BASSETLAW LOCAL PLAN
MORTON GARDEN VILLAGE STATION FEASIBILITY ASSESSMENT
Technical Note 2

Technical Note

12 November 2020

Contents

1.0 Background

1.1.1 WYG previously provided a high-level assessment of the scope for a new station in Bassetlaw in our Rail Issues Technical Note (dated 29 August 2019) to support the emerging Bassetlaw Local Plan and the potential for sustainable travel to and from the proposed Garden Village. Following the consultation on the draft Bassetlaw Local Plan in January and feedback from relevant stakeholders, it was recognised that additional work on the feasibility of a potential station needed to be undertaken to support the progression of the Local Plan and Garden Village.

1.1.2 To achieve this, we have set out a series of actions below, which will help to provide the assurances required as part of the Local Plan process, that the station is necessary, deliverable and affordable.

1.1.3 These actions broadly follow the process we would have to adhere to in the production of a Business Case for such a scheme, and as a consequence, our outputs could be built upon at some point in the future as part of the development of a Strategic Outline Business Case (SOBC) to secure Central Government funding towards the station.

2.0 Optioneering

2.1 Overview

2.1.1 A Local Plan Planning Inspector would need to be confident that the provision of the station is a necessary focus for an integrated package of sustainable transport provision to and from the Garden Village. This would require an assessment of alternative rail and non-rail options, together with a 'do nothing' option, against an agreed set of criteria.

2.2 Long List

2.2.1 To meet these requirements, we have generated a long list of eight public transport based options to potentially serve the new Garden Village, including alternative locations of a new station as set out in Table 2.1.

Table 2.1: Long List of Interventions

Area	Ref.	Scheme Options
Bus	BS.01	Enhanced bus services between Garden Village and Retford/Worksop.
	BS.02	New dedicated bus services between Garden Village and Retford/Worksop.
	BS.03	Dedicated guided busway between Garden Village and Retford/Worksop.
Heavy Rail	HR.01	Station to the east of the B6420 (Mansfield Road).
	HR.02	Station to the west of the A1.
	HR.03	New station at a point between the A1 and the B6420.
Light Rail	LR.01	Light rail connection between Garden Village and Retford/Worksop.
Tram-Train	TT.01	Tram-train services between Garden Village and Retford/Worksop.

2.3 Assessment Criteria

2.3.1 Not all the above options present viable solutions to facilitate the development of the Garden Village. The sifting process focused on the ability of each measure to address locally specific objectives and deliverability issues which could form showstoppers preventing the options from having any realistic chance of implementation. Schemes were expected to contribute towards at least one of the objectives and present no major deliverability issues to be taken forward.

2.3.2 The assessment criteria which formed the basis to the assessment are contained within Table 2.2, together with the rationale behind their use and suitability. The criteria cover the key factors which will determine if the schemes are realistic and deliverable, and correlate with the broad framework of the Department for Transport's Early Assessment and Sifting Tool (EAST).

Table 2.2: Assessment Criteria

Area	Criteria	Rationale
Objectives		
Capacity	Increase in Public Transport Capacity	The ability of the intervention to enable more people to travel to and from the Garden Village using public transport at any given time. This could be related to additional seating on existing services, increased frequency of existing services or entirely new services.
	Scale of Catchment (Housing/Jobs)	The size/population of residential and employment areas that any particular intervention could serve, based upon the 400m and 800m distances widely acknowledged as being the thresholds for which people will walk to a bus stop or station.
Connectivity	Comparative Journey Times	The respective typical journey times by each option and their potential competitiveness compared to those of car-based travel.
	Reliability of Provision	The potential to achieve punctual and reliable service provision based upon the degree of segregation from general traffic and other modes and typical performance from similar schemes elsewhere in the country.
	Ease of Interchange	Facilitates enhanced transfer between different modes of public transport. This enlarges the jobs market catchment for residents looking to travel by sustainable modes of transport whilst also encouraging those in cars to make a switch should no direct public transport service between their origin and destination be available to them.
Deliverability		
Physical	Engineering Constraints	The apparent difficulty of delivering a particular intervention in its proposed location due to level differences, land availability and competing infrastructure.
	Environmental Constraints	The apparent difficulty of delivering a particular intervention in its proposed location due to local sensitivities in the natural environment which can include impacts upon green spaces, water courses and habitats.
Legal	Landownership	Considers the availability of land, the potential need to purchase land, the supportiveness of landowners, and the complexity of multiple landowners. Schemes score better when there are no land take requirements, land is under the control of the local authority, or where there is a commitment from a landowner to be supportive of any works.
	Planning	The extent to which the scheme is likely to require planning permission and the likelihood of planning permission being granted.
Support	Stakeholders	The apparent difficulty of delivering a particular intervention in its proposed location due to local opposition from operators, council members or the general public – including local residents and business owners.
Financial	Capital Costs	Provides an indicative high-level estimate in terms of the relative costs of the scheme options.

