot Drain have been considered. The most obvious being an improvement of the existing Chain Bridge Road. This corridor is already restricted by access to adjacent retail outlets; the existing bridge across the South Forty Foot drain and a level crossing across the Sleaford to Boston railway. The close proximity of the adjacent developments, the location of the A1121 Broadsides junction and the need to maintain access at all time to the retail outlets precludes the provision of a high level route over the railway at this location. Network Rail did indicate in c2003/4 that they would accept improvement of the level crossing, but an at grade option would still suffer from regular obstruction caused by closure of the crossing to permit passage of trains. However policy concerning changes to level crossings is subject to regular review and recent incidents such as that at Hungerford have heightened concerns.

7.5 A1121 Boardsides to C763 Punchbowl Lane.

7.5.1 Immediately to the north of the A1121 Boardsides there are a number of commercial developments, including three car dealerships and one agricultural machinery dealership. There are also small number of residential properties. Great Fen Road forms the only other road of note in this area of interest. It provides the main access to the Princess Royal Arena, a large athletics venue. Boston Rugby Club with its extensive playing areas lies south of the Princess Royal Stadium.

7.5.2 Boston Aerodrome lies between the commercial development adjoining the A1121 and the sports area further north. The airfield consists of a single grass landing/takeoff strip and a small number of adjoining buildings.

7.5.3 The nature of the development in this area is such that there are very limited number of corridors suitable for the distributor road where it will not have significant impact on current land usage or requires demolition of properties.

7.5.4 There is a large commercial development to the east of this section of interest. Known as Endeavour park this area consists of a mixture of commercial, retail and office development. This would form the natural eastward barrier to the route of the distributor road.

7.5.5 The area east of Great Fen Road, beyond the commercial development of the area consists of large arable fields, bounded by drainage ditches. This area is known as Wyberton Fen. It forms a flat open manmade landscape, formed by managed draining of the area. The Fen stretches north to beyond the North Forty Foot Drain.

- 7.5.6 The North Forty Foot Drain is a major drain running west to east across the study area, serving as the primary drainage channel across Wyberton Fen and westwards beyond. It turns south at the eastern limit of the study area before it outfalls into the South Forty Foot Drain.
- 7.5.7 A minor road, South Forty Foot lane, runs along the north bank of the drain. There are a small number of properties situated along this road, including an electricity substation.
- 7.5.8 The arable fenland continues northwards from the drain up to Punch Bowl lane. Punch Bowl Lane is the first road of any significance north of the A1121 Boardsides. It forms a link from the B1192 Coningsby to Hubberts Bridge road to the A1137 Brothertoft Road leading around the north of the town centre. As such it is often used as a rat run for traffic from villages to the north west of Boston avoiding the A52 Sleaford Road into town. The eastern extremity of Punch Bowl Lane enters leads into the built up area of the town.
- 7.5.9 The Lane is narrow and is generally unsuited to use by larger commercial vehicles. It serves a number of farms.

7.5.10 The distributor road will impact on a number of items of utility plant and other infrastructure along this section of the corridor: -

Description	Number
Water mains (>300mm diameter)	-
Foul Sewer	-
11Kv cables	4
33Kv cables (o/h)	-
Low pressure gas mains	-
High pressure gas mains	1
Minor water courses	2
Major water courses	1
Fields drains (approximately)	8
Roads (A and B)	-
Roads (C and u/c)	2
Railway	-

7.5.11 The high pressure gas main runs through Endeavour Park, but north of the development area it follows the corridor of the distributor road. Its location will have a major influence on the location of the new route along this section.

7.5.12 The North Forty Foot Drain may be a navigable waterway, although its official status will need to be confirmed.

7.5.13 There are three 11KV cable routes entering the electricity substation on the north bank of the South Forty Foot Drain. It is likely that there are a number of lower voltage cable running from this location to serve the local development. Whichever route is finally settled on at least one of the 11Kv supplies will be affected.

