

# Penkridge Farm Site Appraisal

Transport Appraisal Report

Staffordshire County Council

24 June 2019



# Notice

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This document has 41 pages including the cover.

## Document history

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# Contents

Chapter	Page
<b>1. Introduction and background</b>	<b>5</b>
1.1. Introduction	5
1.2. Site locations	5
1.3. Strategic context	6
1.4. Report purpose	6
1.5. Report structure	7
<b>2. Design Guidance Review</b>	<b>8</b>
2.1. Local Guidance	8
<b>3. Deanery Estate &amp; Rodbaston Estate</b>	<b>10</b>
3.1. Introduction	10
3.2. Site context	10
3.3. Vehicular access	11
3.4. Highway constraints	13
3.5. Pedestrian and cycle access	13
3.6. Public transport	19
3.7. Deanery Estate trip generation	19
3.8. Rodbaston Estate trip generation	19
3.9. Preliminary cost estimates	20
3.10. Summary	20
<b>4. Levedale Estate</b>	<b>21</b>
4.1. Site context	21
4.2. Vehicular access	21
4.3. Highway constraints	22
4.4. Pedestrian and cycle access	22
4.5. Public transport	27
4.6. Trip generation	27
4.7. Preliminary cost estimates	28
4.8. Summary	28
<b>5. Preston Barn Estate</b>	<b>29</b>
5.1. Site context	29
5.2. Vehicular access	29
5.3. Highway constraints	30
5.4. Pedestrian and cycle access	30
5.5. Public transport	36
5.6. Trip generation	36
5.7. Preliminary cost estimates	36
5.8. Summary	37
<b>6. Summary and Conclusion</b>	<b>38</b>
6.1. Overview	38
6.2. Transport Planning next steps	38
<b>Appendix A. Preliminary cost estimates</b>	<b>40</b>

## Tables

Table 1-1 - Farm disposal site summary	6
Table 2-1 – SCC road classifications and descriptions	9
Table 3-1 - Summary of Accessibility to Local Amenities/ Facilities from the Deanery Estate	16
Table 3-2 - Deanery Estate - multi modal trip generation	19
Table 3-3 - Rodbaston Estate - multi modal trip generation	20
Table 4-1 - Summary of accessibility to local Amenities/ facilities from Levedale Estate	25
Table 4-2 - Levedale Estate - multi modal trip generation	28
Table 5-1 - Summary of Accessibility to Local Amenities/ Facilities from Preston Barn Estate	33
Table 5-2 - Preston Barn Estate - Multi-modal trip generation	36

## Figures

Figure 1-1 - Contextual overview of Penkridge Farm Sites	5
Figure 3-1 – Farm disposal sites (Penkridge)	10
Figure 3-2 - Opportunities and constraints (Deanery Estate & Rodbaston Estate)	11
Figure 3-3 – Whiston Road (looking east towards Pinfold Lane)	12
Figure 3-4 - Schematic Plan (Deanery Estate & Rodbaston Estate)	14
Figure 3-5 - Bungham Lane	15
Figure 3-6 - Water Eaton Lane	15
Figure 3-7 - Pinfold Lane	16
Figure 3-8 - Deanery Estate - Walking Isochrone	17
Figure 3-9 - Bungham Lane – Overbridge	18
Figure 3-10 - Deanery Estate - Cycling Isochrone	18
Figure 4-1 - Opportunities and constraints (Levedale Estate)	21
Figure 4-2 - Schematic Plan (Levedale Estate)	23
Figure 4-3 - Levedale Road	24
Figure 4-4 - Unnamed Road - east of Levedale Estate site boundary	24
Figure 4-5 - Levedale Estate walking isochrone	26
Figure 4-6 - Levedale Estate - Cycling Isochrone	27
Figure 5-1 - Opportunities and constraints (Preston Barn Estate)	29
Figure 5-2 – Schematic Plan (Preston Barn Estate)	31
Figure 5-3 - Preston Vale Lane	32
Figure 5-4 - Levedale Road	32
Figure 5-5 - Preston Barn Estate - Walking Isochrone	34
Figure 5-6 - Levedale Road - Tunnel	35
Figure 5-7 - Preston Barn Estate - Cycling Isochrone	35

# 1. Introduction and background

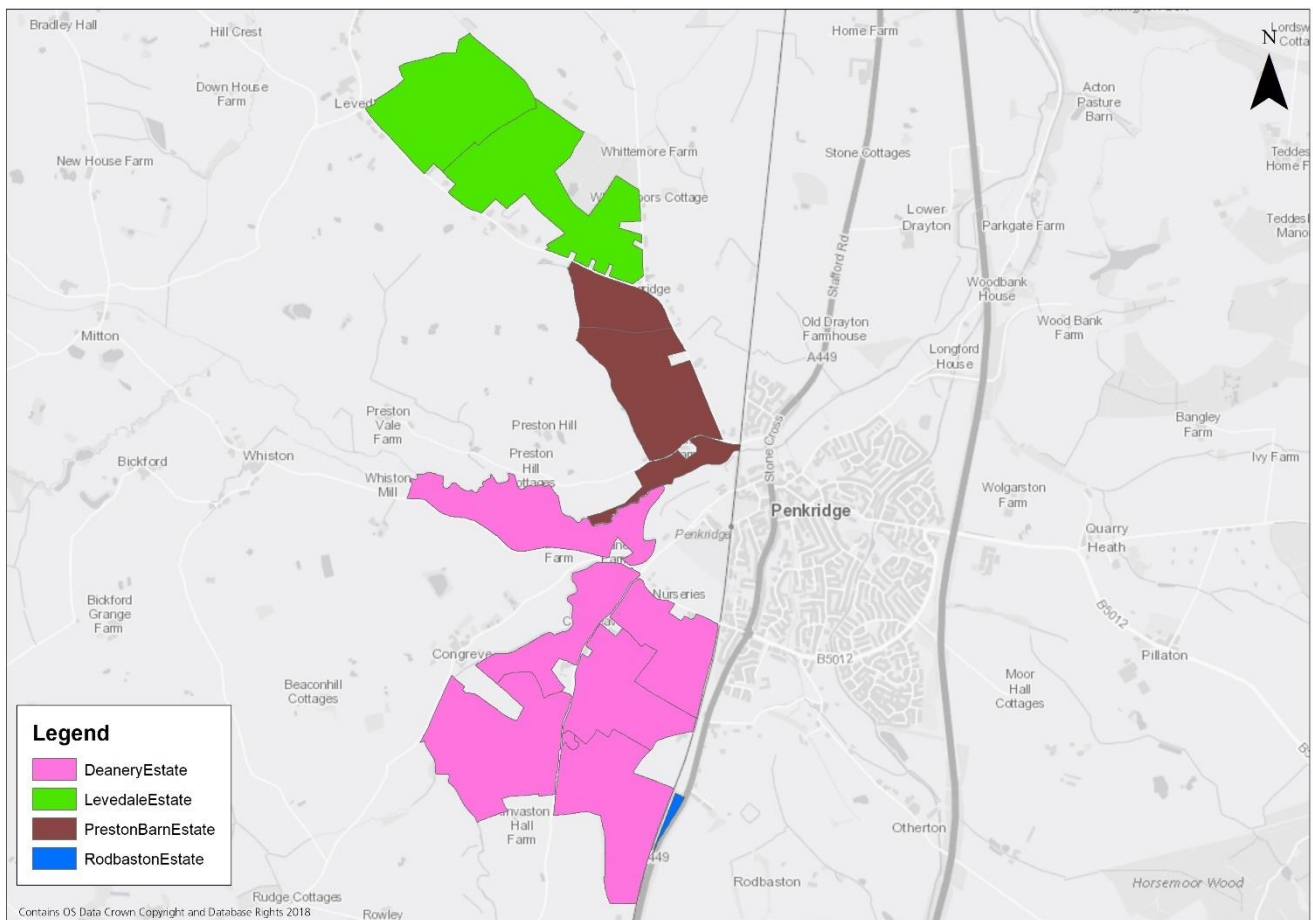
## 1.1. Introduction

Atkins has been commissioned by Staffordshire County Council (SCC) to prepare a high-level transport appraisal report in relation to several farm disposal sites located within Penkridge, Staffordshire. The farm disposal sites have been identified by SCC because they are seeking to understand their potential to be developed for residential use.

## 1.2. Site locations

SCC has identified four farm disposal sites in Penkridge (see Figure 1-1). The four farm disposal sites identified by SCC comprise a number of small land holdings outlined in Table 1-1.

**Figure 1-1 - Contextual overview of Penkridge Farm Sites**



**Table 1-1 - Farm disposal site summary**

Farm Disposal Site	Address
Deanery Estate (Fishing Pool)	Water Eaton Lane, Kinvaston, Penkridge, Staffordshire
Deanery Estate (Holding No.1)	Whiston Bank Farm, Penkridge, Staffordshire, ST19 5QQ
Deanery Estate (Holding No.3)	Bridge Farm, Water Eaton Lane, Penkridge, Staffordshire, ST19 5QE
Deanery Estate (Holding No.5)	Penkridge, Staffordshire, ST19 5QE
Deanery Estate (Holding No.6)	The Deanery, Water Eaton Lane, Penkridge, Staffordshire, ST19 5QE
Deanery Estate (Holding No.7)	Water Eaton Lane, Penkridge, Staffordshire, ST19 5QE
Deanery Estate (Holding No.9B)	Barnfields Farm, Bungham Lane, Penkridge, Stafford, ST19 5NP
Levedale Estate (Holding No.1)	Levedale, Dunston, Penkridge, Staffordshire, ST18 9AH
Levedale Estate (Holding No.4)	Levedale, Dunston, Penkridge, Staffordshire, ST18 9AH
Preston Barn Estate (Holding No.1)	Preston Barn Farm, Penkridge, Staffordshire, ST19 5RB
Preston Barn Estate (Holding No.2)	Prestonfields Farm, Penkridge, Staffordshire, ST19 5RB
Rodbaston Estate (Holding No.137)	Penkridge, Staffordshire, ST19 5PG

### 1.3. Strategic context

The farm disposal sites identified within Penkridge are located within close proximity to the Strategic Road Network (SRN). The SRN is managed by Highways England and covers approximately 2.5% of the total road network in England. The SRN is critical to the operation of the UK economy, accommodating 30% of all road traffic and 60% of all freight and business traffic.

Penkridge is located in close proximity to the following sections of the SRN:

#### 1.3.1. M6

Penkridge is located approximately 6km from Junction 13 of the M6 via the A449 Stafford Road. The M6 runs in a north-south direction and provides connectivity between Coventry, Birmingham, Stoke-on-Trent, Preston, Lancaster, and Carlisle. The M6 forms the longest motorway in the UK and forms an integral part of the main transport corridor connecting the Midlands to the north-west, south-west, and south-east of England, Scotland, and Wales.

#### 1.3.2. A5

South of Penkridge, the A5 provides access to Junction 12 of the M6, while the A449 provides access to Junction 2 of the M54.

### 1.4. Report purpose

This high-level transport appraisal report presents a proportionate assessment of the farm disposal sites relevant to the initial stage of plan making and considers the transport infrastructure required to deliver residential development on each of the sites. SCC have estimated the number of residential dwellings which could be potentially accommodated on each farm disposal site based on the total site area, and this development potential will be considered.

This report also presents high-level cost estimates associated with delivering the transport infrastructure identified to develop the site.

This report should be read in conjunction with the Penkrige Estate Development Appraisal Report prepared by Wood Environment & Infrastructure Solutions UK Limited. The Wood report presents the environmental constraints and opportunities associated with the farm disposal sites located within Penkrige.

## 1.5. Report structure

This high-level transport appraisal report is structured into the following sections:

- Design Guidance Review
- Deanery Estate & Rodbaston Estate
- Levedale Estate
- Preston Barn Estate

## 2. Design Guidance Review

### 2.1. Local Guidance

#### 2.1.1. SCC Supplementary Planning Guidance on Design Quality in Residential Areas (2000)

SCC Supplementary Planning Guidance on Design Quality in Residential Areas (2000) sets out guidelines for design in residential areas. The document is intended to provide flexible guidance which can be interpreted as required depending on the characteristics of the development location.

With regards to new residential development, SCC guidance outlines the following points in relation to sustainable access and facilities:

- Housing development sites of over 500 dwellings should provide employment and shopping facilities within the development;
- Site layout designs should ensure that there is convenient access for pedestrians, cyclists and public transport operators to reduce the need to accommodate the private car;
- In developments of up to 200 houses, cyclists can usually be accommodated safely on the residential road network. For larger schemes or where a small scheme combines with existing housing it will be necessary to consider provision of segregated facilities on key cycle routes;
- To reduce the use of private cars for local trips houses should be located within 350 metres of a bus stop wherever possible;
- Bus stops should ideally be located at 350 – 500 metre intervals to satisfy local demand;
- Pedestrian routes should link to all bus stops; and
- All houses should ideally be located less than 600 metres from a primary school or 1500 metres from a secondary school.

With regards to new residential development, SCC guidance states that vehicle flows and traffic speeds should be kept to a minimum to reduce non-access traffic.

Table 2-1 outlines the different road type classifications outlined within the SCC Planning Guidance. Higher Order Roads (HORs) provide drivers with a greater sense of dominance, whereas Lower Order Roads (LORs) should prioritise pedestrian and cyclist safety<sup>1</sup>.

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<sup>1</sup>SCC Residential Design Guidance – Access Layout  
<https://www.staffordshire.gov.uk/transport/staffshighways/highwayscontrol/Documents/6AccessLayout.pdf>



**Table 2-1 – SCC road classifications and descriptions**

<b>Higher Order Roads</b>	
Local Distributor Road	A road distributing traffic within a large residential estate.
Residential Spine Road (Collector Road)	A spine road which collects traffic within a residential estate. A typical formal highway serving up to 500 dwellings by means of a loop road or inter-connected street pattern served by at least two points of access to the distributor network. This maybe increased by 250 dwellings with each additional access point. It provides access to Lower Order Roads, which includes a Major Access Road. The latter can form part of the same Residential Spine Road.
Connector Road	A hybrid collector road providing a single access to a Lower Order Road system.
<b>Lower Order Roads</b>	
Residential Spine Road (Major Residential Access Road)	This is a loop road or connected street that serves up to 300 dwellings. This road can form part of the same Residential Spine Road serving beyond 300 dwellings although to emphasise the transition a well-defined entrance feature will be required where it meets the Collector Road.
Minor Residential Access Road	A loop road or connecting street serving up to 200 dwellings, or cul-de-sac serving up to 100 dwellings which gains access directly to either a Major Residential Access Road or a Higher Order Road.
Minor Access Way	Roads serving up to 25 dwellings in the form of a cul-de-sac or up to 50 dwellings as a connecting street providing that at no point on the road there is traffic generated from more than about 25 dwellings. This can be achieved either by creating a link or by creating a loop configuration, beginning and terminating at the same junction with a higher category road order.
Mews Court	Serving no more than 25 dwellings as a loop or link subject to equal traffic distribution, or 12 as a cul-de-sac.
Housing Square	A joint use pedestrian/vehicle cul-de-sac serving up to 10 dwellings.