2.4 Results of the Assessment

2.4.1 The assessment of the long list highlighted that the provision of a new heavy rail station within the heart of the new Garden Village would provide the optimum solution in terms of offering a deliverable, high capacity mass transit connection to both Retford and Worksop. Table 2.3 summarises the rationale behind the rejection of the seven discounted options whilst Table 2.4 highlights each options' respective scoring against the assessment criteria.

Table 2.3: Basis for the Rejected Long List Schemes

Ref.	Scheme Options	Rationale for Rejection
BS.02	New dedicated bus services between Garden Village and Retford / Worksop.	Dedicated new bus services could be branded to raise awareness of the Garden Village service but wider demand may be limited due to the duplication of existing routes between Worksop and Retford. The timing at which new services are introduced can also be problematic and often require revenue support in the early years. It could also be questioned if a reliance on bus based mass transit is ambitious enough for a Garden Village and the sustainability credentials to be upheld.
BS.03	Dedicated guided busway between Garden Village and Retford / Worksop.	A guided busway would improve the speed, quality and capacity of bus service provision to both Retford and Worksop but would require significant land take and new structures to provide complete end to end segregated priority. This combined with the engineering complexities of access into both towns make it an unattractive option to take forward.
HR.01	Station to the east of the B6420 (Mansfield Road).	The concept of a new station to serve the Garden Village is sound, however locating it to the east of the A6420 (Mansfield Road) would place it outside of the heart of the new community and in close proximity to Retford Station with subsequent issues in terms of station spacings and timings for example. Its location on the periphery would reduce the propensity for new residents to walk or cycle to the station, but conversely could prove more attractive from a rail parkway perspective. On balance however, it is felt that a location at the heart of the new community would be more appropriate in meeting Garden City principles which are the basis of the Garden Village concept.
HR.02	Station to the west of the A1.	The concept of a new station to serve the Garden Village is sound, however locating it to the west of the A1 would place it outside of the heart of the new community and in close proximity to Worksop Station with subsequent issues in terms of station spacings and timings for example. Its location on the periphery would reduce the propensity for new residents to walk or cycle to the station, but conversely could prove more attractive from a rail parkway perspective. It would also benefit from an existing overbridge which could serve both platforms, and reduce capital costs. On balance however, it is felt that a location at the heart of the new community would be more appropriate in meeting the sustainability objectives of the Garden Village concept.

Ref.	Scheme Options	Rationale for Rejection
LR.01	Light rail connection between Garden Village and Retford / Worksop.	A light rail connection on a new alignment (albeit one which may run alongside the heavy rail line) would require significant land take and present significant engineering complexities, both of which would contribute to an extremely high capital cost. Light rail provision also works most successful in large urban areas and the Garden Village, even combined with both Retford and Worksop, does not provide the scale of demand likely to make services viable, particularly when it would also be in direct competition with heavy rail services.
TT.01	Tram-train services between Garden Village and Retford / Worksop.	The tram-train concept has been applied in nearby Sheffield/Rotherham and could take advantage of the existing rail line before services divert off into the heart of the new Garden Village. The viability of this option is questionable however and it is not felt that there is the critical mass and size of population to support regular services of this nature.

2.5 Short Listed Options

Location of a New Rail Station

2.5.1 The benefits of a new station would be maximised if it was located at a point between the A1 and the A6420. Historically, a station called Checkerhouse was previously in existence in this area, although it closed in 1931, not being convenient for anywhere in particular (Ranby, the nearest village, is 1.5 miles to the north). The station was originally immediately adjacent to the east of a level crossing where the A1 crossed the railway, but a bridge was provided to take the A1 over the railway in 1959.

2.5.2 There is no need for a new station to be located exactly at the site of the former Checkerhouse station and there would be no financial benefit in trying to utilise the remnants of the previous station. In addition, a station at this location wouldn't minimise walking distances for new residents, as it would be located in the far north western corner of the development site.

2.5.3 The key consideration from a rail perspective in terms of the citing of a new station is the location of the existing signals, which are highlighted in Figure 2.1. The existing remotely controlled red/green electronic signals are likely to have been positioned in the same location as the manually controlled signals they superseded[1], and which were installed to serve the previous Checkerhouse station.

2.5.4 The location of a new station between the current signals as shown in Figure 2.1 would ensure that all train movements in and out of the station could be adequately controlled. Locating the station elsewhere would require the relocation of the signals which could generate significant infrastructure works and incur costs of up to £0.5m.