7.6 Punch Bowl Lane to Maud Foster Drain.

7.6.1 This area remains a largely arable fen, retaining the rectangular field patterns characteristic of a manmade landscape. As with the adjoining section to the south the area has been drained by a network of artificial ditches, with those to the south of the River Witham out falling into the South Forty Foot Network, and those to the north out falling into the into the Maud Foster Network.

7.6.2 The River Witham is the main drainage channel for significant part of Lincolnshire. The present course of the river runs in a manmade channel. River levels are artificially controlled by sluice gates situated at Grand Sluice within the town. The sluice forms the boundary between the non-tidal Witham and it's tidal reaches, the Haven.

7.6.3 The river is classified as a navigation, forming a link between the Wash and the Trent, via Lincoln and the Fosdyke Canal. The section of Witham north of the Grand Sluice is used by the local sailing club, with no restrictions to headroom as far as Langrick Bridge (7.2km). Bridging of the Witham will require a S106(3) Bridge Scheme⁶.

7.6.4 From Punch Bowl Lane the corridor follows the North Western Boundary of the town. Whilst development south of the Witham remains at very low density there is a greater number of properties, forming ribbon style developments, between the Witham and the Maud Foster Drain. Existing development along this part of the corridor will have significant impact upon the choice of route.

⁶ S106(3) Highways Act 1980

- 7.6.5 The distributor road will need to cross the line of the high pressure gas main again as it turns eastwards to run around the northern perimeter of the town. The gas main will be in close proximity one of the potential crossing points of the Witham. It possible that the main could lie within the extent of the approach embankment. If this is the case it may be necessary to construct a bridge over the main.
- 7.6.6 The route would cross two minor roads, Washdyke Lane and Fenside Road prior to bridging the Witham.
- 7.6.7 The bridge across the Witham will be a significant structure requiring a clear span in the order of 60 to 70m. Depending upon the requirements of the navigation it will also have to maintain a significant headroom clearance. In view of this constraint the approach embankments will from substantial earthworks rising above the prevailing fenland. The embankments, although probably lower than those at the crossing of the South Forty Foot Drain, are still likely to require some form of special ground treatment to restrict future settlement. As with all high level earthworks the embankments will have a major impact on the environment, both visually and in terms of other factors such as the transmission of noise.
- 7.6.8 Beyond the River Witham the corridor crosses another minor road before heading eastwards across more arable land towards Tattershall Road. Ribbon development along Tattershall Road forms a barrier to the corridor, limiting the choice of route if demolition of properties is to be avoided.

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7.6.9 The corridor then continues eastwards, having to cross further areas of arable land, before having to thread itself through a section intermittent development along both sides of Rawsons Lane, prior to crossing the Maud Foster Drain.

7.6.10 The distributor road will impact on a number of items of utility plant and other infrastructure along this section of the corridor: -

Description	Number
Water mains (>300mm diameter)	2
Foul Sewer	1
11Kv cables	2
33Kv cables (o/h)	-
Low pressure gas mains	-
High pressure gas mains	1
Minor water courses	-
Major water courses	1
Fields drains (approximately)	12
Roads (A and B)	-
Roads (C and u/c)	5
Railway	-

7.7 Maud Foster Drain to the A16.

7.7.1 The Maud Foster Drain is part of a complex drainage network to the north of the town. Other drains, forming the northern boundary of the study area include the Firth Bank Drain, Stone Bridge Drain, West Fen Drain and the Cowbridge Drain. All of the above drains are navigations, although it is envisaged that only the Maud Foster and Cowbridge Drains will require bridging. If this is the case then a S106(3) Bridge Scheme⁷ will be required. Clearances will need to match those provided by nearby structures so as not to hinder the navigation.

7.7.2 B1183 Horncastle Road runs along the top of the western bank of the Maud Foster Drain. This will complicate the connection of the existing road into the proposed distributor road. Space restrictions may limit its connection and a choice will have to be made whether to bridge the road as part of the crossing of the drain or whether a costly connection of the road can be justified.