The road classifications outlined within the SCC Supplementary Planning Guidance on Design Quality in Residential Areas (2000) will be used to determine the number of dwellings which could be accommodated on each of the farm disposal sites identified.

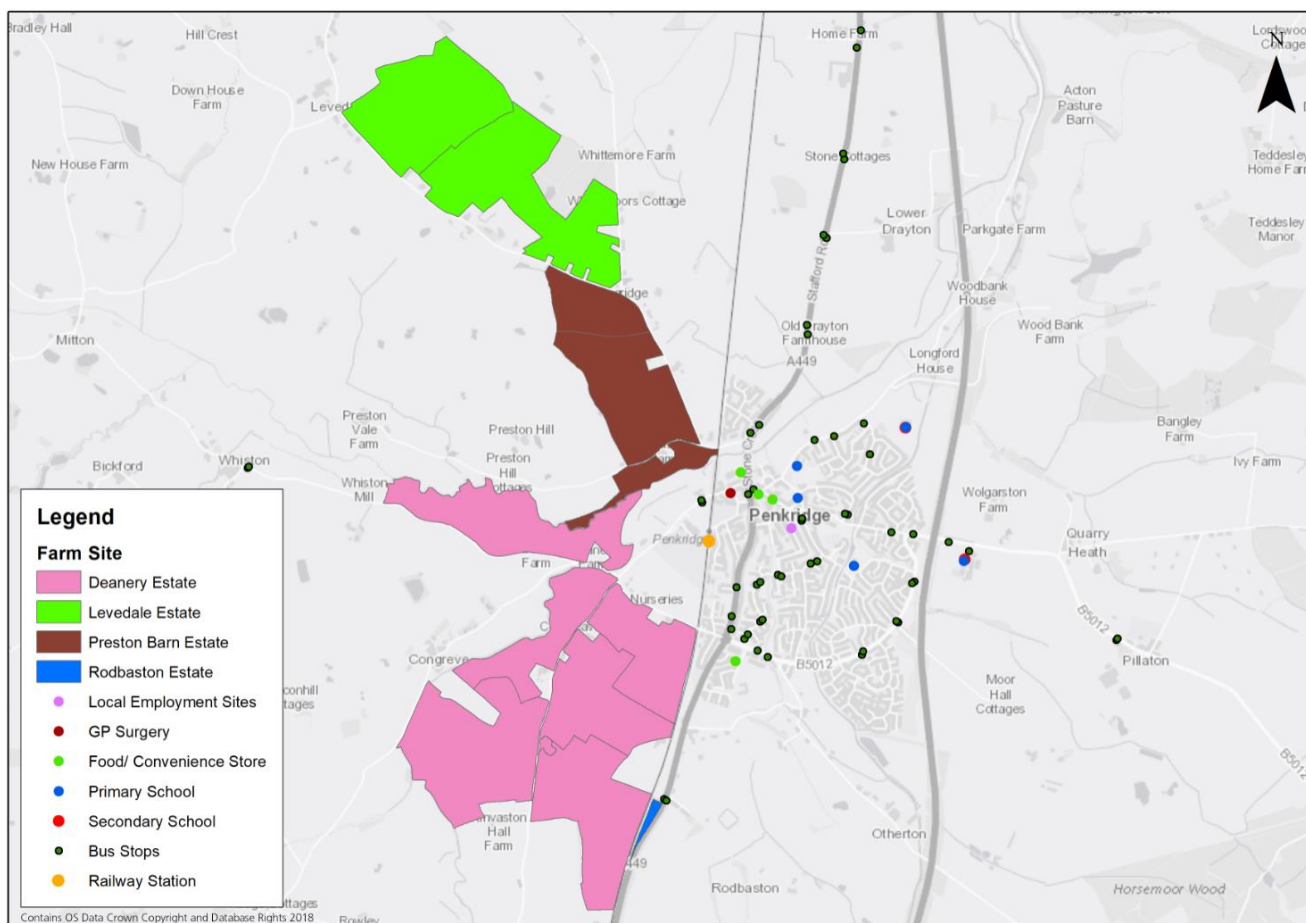
# 3. Deanery Estate & Rodbaston Estate

## 3.1. Introduction

Penkrige is a market town in Staffordshire, located approximately 7 miles south of Stafford via the A449. The A449 Stafford Road runs through the western edge of Penkrige, and M6 Junction 13 is located approximately 3 miles north of Penkrige. Penkrige has a range of local facilities including bus stops, a primary school, a secondary school, food/convenience store and a GP surgery. Penkrige also has a railway station which provides direct West Midlands Railway services between Birmingham New Street and Liverpool Lime Street and intermediate stations including Stafford, Crewe, and Wolverhampton.

Figure 3-1 shows the site locations which are being appraised in Penkrige, and the location of the amenities/facilities identified.

**Figure 3-1 – Farm disposal sites (Penkrige)**



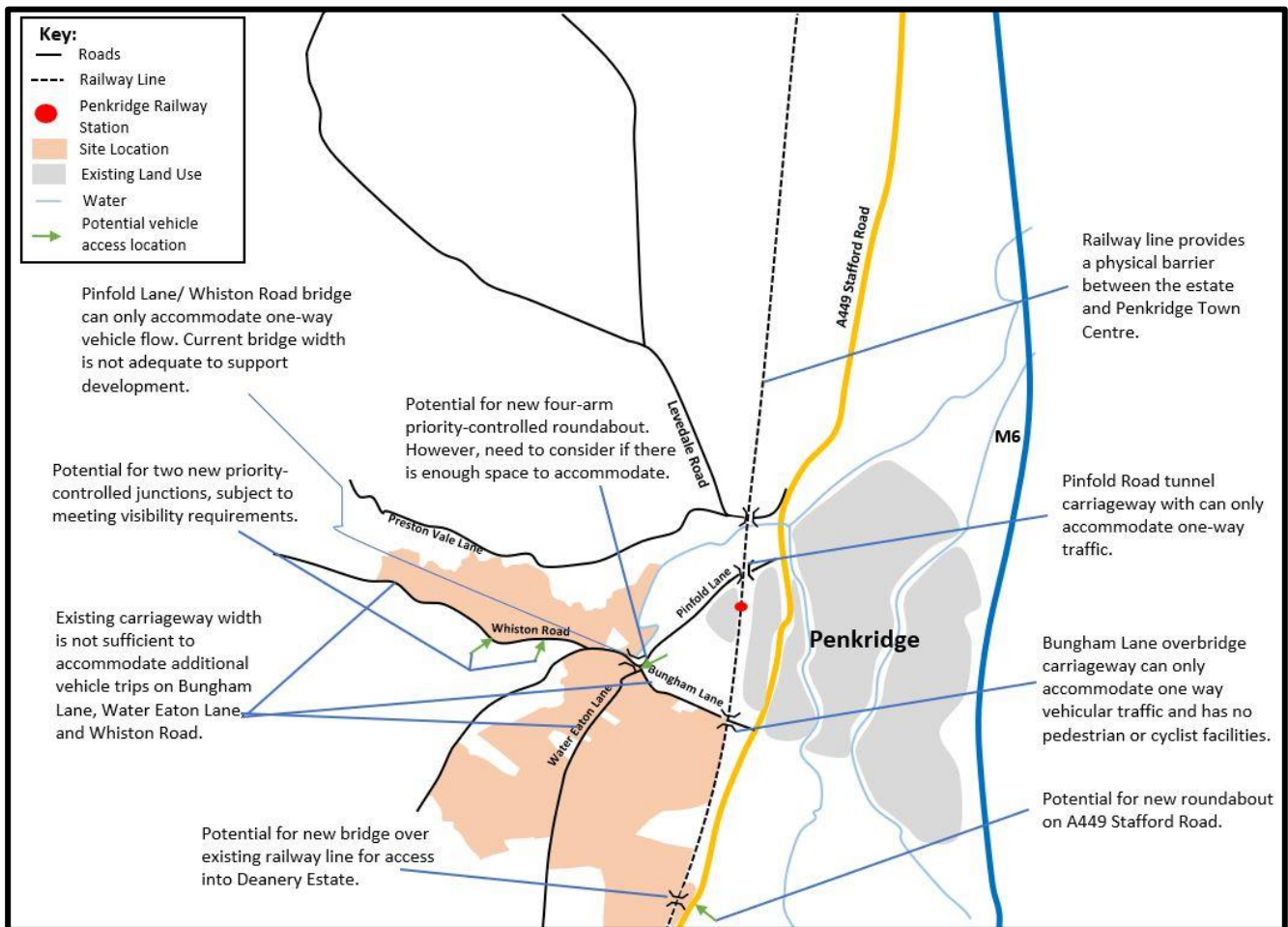
## 3.2. Site context

The Deanery Estate is shown in pink on Figure 3-1 and is located to the south west of Penkrige and the A449 Stafford Road. The site comprises seven separate land parcels which equate to approximately 186 hectares of land. Based on the site area, SCC consider that the Deanery Estate has the potential to accommodate up to 3,629 residential dwellings. The Rodbaston Estate is shown in blue on Figure 3-1 and is located to the south west of Penkrige and the A449 Stafford Road. This site comprises one land parcel that equates to approximately 1 hectare. Based on the site area, SCC consider that the Rodbaston Estate has the potential to accommodate up to 20 dwellings or enable vehicular access to the Deanery Estate.

In this report the Rodbaston Estate has been considered as part of the Deanery Estate because it is anticipated that it would provide vehicular access to the Deanery Estate from the A449.

Figure 3-2 provides a schematic overview of the Deanery Estate and Rodbaston Estate in the context of Penkridge. Figure 3-2 also outlines the opportunities and constraints identified from the site visit undertaken in March 2019. These will be discussed in the subsequent sections of this report.

**Figure 3-2 - Opportunities and constraints (Deanery Estate & Rodbaston Estate)**



### 3.3. Vehicular access

Figure 3-2 indicates that there are four opportunities for vehicular access into the Deanery Estate development parcels. Additional detail is provided below.

#### 3.3.1. New junction on A449 Stafford Road

There is potential to use a combination of existing highway land and a proportion of the Rodbaston Estate to create a new form of junction on the A449 Stafford Road to provide vehicular access to the Deanery Estate (see Figure 3-2). It is considered that a roundabout would be the most appropriate form of junction layout. This would involve realigning the A449 Stafford Road around the Rodbaston Estate site boundary to accommodate a three-arm priority-controlled roundabout. The site access would form one of the approach arms and the A449 Stafford Road would form the other two approach arms.

The key constraints/ improvements which are required to make this a vehicular access point are outlined below:

- The A449 Stafford Road would need to be realigned to provide sufficient room for an access road through the Rodbaston Estate this would involve obtaining third party land;
- A new bridge would be required to take vehicular traffic from the new site access point on the A449 over the existing railway line and into the Deanery Estate. The bridge would need to be 6m wide to facilitate two-way vehicle flow and have either a 2m wide pedestrian footway or a 4m wide shared footway; and
- The relocation of existing utility pylons and overhead cables.

### 3.3.2. New junctions on Whiston Road

The suitability of Whiston Road as a vehicular access point to serve the site has been considered (see Figure 3-2). Whilst Whiston Road provides an opportunity to develop the northern land parcel, Whiston Road is a narrow single carriageway road with no existing pedestrian facilities (see Figure 3-3). Therefore, Whiston Road, in its existing layout, is not a suitable vehicular access point for the Deanery Estate.

**Figure 3-3 – Whiston Road (looking east towards Pinfold Lane)**



Map data © 2019 Google

To upgrade Whiston Road to accommodate additional vehicular traffic, the following improvements would be required:

- Widen the existing carriageway to 6.0m to facilitate two-way vehicular flow;
- Provide a new 4m shared footway to provide pedestrian and cycle facilities in line with SCC Residential Design Guidelines (2000) document;
- Provide street lighting columns on Whiston Road to provide a safe environment for pedestrians and cyclists when it is dark;
- The removal of hedgerows to accommodate carriageway widening and a shared footway (this may require the purchase of third-party land);
- The existing vehicular bridge on Pinfold Lane/Whiston Road would need to be widened to 6m to accommodate two-way vehicular flow and also have either a 2m wide footway or 4m wide shared footway;
- Visibility assessment. The forward visibility along the major arm on the approach to the potential site access locations would have to be considered. Visibility checks will also be required for vehicles approaching the junction from the minor arm due to the alignment of the existing carriageway and the tall hedgerows located on Whiston Road; and
- The relocation of existing utility pylons and overhead cables.

### 3.3.3. New junction at Water Eaton Lane/ Pinfold Lane/ Bungham Lane

There is potential to use a combination of existing highway land and a proportion of the Deanery Estate to create a new form of junction at Water Eaton Lane/ Pinfold Lane/ Bungham Lane (see Figure 3-2). It is considered that a four-arm priority-controlled roundabout would be the most appropriate form of junction layout. It is envisaged that the Water Eaton Lane arm would provide vehicular access into the Deanery Estate. Creation of this junction would potentially involve the realignment of the existing carriageway. This could require the acquisition of third-party land. The key constraints which should be considered at this location are outlined below:



- There are existing utility pylons and overhead cables located within the vicinity of the existing junction which might need to be diverted to introduce a new form of junction at this location. The costs of relocating such facilities would require further consideration; and
- Water Eaton Lane/ Pinfold Lane/ Bungham Lane carriageways would all need to be widened to 6m to accommodate two-way vehicular traffic.

### 3.4. Highway constraints

Based on the site visit observations and online routing software, the local highway network currently operates with minimal congestion. However, it is considered that the additional vehicle trips that would be generated from the Deanery Estate development along Bungham Lane, Water Eaton Lane and Pinfold Lane could generate highway issues due to the rural nature of the lanes and the existing carriageway widths. In addition, Bungham Lane overbridge is a single carriageway controlled with give-way markings, and Pinfold Lane Tunnel is single carriageway controlled by traffic signals. Thus, it is considered that the level of additional vehicle trips generated by the Deanery Estate development could adversely impact on the operation of the local highway network at these locations.

Therefore, it is recommended that traffic surveys are undertaken, and the Local Highway Authority are contacted to discuss any potential network issues/ off-site highway capacity issues.