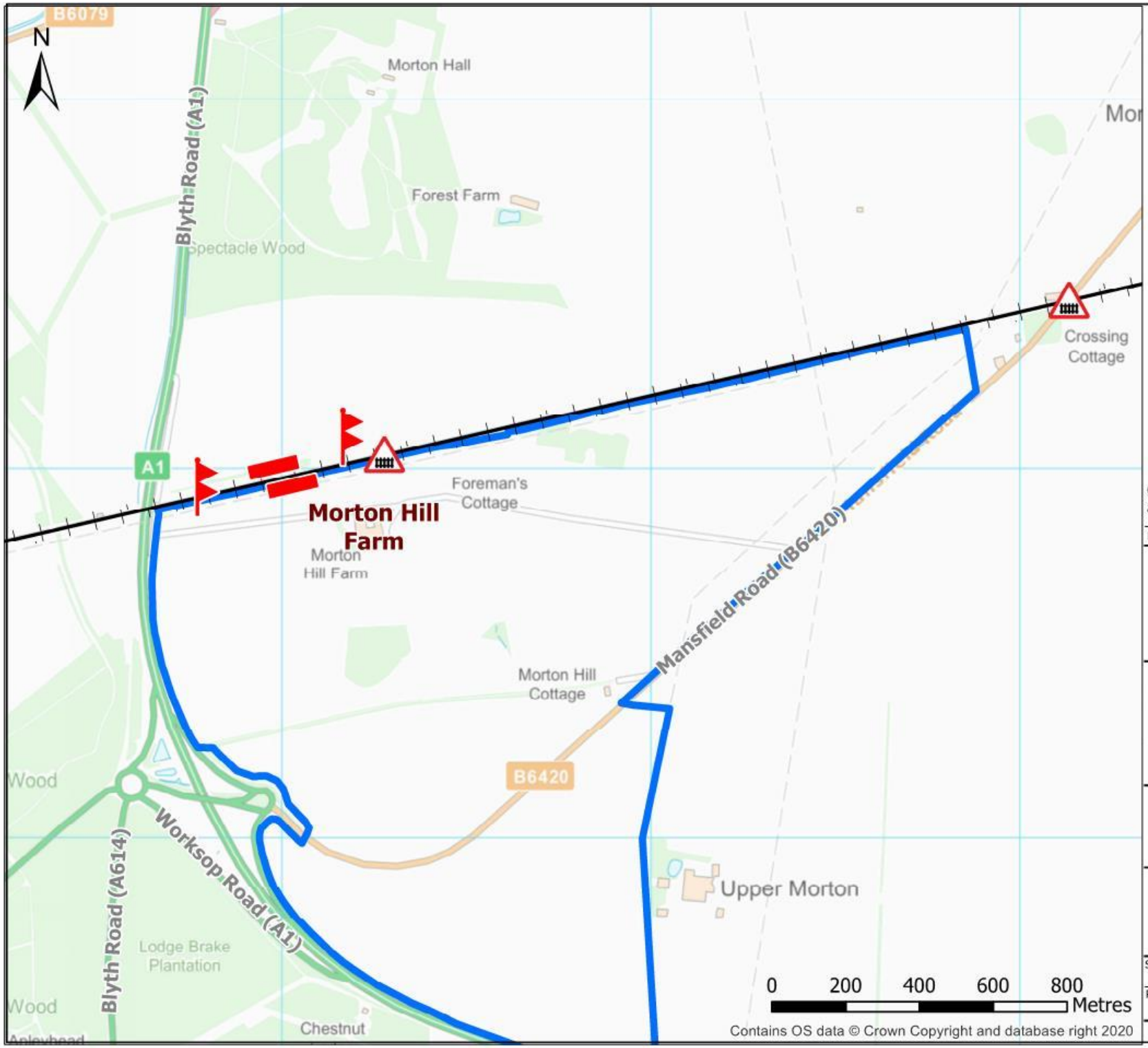
Bus Connectivity

2.5.5 The large-scale housing and employment provision proposed as part of the Garden Village provides opportunities to enhance existing bus services between Retford and Workshop. The current routing of the Stagecoach no.42 service largely runs through open countryside. The realignment of the route through the Garden Village could see it serve a significantly larger population thereby increasing the viability of the service and subsequently the potential to improve operational frequencies, and is supported in principle by the commercial bus operators. The nuances of future service provision, including routing through the Garden Village will be addressed once more detail of the proposals emerge.

[1] Manual operated signals are known as 'semaphore signals'.

