

Air Quality Valuation Workbook - Worksheet 3

Scheme Name: Preston Western Distribution

Present Value Base Year

Current Year

Proposal Opening year:

Project (Road/Rail or Road and Rail):

Overall Assessment Score:

Present value of change in NOx emissions (£):	-£372,097
Present value of change in PM10 concentrations (£):	£947,190
Total value of change in air quality (£):	£575,093

*positive value reflects a net benefit (i.e. air quality improvement)

Quantitative Assessment:

Net total route assessment (opening year) for PM10 : (between 'with scheme' and 'without scheme' scenarios)	-347
Change in NOx emissions over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	755

Qualitative Comments:

Year 2030 emission factors are used for 2037 (forecast/design year). However, in reality this is unlikely because improvements in :
However, this is unlikely because of improvements in automotive technologies between 2030-2037.

The road improvements would result in an increase in local NO_x emissions through attracting extra traffic onto the road network.
Local PM10 concentrations overall reduce at sensitive receptors as a result of the scheme.

Sensitivity Analysis:

Upper estimate net present value of change in air quality (£):	£653,566
Lower estimate net present value of change in air quality (£):	£206,491

Data Sources:

DEFRA EFTV8.0.1 and ADMS-Roads
 No emission factors are available for assessment years after 2030 (EFTv8.0.1), therefore emissions factors for 2031 and after are assumed to be the same as 2030.
 Traffic data supplied by Jacobs Transport Team on 19/09/2018.
 DMRB guidance and associated IANs.

Air Quality Valuation Workbook - Worksheet 2

Regional Air Quality

Scheme name: Preston Western Distribution

Opening year: 2022 Forecast year: 2037

		Without scheme		With scheme		Change in emissions	
		Opening year	Forecast year	Opening year	Forecast year	Opening year	Forecast year
NOx emissions in tonnes per year	Areas not exceeding limit values	420.62	252.28	439.72	263.86	19.11	11.58
	Areas exceeding limit values	0.00	0.00	0.00	0.00	0.00	0.00

Qualitative comments: _____

Data sources:

DEFRA EFTV8.0.1. No emission factors are available for assessment years after 2030 (EFTv8.0.1), therefore year 2030 factors are assumed for years 2031 onward.

Noise Workbook - Worksheet 1

Proposal Name: PWD

Present Value Base Year

Current Year

Proposal Opening year:

Project (Road, Rail or Aviation):

Net present value of change in noise (£):

*positive value reflects a net benefit (i.e. a reduction in noise)

Net present value of impact on sleep disturbance (£):

Net present value of impact on amenity (£):

Net present value of impact on AMI (£):

Net present value of impact on stroke (£):

Net present value of impact on dementia (£):

Quantitative results

Households experiencing increased daytime noise in forecast year:

Households experiencing reduced daytime noise in forecast year:

Households experiencing increased night time noise in forecast year:

Households experiencing reduced night time noise in forecast year:

Qualitative Comments:

In the short-term there are 2101 dwellings and 44 other sensitive receptors predicted to have perceptible increases in noise. In the long-term there are 1193 dwellings and 34 other sensitive receptors predicted to have perceptible increases in noise. There are 4288 dwellings and 72 other sensitive receptors predicted to have perceptible decreases in noise in the short-term. In the long-term 32 dwellings and 3 other sensitive receptors are predicted to experience perceptible noise decreases. There are 130 properties anticipated to be eligible for noise insulation. No instances of noise levels greater than 80 dB LAeq,16h have been predicted. Night-time noise levels (L_{night}) have been derived using the TRL Method 3

Data Sources:

Traffic Data modelled by Jacobs
 Ordnance Survey Basemap
 AddressBase Plus Ordnance Survey

Greenhouse Gases Workbook - Worksheet 1

Scheme Name: Preston Western Distribution

Present Value Base Year

Current Year

Proposal Opening year:

Project (Road/Rail or Road and Rail):

Overall Assessment Score:

Net Present Value of carbon dioxide equivalent emissions of proposal (£):

*positive value reflects a net benefit (i.e. CO2E emissions reduction)

Quantitative Assessment:

Change in carbon dioxide equivalent emissions over 60 year appraisal period (tonnes):
(between 'with scheme' and 'without scheme' scenarios)

Of which Traded

Change in carbon dioxide equivalent emissions in opening year (tonnes):
(between 'with scheme' and 'without scheme' scenarios)

Net Present Value of traded sector carbon dioxide equivalent emissions of proposal (£):

(N.B. this is not additional to the appraisal value in cell I17, as the cost of traded sector emissions is assumed to be internalised into market prices. See TAG Unit A3 for further details)

*positive value reflects a net benefit (i.e. CO2E emissions reduction)

Change in carbon dioxide equivalent emissions by carbon budget period:

	Carbon Budget 1	Carbon Budget 2	Carbon Budget 3	Carbon Budget 4
Traded sector	0	0	0	0
Non-traded sector	0	0	5699.259198	29479.7298

Qualitative Comments:

Working assumption that carbon emissions remain the same after the design year, with 2030 emission factors used for 2037. However, in reality it is likely that improving technologies will result in fewer CO₂ emissions at the scheme.

The road improvements would result in an increase in CO₂ emissions and a net worsening with the scheme (compared to without) as more traffic is attracted onto the network.

Sensitivity Analysis:

Upper Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):

-£19,013,519

Lower Estimate Net Present Value of Carbon dioxide Emissions of Proposal (£):

-£9,506,759.55

Data Sources:

DEFRA EFTV8.0.1

No emission factor is available for assessment years after 2030 (EFTv8), therefore emissions factors for 2031 and after are assumed to be the same as 2030.

Traffic data supplied by Jacobs Transport Team on 19/09/2018.

DMRB guidance and associated IANs

TAG Landscape Impacts Worksheet - PWD / EWLR

	Step 2	Step 3				Step 4
Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Pattern	<p>Gently undulating rural farmland to the north and west of Preston's urban edge ranging from approximately 20-30m in the north gradually descending down to 10m AOD at the River Ribble in the south. The field pattern varies with medium to large fields juxtaposed with areas of very small scale medieval field units. Numerous field ponds and watercourses are a feature of the area. Ribbon development of housing in an eclectic mix of styles and materials has developed along existing lanes creating long linear villages such as Higher Bartle, Woodplumpton and Lea Town. Farmsteads are close to roads with some larger houses on estates such as Bartle Hall and Clifton Lodge scattered throughout the area. The landscape contains numerous urban fringe elements such as recreational areas, new housing development, a sand quarry (Bradley's sand pit and landfill site), a large scale industrial works (BNFL Springfield site). Three major transport routes cross the study area from the east to west, these are the M55 in the north, and the Blackpool to Preston railway line and A583/A5085 Blackpool Road in the south. Electricity pylons are a prominent feature as they stride north to south across the landscape. The area has a comprehensive network of public rights of way.</p>	<p>This type of pattern is common but important at a local scale.</p>	<p>This pattern is regionally and locally common.</p>	<p>The pattern has high local importance due to the relative proximity to the conurbation and pressure from the road network.</p>	<p>Agricultural field pattern is substitutable</p>	<p>Slight Adverse</p> <p>The new road across open countryside would further complicate the pattern and break up its continuity over the length of the study area. Man-made earthworks at the viaduct crossings would be noticeable in the landscape, and lighting would have an urbanising effect on the open countryside along the PWD section of the route. However, the pattern is already disrupted by roads, residential development and urban fringe elements. Mitigation vegetation would help to blend earthworks into the landscape and replace vegetation lost as part of the scheme.</p>

	Step 2	Step 3				Step 4
Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Tranquillity	The area is located to the north and to the west of Preston's urban edge adjacent to the M55 corridor to the north and the A582/A5085 Blackpool road to the south. Both routes run in an east west direction and are notable for moderate to low levels of tranquillity. Preston's urban edge has low levels of tranquillity. In contrast, public rights of way, local roads and rural areas outside the transport/residential corridor have a greater degree of tranquillity.	Tranquillity matters at a national, regional and local level.	Tranquillity is influenced locally and regionally by local conurbations and transport infrastructure making it relatively scarce.	Where pockets of tranquillity exist they will be important as tranquillity is becoming a rare and dwindling resource.	Non Substitutable	Moderate Adverse The proposed scheme, (PWD) is in the rural landscape and adjacent to the urban edge, which would cause a further depletion in the level of tranquillity.
Cultural	A number of hedgerows associated with the farmland are classed as 'Important' under the Hedgerow Regulations due to their cultural and ecological importance. Although Bartle Hall is not a nationally Registered Historic Park and Garden, the former villa's designed grounds and parkland are of regional historic importance. The parkland landscape associated with the hall is a prominent feature within the local landscape. The expanse of open rolling grassland with mature individual trees spaced out within it creates a typical parkland setting for Bartle Hall. The parkland landscape is enhanced by its association with, and being contained in part by, adjacent woodland blocks along Bartle Lane and those enclosing Bartle Hall.	This feature matters at a regional and local level.	Regionally and locally common.	High national, regional and locally important - Important Hedgerows. Regionally and locally important - Bartle Hall.	Non replicable due to the established nature and cultural significance established over long periods.	Slight Adverse The road scheme would result in the loss of veteran and protected trees adjacent to the Hall and some of the characteristic mature individual trees in a meadow setting would be lost. Mitigation planting would replace and enhance the vegetation lost. Important Hedgerows would be translocated where possible.