### 3.5. Pedestrian and cycle access

Figure 3-4 provides a schematic overview of the Deanery Estate and Rodbaston Estate in the context of Penkridge.

Figure 3-4 - Schematic Plan (Deanery Estate & Rodbaston Estate)

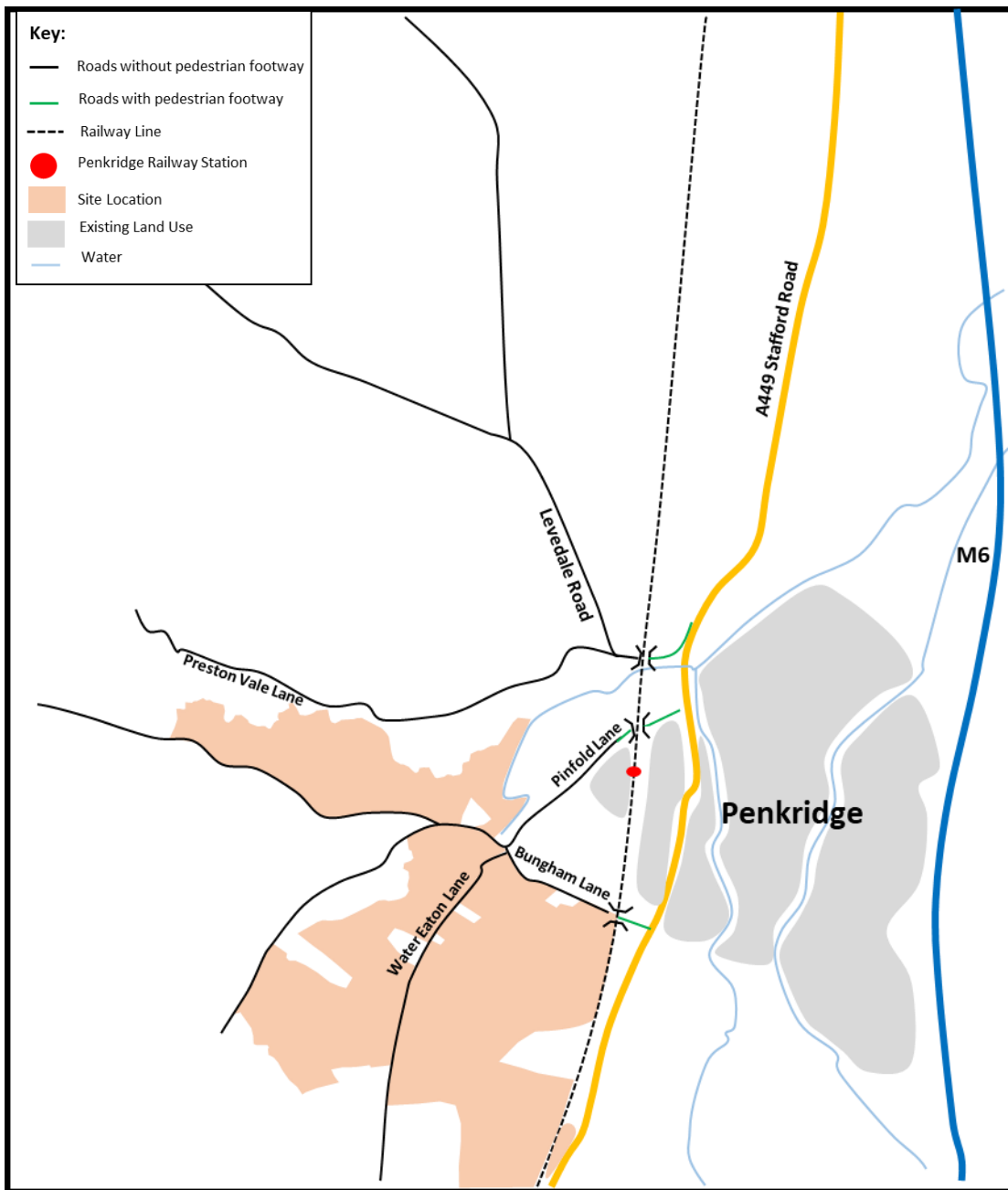


Figure 3-4 demonstrates that there are no existing pedestrian footways located along Bungham Lane (see Figure 3-5), Water Eaton Lane (see Figure 3-6) and Pinfold Lane/ Whiston Road (see Figure 3-7) or any of the roads which border the Deanery Estate site boundary. However, there are pedestrian footways to the east of the railway line on Pinfold Lane and Bungham Lane towards Penkridge Town Centre.

There are no national cycle routes or off-road cycle provision in the vicinity of the Deanery Estate or Rodbaston Estate. Therefore, it is recommended that formal cycle provision is required to develop the Deanery Estate. This could be achieved in the form of a four-metre shared footway along Water Eaton Lane, Pinfold Lane/ Whiston Road, and Bungham Lane. This would increase the sustainability and accessibility from the Deanery Estate.

Figure 3-5 - Bungham Lane



Figure 3-6 - Water Eaton Lane





**Figure 3-7 - Pinfold Lane**



As identified, there are a number of local amenities/ facilities located within Penkridge Town Centre which provide a range of services to support residential development.

Table 3-1 provides a summary of the average distance (km) and time (minutes) between the Deanery Estate and the local amenities/ facilities identified in Penkridge town centre.

**Table 3-1 - Summary of Accessibility to Local Amenities/ Facilities from the Deanery Estate**

Amenity / Facility	Approximate Distance (km)	Approximate Walking Time (Minutes)	Approximate Cycling Time (Minutes)
Bus stop (located on Bungham Lane or opposite Medical Centre)	0.6	8	3
Railway Station (Penkridge)	0.9	10	3
Primary School (Marshbrook First School)	1.4	17	6
Secondary School (Wolgarston High School or Penkridge Middle School)	2.2	27	8
GP surgery (Penkridge Medical Practice)	0.7	9	3
Convenience store/ supermarket (Co-op Food Penkridge/ Sainsbury's Local)	0.9	11	3
Local employment opportunities (Penkridge Town Centre)	1.1	14	5

Table 3-1 indicates that Penkridge Railway Station, a GP surgery and bus stops are located within a 10-minute walk from the Deanery Estate. Primary & secondary schools, a convenience store and local employment opportunities are located within a 30-minute walk and a 10-minute cycle from the Deanery Estate.

SCC Residential Design Guidance recommends that residential developments with more than 500 dwellings should provide shopping and employment facilities on site. Therefore, it is considered that the Deanery Estate should contain a local neighbourhood centre comprising of local amenities/ facilities (e.g shops, health, education, and community facilities). This would increase the sustainability and accessibility from a walking and cycling perspective of the Deanery Estate.

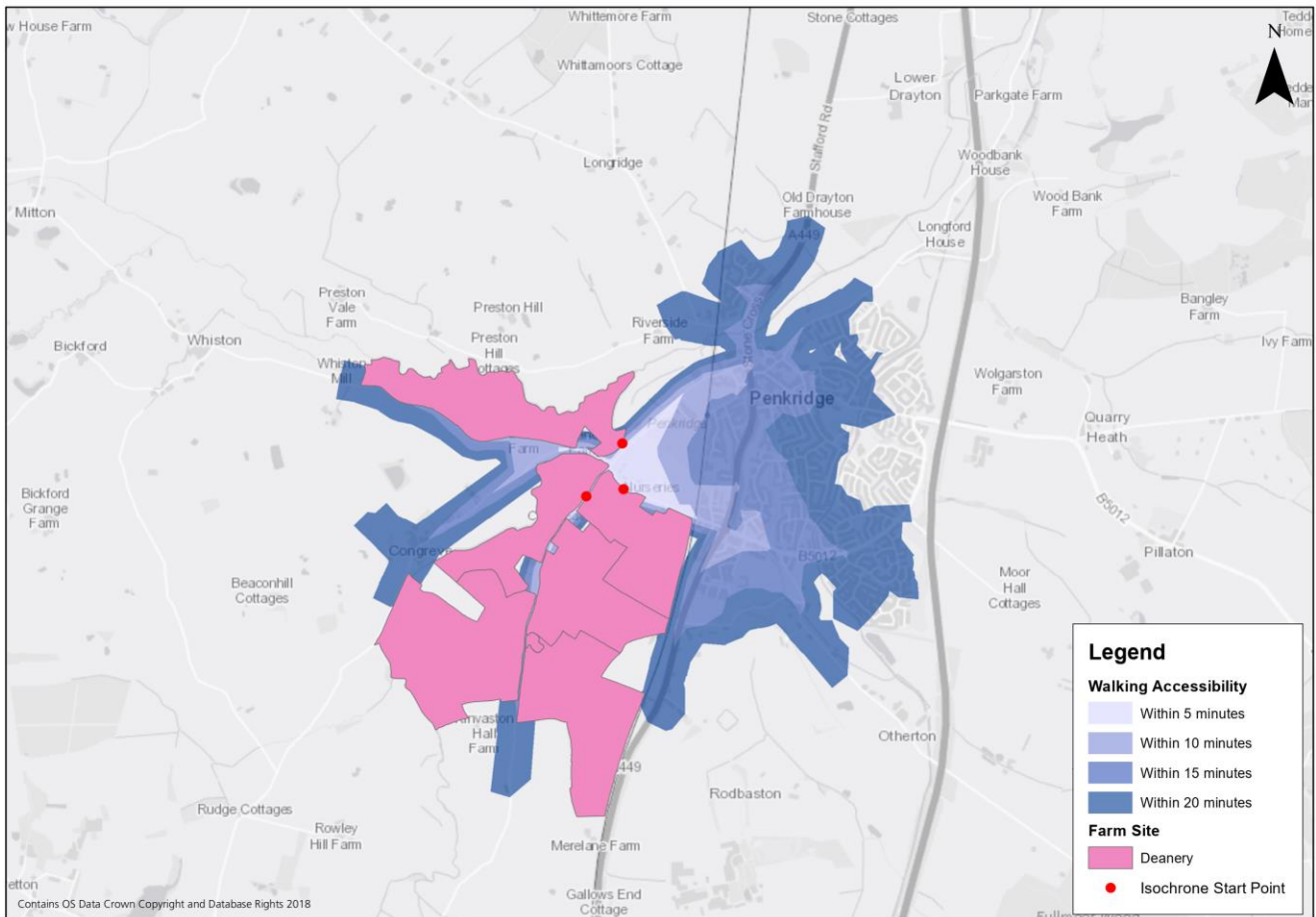
To further demonstrate the accessibility of the Deanery Estate, walking isochrones have been produced which demonstrate the distance which can be walked from the site within 20 minutes based on a walking speed of 1.4m/s<sup>2</sup>. It is therefore assumed that pedestrians can walk 420m in 5 minutes, 840m in 10 minutes, 1260m in

<sup>2</sup> (CIHT) Providing for Journeys on Foot



15 minutes and 1680m in 20 minutes. Figure 3-8 demonstrates that it is possible to reach the centre of Penkridge town centre within a 15-minute walk.

**Figure 3-8 - Deanery Estate - Walking Isochrone**



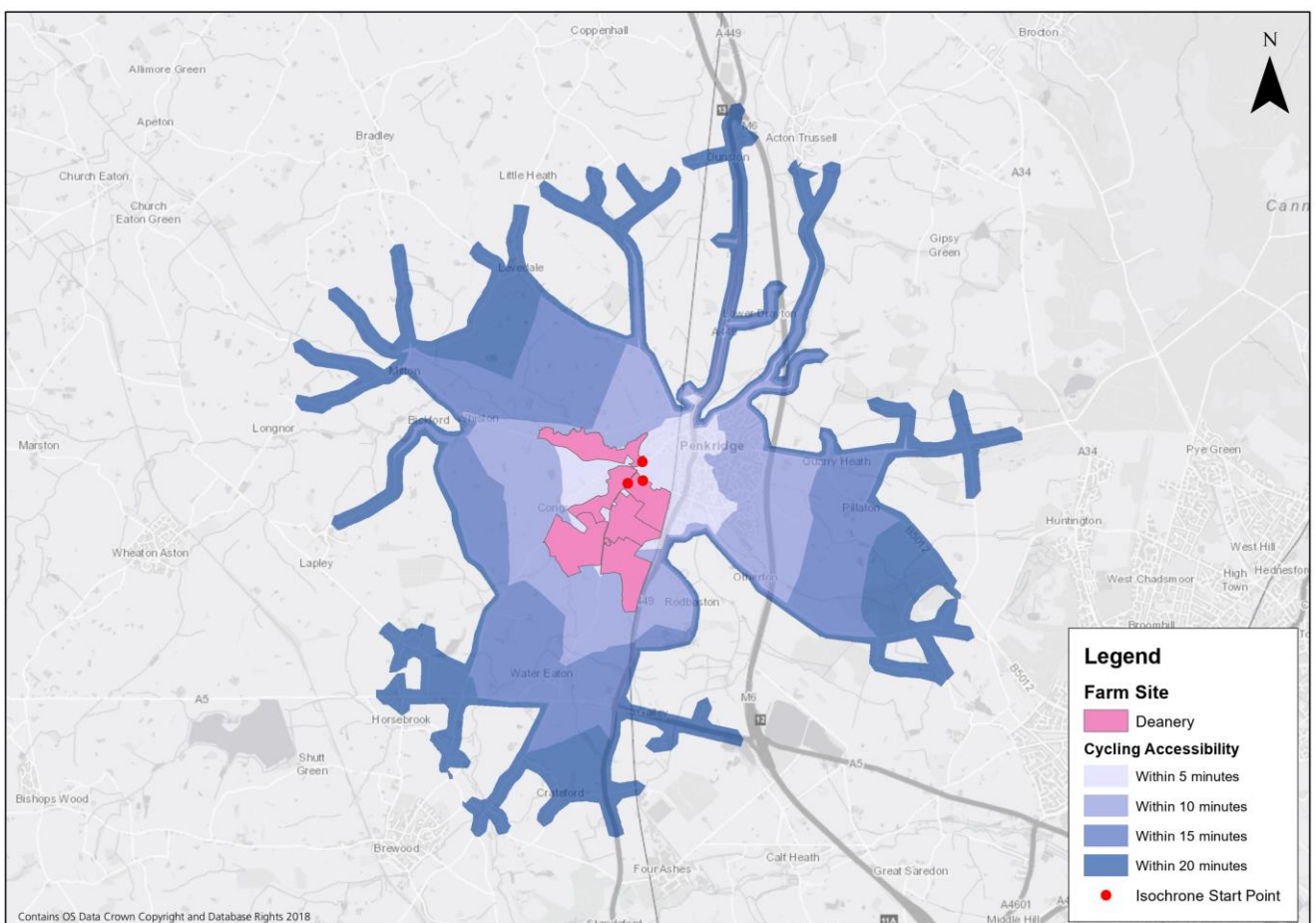
However, as identified there are not existing pedestrian facilities located within the vicinity of the Deanery Estate, therefore additional NMU (Non-Motorised Users) provision would be required to make the site sustainable. It is recommended that new 4-metre-wide shared footways with street lighting columns are installed along Pinfold Lane, Water Eaton Lane, and Bungham Lane to permit high quality safe connectivity between the Deanery Estate and Penkridge Town Centre. In addition, it is recommended that Bungham Lane overbridge is widened to accommodate a new two metre wide footway for pedestrians to provide connectivity over the railway line between the Deanery Estate and Penkridge Town Centre (see Figure 3-9).