Table 2.4: Long List Assessment Summary

Area of Intervention	Ref	Scheme	Description	Strategic Objectives					Deliverability Requirements						Verdict
				Capacity		Connectivity			Physical		Legal		Support	Financial	
				Scale of New Public Transport Capacity	Scale of Catchment & Potential Demand	Comparative Journey Time	Reliability of Provision	Ease of Interchange	Engineering Constraints	Environmental Constraints	Land Ownership Constraints	Planning Constraints	Anticipated Stakeholder Support	Capital Costs	
Bus	BS.01	Enhanced bus services between Garden Village and Retford/Worksop.	Divert existing bus services into the Garden Village and increase the levels of service frequency.	Low	High	Low	Neutral / Medium	Low	Very Low	Very Low	Very Low	Very Low	Low	£0 - £500,000	**Pass**
Bus	BS.02	New dedicated bus services between Garden Village and Retford/Worksop.	Provide new services to supplement existing bus service provision between the towns.	Neutral / Medium	High	Neutral / Medium	Neutral / Medium	Low	Very Low	Very Low	Very Low	Very Low	Neutral / Medium	£500,000 - £1m	**Reject**
Bus	BS.03	Dedicated guided busway between Garden Village and Retford/Worksop.	Operate bus services along a dedicated guided busway.	High	High	High	High	Low	Very High	Very High	Very High	Very High	Low	£10m - £50m	**Reject**
Heavy Rail	HR.01	Station to the east of the B6420 (Mansfield Road).	Provide a new station to the immediate east of the existing level crossing.	Very High	Low	Very High	High	Neutral / Medium	Neutral / Medium	Neutral / Medium	High	Neutral / Medium	High	£5m - £10m	**Reject**
Heavy Rail	HR.02	Station to the west of the A1.	Provide a new station to the west of the A1, adjacent to an existing overbridge.	Very High	Neutral / Medium	Very High	High	Neutral / Medium	Neutral / Medium	High	High	High	High	£1m - £5m	**Reject**
Heavy Rail	HR.03	New station at a point between the A1 and the B6420.	Potential utilise platforms from the original station to provide a new facility to the east of the A1.	Very High	Very High	Very High	High	High	Low	Low	Low	Neutral / Medium	Very High	£5m - £10m	**Pass**
Light Rail	LR.01	Light rail connection between Garden Village and Retford/Worksop.	Construct a light rail link between Worksop and Retford through the heart of the Garden Village.	Very High	Very High	High	Very High	High	Very High	Very High	Very High	Very High	Very Low	£50m +	**Reject**
Tram-Train	TT.01	Tram-train services between Garden Village and Retford/Worksop.	Run tram-trains along the existing heavy rail line between Worksop and Retford with services diverting into the Garden Village.	Very High	Very High	High	High	Very High	High	Neutral / Medium	Neutral / Medium	Neutral / Medium	Low	£10m - £50m	**Reject**



Legend

Site Boundary

Level crossing

Indicative Location of Proposed Railway Station

Platform

Signal

REV	DESCRIPTION	BY	CHK	APP	DATE

Client: Bassetlaw DISTRICT COUNCIL — North Nottinghamshire —

EXECUTIVE PARK
AVALON WAY
ANSTEY
LEICESTER
LE7 7GR
TEL: +44 (0)116 234 8000
FAX: +44 (0)116 234 8001
e-mail: leicester@wyg.com

Project:
Bassetlaw Local Plan

Figure 2.2:
Optimum Location of Station

Scale @ A3	Drawn	Date	Checked	Date	Approved	Date
NTS	BG	22/09/20	BK	22/09/20	ASG	22/09/20

Project No.	Office	Type	Drawing No.	Revision
A117771	35	18	006	-

3.0 Making the Case for the Station

3.1 Overview

3.1.1 Based upon our high level appraisal of the alternatives, it is apparent that a heavy rail station located in the heart of the new Garden Village provides the best opportunity to provide sustainable mass transit to and from Worksop, Retford and beyond. The nature of the facility to be provided and how it may operate are explored herein.

3.2 Strategic Case

3.2.1 A station at Morton could support the creation of a new settlement midway between Worksop and Retford. It is envisaged that up to 4,000 dwellings and 15 hectares of employment/commercial space could be provided in the area and these would require high capacity, high quality, fast and frequent public transport connections to reduce reliance on the car and ensure the long-term sustainability of the new community.

3.2.2 Direct benefits of the new station may include:

- **Commuter Link** – The station would provide access to existing services operating between Sheffield and Lincoln via Worksop and Retford ensuring the new settlement is within easy reach of the major employment centres in the sub-region. Connecting services available at Retford would also open up the possibility of longer distance rail-based commuting to Doncaster and Leeds in the north and London to the south, whilst Nottingham could be reached via the Robin Hood Line at Worksop. It could also improve access to employment opportunities east of Worksop and in Ranby. These services would offer a realistic alternative to the car for many, which bus-based public transport provision couldn't provide.
- **Parkway Station** – The proposed location, adjacent to the A1/A57 Apleyhead junction, also suggests that it could function as a Parkway Station for commuters wanting to travel into Sheffield, and to a lesser extent Worksop. This could help to reduce the volume of traffic, including on the A1 and A57, and supplement local demand for rail travel, thereby increasing the viability of investment in a new facility.
- **Gateway to Clumber Park** – The station would also provide scope to encourage more sustainable access to Clumber Park. At present the park is only realistically accessible by car. The new station could provide the opportunity for it to be served more sustainably with the additional provision of cycle hire facilities and a shuttle bus service, to coincide with major events for example.
- **Viability of Services** – Given that the station would also take advantage of existing train services operating on the line, it would reduce both the cost and risk of intervention, whilst the additional passenger numbers the station could generate may help to support long-term viability of the rail service, benefiting the wider community, and could generate the case for increasing the frequency of current rail services.
- **Density of Development** – The station could reduce reliance on the car and therefore potential levels of car ownership within the new community. This may enable the provision of housing at higher densities and ensure that general traffic does not dominate the public realm.