Landcover	<p>Predominantly arable and agricultural pastoral fields with frequent interspersed ponds. Clipped native hedgerows, some 'Important' and some with hedgerow trees are a prominent feature along roads and field boundaries. Woodlands are infrequent and are found along watercourses such as Woodplumpton Brook, along major highway routes and enclosing country estates such as Bartle Hall and Clifton Hall. Small woodland blocks are associated with settlements off local roads, as well as sports facilities and enclosing the large industrial complex at Lea Town. Individual trees are a feature of the landscape filtering views, often associated with hedgerows enclosing smaller scale spaces. Veteran trees within a parkland setting are located to the west of Bartle Hall and along Bartle Lane including a group covered by a Tree Preservation Order.</p>	<p>This type of land cover matters at a local level</p>	<p>Nationally, regionally and locally common.</p>	<p>Low importance nationally and regionally and high importance locally. Important Hedgerows have a high importance nationally, regionally and locally.</p>	<p>Substitutable - agricultural land Non substitutable - woodland blocks, Important hedgerows</p>	<p>Slight Adverse</p> <p>The scheme impacts on limited sections of the land cover resource. There would be the loss of some field boundaries (some Important) and agricultural land. Mitigation planting would help restore vegetation lost as part of the scheme and help establish green infrastructure along the road.</p>
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Features	Description	Scale it matters	Rarity	Importance	Substitutability	Impact
Summary of character	A regionally and locally common rural landscape influenced by modern infrastructure, new housing development and Preston's north and west urban edge. Flat to gently undulating farmland with a medium to large regular shaped pastoral fields with some arable juxtaposed with smaller more irregular shaped fields. Strong hedgerows (some 'important') and hedgerow trees enclose fields. Numerous field ponds occasionally linked by hedgerows. Small deciduous woodland blocks occur adjacent to watercourses, major highways routes and country estates. Urban elements such as pony paddocks, recreation areas, golf courses, industrial complex, quarry and electricity pylons are dispersed within the rural landscape to the north of west of Preston's urban edge.	The character matters at a regional level and at a local level because it contrasts with the urban nature of the road networks and the influence of Preston.	Nationally, regionally and locally common.	Low national and medium regional importance. This character is important to local people.	The substitutability of the character is possible for some features (field boundaries) but will be irreplaceable for others (landform and land cover).	<p>Slight Adverse</p> <p>The proposed scheme would be an uncharacteristic feature installed through the currently agricultural and residential area (new housing development north of Cottam) but it would not be an incongruous feature in the wider setting which has been influenced by a significant road network and Preston's urban edge. Mitigation planting would replace and enhance vegetation lost. Planting would also help to integrate viaduct crossing embankments and recreate vegetated field boundaries. However traffic on the new road would continue to reduce tranquillity, especially along the PWD section of the route.</p>

Reference Sources

Guidelines for Landscape and Visual Impact Assessment (GLVIA); 3rd Edition - 2013;
National Planning Policy Framework (NPPF) Chapter 7: Requiring Good Design, Chapter 8: Promoting Healthy Communities, Chapter 11: Conserving and Enhancing the Natural Environment;
Central Lancashire Core Strategy (2012) ;
North West Preston Masterplan;
Preston Local Plan 2012-2026;
Fylde Borough Local Plan (October 2005)
Natural England Landscape Character Assessment: Volume 2 North West;
A Landscape Strategy for Lancashire Landscape Character Assessment - Lancaster County Council, 2000;
Campaign to protect Rural England Information Relating to Tranquillity;
East West Link BS 5837:2012 Tree Development Report Revision 3, and the Preston Western Distributor BS5837:2012 Tree Development Report Revision 3;

Step 5 - Summary Assessment Score

Slight Adverse

Qualitative Comments

The scheme would adversely affect the landscape and result in a loss of vegetation, topographical changes, a reduction in tranquillity and visual amenity, and the interruption of field pattern. Mitigation vegetation would serve to help integrate the road into the surrounding landscape, enhance and link vegetation and restore lost field boundaries, but adverse impacts would remain.

TAG Townscape Impacts Worksheet - PWD / EWLR

	Step 2	Step 3					Step 4
Features	Description	Scale it matters	Rarity	Importance	Substitutability	Changes in Without-scheme case	Impact
Layout	An area of flat to slightly undulating (up to 21m AOD) suburban development located to the north and west of Preston including the suburbs of Lea, Tanterton and Nog Tow. A mix of housing estates predominantly with a cul-de-sac layout linked together by well vegetated main spine roads. Each estate has local amenities such as churches, public houses, schools and shops. Some older more linear development along Hoyles Lane and Lightfoot Lane.	This layout matters at a local level.	This layout is not rare.	This layout is important locally.	Substitution is not practical.	Housing development is proposed within farmland to the north and west of Preston (outside the townscape area).	NEUTRAL The road layout would not alter the townscape layout.
Density and mix	A medium density due to mix of modern, 1970s and 1980s detached and semi-detached housing estates with small to medium sized housing and some localised areas of open space. Some larger units for schools, shops and amenity buildings are located within central areas of the estates.	This density matters at a local level.	This type of layout is not rare nationally, regionally and locally.	The density and mix is important at a regional and local level	Substitution is not practical.	As above.	NEUTRAL The scheme proposals would not directly affect the density. Effects to viability and vitality of mix would not be affected.
Scale	Predominantly small to medium sized residential buildings with some larger scale buildings where local amenities and schools are present.	This scale matters at a local and regional level.	This type of scale is not rare nationally, regionally and locally.	This scale is important at a regional and local level.	Substitution is not desirable	As above.	NEUTRAL The scheme proposals would not directly affect the scale.

Appearance	A mix of modern, 1970s and 1980s detached and semi-detached houses and bungalows with well maintained gardens and boundaries. Each estate has local amenities such as churches, shops, public houses and schools; and areas of public open space. Arterial roads are lined with hedgerows or native trees.	This appearance matters at a local level.	The appearance is not rare.	The appearance is important at a regional and local level.	Substitution is not desirable	As above.	NEUTRAL - The scheme proposals would not directly affect appearance.
Human interaction	Human interaction takes place via shops, public houses, churches and petrol stations located within the housing development areas.	Human interaction matters at a regional and local level.	This type of human interaction is not rare locally, regionally or nationally. .	The level of interaction is important at a local level.	Substitution is not desirable	As above.	NEUTRAL The scheme proposals would not directly affect existing human interaction.
Cultural	Modern, 1970s and 1980s detached and semi-detached housing estates linked by well vegetated spine roads. Some older development, and listed buildings exist along the edge of these developments.	The cultural effects matter at a local level.	The cultural reference is not rare locally, regionally or nationally.	Important at a local level.	Substitution would be economically unviable.	As above	NEUTRAL There is unlikely to be a change to either historical or contemporary cultural features of the urban area.
Land use	Townscape is dominated by residential properties. There are a number of commercial properties including petrol stations, public houses, schools and local shops.	Land use matters at a local level.	This combination of land use is not rare within the urban context.	Important at a local level.	Substitution is not desirable	As above	NEUTRAL The scheme would tie into Lightfoot Lane and the Cottam Link Road. The townscape will remain unaltered.