7.7.3 The corridor continues eastwards across further arable land before encountering the Boston to Skegness railway. It is no longer possible to construct new level crossing on the railway network, so a bridge crossing of the railway will be required. The railway will require a minimum clearance of the rail line in the order of 5.5m. However the existing line is founded on a shallow embankment. In view of this the height of the bridge and approach embankment is likely to be in the region of 8m above existing ground level.

⁷ S106(3) Highways Act 1980

- 7.7.4 The close proximity of the railway to the Maud Foster Drain suggests that the embankment leading to the railway bridge is likely to be a continuation of the same earthworks that form the approaches to the bridge over the Maud Foster Drain. Such an extensive length of embankment is likely to have marked impact upon the flood flow paths. Provision of drainage through the embankments to maintain existing flow paths will need to be made in the design.
- 7.7.5 Beyond the railway line is further arable land across which lies the route of the Cowbridge Drain. As with the Maud Foster Drain it is a navigation and will require a bridge crossing of sufficient height to avoid restrictions to the waterway. A s106 Bridge scheme will be required⁸. It's close proximity to the railway is likely to necessitate the continuation of the embankment between the two bridge crossings. Account will need to be made of the need to maintain flood flow paths.
- 7.7.6 This section requires the construction of what can best be described as a high level route. Such a route will form an extended barrier to views across the fen landscape to the Wolds beyond. The environmental impact is likely to be significant even with mitigation measures in place. The embankments, being constructed across lands that formed the coastal margins of Lincolnshire, will probably need to be founded on ground subject to reinforcement, or improvement.
- 7.7.7 Beyond the Cowbridge Drain the corridor continues eastwards, crossing another drain, to form an at grade junction with the existing A16. Although there is some development along this part of the A16 it should be possible to form a roundabout type junction with the existing road.

⁸ S106(3) Highways Act 1980

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7.7.8 Dense ribbon development along Horncastle Lane south of the railway and along Pilley's Lane prevents a more southerly route for the distributor road unless demolition of existing properties is undertaken. The route, still largely on embankment, would have a marked environmental impact on a number of houses, particularly where it cuts across the ribbon development.

7.7.9 The distributor road will impact on a number of items of utility plant and other infrastructure along this section of the corridor: -

Description	Number
Water mains (>300mm diameter)	-
Foul Sewer	-
11Kv cables	1
33Kv cables (o/h)	-
Low pressure gas mains	-
High pressure gas mains	-
Minor water courses	1
Major water courses	2
Fields drains (approximately)	12
Roads (A and B)	2
Roads (C and u/c)	-
Railway	1

8.0 Discussion

8.1 Development Demands

8.1.1 It is intended that the distributor road would serve three objectives : -

1. To provide a road on the outskirts of the built up area of the town that would provide alternative ways into Boston avoiding the existing heavily trafficked primary routes.
2. To provide a route for traffic avoiding the town centre.
3. To serve potential developments areas to the west of the town.

8.1.2 It is intended that the route would benefit from a significant contribution from the private development that it would facilitate. In order for this to succeed the area of land served by the road would need to be sufficiently large to be attractive to potential developers, but not so large as to be beyond the development needs of the town. The current housing allocation for the Borough of Boston as a whole is in the order of 290 dwellings per calendar year^{9, 10}. Based on this rate of uptake it is unlikely that there will be a need to source any significant new areas of land for housing in the area for a number of years.

⁹ See Draft Regional Spatial Study.

¹⁰ See also the RSS panel report.

8.1.3 Boston is densely developed within the built up area, however most roads radiating from the town experience varying degrees of ribbon development. If demolition of properties is to be avoided the route of the distributor road would be forced out away from the fringes of the urban core of the town. If such a route were to be adopted it is likely that the area of land available for development would be too great for the foreseeable needs of the town and would be less likely, as a consequence, to be attractive to potential developers. This would need to be taken into account by Boston Borough Council in the developing the Local Development Framework.