Figure 3-9 - Bungham Lane – Overbridge



Figure 3-10 demonstrates that based on a cycling speed of 4.4m/s, it is possible to reach Penkrige Town Centre within a 5-minute cycle, and the majority of the local amenities/ facilities identified within a 10-minute cycle of the Deanery Estate.

Figure 3-10 - Deanery Estate - Cycling Isochrone



### 3.6. Public transport

As identified, there are bus stops located within 0.6km of the Deanery Estate, taken as an average distance from the centre of the Deanery Estate land parcels. The Bungham Lane bus stop is served by route number 54/54A which provides an hourly service between Stafford, Penkridge and Wolverhampton. The Medical Centre bus stop is served by route 878 which provides a service approximately every three hours between Stafford, Brewood and Wolverhampton.

According to SCC Residential Design Guidance, houses should be located within 350 metres of a bus stop. Therefore, it is considered that new bus stop infrastructure and a new bus service would be required to serve the Deanery Estate. This aligns with the sustainable development planning objective (outlined within SCC Residential Design Guidance) of reducing the existing levels of private car use.

### 3.7. Deanery Estate trip generation

As identified, it is considered that there are four opportunities for vehicular access into the Deanery Estate development parcels (subject to additional carriageway works and upgrading). Based on the site area, SCC consider that the Deanery Estate has the potential to accommodate up to 3,629 residential dwellings.

In accordance with the SCC Residential Design Guidance, a residential spine road (collector road) would be required to provide a link between the proposed vehicular access points and the internal site layout. A residential spine road (collector road) can serve up to 500 dwellings by either a loop road or inter-connected street pattern served by at least two points of access to the distributor network. This can be increased by 250 dwellings with each additional vehicle access point. This type of internal road network would be required to serve the new junction on the A449 Stafford Road and the new junction at Water Eaton Lane/ Pinfold Lane/ Bungham Lane.

A residential spine road (major residential access road) up to 300 dwellings or a minor residential access road up to 200 dwellings would be required to serve the two vehicular access points on Whiston Lane (subject to the number of dwellings).

To determine the level of vehicular trip generation which could potentially be accommodated by the proposed vehicular access points, the multi-modal trip generation for the Deanery Estate has been calculated (see Table 3-2).

**Table 3-2 - Deanery Estate - multi modal trip generation**

Time Period	Land Parcel Size (Hectares)	Potential Capacity (Dwellings)	Total Person Trip Generation		Vehicular Trip Generation		Cyclists		Pedestrians		Bus/ Tram		Public Transport Users	
			Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
AM Peak	186.1	3,629	631	2043	479	1379	15	47	138	450	0	69	0	98
PM Peak			1622	791	1216	584	54	33	254	152	40	11	58	11

The multi-modal trip generation outlined in Table 3-2 indicates that the Deanery Estate could generate up to 1,858 two-way vehicular trips during the AM Peak period, and a total of 1,800 two-way vehicular trips during the PM Peak period. However, it is not considered that the local highway network could accommodate this level of additional vehicular trip generation. Therefore, based upon the transport infrastructure requirements identified within this report it is considered that a reduced number of dwellings is proposed on the Deanery Estate.

### 3.8. Rodbaston Estate trip generation

As identified, it is anticipated that the Rodbaston Estate would provide vehicular access to the Deanery Estate from the A449. However, should the Rodbaston Estate be built out for residential development, SCC consider the Rodbaston Estate has the potential to accommodate up to 20 dwellings based on the site area.

To determine the level of vehicular trip generation which could potentially be generated by the Rodbaston Estate, the multi-modal trip generation has been calculated (see Table 3-3).



**Table 3-3 - Rodbaston Estate - multi modal trip generation**

Time Period	Land Parcel Size (Hectares)	Potential Capacity (Dwellings)	Total Person Trip Generation		Vehicular Trip Generation		Cyclists		Pedestrians		Bus/ Tram		Public Transport Users	
			Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
AM Peak	1.03	20	3	11	3	8	0	0	1	2	0	0	0	1
PM Peak			9	4	7	3	0	0	1	1	0	0	0	0

The multi-modal trip generation outlined in Table 3-3 indicates that the Rodbaston Estate could generate up to 11 two-way vehicular trips during the AM Peak period, and a total of 10 two-way vehicular trips during the PM Peak period.

### 3.9. Preliminary cost estimates

High-level preliminary cost estimates have been calculated for the transport infrastructure required to deliver a reduced number of residential development on the Deanery Estate. The average total cost estimate is approximately £14,900,000. A full breakdown of the preliminary cost estimates calculated is provided in Appendix A of this report, including a full list of assumptions.

The above costs is based on the assumed transport infrastructure required to support the proposed development, as discussed within this note, as summarised below:

- Two new three-arm priority-controlled junctions on Whiston Road;
- New four-arm priority-controlled roundabout for site vehicular access at junction of Water Eaton Lane/ Bungham Lane/ Whiston Road/ Pinfold Lane;
- Realign A449 Stafford Road;
- New three-arm priority-controlled roundabout on A449 Stafford Road;
- New bridge over existing railway line for access into Deanery Estate;
- New road to provide access into Deanery Estate from A449 Stafford Road;
- Widen Bungham Lane overbridge carriageway and new footway;
- Widen bridge on Pinfold Lane/ Whiston Road;
- Widen carriageway on Water Eaton Lane, Bungham Lane, and Whiston Road;
- New shared footway on Water Eaton Lane, Bungham Lane, and Whiston Road;
- Street lighting at vehicle access points and new shared footways; and
- New bus stop and bus service.

### 3.10. Summary

In summary, four opportunities for vehicular access points into the Deanery Estate have been identified. The main highway constraints associated with the Deanery Estate is whether the roads adjacent to the Deanery Estate (Bungham Lane, Water Eaton Lane, and Pinfold Lane), Bungham Lane overbridge, and Pinfold Lane Tunnel would be able to cope with the additional vehicle trips that would be generated from the residential development.

It is not considered that the Deanery Estate is located within a sustainable location based on the layout of the existing highway network, and pedestrian and cyclist provision. There are a range of local amenities/ facilities that are accessible within a 15-minute walk from the Deanery Estate, however this currently requires NMUs to walk along live carriageway for part of the route because there are no pedestrian footways to the west of the railway line. Further, there is no existing formal cycle provision between the Deanery Estate and Penkrige. Pedestrian and cyclist infrastructure would need to be improved to develop the Deanery Estate.

The existing public transport provision is poor; the nearest bus stops to the Deanery Estate are approximately 0.6km away and the frequency of buses is poor. Therefore, to meet SCC Design Guidance new bus stops and bus services will be required to ensure all dwellings are within 350 metres of a bus stop which has a regular bus service.

Significant highway and transport infrastructure is required to support the development of the Deanery Estate. A high-level cost estimate of £14.9m has been calculated for the assumed site access junctions and off-site improvements.

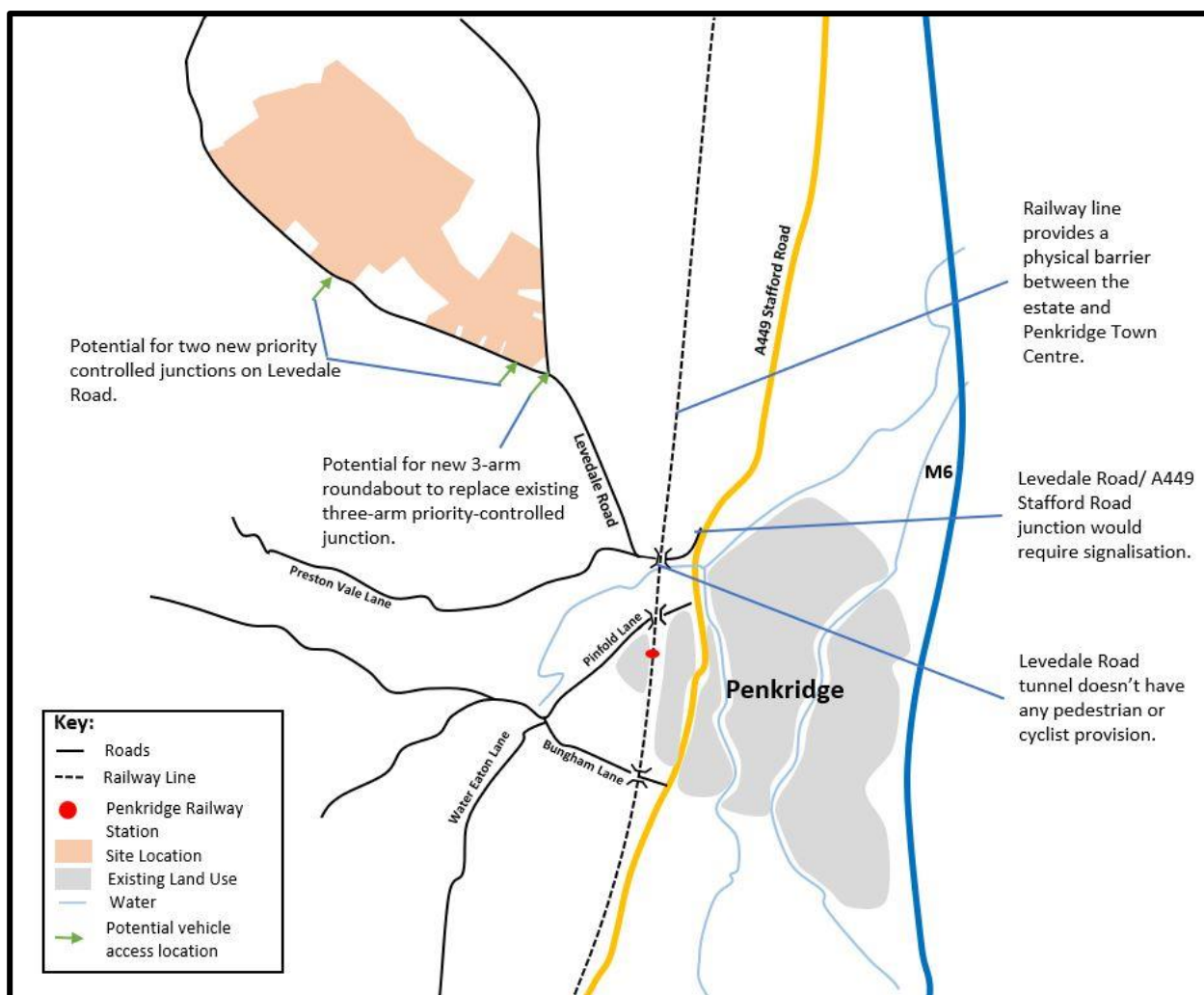
## 4. Levedale Estate

### 4.1. Site context

The Levedale Estate is shown in green on Figure 3-1 and is located to the north-west of Penkridge, north of Levedale Road. Levedale Road provides a route between Penkridge and the village of Levedale. The Levedale Estate equates to approximately 90 hectares of land. Based on the site area, SCC consider that the Levedale Estate has the potential to accommodate 1,754 dwellings.

Figure 4-1 provides a schematic overview of the Levedale Estate in the context of Penkridge. Figure 4-1 also outlines the opportunities and constraints identified from the site visit undertaken in March 2019. These will be discussed in this chapter of the report.

**Figure 4-1 - Opportunities and constraints (Levedale Estate)**



### 4.2. Vehicular access

Figure 4-1 indicates that there two potential opportunities for vehicular access into the Levedale Estate. Additional detail is provided below.

#### 4.2.1. Levedale Road

There is the potential to provide two vehicular access points on Levedale Road to provide access to the Levedale Estate (see Figure 4-1). Levedale Road is a single carriageway road which is subject to national speed limit (60mph). Given the existing road alignment, it is considered that the potential form of the proposed access junctions could be three-arm priority-controlled junctions, with the site access forming the minor arm.

However, preliminary design options would be required to determine if sufficient visibility splays could be achieved.

The key constraints which should be considered at this location include:

- The proposed southern vehicular access point on Levedale Road is in close proximity to a tight bend, with limited forward visibility. Therefore, further analysis would be required to determine if the forward visibility would meet design standards. In addition, setback visibility from the minor arm would also need to be considered for both proposed access junctions;
- Levedale Road is subject to the national speed limit (60mph). To accommodate two new priority-controlled junctions on this road the speed limit on this section of the road would need to be reduced from 60mph to 30mph to ensure driver safety. This would require a TRO;
- The Levedale Road/ A449 Stafford Road priority-controlled junction would potentially need to be upgraded to a signalised junction;
- A new three arm priority-controlled roundabout would be required to replace the existing Levedale Road/ Whittamore Lane priority-controlled junction; and
- The existing overhead cables would need to be relocated.

### 4.3. Highway constraints

Based on the site visit observations and online routing software, the local highway network currently operates with minimal congestion. Therefore, it is not considered that there are any existing highway capacity issues on the local highway network.

However, it is considered that the additional vehicles associated with the Levedale Estate could have an adverse impact on Bungham Lane, Water Eaton Lane and Pinfold Lane due to the rural nature of the lanes and the limited carriageway widths. In addition, Bungham Lane overbridge is single carriageway with give-way parameters, and Pinfold Lane Tunnel is signal controlled. Therefore, it is considered that the additional vehicle trips generated by the Levedale Estate would adversely impact on the operation of the local highway network. It is recommended that the Local Highway Authority are contacted to discuss any potential network issues/ off-site highway capacity issues should the Levedale Estate be taken forward.

### 4.4. Pedestrian and cycle access

Figure 4-2 provides a schematic overview of the Levedale Estate in the context of Penkridge.