Summary of character	An area of flat to slightly undulating (up to 21m AOD) suburban development located to the north and west of Preston including the suburbs of Lea, Tanterton and Nog Tow. A mix of modern, 1970s and 1980s detached and semi-detached housing estates predominantly with a cul-de-sac layout linked together by well vegetated main spine roads. Each estate has local amenities such as churches, public houses, golf courses, recreation areas, schools and shops. Some older more linear development with a mix of housing styles along Hoyles Lane and Lightfoot Lane. Residential properties have well maintained gardens, and spine roads planted with native hedgerows or trees.	This built character matters principally at a local level but it not necessarily desirable.	This character is not rare locally, regionally or nationally.	Important at a local level.	Substitution is not desirable	As above	NEUTRAL The proposed scheme would not have an affect on the townscape character. The scheme tie in at Lightfoot lane and the Cottam Link Road would not affect the local townscape character once the mitigation vegetation has established.
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Reference Sources

Guidelines for Landscape and Visual Impact Assessment (GLVIA); 3rd Edition - 2013;
National Planning Policy Framework (NPPF); Chapter 7: Requiring Good Design, Chapter 8: Promoting Healthy Communities, Chapter 11: Conserving and Enhancing the Natural Environment;
Central Lancashire Core Strategy (2012);
North West Preston Masterplan; Preston Local Plan 2012-2026;
Fylde Borough Local Plan (October 2005);
Natural England Landscape Character Assessment: Volume 2 North West;
A Landscape Strategy for Lancashire Landscape Character Assessment - Lancaster County Council, 2000;
Campaign to protect Rural England Information Relating to Tranquillity;
East West Link BS 5837:2012 Tree Development Report Revision 3, and the Preston Western Distributor BS5837:2012 Tree Development Report Revision 3;

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The Preferred Route runs through a landscape area, therefore, there would be no change to the townscape.

TAG Historic Environment Impacts Worksheet

Feature	Step 2		Step 3		Step 4
	Description	Scale it matters	Significance	Rarity	Impact
Form	A series of known heritage assets are affected by the proposed route, ranging from the line of a Roman road and the supposed site of a deserted medieval village and other features associated with medieval rural settlement and farming, to a landscaped park, probably of later 19th century origin and a spoil bank produced during the construction of the adjacent M55. A series of sites of buildings where no standing remains now exist are also impacted, where most of these structures have been identified on mid 19th century mapping but some also known to have been extant in 1786. A significant number of hollows and ponds, almost all of which probably originated as marl pits, are also known. 45 historic buildings have been identified that could be affected by the proposed route, where one of these is the Listed Grade I farmhouse at Old Lea Hall along with two further Grade II farm buildings. A further Grade II Listed house and two canal bridges of the same grade are the only other designated heritage assets affected. The majority of the remaining buildings are small farmsteads of the 18th-19th century (a limited number of whose sites may have significantly earlier origins), with a small number of canal-related structures, a pre-1838 free school, the base of a wayside cross and a railway milepost. Seven historic landscape types (HLTs) were identified in the road area, with the three rural enclosure types of Ancient, Post Medieval and Modern date ranges contrasting with suburban Modern Settlement and Modern Recreation (a golf course). A single example of an Ancient and Post medieval Settlement area and an Ancient and Post Medieval Ornamental type are also present, but it is probable that the latter (the landscape park above) is mis-classified.	Local to Regional	No sites of national importance are directly impacted by the proposals. Of the Listed Buildings in the vicinity of the route, the settings of three Grade II buildings are slightly affected but the Grade I building is not significantly impacted. The undesignated heritage assets are of county to local significance.	None of the identified assets impacted are rare at a regional or county level. Marl pits are locally very common.	Seven archaeological sites are removed or badly impacted by the proposals, with six further sites suffering to a moderate degree. Most of the remainder are not significantly affected. There is a major impact on the Lancaster Canal which is crossed by the new road, but only four other buildings have as much as a moderate impact with the majority of sites having experiencing negligible impacts. There is a major impact on one HLT, but other types are not significantly affected.
Survival	Archaeological remains of any significance are generally preserved as very low earthworks or buried remains. Survival of the buried remains will have been affected by ploughing, but modern pastoral or meadow uses will have avoided deep modern plough damage. The line of the Roman road has probably been badly damaged by the subsequent excavation of the Lancaster Canal in the immediate vicinity of the proposed route. There is reasonable to good survival of historic buildings, although a number have been heavily modernised. The seven HLTs are in moderate to good condition.	Local to Regional	No sites of national importance are directly impacted by the proposals. Of the Listed Buildings in the vicinity of the route, the settings of three Grade II buildings are slightly affected but the Grade I building is not significantly impacted. The undesignated heritage assets are of county to local significance.	None of the identified assets impacted are rare at a regional or county level. Marl pits are locally very common.	Removal of archaeological remains subject to major impact will be mitigated by phased schemes of investigation and recording, leading to a minor residual impact. Some earthwork recording is also proposed to mitigate impact. The survival of the built heritage is not significantly affected by the proposed road, although some screening to reduce impact on the settings of a minority of sites is recommended. No real mitigation of the impact of the scheme on the Ancient and Post medieval Ornamental HLT is possible, but as noted above this HLT may have been mis-classified, the site being of later 19th and not earlier, origin.
Condition	Unknown condition of the buried archaeological sites, with potential for erosion from ploughing/reseeding activities, which also threaten the earthwork sites (although the former marl pits are generally very robust). Historic buildings are generally in use and in a stable condition. HLTs are at a minor risk of alteration, mainly from changing to 'horsiculture' activities	Local to Regional	No sites of national importance are directly impacted by the proposals. Of the Listed Buildings in the vicinity of the route, the settings of three Grade II buildings are slightly affected but the Grade I building is not significantly impacted. The undesignated heritage assets are of county to local significance.	None of the identified assets impacted are rare at a regional or county level. Marl pits are locally very common.	Removal of archaeological remains subject to major impact will be mitigated by phased schemes of investigation and recording, leading to a minor residual impact. Some earthwork recording is also proposed to mitigate impact. The survival of the built heritage is not significantly affected by the proposed road, although some screening to reduce impact on the settings of a minority of sites is recommended. No real mitigation of the impact of the scheme on the Ancient and Post medieval Ornamental HLT is possible, but as noted above this HLT may have been mis-classified, the site being of later 19th and not earlier, origin.
Complexity	Most sites have a limited range of features and associations, with only the possible medieval features around Higher Bartle being of more than limited to moderate extent. Historic buildings range from single structures to medium-sized farmsteads, although both the canal and railway form linear corridors across the affected area. HLTs show evidence of progression from medieval to modern landscape types.	Local to Regional	Limited complexity means that significance is also limited. Farmsteads set within their agricultural fields are regionally common but becoming locally rare, and thus of somewhat higher significance. Truncation of HLTs by a new road will decrease their connectivity and thus their significance	The archaeological remains are not particularly complex or rare. Farmsteads set within their agricultural fields are regionally common but becoming locally rare, and thus of somewhat higher significance. Truncation of HLTs by a new road will decrease their connectivity and thus surviving examples will become more rare.	Seven archaeological sites are removed or badly impacted by the proposals, with six further sites suffering to a moderate degree. Most of the remainder are not significantly affected, and overall there would be a slight adverse effect on complexity. There is a major impact on the Lancaster Canal which is crossed by the new road, but only four other buildings have as much as a moderate impact with the majority of sites experiencing negligible impacts on complexity. There is a major impact on one HLT, but other types are not significantly affected, and overall there would be a slight adverse effect on complexity.
Context	Field systems retain evidence of medieval agricultural activities within a landscape which is predominantly later, with a number of significant modern elements and intrusions. Historic buildings generally relate to later post medieval agricultural activities or transport, both of which became particularly important during the industrialisation of Lancashire.	Local to Regional	The known assets are generally well bedded into and thus understandable in their present context, contributing to their significance.	The archaeological remains are not particularly complex or rare. Farmsteads set within their agricultural fields are regionally common but becoming locally rare, and thus of somewhat higher significance. Truncation of HLTs by a new road will decrease their connectivity and thus surviving examples will become more rare.	The construction may also remove archaeological remains associated with the Roman Road. Moderate impacts on the setting of designated and undesignated historic buildings due to the introduction of a new road into their rural setting. Construction will sever minor elements of the HLT leading to a minor impact. Impacts during construction will be mitigated by archaeological investigation and earthwork survey, historic building recording and photographic recording, and mapping of historic landscape elements. Impacts during operation on setting of heritage assets will be mitigated through the use of landscape planting.
Period	With the single exception of the line of the Roman road, the earliest known features are of medieval date, with the majority of the remainder being in the later post medieval period. Potential for earlier remains is thought to be limited.	Local to Regional	The limited range of dates do not raise the significance of the majority of the known sites beyond county level, although the Grade I medieval building at Old Lea Hall is of national importance.	The majority of the sites are common	Impacts are spread across Roman, medieval, post-medieval and modern time periods.