3.2.3 The station also has the potential to contribute towards wider benefits to not just the district, but the wider sub-region, including through:

- Reducing the volume of traffic on the wider network.
- Reduce parking pressure at other stations.
- Improve safety along the line through the removal of level crossings.
- Increase in public transport capacity.
- New opportunities for interchange.
- Environment, air quality and carbon benefits as a result of the transfer from road to rail.

Car Parking Provision at Neighbouring Stations

3.2.4 A new station at Morton and the abstraction of demand from other stations, may help to alleviate car parking problems experienced elsewhere.

3.2.5 At Worksop Station there are 100 car parking spaces available 24 hours a day at a cost of only £3. Similarly, at Retford Station there are a further 101 spaces, albeit considerably more expensive, at a cost of £10 per day. At Shireoaks Station, there is no dedicated car parking provision which causes parking issues and traffic flow issues within the village as people tend to park up and use the station as park and ride service into Sheffield.

3.2.6 Parking issues and the potential for future provision are being investigated in Shireoaks and there is community support for the provision of a dedicated car park close to the station on some redundant land. However, discussions are ongoing with Network Rail and the service provider; Northern.

3.2.7 From discussions with Bassetlaw District Council, station users and local businesses during a site visit on 17 September 2020, anecdotal evidence suggests that:

- Following discussions with the owner of a sandwich shop adjacent to Shireoaks Station, it was highlighted that commuter parking causes access problems along Shireoaks Row and Shireoaks Common (the roads on either side of the tracks) as a result of vehicles parked on both sides of the road. Whilst some on street parking restrictions are in place, they don't alleviate this issue.
- At Worksop Station, whilst the car park is typically very busy, you can always find a parking space according to the views of a Northern Trains representative interviewed on the station platform. On street parking restrictions are in place on surrounding roads.
- At Retford Station, a regular station user emphasised the very high parking demand on a typical weekday. This is reflected in the high parking charges in place, the comprehensiveness of on street parking restrictions on surrounding residential streets, and the presence of a privately operated car park serving the station, located around 400m from the station.

3.2.8 Figure 3.1 highlights the car parking provision in place at each station. However, during the site visit undertaken in September 2020, minimal car parking activity was observed due to the reduced demand for rail travel during the Covid-19 pandemic. Based on the anecdotal evidence the observed conditions were not typical.

3.3 Demand Forecasting

3.3.1 Initial calculations have been undertaken to quantify the potential level of demand and revenue which could be generated by the new station.

Patronage

3.3.2 In terms of actual patronage projections for the station, estimations have been made based on the scale of new development to be delivered, the resultant population, levels of economic activity and the current modal split of commuting trips across Bassetlaw.

3.3.3 If the current level of rail-based commuting across the district is applied (1.2% from the 2011 Census), it is envisaged that the station would accommodate around 42,000 trips per annum from a resident population approaching 9,500. Such a trip rate would equate to 84 two-way trips to/from the station each day (based upon 250 working days per year). This would put the station in a similar league to other stations on the line, such as Kiveton Bridge and Kiveton Park. Both of which also have a total population of about 10,000, although they also provide rail access for other villages such as South Anston and Wales.

3.3.4 However, if rail-based commuting accounted for 5% of all trips from the new development, the annual number of trips using the station would increase to around 175,000 before other journeys are considered, equating to around 350 two-way trips per day.

3.3.5 Given the location of the station (directly off the A1 at a major interchange), there may also be some potential for additional patronage to be generated through the provision of a Park and Ride facility, however at this stage it is hard to estimate the level of demand.

Figure 3.1: Car Parking Provision at Stations on the Sheffield to Lincoln Line

Worksop Station Car Park

Shireoaks Row, Shireoaks

Parking Restrictions, Shireoaks

Pay and Display, Worksop Station

Shireoaks Common, Shireoaks

Retford Station Car Park

Restrictions on Residential Streets, Retford

Victory Road Car Park, Retford

Boardings

3.3.6 At a more disaggregated level, one would expect a broadly-hourly service provision at the new station, giving 32 potential departures per day (16 each way). The majority of these would be expected to be Sheffield-focussed, giving a range of between 60 and 260 passengers travelling to Sheffield each day (based upon the daily trip forecast for low and high use scenarios).

3.3.7 With at least half of trips being in the three hours of the peak period, that could lead to between 10 and 40 people boarding the busiest train. The higher value of these could lead to overcrowding issues, but some of the passengers would be expected to alight in Worksop, allowing new passengers to take their place.

3.3.8 However, that is potentially only a longer-term issue, and would also be alleviated through peak-only extra stops on the Lincoln to Sheffield semi-fast services, which also pass by and (in the peaks) call at the other local stations on the line, in order both to provide capacity and a higher, more-attractive, service frequency.