Figure 4-2 - Schematic Plan (Levedale Estate)

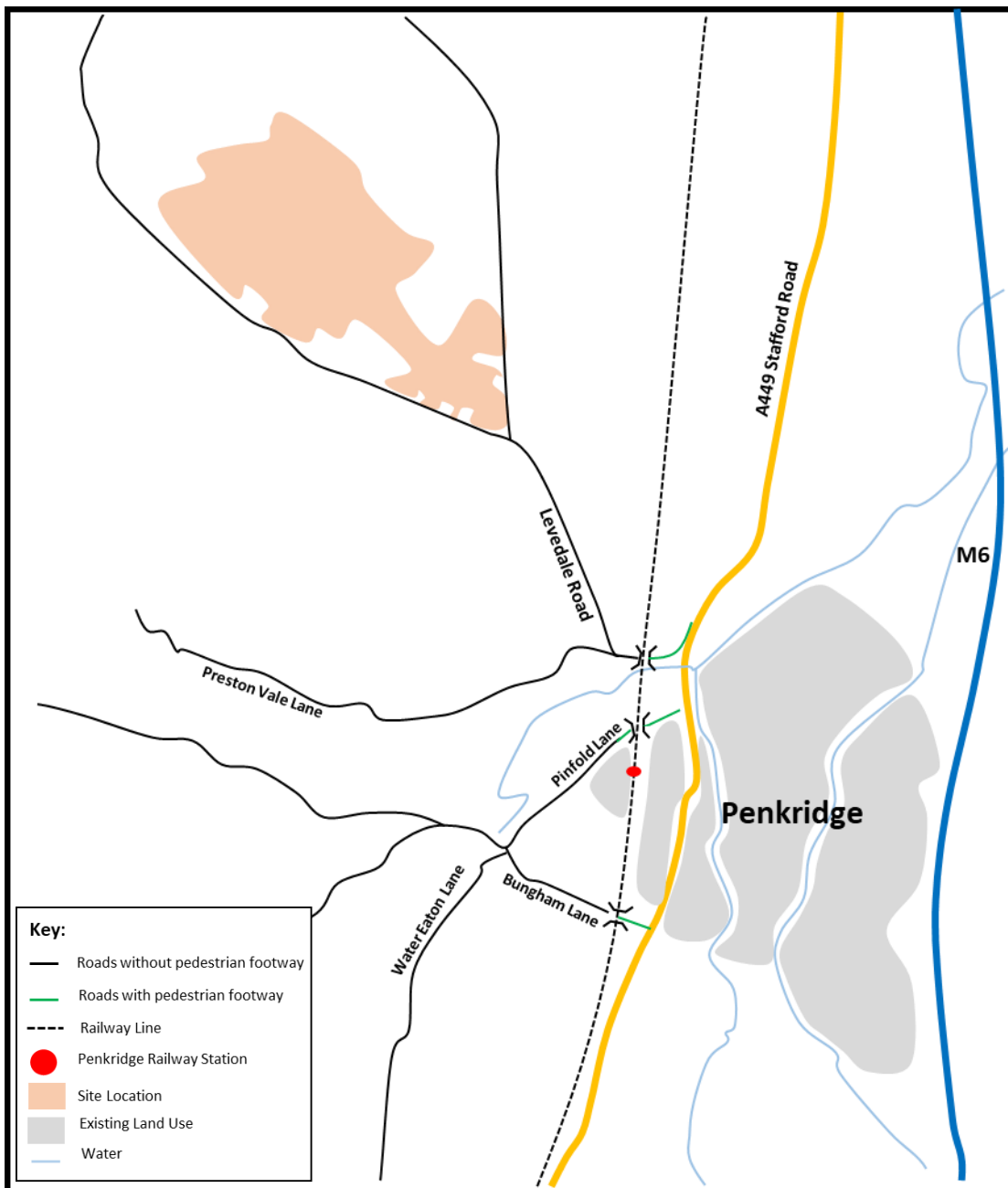


Figure 4-2 demonstrates that there are no existing footways located along Levedale Road (see Figure 4-3) or the unnamed road bordering the east of the Levedale Estate (see Figure 4-4). Figure 4-3 and Figure 4-4 show the existing carriageways and lack of NMU provision between the Levedale Estate and Penkrigde.

However, as identified in Figure 4-2, there are pedestrian footways located to the east of the railway line along Levedale Road and the A449 Stafford Road towards Penkrigde Town Centre.

There are no existing formal national cycle routes or off-road cycle provision in the close vicinity of the Levedale Estate. Therefore, it is recommended that formal pedestrian and cycle provision is provided to facilitate residential development on the Levedale Estate. This could be achieved in the form of a four-metre shared footway along Levedale Road and the unnamed road bordering the east of Levedale Estate site boundary. This would increase the sustainability of the Levedale Estate.



Figure 4-3 - Levedale Road



Figure 4-4 - Unnamed Road - east of Levedale Estate site boundary



As identified, there are a number of local amenities/ facilities located within Penkridge town centre which provide a range of services to support residential development. Table 4-1 provides a summary of the distance (km) and time (minutes) between the Levedale Estate and the local amenities/ facilities identified in Penkridge.



**Table 4-1 - Summary of accessibility to local Amenities/ facilities from Levedale Estate**

Amenity / Facility	Approximate Distance (km)	Approximate Walking Time (Minutes)	Approximate Cycling Time (Minutes)
Bus Stop (located on A449 Stafford Road)	1.4	18	5
Railway Station (Penkridge)	2.3	27	8
Primary School (Marshbrook First School)	2.3	27	8
Secondary School (Penkridge Middle School)	2.9	35	10
GP Surgery (Penkridge Medical Practice)	2.1	25	7
Convenience Store/ Supermarket (Sainsbury's Local)	1.8	22	6
Local Employment Opportunities (Penkridge Town Centre)	1.9	23	7

Table 4-1 indicates that a Bus Stop is located within a 20-minute walk or a 5-minute cycle of the Levedale Estate. Penkridge Railway Station, a primary school, a convenience store, and local employment opportunities are located within a 30-minute walk or a 10-minute cycle of the Levedale Estate. A secondary school is located over a 30-minute walk or a 10-minute cycle from the Levedale Estate.

SCC Residential Design Guidance recommends that residential developments with more than 500 dwellings should provide shopping and employment facilities on site. Therefore, it is considered that the Levedale Estate should contain a local neighbourhood centre comprising of local amenities/ facilities (e.g. shops, health, education, and community facilities). This would increase the sustainability and accessibility from a walking and cycling perspective of the Levedale Estate.

To further demonstrate the accessibility of the Levedale Estate, walking isochrones have been produced which demonstrate the distance which can be walked from the site within 20 minutes, based on a walking speed of 1.4m/s<sup>3</sup>. It is therefore assumed that pedestrians can walk 420m in 5 minutes, 840m in 10 minutes, 1260m in 15 minutes and 1680m in 20 minutes. Figure 4-5 demonstrates that it is not possible to reach the centre of Penkridge within 20-minutes.

<sup>3</sup> (CIHT) Providing for Journeys on Foot

Figure 4-5 - Levedale Estate walking isochrone

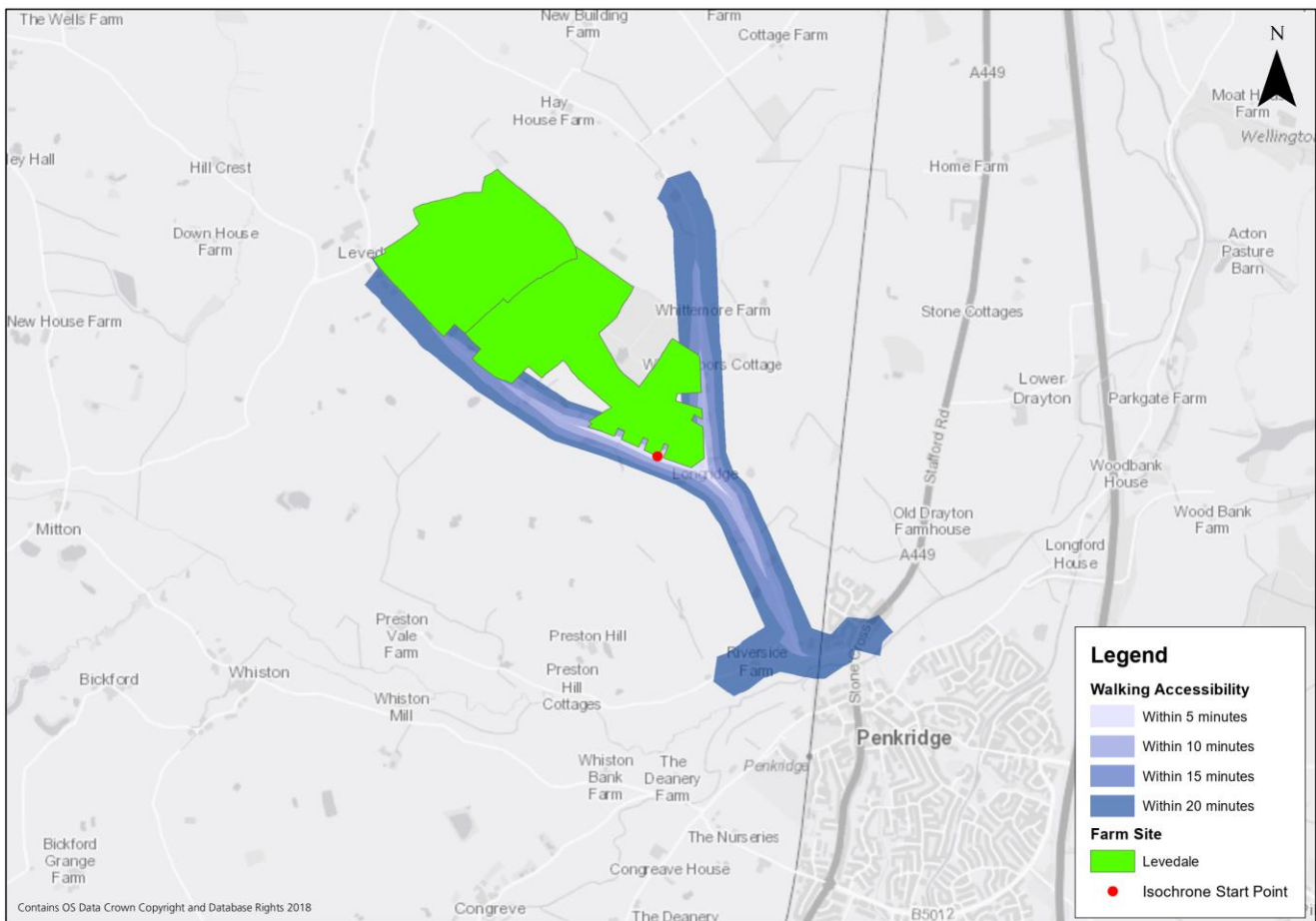
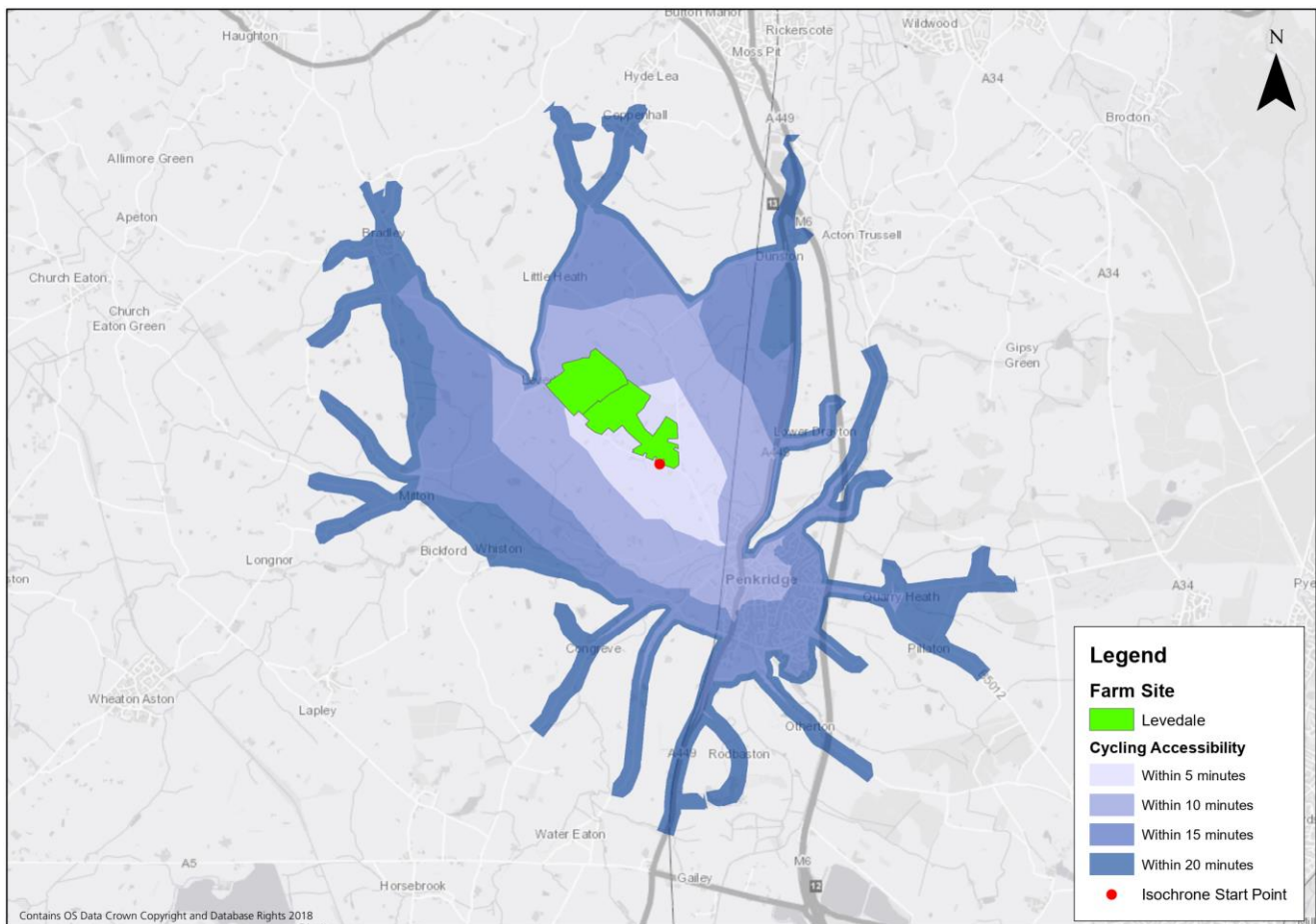


Figure 4-6 demonstrates that based on a cycling speed of 4.4m/s, it is possible to reach the centre of Penkridge, and most of the local amenities/ facilities identified in Table 4-1 within a 10-minute cycle of the Levedale Estate.