Reference Sources

Preston Western Distributor and East West Link Roads, Heritage technical report (Iles, 2016); Preston Western Distributor and East West Link Roads, Environmental Statement (Iles, 2016).

Step 5 - Summary Assessment Score

Slight adverse

Qualitative Comments

A total of 110 heritage assets have been identified, of which only 56 appear to be impacted by the scheme. After mitigation, residual impact is assessed as moderate adverse on two assets and slight adverse for seven assets, with the remainder being neutral. The potential for as-yet unknown archaeological remains is considered to be low.

Preston Western Distributor (PWD) – Proposed route

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
Statutory designated sites (within 500m of the route)							
No statutory designated sites exist within 500m of the proposed route	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Non-Statutory designated sites or Biological Heritage Sites (BHS) (within 500m of the route)							
BHS	Bartle Wetland- 4.18 ha. An area of wetland composed of interlinked ponds surrounded by tall marginal vegetation, swamp and marshy grassland. Supports a variety of wildlife.	County	Medium: Comprises a mosaic of habitats offering opportunities for a variety of wildlife.	Based on information available it is assumed that the site is in favourable condition.	Medium: Designated site of county importance with locally important wetland and associated habitats.	Neutral	Neutral
BHS	Lancaster Canal – 179.52ha in total, of which 3.8ha is within 500m of the scheme and is crossed by the proposed route at one point. Supports a rich assemblage of aquatic plants and animals along its entire length Supports a variety of wildlife.	County	Medium: An important habitat corridor supporting a rich assemblage of flora and fauna.	Favourable condition given the species composition	Medium: Designated site of county importance. A locally important site and although man-made it is a well-established feature.	Neutral	Neutral
BHS	Lea Marsh – 30.41ha. Saltmarsh subject to infrequent inundation. Mosaic of common saltmarsh-grass and saltmarsh rush.	County	Medium: A locally important site comprising locally rare botanical	Based on information available it is assumed that	Medium: Designated site of county importance. A locally important site comprising a mosaic of	Neutral	Neutral

¹ Impact magnitude assessed with mitigation and compensation at 15 years operation

² Significance of residual impact with mitigation and compensation assumed at 15 years operation

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
	Supports a variety of wildlife.		species.	the site is in favourable condition.	habitats which is uncommon in Lancashire.		
BHS	Mason's Wood – 2.46ha. Band of semi-natural broadleaved woodland which adjoins Lea Marsh. Supports a variety of wildlife.	County	Medium: Woodland habitat which compliments the habitats associated with Lea Marsh (above).	Woodland is a declining resource locally and nationally. The silting up of ponds suggests the site is an unfavourable condition.	Medium: Designated site of county importance. Woodland is an important habitat in Lancashire.	Neutral	Neutral
BHS	Savick Bridge – 2.5ha. A short tidal section of Savick Brook with associated swamp, tall herb, scrub and deciduous woodland communities. A nationally scarce plant, the long-stalked orache has been recorded. Supports a variety of wildlife.	County	Medium: A locally important habitat corridor supporting a mosaic of habitats.	Frequent stands of the invasive Himalayan balsam pose a threat to the native vegetation.	Medium: Designated site of county importance. Woodland and wetland habitats are important habitats in Lancashire.	Neutral	Neutral
Notable Habitats							
Broad-leaved semi-natural woodland	There were several areas of small to mid-sized broad-leaved woodland across the study area which was predominantly natural regeneration secondary woodland. The woodlands generally consisted of mature trees with varying presence of shrub species in the understorey and a ground layer of woodland flora. Two small areas received further survey as part of PWD (NVC Area I	District	Medium: Lancashire is a sparsely wooded county.	Declining resource at county and national level	Medium: Low abundance within the county and mature woodland is difficult to substitute. Two small areas of broad-leaved semi-natural woodland (I and F) qualify as Habitats of Principal Importance (NERC Act, 2006) and LBAP habitats.	Neutral	Neutral

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
	at Ashton and Lea Golf Course and NVC Area F around Clock House Farm), NVC communities W6 <i>Alnus glutinosa</i> - <i>Urtica dioica</i> and W8 <i>Fraxinus excelsior</i> - <i>Acer campestre</i> - <i>Mercurialis perennis</i> woodland respectively.						
Broad-leaved plantation woodland	This includes all planted woodland of any age. Areas of mature plantation woodland including native and non-native trees occur within/immediately adjacent to the scheme footprint But were infrequent across the study area and limited in extent.	Local	Medium: Mature broad-leaved plantation woodland is a rare habitat type within the study area and within the wider Coastal Plain character area (1.4% cover in 2006)	Broad-leaved woodland is a declining resource at county and national level	Low: Low abundance in the study area and the wider area however this habitat type can be replicated fairly easily in the medium term. These areas did not qualify under Local Wildlife Site selection criteria, as Lancashire BAP habitat or as Habitat of Principal Importance (NERC Act, 2006).	Neutral	Neutral
Scattered broad-leaved trees	Mature standard trees were scattered in distribution throughout the study area. Stand-alone trees were rare and limited in number, more often they were found within hedgerows, along field margins and the banks of watercourses/ponds.	Local	Low: They vary in inherent value according to location, maturity and species. Provide value as a stepping stone habitat.	Likely to be declining at county and national levels.	Low Did not qualify under Local Wildlife Site selection criteria, as Lancashire BAP habitat or as Habitat of Principal Importance (NERC Act, 2006). Good potential for substitution.	Neutral	Neutral
Veteran trees	Eight veteran trees would be lost to the scheme. These are over-mature trees which exhibit several veteran tree characteristics. Seven of these trees just achieve qualification as veteran trees due to their diameter. One tree can be classified as ancient.	Regional	Medium: Veteran trees are historic and important ecological features. They are irreplaceable.	Declining resource at both county and national levels.	Medium: Veteran trees are important ecological features which are irreplaceable.	Major negative	Moderate Adverse

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
Species rich hedgerows	Species rich hedgerows which are crossed by the footprint. These have at least four woody hedgerow species.	District	Medium: Well established features which provide connectivity. Many hedgerows contain mature trees.	Declining resource at both county and national levels.	Medium: Provides connectivity a good wildlife resource. Connectivity can be replaced. Habitat of Principal Importance (NERC Act 2006). Some of these hedgerows to be impacted qualify as 'Important' under the Hedgerows Regulations (1997)	Neutral	Neutral
Species-poor hedgerows.	Intact or defunct species-poor hedgerows that are crossed by the footprint. These have less than four woody hedgerow species.	Local	Low: However, they provide good links / wildlife stepping stones across the landscape.	Declining resource at both county and national levels	Low: Provides connectivity. Can be readily replaced. Habitat of Principal Importance (NERC Act 2006). Some of these hedgerows to be impacted qualify as 'Important' under the Hedgerows Regulations (1997)	Neutral	Neutral
Semi-improved neutral grassland	Majority of this habitat was relatively species poor, although a few areas of species rich grassland were present.	Local	Low. The majority of this habitat type is species poor and is a common habitat type.	Stable - common widespread habitat	Low: Widespread and common habitat which can be replaced with correct mitigation/compensation and management.	Neutral	Neutral