Abstraction from Adjacent Stations

3.3.9 The proposed site is approximately four miles from both Worksop and Retford. For local services in the regions, the existing inter-station spacing is more than enough to sustain the insertion of another stop.

3.3.10 Typically, 50% of the demand from stations serving residential areas comes from places within 800m of the station, a fact which demonstrates how far this site is outside the normal catchment areas of the two existing stations.

3.3.11 We would therefore assess the potential of this station to abstract from its neighbours to be very low, especially as both Worksop and Retford have a better service offering with a wider range of destinations.

Maximising Demand in the Garden Village

3.3.12 Quite small adjustments to the exact pattern of development across the Garden Village could make a notable difference to the potential rail demand. For stations in residential areas, experience shows that 50% of passengers live within 800m, and there is some anecdotal evidence to disaggregate this: few people actually want to live right next to the station, but 100-200m distant is very attractive.

3.3.13 If the development included higher densities in places, without car-parking provision, at this sort of distance from the station, its inhabitants would be expected disproportionately to use the railway for their journeys. This could be complemented by a more commercial building (e.g. parade of shops, perhaps with upstairs offices) directly adjacent to the station, making it something of a focus of the local community.

3.4 Station Categorisation

3.4.1 There are over 2,500 stations on the National Rail network across the UK and these are classified into six categories from A to F. The classification is not a watertight system, since allocation to a category is based both on the function of the station, and the quantity of passengers using the station. The thresholds governing the latter have varied over time, in general upwards following the background trend in demand, but obviously effectively sharply downwards during the Coronavirus pandemic of 2020.

3.4.2 There is no obvious need for a new station to be staffed, not least because the larger towns on either side (Worksop and Retford) do have staffed stations. The new station will therefore be categorised (with about half the existing stations in the country) as a category F station.

3.4.3 Distinguishing between categories F1 and F2 by a demand-based threshold is unhelpful, when that threshold (100,000 trips p.a.) is about the number of trips expected at the new station. However, its function suggests that the lower F2 category will be appropriate, as this station will not be an interchange, and is not in an established town with urban (shopping, personal business, employment) facilities.

3.4.4 Stations in category F are expected to have shelter from inclement weather, seating, lighting, security features, a departure sheet and real-time information display on each platform, and local information at the entrance area. This provides a basic specification which enables an indicative costing.

4.0 Refining the Scheme

4.1 Overview

4.1.1 With a case for the provision of a new station emerging, this section seeks to touch upon some of the features which may shape the look and feel of the station and the services which operate through it.

4.2 Constraints

4.2.1 The site for the potential new station is relatively free of constraints. The track is straight, and the topography is flat. In the wider context for the Garden Village, there are several features that should be retained and potential impacts that need to be addressed, albeit none of which could be considered showstoppers to provision of a new station, as illustrated in Figure 4.1.

4.3 Design Features

4.3.1 In order to minimise the costs of providing a new station, it is recommended that any changes to the existing signalling are avoided. With signal overlaps[2] required to be 200m, and it being operationally helpful to have 'starter' signals[3] to control the departure from stations, the location of two of the existing signals suggests a location slightly to the east of the former Checkerhouse Station as depicted in Figure 2.1.

4.3.2 It should be noted that the two platforms do not have to be directly opposite each other; a degree of staggering may be required. The required length of the platforms also needs to be considered. One would expect the new station to have platforms capable of accommodating a 4-car DMU (diesel multiple unit – i.e. units which do not require a dedicated engine at the front of the train). The Class 195 DMUs recently introduced on this line are 24m long so, allowing for a few metres spare, the platform should be 105m long.

4.3.3 Platforms of this length, 200m from the existing signals, would lead to a layout as shown in Figure 2.1.

4.3.4 The south (westbound) platform would be approached by a ramp from the west of the station, whilst a fully-accessible footbridge with lifts would start here (although the ramped access for that would zigzag towards the A1 overbridge) to provide access to the north (eastbound) platform.