Figure 4-6 - Levedale Estate - Cycling Isochrone



There is currently no existing pedestrian and cyclist infrastructure within the vicinity of the Levedale Estate, therefore NMU provision would be required to make the site sustainable. It is recommended that new 4-metre wide shared footways with street lighting columns are provided along Levedale Road, and the unnamed road east of the Levedale Estate site boundary to permit high quality and safe connectivity between the Levedale Estate and Penkridge Town Centre. In addition, Levedale Road tunnel requires widening to accommodate either a new two-metre wide footway or four metre shared footway for pedestrians and cyclists to provide connectivity under the railway line between the Levedale Estate and Penkridge town centre.

#### 4.5. Public transport

As identified, there is a bus stop located within 1.4km of the Levedale Estate, taken as an average distance from all of the Levedale Estate land parcels. The bus stops are served by six existing services (54/ 54A/ 75/ 75A/ 75B/ 878) which provide a daily service frequency of up to every 60 minutes to the following destinations including Stafford, Penkridge town centre, Wheaton Aston, Brewood, i54, Wolverhampton, and Cannock.

According to SCC Residential Design Guidance, houses should be located within 350 metres of a bus stop. Therefore, new bus stops and a new bus service would be required to serve the Levedale Estate. This aligns with the SCC Residential Design Guidance objective of reducing levels of private car use.

#### 4.6. Trip generation

As identified, there are two locations which could accommodate vehicular access to serve the Levedale Estate (subject to additional carriageway works and upgrading). Based on the site area, SCC consider that the Levedale Estate has the potential to accommodate 1,754 dwellings. To accommodate this number of dwellings a residential spine road (collector road) would be required (in accordance with the SCC Residential Design Guidance) to link the proposed vehicular access points on Levedale Road.

According to SCC guidance, a residential spine road (collector road) can serve up to 500 dwellings by either a loop road or inter-connected street pattern served by at least two points of access to the distributor network. This can be increased by 250 dwellings with each additional vehicle access point.

Therefore, based on the number of vehicular access points identified (two), only 500 residential dwellings could be delivered at the Levedale Estate. Standalone junction capacity analysis would also have to be undertaken to ensure that the proposed access strategy could accommodate the proposed level of vehicular trip generation.

To determine the level of vehicular trip generation which could potentially be accommodated by the proposed vehicular access points, the multi-modal trip generation for the Levedale Estate has been calculated (see Table 4-2).

**Table 4-2 - Levedale Estate - multi modal trip generation**

Time Period	Land Parcel Size (Hectares)	Potential Capacity (Dwellings)	Total Person Trip Generation		Vehicular Trip Generation		Cyclists		Pedestrians		Bus/ Tram		Public Transport Users	
			Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
AM Peak	89.93	1754	305	987	231	666	7	23	67	217	0	33	0	47
PM Peak			784	382	587	282	26	16	123	74	19	5	28	5

The multi-modal trip generation outlined in Table 4-2 indicates that the Levedale Estate could generate up to 897 two-way vehicular trips during the AM Peak period, and a total of 869 two-way vehicular trips during the PM Peak period.

### 4.7. Preliminary cost estimates

High-level preliminary cost estimates have been calculated for the transport infrastructure required to deliver residential development on the Levedale Estate. The average total cost estimate is approximately £3,000,000. A full breakdown of the preliminary cost estimates calculated is provided in Appendix A of this report, including a full list of assumptions.

The transport infrastructure required is outlined below:

- Two new three-arm priority-controlled junctions on Levedale Road;
- New three-arm priority-controlled roundabout on Levedale Road;
- Signalisation of Levedale Road/ A449 Stafford Road junction;
- Traffic Regulation Order (TRO) required Levedale Road to reduce the 60mph speed limit to accommodate the proposed site access points on Levedale Road;
- New shared footway along Levedale Road;
- Widen Levedale Tunnel to accommodate pedestrian and cyclist provision;
- New bus stops and bus service; and
- Street lighting at vehicle access points and new shared footways.

### 4.8. Summary

In summary, the main constraint of developing the Levedale Estate is the limited pedestrian and cyclist provision and connectivity between the Levedale Estate and Penkrige town centre. This report has identified that there are no existing pedestrian footways west of the railway line, and there is no formal cycle infrastructure either. Further, whilst there is a range of local amenities/ facilities located within Penkrige, NMUs are required to interact with sections of live carriageway to access them. Therefore, it is considered that the Levedale Estate is located within an unsustainable location based on the current infrastructure provision.

The existing public transport provision is below standard; the nearest bus stop to the Levedale Estate is approximately 1.4km away and the frequency of buses is poor. Therefore, to meet SCC Design Guidance new bus stops and bus services will be required to ensure all dwellings are within 350 metres of a bus stop which has a regular bus service.

Two locations have been identified which could potentially provide opportunities for vehicular access to the Levedale Estate subject to additional carriageway works and upgrading, and no major highway constraints have been identified.

Significant highway and transport infrastructure is required to support the development of the Levedale Estate. A high-level cost estimate of £3m has been calculated for the site access junctions and off-site improvements.

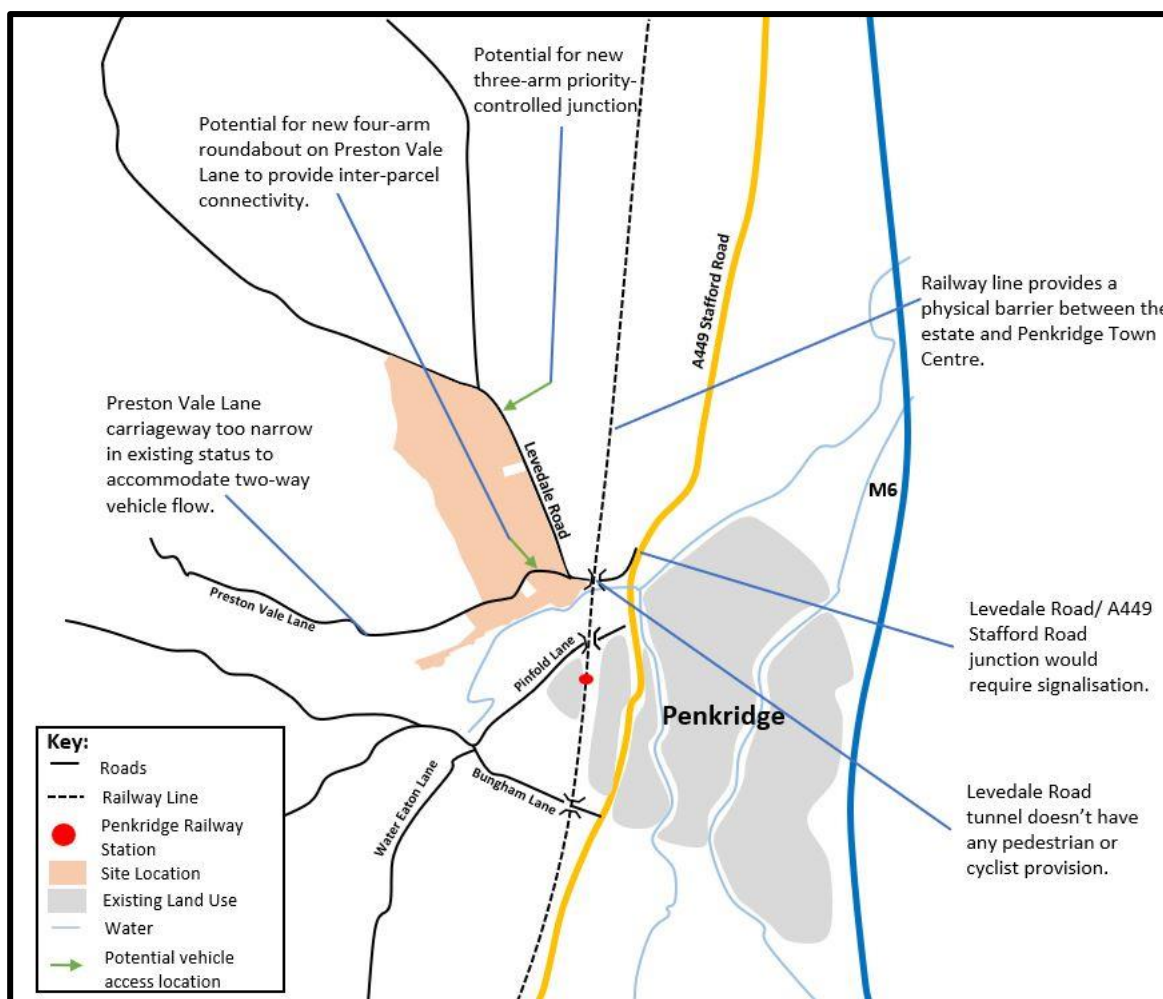
## 5. Preston Barn Estate

### 5.1. Site context

The Preston Barn Estate is shown in brown on Figure 3-1 and is located to the north west of Penkridge, to the west of Levedale Road. The Preston Barn Estate comprises two land parcels which equate to approximately 55 hectares of land. Based on the site area, SCC consider that the Preston Barn Estate has the potential to accommodate 1,067 residential dwellings.

Figure 5-1 provides a schematic overview of the Preston Barn Estate in the context of Penkridge. Figure 5-1 also outlines the opportunities and constraints identified from the site visit undertaken in March 2019. These will be discussed in this chapter of the report.

**Figure 5-1 - Opportunities and constraints (Preston Barn Estate)**



### 5.2. Vehicular access

Figure 5-1 shows that there are three potential opportunities for vehicular access into the Preston Barn Estate. Further information is provided below.

#### 5.2.1. Levedale Road access

There is the potential to provide a vehicular access point to serve the Preston Barn Estate on Levedale Road (see Figure 5-1). Levedale Road is a single carriageway road which forms the eastern boundary of the site. It is subject to the national speed limit. It is considered that a three-arm priority-controlled junction would be the most appropriate form of junction at this location, with the site access forming the minor arm. However, the existing highway layout is not considered suitable because the carriageway is surrounded by tall hedgerows on



both sides of the carriageway which restrict visibility. Therefore, to upgrade Levedale Road for vehicular access the following transport infrastructure would be required:

- Visibility assessment to assess whether sufficient visibility for the proposed new junction;
- The removal of hedgerows to accommodate sufficient visibility splays from the major and minor arms (this may require the purchase of third-party land);
- Levedale Road is currently subject to national speed limit. To accommodate the new junction on this road, the speed limit on this section of the road would need to be reduced to 30mph-40mph to ensure driver safety this would require a TRO and liaising with the Local Highway Authority; and
- Potential relocation of existing utility pylons and overhead cables.

### 5.2.2. Inter-parcel connection on Preston Vale Lane

Preston Vale Lane is a single-track carriageway located between the two land parcels which form the Preston Barn Estate. It is not considered that the existing highway network is a suitable location for a potential vehicle access. This is because the existing carriageway width cannot accommodate two-way vehicle flows. In addition, the forward visibility along Preston Vale Lane is limited due to the existing hedgerows and the winding nature of the road. This reduces forward visibility making it difficult to see oncoming traffic.

Therefore, to upgrade Preston Vale Lane to a four-arm priority-controlled roundabout for vehicular access (see Figure 5-1) the following transport infrastructure improvements would be required:

- Widen Preston Vale Lane carriageway to 6m wide to permit two-way vehicle flow;
- Preston Vale Lane is currently subject to national speed limit (60mph). To accommodate a new priority-controlled junction on this road the speed limit on this section of the road would need to be reduced to 30mph-40mph to ensure driver safety this would require a TRO;
- Visibility assessment and any post assessment work which needs to be undertaken such as removal of hedgerows this could involve acquiring third party land, and carriageway realignment;
- Provide a new roundabout on Preston Vale Lane to accommodate two vehicular access points; and
- The relocation of existing utilities pylons and overhead cables.

If the above improvements were made then it is considered that Preston Vale Lane would have the potential to accommodate a four-arm priority-controlled roundabout.

### 5.3. Highway constraints

Based on the site visit observations and online routing software, the local highway network currently operates with minimal congestion. Therefore, it is not considered that there are any existing highway capacity issues on the local highway network.

However, it is considered that the trip generation associated with the Preston Barn Estate would adversely impact on Bungham Lane, Water Eaton Lane and Pinfold Lane due to the rural nature of the lanes and the existing carriageway widths. In addition, the Bungham Lane overbridge is single carriageway permitting one-way vehicle flow with give-way parameters, and the Pinfold Lane Tunnel is single carriageway subject to signal control. Therefore, it is considered that additional vehicle trips generated by the Preston Barn Estate would adversely impact on the operation of the local highway network. It is recommended that traffic surveys are undertaken, and the Local Highway Authority are contacted to discuss any potential network issues/ off-site highway capacity issues.

### 5.4. Pedestrian and cycle access

Figure 5-2 provides a schematic overview of the Preston Barn Estate in the context of Penkridge.