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
					No semi-improved neutral grassland within the scheme footprint qualifies as a Habitat of Principal Importance (NERC Act, 2006) or as a Lancashire LBAP Habitat.		
Swamp, Marginal and Inundation	Swamp habitat frequent to the north of PWD around Bartle Wetland BHS and also in the south near Savick Brook. Only a small area of swamp habitat would be impacted by the scheme.	Local	Low: Generally species poor with only a few representative species recorded	Common -Stable and widespread habitat	Low: Only small areas occur within the scheme footprint. Widespread and common habitat which can be replaced with correct mitigation/compensation and management. This habitat type does not qualify as a Habitat of Principal Importance (NERC Act, 2006) or as a Lancashire LBAP Habitat.	Neutral	Neutral
Open standing water: ponds	A total of 106 ponds were identified across the study area. In general, the majority of ponds were similar in nature and relatively small with late successional features situated amongst improved grassland and/or pasture with little shading by overhanging trees and emergent macrophytes. Ten ponds received more detailed survey due to the likelihood of significant scheme impacts.	Local	Low: Only a small number of ponds within the scheme footprint which contribute to a large network of ponds in the wider area.	Declining resource at both county and national levels.	Low: Can be readily replaced within the immediate environment. Seven ponds are Habitats of Principal Importance (NERC Act, 2006) due to the presence of two faunal species of principal importance: Great crested newt (<i>Triturus cristatus</i>) and common toad (<i>Bufo bufo</i>).	Neutral	Neutral
Open Standing Water: Lancaster Canal	The canal is considered to be of Regional value, due to its designation as a Biological Heritage Site and its role in supporting aquatic and terrestrial wildlife in Lancashire,	Regional	Medium. A well-established habitat corridor providing good connectivity.	Favourable condition given the healthy fish and eel population.	Medium: A valuable habitat corridor connecting the wider landscape.	Neutral	Neutral

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
	including protected otter and European eel.				This habitat type does not qualify as a Local BAP habitat or a habitat of principal importance.		
Open Standing Water: Savick Brook	Savick Brook- a watercourse heavily modified and maintained for navigation. Healthy coarse fish and European eel populations present. Savick Brook does not qualify as a Local BAP habitat or a NERC 2006 habitat of principal importance.	Regional	Medium. A well-established habitat corridor providing good connectivity.	Favourable condition given the healthy fish and eel population.	Medium: A valuable habitat corridor connecting the wider landscape. Savick Brook does not qualify as a Habitat of Principal Importance (NERC Act, 2006) or as a Lancashire LBAP Habitat.	Neutral	Neutral
Other habitats	Other habitats present within or immediately adjacent to the scheme footprint which have been assessed as being of below Local importance for biodiversity include; small watercourses, improved grassland, amenity grassland, marshy grassland, arable, scrub, coniferous woodland, railway verges and tall ruderal habitats.	Negligible – below local.	Negligible	Common and widespread	Negligible	Neutral	Neutral
Protected and/or notable species (within 500m of the scheme)							
Riverine Invertebrates	Five species of conservation interest were identified in ponds and watercourses from macroinvertebrate surveys on PWD All are relatively common to those habitat types in which they were identified.	Local	Low	Stable	Low None of the species identified are listed under current legislation and are not Species of Principal Importance (NERC Act, 2006), or	Neutral	Neutral

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
					listed in the Lancashire LBAP or other lists of conservation concern.		
Riverine fish (excluding European eel)	The fish assemblage of Savick Brook and the Lancaster Canal are typical of low lying canalised stretches of river.	Local	Low	Stable	Low None of the fish species identified are listed under current legislation and are not Species of Principal Importance (NERC Act, 2006), or listed in the Lancashire LBAP or other lists of conservation concern.	Neutral	Neutral
European eel (<i>Anguilla anguilla</i>)	Found on Savick Brook and Lancaster Canal. Small size of individual eels (<10mm) found indicates that Savick Brook is acting as a nursery area.	Regional	Medium: Common but has suffered significant decline over the last 50+ years. Protected by national legislation.	Definite evidence of species decline in the UK although little evidence exists of a reduction in geographical range.	Medium A Species of Principal Importance (NERC Act, 2006) A legally protected species under the Eel (England and Wales) Regulations 2009.	Neutral	Neutral
Great crested newt (GCN) (<i>Triturus cristatus</i>)	Terrestrial and aquatic habitat confirmed to be used by GCN is present. Eight ponds (six likely meta-populations) within the study area support GCN, with three of these confirmed as breeding ponds comprising one medium and five small populations).	District	High – This species is protected at the European level. Relatively common in UK but rare in Europe.	A large number of GCN populations occur in the county due to the high pond density. The North-West of England is a stronghold for this species in Britain. However the number of ponds in Lancashire and	Medium A Species of Principal Importance (NERC Act, 2006) and listed on the Lancashire BAP. A legally protected species under the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended).	Neutral	Neutral

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
				England is gradually decreasing.			
Common toad (<i>Bufo bufo</i>)	A "good" population of toads (i.e. 100-1000 toads) was recorded in the study area.	Local	Low	Declining at a national level, particularly in the south of England.	Low Species of Principal Importance (NERC Act, 2006)	Neutral	Neutral
Reptiles	A small slow worm population found on habitat adjacent to the railway line.	Local	Medium Slow-worm is protected by national legislation.	Declining at national level	Low Species of Principal Importance (NERC Act, 2006) and listed on the Lancashire LBAP A legally protected species under the Wildlife and Countryside Act 1981 (as amended).	Neutral	Neutral
Breeding Birds	A total of 70 breeding bird species were recorded within the study area comprising: three Schedule 1 species (Wildlife and Countryside Act, 1981 (as amended)); 11 species of principal importance (NERC, 2006); four Lancashire Biodiversity Action Plan species; 11 species on the Red List of Birds of Conservation Concern (BoCC 4: 2015); and 21 species on the Amber List of the Birds of Conservation Concern (BoCC 4: 2015). In addition, a number of qualifying bird species for statutory designated sites located approximately 2.6km away were recorded including: one qualifying species for the Ribble and	Local	Low - Medium Breeding birds are protected by national legislation	Some species are increasing or stable while other species including many farmland birds are declining.	Low Some birds are Species of Principal Importance (NERC Act, 2006), and/or listed on the Lancashire LBAP. Several recorded bird species are listed as birds of conservation concern by the RSPB. Some species qualify for inclusion statutory designated sites All wild birds are protected whilst nesting Wildlife and Countryside Act (as amended) 1981	Neutral	Neutral

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
	<p>Alt Estuaries Special Protection Area (SPA); one qualifying species for the Ribble and Alt estuaries Ramsar site; and four breeding species associated with the Ribble estuary Site of Special Scientific Interest (SSSI).</p>						
<p>Wintering Birds</p>	<p>A total of 70 wintering bird species were recorded within the study area comprising: 12 species of principal importance (NERC, 2006); eight Lancashire Biodiversity Action Plan species; 16 species on the Red List of Birds of Conservation Concern 4: 2015; and 17 species on the Amber List of the Birds of Conservation Concern 4: 2015.</p> <p>In addition, a number of qualifying bird species for statutory designated sites located approximately 2.6km away were recorded including: three qualifying species for the Ribble and Alt Estuaries SPA; three qualifying species for the Ribble and Alt estuaries Ramsar; six qualifying species for the Ribble Estuary SSSI;</p>	<p>Local</p>	<p>Low-Medium</p>	<p>Some species are increasing or stable while other species including many farmland birds are declining.</p>	<p>Low</p> <p>Some birds are Species of Principal Importance (NERC Act, 2006), and/or listed on the Lancashire LBAP. Several recorded bird species are listed as birds of conservation concern.</p>	<p>Neutral</p>	<p>Neutral</p>
<p>Barn owl (<i>Tyto alba</i>)</p>	<p>Evidence of barn owls was identified within a total of nine buildings and one tree within the study area. This included four likely breeding sites.</p>	<p>District</p>	<p>Medium</p> <p>Barn owls are protected by national legislation.</p>	<p>Has suffered significant declines at a national and European level in the 20th Century and although numbers appear to be increasing populations have not fully recovered.</p>	<p>Medium</p> <p>A legally protected species under Schedule 1 of the Wildlife and Countryside Act (as amended) 1981.</p>	<p>Neutral</p>	<p>Neutral</p>