4.4 Indicative Timetable and Destinations served by the Station

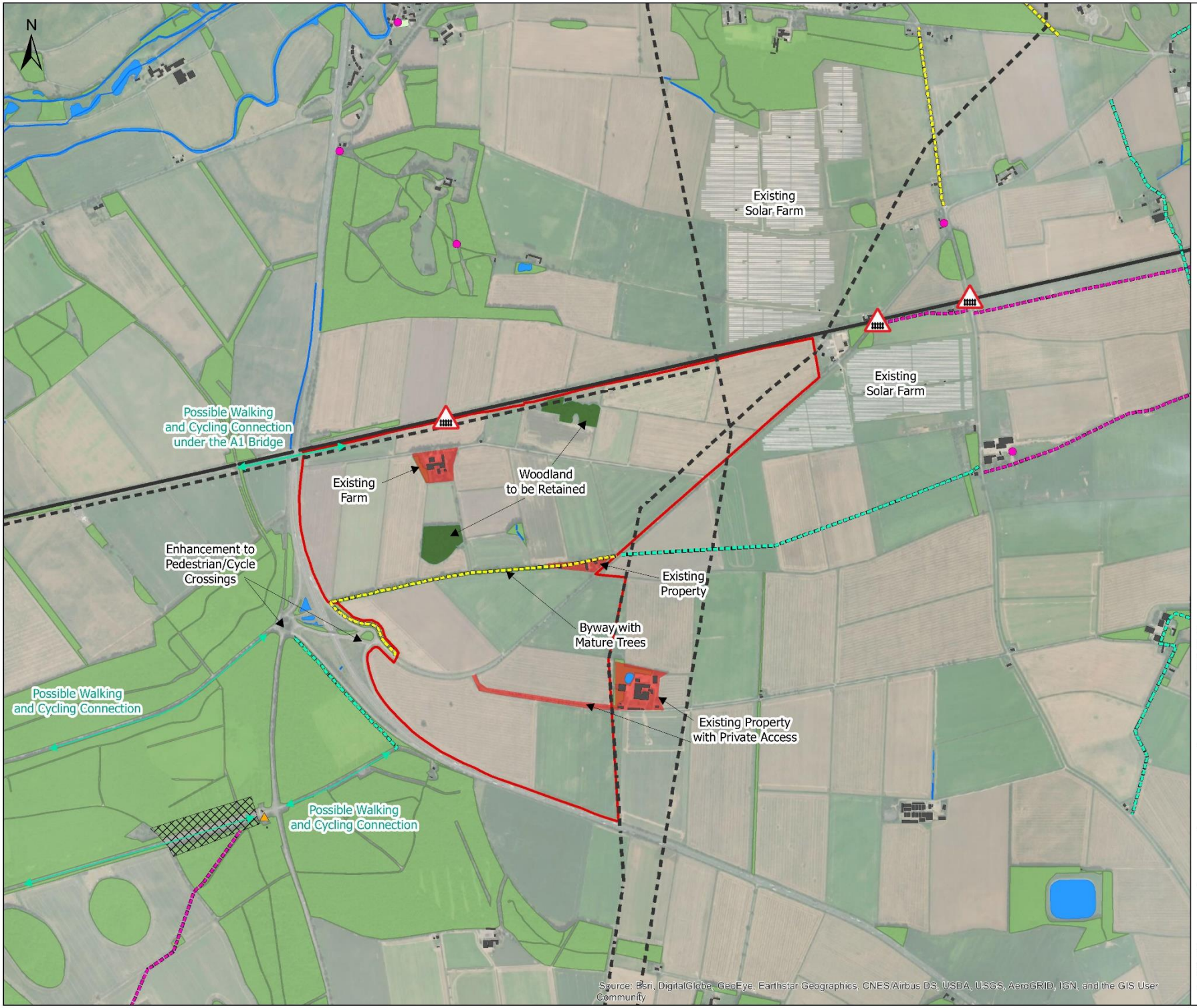
Services

4.4.1 The Bassetlaw site is currently passed by two trains per hour in each direction. One of these is typically a semi-fast service from Lincoln to Leeds via Sheffield (although it does make some extra stops during peak hours on this line) whilst the other (introduced in 2019) is an all-stations service between Gainsborough Central and Sheffield. Both formed part of the Northern franchise specification until the Government took the railways under direct control earlier this year.

4.4.2 Our judgment is that it is entirely appropriate for all the passing all-stations services to call at the new station, since they have capacity. This would provide an all-day hourly service, giving Morton direct trains to Sheffield, Worksop, Retford and Gainsborough. These might reasonably be supplemented by extra calls in the Lincoln semi-fast services during peak periods, in order to provide a half-hourly frequency at those times (see Appendix A).

[2] Signal overlap: the safety margin distance between a signal and the section of track it is controlling.

[3] Starter signals: signals traditionally located at the end of platforms, to give permission for drivers to start trains away from station stops.



Legend

- Proposed Garden Village

Woodlands

- Woodland to be Retained
- Woodland
- Site of Special Scientific Interest (Clumber Park)

Public Rights of Way

- Footpath
- Bridleway
- Byway Open to All Traffic
- Railway Track
- Level crossing
- Electricity Transmission Line

Listed Buildings

- Grade I
- Grade II

REV	DESCRIPTION	BY	CHK	APP	DATE

Client: Bassetlaw District Council — North Nottinghamshire

EXECUTIVE PARK
AVALON WAY
ANSTEY
LEICESTER
LE7 7GR
TEL: +44 (0)116 234 8000
FAX: +44 (0)116 234 8001
e-mail: leicester@wyg.com

Project: Bassetlaw Local Plan

Drawing Title: Constraints Plan

Scale @ A3	Drawn	Date	Checked	Date	Approved	Date
NTS	PJ	13/08/20	BK	13/08/20	ASG	13/08/20

Project No.	Office	Type	Drawing No.	Revision
A117771	35	18	002	-

Timetabling

4.4.3 From a timetabling perspective, the 'busy' end of the route is the Sheffield end. In particular, the last 800m into Sheffield (from Nunnery Main Line Junction) is particularly congested, since the route from Worksop joins other routes from Barnsley, Leeds, York and Doncaster, and only two tracks are available. We have therefore assumed that that western end of the route should be regarded as fixed i.e. any changes required to accommodate the stop at Morton Garden Village should be at the other (eastern) end of the route.