Figure 5-2 – Schematic Plan (Preston Barn Estate)

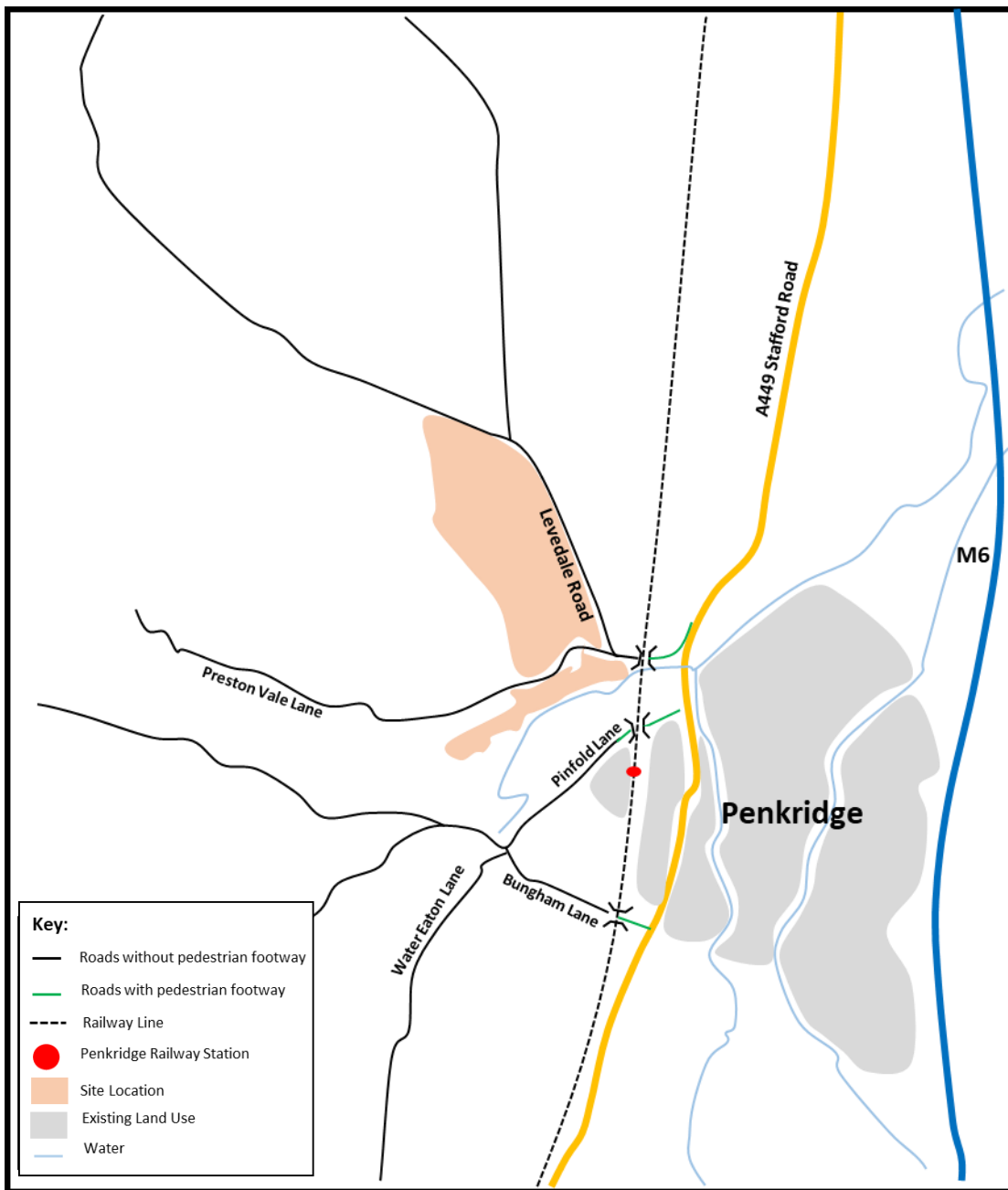


Figure 5-2 demonstrates that there are no existing footways located along Preston Vale Road (see Figure 5-3), or Levedale Road (see Figure 5-4). However, there are existing pedestrian footways located to the east side of the existing railway line on Levedale Road towards Penkridge town centre and the A449 Stafford Road.

There are no existing formal cycle routes or off-road cycle provision in the close vicinity of the Preston Barn Estate. Therefore, it is recommended that formal pedestrian and cycle provision is required to develop the Preston Barn Estate. This could be achieved in the form of a four-metre shared footway along Preston Vale Lane and Levedale Road in accordance with SCC Residential Design Guidance.

Figure 5-3 - Preston Vale Lane



Figure 5-4 - Levedale Road



As identified, there are a number of local amenities/ facilities located within Penkridge Town Centre which provide a range of services to support residential development.

Table 5-1 provides a summary of the average distance (km) and time (minutes) between the Preston Barn Estate and the local amenities/ facilities identified in Penkridge town centre.



**Table 5-1 - Summary of Accessibility to Local Amenities/ Facilities from Preston Barn Estate**

Amenity / Facility	Approximate Distance (km)	Approximate Walking Time (Minutes)	Approximate Cycling Time (Minutes)
Bus Stop (located on A449 Stafford Road)	0.8	10	4
Railway Station (Penkridge)	1.6	19	6
Primary School (Marshbrook First School)	1.6	19	6
Secondary School (Penkridge Middle School)	2.2	27	8
GP surgery (Penkridge Medical Practice)	1.4	17	5
Convenience store/ supermarket (Sainsbury's Local)	1.1	14	5
Local employment opportunities (Penkridge Town Centre)	1.2	16	6

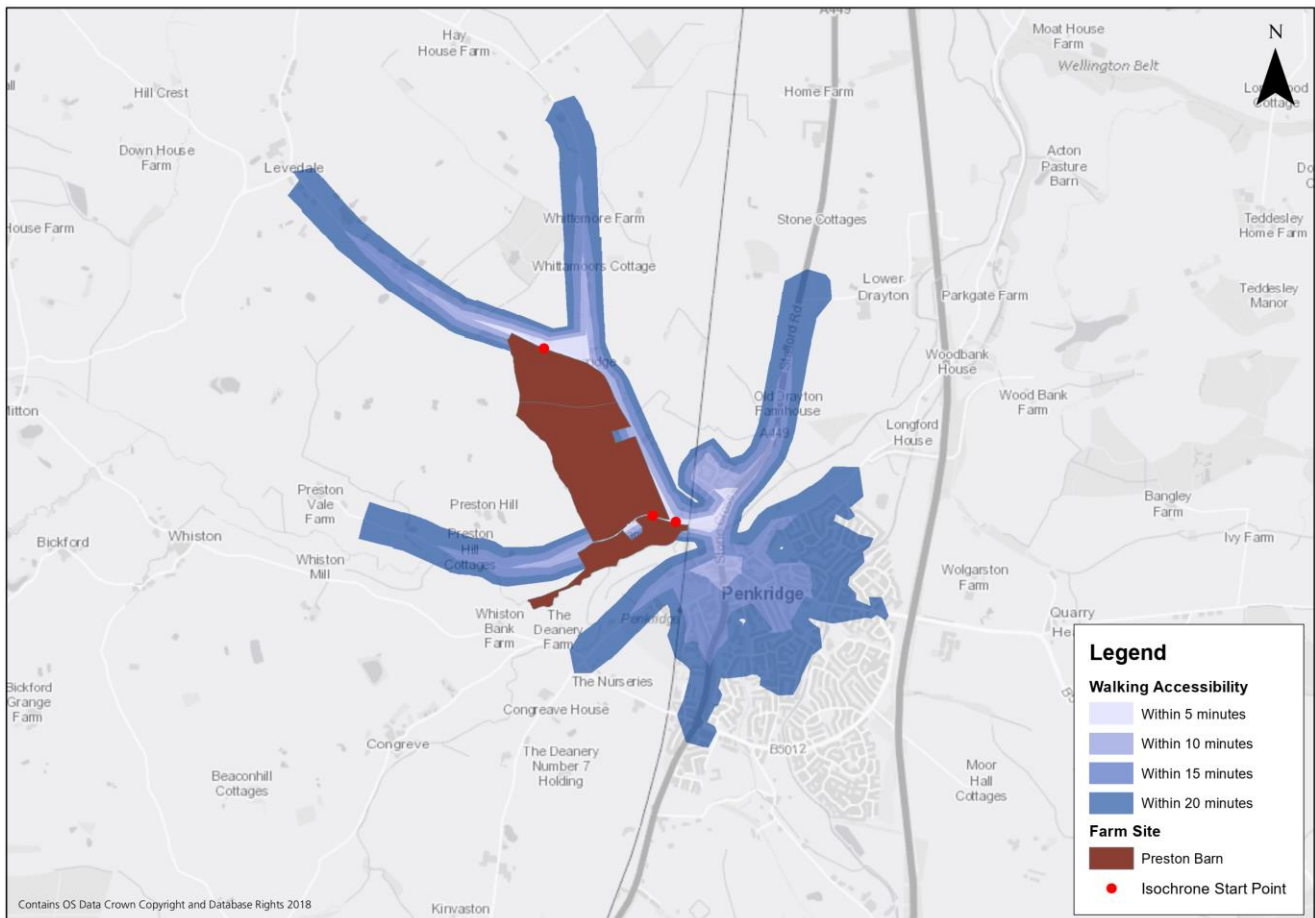
Table 5-1 indicates that bus stops, Penkridge Railway Station, a primary school, a GP surgery, a convenience store, and local employment opportunities are located within a 20-minute walk or 10-minute cycle of the Preston Barn Estate. The secondary school is located within a 30-minute walk or 10-minute cycle of the Preston Barn Estate.

SCC Residential Design Guidance recommends that residential developments with more than 500 dwellings should provide shopping and employment facilities on site. Therefore, it is considered that the Preston Barn Estate should contain a local neighbourhood centre comprising of local amenities/ facilities (e.g. shops, health, education, and community facilities). This would increase the sustainability and accessibility from a walking and cycling perspective of the Preston Barn Estate.

To further demonstrate the accessibility of the Preston Barn Estate, walking isochrones have been produced which demonstrate the distance which can be walked from the site within 20 minutes based on a walking speed of 1.4m/s<sup>4</sup>. It is therefore assumed that pedestrians can walk 420m in 5 minutes, 840m in 10 minutes, 1260m in 15 minutes and 1680m in 20 minutes. Figure 5-5 demonstrates that it is possible to reach most of Penkridge town centre within a 20-minute walk.

<sup>4</sup> (CIHT) Providing for Journeys on Foot

Figure 5-5 - Preston Barn Estate - Walking Isochrone



However, the existing highway network requires NMUs to walk and cycle along a live carriageway. Therefore, to improve the sustainability of the Preston Barn Estate it is recommended that new 4-metre wide shared footways with street lighting columns are provided along Preston Vale Lane and Levedale Road to permit high quality and safe connectivity between the Preston Barn Estate and Penkridge.

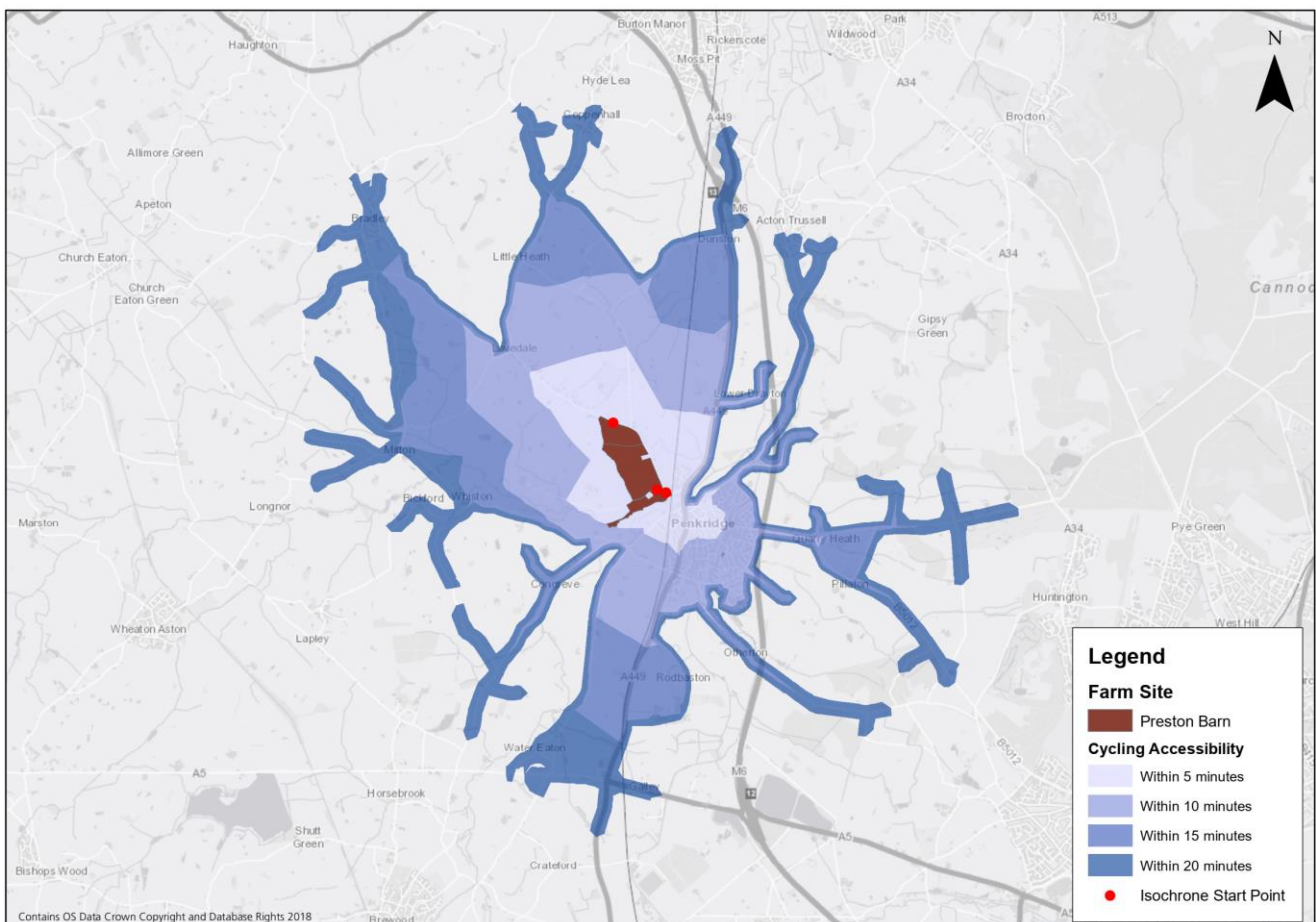
In addition, Levedale Road tunnel (see Figure 5-6) would require widening to accommodate a new 4 metre shared footway for pedestrians and cyclists to provide connectivity under the railway line between the Preston Barn Estate and Penkridge.

Figure 5-6 - Levedale Road - Tunnel



Figure 5-7 demonstrates that based on a cycling speed of 4.4m/s, it is possible to reach the centre of Penkridge, and most of the local amenities/ facilities identified in Table 5-1 within a 10-minute cycle of the Preston Barn Estate.

Figure 5-7 - Preston Barn Estate - Cycling Isochrone





## 5.5. Public transport

As identified, there is a bus stop located within 0.8km of the Preston Barn Estate, taken as an average distance from the Preston Barn Estate. The Goods Station Lane bus stop on the A449 Stafford Road is served by six existing services (54/ 54A/ 75/ 75A/ 75B/ 878) which provide a daily service frequency of up to every 60 minutes to the following destinations Stafford, Penkridge town centre, Wheaton Aston, Brewood, i54, Wolverhampton, and Cannock.

According to SCC Residential Design Guidance, houses should be located within 350 metres of a bus stop. Therefore, new bus stops and a new bus service would be required to serve the Preston Barn Estate. This aligns with the SCC Residential Design Guidance objective of reducing levels of private car use.

## 5.6. Trip generation

As identified, it is considered that there is the potential to provide three vehicular access points to serve the Preston Barn Estate based on the existing local highway network. Based on the site area, SCC consider that the Preston Barn Estate has the potential to accommodate, 1,067 dwellings.

To accommodate this number of dwellings for the development, a residential spine road (collector road) would be required (in accordance with the SCC Residential Design Guidance) to serve the northern land parcel of Preston Barn Estate from the Levedale Road and inter-parcel connection vehicular access points.

According to SCC guidance, a residential spine road (collector road) can serve up to 500 dwellings by either a loop road or inter-connected street pattern served by at least two points of access to the distributor network. This can be increased by 250 dwellings with each additional vehicle access point.