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
Bats	At least five species of bat known to be active within the study area comprising common pipistrelle (<i>Pipistrellus pipistrellus</i>), soprano pipistrelle (<i>Pipistrellus pygmaeus</i>), noctule (<i>Nyctalus noctula</i>), brown long-eared bat (<i>Plecotus auritus</i>) and <i>Myotis</i> sp. In total 21 bat roosts identified including three common pipistrelle and one brown long-eared maternity roosts.	District	High Bats are protected at the European level.	Declining: Decrease of 25 – 49% in numbers / range in last 25 years.	Medium Bats are active throughout the study area. Includes Species of Principal Importance (NERC Act, 2006) and species listed in the Lancashire LBAP. All bats are legally protected under the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended).	Neutral	Neutral
Water vole (<i>Arvicola amphibius</i>)	No desk study records within 2km of the scheme and surveys concluded that this species is absent from the study area	N/A	N/A	N/A	N/A	N/A	N/A
Otter (<i>Lutra lutra</i>)	Evidence of otter recorded along Savick Brook, likely also use connected watercourses (including Lancaster Canal)	Local	High Otter is protected at the European level.	Otter suffered significant declines in the 20 th century but populations have been recovering in England since 1978.	Medium Species of Principal Importance (NERC Act, 2006) and species listed in the Lancashire LBAP. A legally protected species under the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended).	Neutral	Neutral

Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact ¹	Assessment Score ²
Badger (<i>Meles meles</i>)	No desk study records or field evidence recorded within the study area.	N/A	N/A	N/A	N/A	N/A	N/A
Brown hare (<i>Lepus europaeus</i>)	Brown hare are widespread across the study area.	Local	Low	Widespread but declining in the North-West of England.	Low Species of Principal Importance (NERC Act, 2006) and species listed in the Lancashire LBAP	Neutral	Neutral
Hedgehog (<i>Erinaceus europaeus</i>)	Occur in a variety of habitats widespread across the study area.	Local	Low	Declining at the national level.	Low Species of Principal Importance (NERC Act, 2006)	Neutral	Neutral

Reference Sources: Preston Western Distributor (PWD) and East West Link Road (EWLR) Environmental Statement (Lancashire County Council, May 2016). Specialist technical reports can be found in Environmental Statement Appendices 6.1 – 6.34; Lancashire Biodiversity Action Plan; Lancashire Environmental Records Network (LERN); the Multi-Agency Geographic Information for the Countryside (MAGIC) website.

Summary Assessment Score:

With implementation of the proposed scheme design, including any prescribed mitigation and/or compensation measures and sensitive construction practices, the impacts on the majority of identified biodiversity features at 15 years operation are assessed as **Neutral**. i.e. no additional significant residual effects are predicted after 15 years.

However, major negative impacts are anticipated at 15 years operation for one biodiversity feature of medium biodiversity and earth heritage value: veteran trees (eight) which are important ecological features and irreplaceable habitat. Due to the timescale needed for trees to establish veteran status, new planting cannot adequately compensate for the loss of these trees. This would represent an overall assessment score of **Moderate Adverse impact**.

Qualitative Comments:

Although significant impacts at 15 years of operation are only predicted for veteran trees, significant impacts are anticipated for the following features for the year of scheme opening: Bartle Wetland Biological Heritage Site (BHS); broad-leaved plantation woodland, broad-leaved semi-natural woodland, scattered broad-leaved trees; veteran trees; species-rich and species-poor hedgerows; breeding birds, wintering birds, barn owl and bats. This would represent an overall Slight to Moderate Adverse impact in the short term. Once habitat creation measures have become established and protected/notable species have become habituated to the scheme, no residual effects on these features are predicted after 15 years (with the exception of veteran trees as described above).

Construction of the proposed route would directly affect one non-statutory designated site for nature conservation: Bartle Wetland BHS. Construction is anticipated to lead to a loss of 6,110m² of poor semi-improved grassland and 188m of native species rich hedgerow. Pond, swamp and fen habitats for which the BHS is designated within Bartle Wetland BHS would not be affected. The scheme is not predicted to have any significant effects on the BHS after 15 years.

TAG Water Environment Impacts Worksheet

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study area: 1km from the PWD scheme extent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Potential Impacts (without mitigation): Deterioration of surface water quality from runoff from the construction area; carriageway during the operation phase; and accidental spillage. Restriction in flow conveyance through installation of culverts and watercourse diversions.	Savick Brook, Woodplumpton Brook and their tributaries	Water quality / supply	Overall WFD classification and physico-chemical quality of 'Moderate' . No water abstractions are recorded.	Local	Low	Not substitutable	Low	Slight Adverse	Insignificant
		Conveyance of flow and materials; Increased peak runoff	Savick Brook and Woodplumpton Brook Drain medium sized catchments. Floodplains of these watercourses and their tributaries are largely agricultural land.	Local	Low	Not substitutable	Low	Slight Adverse	Insignificant
		Transport and dilution of waste products	Likely to receive surface water runoff from existing road network and surrounding agricultural land. Capacity to dilute new, untreated discharges would be limited as WFD classification is only "moderate".	Local	Low	Not substitutable	Low	Slight Adverse	Insignificant
		Biodiversity	Water vole not recorded. Otter records found in Savick Brook but not elsewhere. A wide variety of fish have been encountered in tributaries of Savick brook including an important eel population Ecological quality not classified. 'Moderate' equivalent assumed.	Regional	Medium	Not substitutable	Medium	Slight Adverse	Insignificant
Potential Impacts (without mitigation): Complete loss of three ponds and the partial loss of one pond; Disruption to inputs of water to ponds adjacent to the scheme	Ponds and wetlands	Water quality / supply	These ponds have not been assessed by the EA as part of WFD compliance assessment. No abstractions recorded and they have limited connectivity to wider hydrological features.	Local	Low	Good potential for substitution	Low	Large Adverse	Low significance
		Biodiversity	Great crested Newt observed in some ponds	Local	Low	Good potential for substitution	Medium	Large Adverse	Significant
Potential Impacts (Without mitigation): Short term deterioration in quality as a result of runoff and accidental spillages during the construction phase of the development; No deliberate discharges or permanent outfalls will be made into the Canal	Lancaster Canal	Water quality / supply	WFD classification 'Good'. No water abstractions recorded	Local	Low	Not substitutable	Medium	Slight Adverse	Insignificant
		Conveyance of flow and materials; Increased peak runoff	Not a significant flow route or potential source of flooding	Local	Low	Not substitutable	Low	Negligible	Insignificant
		Transport and dilution of waste products	No known or proposed discharges. However, low flow will result in a limited potential to dilute pollutants	Local	Low	Not substitutable	Low	Negligible	Insignificant
Potential Impacts (without mitigation): Deterioration in quality as a result of spillages or leakages of fuel or other chemicals during Construction Phase; The creation of pathways for pollution to enter the principal aquifer through deep excavations and piling. No discharge of road drainage to the ground is proposed	Groundwater		Underlain by a principal aquifer. Scheme is within source protection zone 3 of a groundwater abstraction for public supply.	Regional	Medium	Not substitutable	Very high	Negligible	Low significance

Reference Sources

PWD EWLR Environmental Statement, Lancashire County Council, March 2016; PWD EWLR Flood risk Assessment, Jacobs, March 2016;

Summary Assessment Score

Slight Adverse

Qualitative Comments

Potential impacts are identified prior to the application of any mitigation measures. Impacts from construction runoff, routine road runoff and spillages will be mitigated through a drainage system designed to attenuate flows and treat pollutants. Culverts and watercourse diversions will be designed with sufficient capacity to convey anticipated flows and to minimise erosion. Contamination has not been encountered in areas where piling is proposed. Design and installation of piles in accordance with Environment Agency guidance would ensure that risks to groundwater receptors are negligible. The assessment of significance assumed the effective application of mitigation measures identified within the environmental statement.