8.2 Flood Risk

8.2.1 Boston sits wholly within an area designated as being at risk from flooding. Being situated on the coastal margins of the County Boston is at risk from both fluvial and tidal flooding¹¹.

8.2.2 Rainfall if prolonged or heavy can result in localised flood events. Of greater concern is flooding that would occur from the overtopping of the existing flood defences. Such events could arise from exceptional rainfall or the failure of pumping equipment. In any event the extent of the flood is likely to be confined to the lowest lying areas¹².

¹¹ Boston Strategic Flood Risk Assessment (2007 Revision).

- 8.2.3 Tidal flooding would arise from the overtopping of the banks of the Haven, generally away from the corridor being investigated, or a catastrophic failure of the river banks. The most likely event would be the overtopping of the banks of the Haven, with the quantity of water released being dependant upon the duration and level of the high tide. Such flooding would be shallow in nature although likely to affect a large area. A catastrophic failure would be more significant and has the potential to release a substantial volume of water in short space of time.
- 8.2.4 The whole of the district of Boston sits within a managed drainage system. It success depends upon the maintenance of the system, including the drains and the pumping equipment. The risk of flood can be assessed as low providing the system is properly maintained.
- 8.2.5 Within the context of flood risk the distributor road is unlikely to have a significant impact providing that the discharge from the highway drainage into the existing drainage network does not exceed it's capacity. It is likely that the route has the potential to impact upon the behaviour of flood events described above. The road may create a barrier cutting across the existing paths that flood water would otherwise take. Such a barrier might redirect water along new routes and create new areas at risk of flooding. This is unlikely to be acceptable to the drainage authorities unless the diversion of flood water reduces flood risk in areas of housing or commercial activity.
- 8.2.6 The design of the distributor road will need to take into account any impact that it may have on flood risk. Provision will need to be made within the design for either the maintenance of the existing flood paths or the creation of new flood defences. Either option will impact upon cost.

8.3 Environmental Constraints

- 8.3.1 The environmental constraints are discussed in the report produced by Jacobs UK Limited – Boston Distributor Road Environmental Constraints Study. However it is pertinent to consider the potential impacts that the distributor road may have.
- 8.3.2 The construction phase of any major infrastructure project will, inevitably, have an impact upon the surrounding area. The work phase has the potential to create nuisance from dust and noise, as well as disrupting traffic flows where the works interface with the existing highway network. Care will need to be taken to ensure that watercourses are not affected by the introduction of chemicals and fine silts arising from the works. An environmental management plan will need to be developed prior to construction.
- 8.3.3 The route will cross the Sleaford to Boston and Boston to Skegness Railway. Works required to bridge the railway will need to be carefully planned and will need the consent of Network Rail. Works of this nature attract long lead in times and will need to meet the time slots made available by the railway. If the programmed times are missed the works could be subject to significant delay.
- 8.3.4 The completed scheme will, inevitably, impact on the existing environment. The need to build a large proportion of the route on embankments will promote the transmission of traffic noise and limit the extent of possible mitigation works. The embankments will be an uncharacteristic feature within the Fenland landscape and will have significant visual impact.

8.3.5 The route of the distributor road will cut across a large number of the existing roads radiating from Boston. Whilst it is intended to provide junctions with most of the roads a small number of minor roads and tracks may be severed. The route will also cut across a number of public footpaths.