A minor residential access road which can serve up to 200 dwellings would be required to serve the southern land parcel south of Preston Barn Estate from the inter-parcel connection on Preston Vale Lane.

It is not considered that the full 1,067 dwellings can be developed on the Preston Barn Estate based on the vehicular access points identified in this report. However, it is considered that a smaller number of dwellings could be delivered with up to 500 dwellings on the northern land parcels, and up to 200 dwellings on the southern land parcel.

To determine the level of vehicular trip generation which could potentially be accommodated by the proposed vehicular access points, the multi-modal trip generation for the Preston Barn Estate has been calculated (see Table 5-2).

**Table 5-2 - Preston Barn Estate - Multi-modal trip generation**

Time Period	Land Parcel Size (Hectares)	Potential Capacity (Dwellings)	Total Person Trip Generation		Vehicular Trip Generation		Cyclists		Pedestrians		Bus/ Tram		Public Transport Users	
			Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
AM Peak	54.73	1067	186	601	141	406	4	14	41	132	0	20	0	29
PM Peak			477	233	358	172	16	10	75	45	12	3	17	3

The multi-modal trip generation outlined in Table 5-2 indicates that the Preston Barn Estate could generate up to 547 two-way vehicular trips during the AM Peak period, and a total of 530 two-way vehicular trips during the PM Peak period.

## 5.7. Preliminary cost estimates

High-level preliminary cost estimates have been calculated for the transport infrastructure required to deliver residential development on the Preston Barn Estate. The average total cost estimate is £3,400,000. A full breakdown of the preliminary cost estimates calculated is provided in Appendix A of this report, including a full list of the assumptions.

The transport infrastructure required is outlined below:

- New four-arm priority-controlled roundabout on Preston Vale Lane;
- New three-arm priority-controlled junction on Levedale Road;
- Signalisation of Levedale Road/ A449 Stafford Road junction;
- Widen carriageway on Preston Vale Lane;
- New shared footway along Levedale Road and Preston Vale Lane;
- Widen Levedale Tunnel to accommodate pedestrian and cyclist provision;

- Traffic Regulation Order (TRO) required on Levedale Road and Preston Vale Lane to reduce the 60mph speed limit to accommodate the proposed site access points;
- New bus stops and bus service; and
- Street lighting at vehicle access points and new shared footways.

## 5.8. Summary

In summary, the main constraint associated with the development of the Preston Barn Estate is the limited pedestrian and cyclist provision and the limited connectivity between the Preston Barn Estate and Penkrudge town centre. This report has identified that there are no existing pedestrian footways west of the railway line which provide access to the Preston Barn Estate, nor is there any formal cycle infrastructure either. Whilst, there is a range of local amenities/ facilities located within Penkrudge, NMUs are required to interact with sections of live carriageway to access them. Therefore, it is considered that the Preston Barn Estate is located within an unsustainable location based on the current infrastructure provision.

Another constraint of developing the Preston Barn Estate is the existing public transport provision is sub-standard; the nearest bus stop to the Preston Barn Estate is approximately 0.8km away and the frequency of buses is poor. Therefore, to meet SCC Design Guidance new bus stops and bus services will be required to ensure all dwellings are within 350 metres of a bus stop which has a regular bus service.

Two locations have been identified which could potentially provide three opportunities for vehicular access to the Preston Barn Estate subject to additional carriageway works and upgrading, and no major highway constraints have been identified.

Significant highway and transport infrastructure is required to support the development of the Preston Barn Estate. A high-level cost estimate of £3,400,000 has been calculated for the site access junctions and off-site improvements.

## 6. Summary and Conclusion

### 6.1. Overview

Atkins has been commissioned by SCC to prepare a high-level transport appraisal report in relation to several farm disposal sites located to the west of Penkridge, Staffordshire. The farm disposal sites have been identified by SCC as they are seeking to understand their potential to be developed for residential use.

This appraisal report has considered the following farm disposal sites in Penkridge:

- Deanery Estate & Rodbaston Estate
- Levedale Estate
- Preston Barn Estate

SCC have estimated the number of dwellings which could be potentially accommodated on each farm disposal site based on the site area. This report has presented a proportionate assessment of the farm disposal sites and has considered the transport infrastructure required to deliver residential development on each of the sites.

High-level cost estimates have been calculated for the transport infrastructure identified (note that the high-level cost estimates do not include for the transport infrastructure required within the internal site boundary). The transport infrastructure required, and approximate average total cost estimates are outlined below:

- |                                     |                    |
|-------------------------------------|--------------------|
| • Deanery Estate & Rodbaston Estate | <b>£14,900,000</b> |
| • Levedale Estate                   | <b>£3,000,000</b>  |
| • Preston Barn Estate               | <b>£3,400,000</b>  |

### 6.2. Transport Planning next steps

The following bullets provide a summary of the key next steps from a transport perspective to build upon the findings of this report.

#### 6.2.1. Deanery Estate & Rodbaston Estate

- Liaise with utility companies to obtain additional information regarding utility structures which could impact on access designs;
- Obtain land ownership and highway boundary information;
- Develop a preliminary design to determine feasibility of the proposed roundabout on A449 Stafford Road and A449 realignment;
- Develop a preliminary design to determine feasibility of new bridge over railway line as part of the new proposed vehicular access point into the Deanery Estate from the A449 Stafford Road;
- Develop a preliminary design to determine feasibility of widening the carriageway and accommodating pedestrian and cyclist facilities at Bungham Lane overbridge;
- Develop a preliminary design to determine feasibility of widening the carriageway and accommodating pedestrian and cyclist facilities at Pinfold Lane/ Whiston Road overbridge;
- Develop a preliminary design to determine feasibility of new roundabout at Water Eaton Lane/ Pinfold Lane/ Bungham Lane; and
- Test junction capacity of the proposed site accesses to establish capacity.

#### 6.2.2. Levedale Estate

- Obtain land ownership and highway boundary information;
- Develop a preliminary design to determine feasibility of the proposed new two new junctions on Levedale Road;
- Develop a preliminary design to determine feasibility of the proposed new three-arm priority-controlled roundabout at Levedale Road/ Whittamore Lane;
- Develop a preliminary design to determine feasibility of widening/ accommodating pedestrian and cyclist facilities at Levedale Road tunnel;

- Determine the feasibility and test junction capacity of signalling Levedale Road/ A449 Stafford Road junction; and
- Test junction capacity of the proposed site accesses to establish capacity.

### 6.2.3. Preston Barn Estate

- Obtain land ownership and highway boundary information;
- Develop a preliminary design to determine feasibility of the proposed new junction on Levedale Road;
- Develop a preliminary design to determine feasibility of the proposed new roundabout on Preston Vale Lane;
- Develop a preliminary design to determine feasibility of widening/ accommodating pedestrian and cyclist facilities at Levedale Road tunnel;
- Determine the feasibility and test junction capacity of signalling Levedale Road/ A449 Stafford Road junction; and
- Test junction capacity of the proposed site accesses to establish capacity.

# Appendix A. Preliminary cost estimates



**Project Name: SCC Farm Disposal Sites Transport Appraisal**

**ASSUMPTIONS**

**The following assumptions have been made when calculating the high-level preliminary cost estimate for each farm site:**

SPONs 2010 rates have been factored up to today's (2019) prices using RPI

44% Optimism Bias has been applied to item costs

It has been assumed that the widening requirements for pedestrian/cyclist footway at Levedale Tunnel is not possible to be achieved by widening of the actual structure. Therefore we have included additional carriageway provision/ footway provision through the adjacent archway. Please note this is also a flood plain area, based on the Environment Agency website, thus prices have been inflated to account for the raised level of requirement. This applies to Preston Barn Estate and Levedale Estate costings.

New Bus Service Developer Contribution Costings have been calculated using 2011 Census Data from Nomis ([https://www.nomisweb.co.uk/sources/census\\_2011](https://www.nomisweb.co.uk/sources/census_2011)), Arriva Bus Ticket Price data (<https://tickets.arrivabus.co.uk/midlands/cannock-and-stafford/>) correct as of May 2019, and a 161 dwellings per year build out rate as stated as the average residential build out rate for developments of >2,000 dwellings (<https://lichfields.uk/media/1728/start-to-finish.pdf>). Further it has been assumed that developer contributions will terminate either when the full residential development has been built out or when the bus service becomes self-sufficient.

**EXCLUSIONS**

**No allowance at this stage has been made for:**

Any Statutory diversions/ protection required

Any third party land taking requirements

Any fees associated with design/ supervision, checking

**Project Name: SCC Farm Disposal Sites Transport Appraisal**

**Farm Disposal Site: Deanery Estate/ Rodbaston Estate**

ITEM	DESCRIPTION	UPPER COST	LOWER COST	MEAN COST
<b>Vehicle Access</b>				
2 new priority controlled junctions	Two 3-arm priority controlled junctions. Includes cost of new street lighting provision at vehicle access points.	£311,040	£241,920	<b>£276,480</b>
2 new roundabouts	One new 3 arm priority controlled roundabout on A449 Stafford Road. One new 4 arm priority controlled roundabout at Water Eaton Lane/Pinfold Lane/ Whiston Road. Includes cost of new street lighting provision at vehicle access points.	£777,600	£596,160	<b>£686,880</b>
Realign Road	Realign A449 Stafford Road by Rodbaston Drive to accommodate new roundabout and link road.	£1,231,200	£987,840	<b>£1,109,520</b>
New bridge	One new bridge 6m wide over railway line to accommodate new link road into development. Bridge needs to be wide enough to accommodate two-way vehicle flow and 2m footway.	£1,872,000	£993,600	<b>£1,432,800</b>
New road	New access road from the A449 Stafford Road over the new bridge to provide access into Deanery Estate. The new road is approx 200m in length. (PE 450m length based on sagan d crest curve requirements)	£3,877,920	£3,656,160	<b>£3,767,040</b>
Widen Bridge	Widen Bungham Lane bridge to include capacity for two way vehicle traffic (approx. 6m wide) and shared footway (approx. 4m wide). Widen bridge over Whiston Road to 6m wide carriageway.	£1,879,200	£1,135,440	<b>£1,507,320</b>
Widen road	Widen Water Eaton Lane, Bungham Lane and Whiston Road to 6m to allow two-way free flow of traffic.	£4,521,600	£2,833,920	<b>£3,677,760</b>
<b>Pedestrian and Cyclist Access</b>				
New 4 metre wide shared footway	Widen Water Eaton Lane (500m in distance), Bungham Lane (1,250m in distance) and Whiston Road (1,250m in distance) to accommodate new 4 metre wide shared footway on one side of the road. Includes cost of new street lighting on shared footway.	£1,261,440	£1,088,640	<b>£1,175,040</b>
<b>Public Transport</b>				
Bus Service and Bus Stops	A new bus service and bus stops would need to be provided	£72,000	£36,000	<b>£54,000</b>
New bus service	New bus service would be required to serve the Aston Hall Estate. The cost provided here is the amount the developer would be required to contribute.	£1,403,292	£982,868	<b>£1,193,080</b>
<b>TOTAL COST</b>		<b>£17,207,292</b>	<b>£12,552,548</b>	<b>£14,879,920</b>

**Project Name: SCC Farm Disposal Sites Transport Appraisal**

**Farm Disposal Site: Levedale Estate**

ITEM	DESCRIPTION	UPPER COST	LOWER COST	MEAN COST
<b>Vehicle Access</b>				
2 new vehicle access points	Two new 3 arm major/minor priority controlled junctions on Levedale Road. Includes cost for street lighting provision at vehicle access points.	£311,040	£241,920	<b>£276,480</b>
1 new roundabout	One new 3 arm priority controlled roundabout on Levedale Road.	£246,240	£180,000	<b>£213,120</b>
Signalise Junction	Signalise junction of A449 Stafford Road/Levedale Road/Goods Station Lane junction.	£122,400	£72,000	<b>£97,200</b>
Widen tunnel	Widen Levedale Road Tunnel arches to accommodate 4 metre wide shared footway. Includes cost of street lighting provision.	£532,800	£426,240	<b>£479,520</b>
<b>Pedestrian and Cyclist Access</b>				
New 4 metre wide shared footway	Widen Levedale Road to accommodate new 4 metre wide shared footway approximately 2,000 metres in length on one side of the road. Includes cost of street lighting provision on shared footway.	£900,000	£767,520	<b>£833,760</b>
<b>Public Transport</b>				
Bus Service and Bus Stops	A new bus service and bus stops would need to be provided	£72,000	£36,000	<b>£54,000</b>
New bus service	New bus service would be required to serve the Aston Hall Estate. The cost provided here is the amount the developer would be required to contribute.	£1,254,047	£876,405	<b>£1,065,226</b>
<b>TOTAL COST</b>		<b>£3,438,527</b>	<b>£2,600,085</b>	<b>£3,019,306</b>

**Project Name: SCC Farm Disposal Sites Transport Appraisal**

**Farm Disposal Site: Preston Barn Estate**

ITEM	DESCRIPTION	UPPER COST	LOWER COST	MEAN COST
<b>Vehicle Access</b>				
1 new priority controlled vehicle access point	New three arm major/minor priority controlled junctions on Levedale Road. Includes cost of new street lighting provision at junction.	£296,640	£237,600	<b>£267,120</b>
1 new roundabout	New four arm priority controlled roundabout on Preston Vale Lane. Includes cost of new street lighting provision at vehicle access.	£531,360	£416,160	<b>£473,760</b>
Junction improvement	New four arm signal controlled junction on A449 Stafford Road/Leveldale Road/Goods Station Lane junction.	£122,400	£72,000	<b>£97,200</b>
Widen road	Widen Preston Vale Lane to 6m to accommodate two-way vehicle flow. Approximately 500m in distance.	£722,880	£472,320	<b>£597,600</b>
<b>Pedestrian and Cyclist Access</b>				
New 4 metre wide shared footway	Widen Levedale Road (approximately 1000m in distance) and Preston Vale Lane (approximately 500m in distance) to accommodate new 4 metre wide shared footway on one side of the road. Includes cost for new street lighting provision along shared footway.	£688,320	£581,760	<b>£635,040</b>
Widen tunnel	Widen levedale Road Tunnel arches to accommodate 4 metre wide shared footway. Includes cost of new street lighting provision.	£532,800	£426,240	<b>£479,520</b>
<b>Public Transport</b>				
Bus Service and Bus Stops	A new bus service and bus stops would need to be provided	£72,000	£36,000	<b>£54,000</b>
New bus service	New bus service would be required to serve the Aston Hall Estate. The cost provided here is the amount the developer would be required to contribute.	£965,345	£644,303	<b>£804,824</b>
<b>TOTAL COST</b>		<b>£3,931,745</b>	<b>£2,886,383</b>	<b>£3,409,064</b>

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