TAG Physical Activity Impacts Worksheet (Basic)

	Description	Pedestrians (i)	Cyclists (ii)	Equestrians and Others (iii)
Numbers affected (a)	Guild Wheel Cycle Route 622	59	277	
	Lea Footpath 22	4		
	National Cycle Route 62	20	72	2
	Lea Footpath 7	23		
	Newton with Clifton Footpath 1	1		
	Woodplumpton Footpath 98	4		
	Northern Loop - Regional Cycle Route 90		73	
	Woodplumpton Footpath 95	5		
	Woodplumpton Footpath 69	0		
	Woodplumpton Footpath 70	5		
Change in journey time in minutes (b)	Guild Wheel Cycle Route 622	0	0	
	Lea Footpath 22	1.4		
	National Cycle Route 62	0	0	0
	Lea Footpath 7	1.2		
	Newton with Clifton Footpath 1	-1.44		
	Woodplumpton Footpath 98	0.54		
	Northern Loop - Regional Cycle Route 90		0.23	
	Woodplumpton Footpath 95	9.8		
	Woodplumpton Footpath 69	12.14		
	Woodplumpton Footpath 70	2.51		
Combined impact (c=a*b)	Guild Wheel Cycle Route 622	0	0	
	Lea Footpath 22	5.6		
	National Cycle Route 62	0	0	0
	Lea Footpath 7	27.6		

Newton with Clifton Footpath 1	-1.44		
Woodplumpton Footpath 98	2.16		
Northern Loop - Regional Cycle Route 90		16.79	
Woodplumpton Footpath 95	49		
Woodplumpton Footpath 69	0		
Woodplumpton Footpath 70	12.55		

Reference Source

- Department for Transport, Traffic Analysis Guidance (TAG), TAG Unit A4.1 Social Impact Appraisal – Physical Activity Impacts;
- Department for Transport, TAG Unit A5.1 Active Mode Appraisal;
- Design Manual for Roads and Bridges Volume 11, Section 3, Part 8 – Pedestrians, Cyclists, Equestrians and Community Effects, June 1993; and,
- PWD and EWLR Environmental Statement. LCC, May 2016

Summary Assessment Score

Overall NMUs would experience a slight beneficial impact. This will be a result of the scheme providing some new facilities and some NMUs experiencing slightly increased journey times (longer routes) when using some of the Public Rights of Way (PRoW).

Qualitative Comments

There are several Public Rights of Way (PRoW) in close proximity to the scheme along with one nationally designated cycle route, one regionally designated cycle route and an important locally designated cycle route. In addition the scheme would have junctions on an 'A' road as well as some more minor roads. PRoWs in the vicinity of the route are infrequently used, with those in the northern extent of the scheme showing the lowest numbers of pedestrians. In particular, Woodplumpton Footpath 69 is unused along the footbridge that crosses the M55. Woodplumpton Footpaths 1, 24 and 97 are all used by less than once a day in each direction. Lea Footpath 7 is the best used as a result of its proximity to Brylea Caravan Park, with over 20 people using this route in both directions on a given day. At the southern end of the scheme Lea Footpaths 20 and 21 are reasonably well used in comparison to other footpaths within the vicinity of the scheme, with 5 people using these footpaths in each direction on any given day. The people using the footpaths in the study area are predominantly travelling to / from home or making recreational journeys such as dog walking, as would be expected in a rural setting.

Preston Western Distributor (PWD) road would permanently sever a small number of PRoWs, most significantly Lea FP7 and 22, and Woodplumpton FP69, 70, 95. Severance of Woodplumpton FP69 would also impede use of Woodplumpton FP64 and FP66. . These would be retained where possible through the use of crossings or underpasses. Where this is not feasible, the PRoWs would be stopped up and diverted where necessary. The changes to the PRoWs, in terms of stopping up sections of existing routes, diverting these along new sections of footpath and footways, and provision of crossing points and an underpass, would reduce the amenity value of the affected PRoWs as the setting would change at the location where the footpath crosses the road. This may dissuade people from using these routes which would have an insignificant adverse effect on physical activity.

The proposed diversions would also increase journey lengths at the majority of the affected PRoWs. Users of Woodplumpton FP95 would experience a journey time increase of approximately 10 minutes

and along Woodplumpton F64, 66 and 69 north or south journeys across the M55 would experience an increase of 12 minutes resulting from the extinguishment of the footbridge. These increased journey times may dissuade some people from using these NMU routes, however the increased distance travelled for those who use the routes would have associated health benefits. As such the severance of footpaths in the study area would have a neutral effect.

NMU's traveling along the Millennium Link tow path/Guild Wheel and the Lancaster Canal tow path where the PWD road is proposed to intersect these existing routes would not experience any increase in journey time as the scheme would pass over each of these routes along two viaducts. Similarly pedestrians, cyclists or equestrians traveling east or west along Darkinson Lane (National Cycle Route 62) where the PWD road is proposed to intersect the existing Darkinson Lane, would not experience any increase in journey time when using the new underpass. NMUs travelling east or west along Bartle Lane (Regional Cycle Route 90 - Northern Loop), where the PWD is proposed to intersect the existing Bartle Lane, would experience a minor increase in journey time when using the new bridge over the PWD.

It is proposed that a combined cycleway footway is provided along the eastern side of the proposed scheme between the A583 and the junction with Lea Lane and the proposed EWLR which would tie into existing footpaths (Lea FP7, Newton with Clifton FP1 and Woodplumpton FP98) and cycle facilities (Guild Wheel, Northern Loop and National Cycle Route via Cottam Link Road) and facilities on the proposed EWLR.. This has the potential to greatly increase the amenity value of the study area for NMUs in the surrounding communities as it provides new facilities for their use as well as increasing accessibility of the existing facilities, thus having a beneficial impact on NMUs travelling between communities. The new facilities are likely to attract an increased number of NMUs to the area which will result in a significant beneficial impact.

TAG Journey Quality Impacts Worksheet

Factor	Sub-factor	Better	Neutral	Worse
Traveller Care	Cleanliness	✓		
	Facilities		✓	
	Information		✓	
	Environment	✓		
Travellers' Views	-	✓		
Traveller Stress	Frustration	✓		
	Fear of potential accidents	✓		
	Route uncertainty	✓		

Reference Source

- Department for Transport, Traffic Analysis Guidance (TAG), TAG Unit A4.1 Social Impact Appraisal – Journey Quality Impacts;
- Design Manual for Roads and Bridges Volume 11, Section 3, Part 9 – Vehicle Travellers, June 1993; and,
- PWD and EWLR Environmental Statement. LCC, May 2016

Summary Assessment Score

Large beneficial.

As the number of travellers affected exceeds 10,000, the impact is likely to be a large beneficial.

Qualitative Comments

Summary

As a result of the scheme, there would be a significant beneficial effect on travellers' views from the proposed distributor road due to the good quality views across the countryside along the new route, particularly across the two proposed viaducts. There would also be an improvement in traveller stress due to a reduction in driver frustration, fear of accidents and journey uncertainty as well as the improvement in NMU facilities. In addition, a beneficial impact on traveller care would be experienced through improving the environmental factors of the journey. As the number of travellers affected exceeds 10,000, the impact is likely to be a large beneficial.

Traveller Care

Road users

The scheme would reduce congestion along the existing road network in Lea, Lea Town, Cottam, Lower Bartle, Higher Bartle and Woodplumpton by providing a new distributor route between the A583 and the M55. There would be a new section of footway/cycleway along the east side of the distributor road which would tie into the existing facilities where appropriate. There would also be a section of the existing road network (Darkinson Lane, which is part of NCN route 62) that would be stopped up to through traffic and left for the use of Non-Motorised Users (NMUs). The associated reduction in traffic along this section of the existing road network would reduce the likelihood of conflict for NMUs. With less traffic there would be improved amenity value with improved views,

safety and air quality. As a result slight improvements in journey quality are expected in comparison to existing cycling and pedestrian movements on the local road network. Thus this would lead to a beneficial impact on traveller care through improving the environmental factors of the journey.

With the new distributor road passing predominantly through rural and agricultural surroundings, vehicle travellers would see an increase in cleanliness compared to the parallel urban route between Blackpool Road and the M55 along the A6.

Public Transport

The scheme includes a minor change to the routing of public transport vehicles as a result of vehicular severance on Sidgreaves Lane and Lea Road. A minor permanent diversion along the alignment of the new road would be in place and one bus stop would be relocated. Therefore, there would be a neutral impact on public transport vehicle's cleanliness, facilities, information and environment.

Overall, the impact of the scheme on traveller care would be neutral.

Travellers' Views

Views from the proposed scheme between A582 and Cottam Link Road would be predominantly open as the route is raised on embankment crossing three structures (Savick Viaduct, Darkinson Lane Underpass, and Lea Viaduct). Crossing Savick Brook Viaduct there are open views to the east and west of Savick Brook and agricultural land. Ashton and Lea Golf Course can be seen further east before the road declines into a slight cutting restricting views. The views open again as the route inclines across Darkinson Lane and continues on embankment before crossing Lea Viaduct. Crossing Lea Viaduct there are open views of the countryside. The Preston to Blackpool Railway Line and the Lancaster Canal are visible to the east and west.