9.0 Summary/Conclusions

- 9.1 The report has focused upon identifying the constraints that would have to be addressed in order to achieve the delivery of a distributor road for Boston. How a distributor road may be funded is beyond the scope of the report which has dealt with the 'physical' constraints that may be encountered.
- 9.2 The low lying fenland character of the area is crossed by a number of significant features such as waterways and the railway. These features will have a major impact on the upon the elevation of any future road which will, in turn, lead to a number of environmentally intrusive works. Among the environmental factors that will need to be addressed include noise, visual intrusion and severance.
- 9.3 In terms of visual intrusion the height of the embankments will be in excess of 8 metres where the road has to cross the railway and the River Witham and will form significant features in such a low lying flat landscape. The height of any supporting elements for the crossing of the South Forty Foot Drain and railway are such that they are likely to conflict with current planning policies regarding the Boston Stump. English Heritage holds particularly strong views on this in relation to previous schemes which if sustained will need to be overcome.
- 9.4 There are also the softer environmental issues which include impact upon flora and fauna which will need to be addressed.
- 9.5 The location of a major gas supply pipe through the area will have a major impact on any choice of route. Whilst it may be possible to overcome this the protection works required is likely to be very costly.
- 9.6 Boston lies wholly within an area of flood risk. Work undertaken by consultants acting for the Borough has dealt with this in great detail. Any proposal will need to meet the needs of all parties responsible for the management of flood risk within the Borough. As there are a number of agencies involved this will add a further level of complication to the process.
- 9.7 Whilst it is feasible to determine a route for the Distributor Road it is unlikely that it would be delivered in one go. For it to achieve the goals set by the two councils it will be necessary to ensure that the road meets a consistent design standard determined in advance of the selection of the areas for development through the LDF process.

APPENDIX A

Commission Brief

BOSTON TRANSPORT STRATEGY
DISTRIBUTOR ROAD – DRAFT BRIEF FOR CONSTRAINTS
IDENTIFICATION

1. BACKGROUND

The purpose of this brief is to outline requirements for the commission to carry out a constraints identification exercise within the corridor identified for the potential distributor road in 'The Transport Strategy for Boston 2006 to 2021 and Beyond'; December 2006 (Transport Strategy) Appendix A. It is not intended that this exercise will produce potential road alignments, however, consideration of constraints influencing horizontal and vertical alignment should be highlighted.

The commission shall be carried out and reported in two stages, an initial high level review of potential constraints followed by a detailed constraints report based on the requirements and level of detail defined within TD 37/93 Stage 1.

2. STAGE 1

2.1. General

Stage 1 of the commission is a desk-top exercise to identify and review potential constraints and land ownership in the form of an initial feasibility study with figures as appropriate. The corridor of interest for the study will be as defined within the transport strategy document.

Budget fee for this element of work [REDACTED].

3. STAGE 2

3.1. General

The level of detail required corresponds to that defined within TD 37/93 as 'Stage 1', supplemented by specific requirements detailed below. Output from the commission will be in the form of a 'Constraints Report' based on the Stage 1 report contents in TD 37/93 with associated figures/plans. Stage 2 will refine and build upon the findings of Stage 1.

It is envisaged that this commission will be predominantly in the form of a desk-top exercise, supplemented as appropriate with site survey information.

It is anticipated that the output from this commission will be utilised in subsequent development of potential alignments and junction arrangements.

The following Sections 2-7 follow the headings within the Stage 1 requirements of TD 37/93 and should be read as supplemental to Section 3 of that document. Section 8 details areas not covered within TD 37/93.

Budget fee for this element of work [REDACTED].

3.2. EXISTING CONDITIONS

As TD 37/93 requirements.

3.3. DESCRIPTION OF ALTERNATIVE SCHEMES

§ Alternative Schemes

Description of potential corridor only, description of alternative routes within the corridor is not expected.

§ Preliminary Cost Estimates

Not required.

3.4. ENGINEERING ASSESSMENT

As TD 37/93, note should be made of interfaces with Network Rail infrastructure.

3.5. ENVIRONMENTAL ASSESSMENT

As TD 37/93, assessment to include review of flood risk and Environment Agency consultation.

3.6. SOURCES OF INFORMATION

As TD 37/93.

3.7. TRAFFIC & ECONOMIC ASSESSMENT

As TD 37/93.

§ Traffic

Reference should be made to previous traffic data and modelling for existing and future situations.

§ Economic Assessment

Consideration of potential development facilitated through the construction of a distributor road should be considered as part of this section.

APPENDIX B

Major Constraints Plan