Between the Cottam Link road junction and the junction with Lea Lane views would be similar to the existing Sidgreaves Lane. Initial views would be more open prior to mitigation planting taking effect with the road on slight embankment. As planting takes effects views will become increasing intermittent. There would be restricted views as the proposed road passes Highfield Farm.

Approaching the roundabout junction with Lea Lane views to the east and west are obscured by planting. The Saddle Inn Public House is visible on the immediate right hand side beyond a planted verge.

Between the junction with Lea Lane and the M55 views of White House and Crow Lady Farm are restricted by tree planting and vegetation. The road then declines into cutting as the route passes under Bartle Lane bridge and to the east of Bartle Hall with views heavily restricted by landscaped embankments.

Continuing beyond Bartle Hall the road inclines from in cutting to ground level. Dense tree planting restricts views to the east and west although as the road rises from in cutting glimpses of rolling agricultural countryside can be seen.

The road inclines along embankment towards the M55 junction. Mitigation planting would result in intermittent views of the M55 with the open countryside visible beyond.

Establishment of mitigation vegetation would serve to create views from the proposed scheme of a character similar in nature to other local roads in the area. Vegetation would also serve to restrict longer distance views from the proposed scheme in places.

Travellers Stress

Frustration

Once operational, as demonstrated by traffic modelling, the new road would attract a significant number of vehicles from the local road network due to the higher travel speeds. This would help to reduce congestion on the local roads which improves journey time for vehicle travellers and reliability of public transport services operating along these routes. As a consequence, it is concluded that both drivers and public transport users would experience a reduction in frustration as a result of the

scheme. As vehicle traveller frustration would reduce as a result of the scheme, this would provide a beneficial impact.

Route uncertainty

During the construction phase, a traffic management plan would be implemented to minimise both route uncertainty and any increase in stress caused by the road works. This would include temporary short-term diversions and temporary signage.

The route would have fewer junctions and has fewer side roads compared to the existing connections between the A583 and the M55 such as along the A6 or the A585. With fewer routes, travellers would experience a reduction in the uncertainty of where to go. In addition, signs would be installed to current design standards which would also reduce route uncertainty. As route uncertainty would reduce as a result of the scheme, this would provide a beneficial impact.

Fear of accidents

As the new distributor road is located away from local uncontrolled side roads and settlements there would be fewer cars pulling out and a lower number of pedestrians along the route. In addition, new NMU facilities are proposed along the east side of the link road, segregated from the carriageway, thus reducing the number of NMUs on the road. With fewer cars emerging and less people around this will reduce the fear of accidents for vehicles travelling along the new road.

The reduction of traffic flow through rural settlements such as Lea Town would also reduce the fear of accidents.

As fear of accidents would reduce as a result of the scheme, this would provide a beneficial impact.

TAG Severance Impacts Worksheet

Change in Severance	Population Affected					
	Lea	Lea Town	Cottam	Lower Bartle	Woodplumpton	Total Affected
Large negative						
Moderate negative						
Slight negative				<200	<200	<400
Neutral	<200		<200			<400
Slight positive		<200				<200
Moderate positive						
Large positive						

Reference Source

- Department for Transport, Traffic Analysis Guidance (TAG), TAG Unit A4.1 Social Impact Appraisal – Severance Impacts;
- Department for Transport, TAG Unit A4.2 Distributional Impact Appraisal - Distributional Impacts of Severance;
- Design Manual for Roads and Bridges Volume 11, Section 3, Part 8 – Pedestrians, Cyclists, Equestrians and Community Effects, June 1993; and,
- PWD and EWLR Environmental Statement. LCC, May 2016

Summary Assessment Score

Overall the scheme is considered to have a moderate beneficial impact on community severance between Lea Town and Cottam and the surrounding communities. The new facilities provided along the distributor road would provide increased access for NMUs.

Based on the NMu count survey data collected, and in the absence of further quantitative data from the surrounding communities, the summary assessment score is based on the assumption that daily footfall from each location is likely to be less than 200 pedestrians. These values are inclusive of footfall along the Guild Wheel, which is assumed to be between 200-500 pedestrians/cyclists. However, as the Guild Wheel forms an important loop route that is significant to Preston as a whole, a large proportion of these users are not considered to be moving between communities within the scheme area.

Qualitative Comments

Without the scheme, no current hindrance to movements in the locality of the link road is noted.

The community most likely to be affected by construction and operation of the new distributor road are those in the civil parish of Lea which includes the villages of Lea, Lea Town and Cottam, which have a range of facilities including small shops; post offices; doctor's surgeries; schools; churches; restaurants; petrol stations; employment sites; public houses; a caravan park; and sports & leisure facilities. There are a number of additional communities in close proximity to the scheme that could be impacted by the new road, namely the civil parishes of Woodplumpton; which includes the village of Woodplumpton and the small hamlets of Lower Bartle and Swillbrook, and Newton-with Clifton, located in the Borough of Fylde; which includes the village of Salwick. Lea CP is the largest of these communities with a population of 5,962 (2001 census) however the community of Lea Town which is closest to the scheme has a small population of 291 (2011 census). Woodplumpton CP and Newton-with-Clifton CP have populations of 2,154 and 2,735 respectively (2011 census).

Severance primarily concerns those using non-motorised modes, particularly pedestrians. There are several Public Rights of Way (PRoW) in close proximity to the scheme along with one nationally designated cycle route, one regionally designated cycle route and an important locally designated cycle route. In addition the scheme would have junctions on an 'A' road as well as some more minor roads. PRoWs in the vicinity of the route are infrequently used, with those in the northern extent of the scheme showing the lowest numbers of pedestrians. In particular, Woodplumpton Footpath 69 is unused along the footbridge that crosses the M55. Woodplumpton Footpaths 1, 24 and 97 are all used by less than once a day in each direction. Lea Footpath 7 is the best used as a result of its proximity to Brylea Caravan Park, with over 20 people using this route in both directions on a given day. At the southern end of the scheme Lea Footpaths 20 and 21 are reasonably well used in comparison to other footpaths within the vicinity of the scheme, with 5 people using these footpaths in each direction on any given day. The people using the footpaths in the study area are predominantly travelling to / from home or making recreational journeys such as dog walking, as would be expected in a rural setting.

Preston Western Distributor (PWD) road would permanently sever a small number of PRoWs, most significantly Lea FP7 and 22, and Woodplumpton FP69, 70, 95. Severance of Woodplumpton FP69 would also impede use of Woodplumpton FP64 and FP66. These would be retained where possible through the use of crossings or underpasses. Where this was not feasible the PRoWs would be stopped up and diverted where necessary. It is proposed that a combined cycleway footway is provided along the eastern side of the proposed scheme between the A583 and Lea Lane which would tie into the existing facilities. This has the potential to greatly increase the amenity value of the study area for NMUs in the surrounding communities as it provides new facilities for their use as well as increasing accessibility of the existing facilities, thus having a beneficial impact on NMUs travelling between communities.

PWD road would not directly impact the community of Lea Town with regards to community severance. With the introduction of the distributor road, less traffic will need to travel through the centre of Lea Town which would increase the desirability of the village centre for NMUs due to reduced fear of accidents and improved environmental conditions. The surrounding communities would benefit from increased access between each community due to the new NMU facilities along the distributor road. Vehicular severance of Darkinson Lane and the provision of a non-vehicular underpass would significantly benefit NMU connections between Lea Town and Cottam.

The new distributor road would extend into the southern area of the civil parish of Woodplumpton, which currently experiences severance due to the location of the M55. The hamlet of Lower Bartle and Swillbrook would retain connectivity along Bartle Lane via the proposed Bartle Bridge which also retains Regional Cycle Route 90. Journeys north and south of the M55 would not be prevented as access would remain via the Rosemary Lane and Sandy Lane. Closure of FP69 and removal of the footbridge over the M55 would have a limited impact on NMU connectivity between Lower Bartle and Swillbrook and/or Woodplumpton as a new diversion route would be provided, which would result in a neutral impact.