4.4.4 When a train makes an additional station stop, extra time is required. This includes the time losses incurred whilst braking and re-accelerating, as well as the time spent stationary. The exact time loss depends primarily on the line speed through the location of concern: the greater that line speed, the greater the time loss incurred from an extra stop. The braking and (more particularly) acceleration characteristics of the rolling stock also affect the time loss.

4.4.5 The line speed through this location is 60mph[4]. Our calculations show that the loss of time from stopping at Morton Garden Village would be around 35 seconds from the braking and acceleration phases which, together with a fairly-generous allowance of 55 seconds for the station stop, would add 90 seconds to schedules in each direction.

4.4.6 The services to/from Lincoln are currently given significant time (20-40 minutes) at Lincoln before returning to Sheffield. Only those services running in peak commuting periods in the peak direction would be expected to call at Morton Garden Village, to provide it with a half-hourly service to Worksop and Sheffield.

4.4.7 Whilst there might be particular issues with specific freight trains between Gainsborough and Lincoln (issues which should be resolvable during detailed timetabling work at the time of service introduction), in general it would appear relatively easy to run these few services 90 seconds later in the eastbound direction and 90 seconds earlier in the westbound direction as appropriate.

4.4.8 Similarly, the services to/from Gainsborough Central are typically given 26 minutes to turn round there (arriving at 50 minutes past the hour, departing at 16 minutes past the hour). Here, however, there is a bigger caveat: there are crossing movements with freight trains at (Gainsborough) Trent Junction, and amending the timings of the Gainsborough Central services might cause them to miss their 'slot' at this location. Nevertheless, the significant amount of slack available (compared to a minimum required turnround of (say) 10 minutes) gives us every confidence that these issues could also be resolved.

4.4.9 The only exceptions to the above relate to a couple of early morning trains from Sheffield to Retford, which provide peak commuter workings back again after a minimum turnround time at Retford. Those trains might need to be re-timed 90 seconds earlier in the eastbound direction, so that they maintain their turnround time at Retford.

Train Occupancy

4.4.10 Of the trains considered for the extra stop at Morton Garden Village, the Gainsborough trains are particularly lightly-loaded at this end of the route, whilst the Lincoln trains are busier but are only to stop during peak periods. Whilst detailed passenger loadings are not available at this stage, we would be surprised if the average on-train load passing this site exceeded 20 passengers. Even at the Sheffield end of the route, we were not aware of any train capacity issues even before the Coronavirus pandemic.

4.4.11 In summary, there is enough slack in the timetable at the eastern end of the route that re-timings of existing trains are possible, without increasing the Peak Vehicle Requirement[5]. Appendix A provides suggested timings (existing and future) for the morning period.

4 Network Rail LNE Sectional Appendix, route reference LN736.

5 Peak Vehicle Requirement: the maximum number of trainsets required to run a train service, usually at its maximum during one or other of the commuter peaks.

5.0 Assurances over Deliverability

5.1 Overview

5.1.1 The successful allocation of the Garden Village in the Local Plan will require assurances that the station is deliverable to provide a long-term sustainable travel option. This section seeks to provide those assurances and in doing so focuses on some of the aspects required to be included in the Commercial, Financial and Management Cases of a Business Case.

5.2 Support of Stakeholders

5.2.1 The deliverability of a new station will be heavily dependent upon the support of Network Rail and the Train Operating Companies (TOCs) who would serve it, together with Nottinghamshire County Council as the local transport authority and Highways England as the strategic highway authority.

5.2.2 Initial discussions were held with the County Council, Network Rail and Northern, who operate the current Sheffield to Lincoln service, between July and August 2019 and follow up meetings were held with all three organisations, plus Highways England in August 2020. A summary of their feedback is set out below.

Northern

5.2.3 Discussions were held with Pete Myers, the Stakeholder Manager for Northern on 23 July 2019 and 7 August 2020. In principle, Northern support a new station at Morton. It was questioned if the location of the station would function effectively as a Parkway Station to serve either Sheffield or Lincoln, but they could see a role for it in providing access to the rail network for many of the surrounding villages, as well as the Garden Village itself.

5.2.4 From an infrastructure perspective there are not considered to be any real issues. The line is straight and there are no other stops, although advice from Network Rail would be required in terms of the most appropriate location.

5.2.5 It was stated that there would be no financial benefit in using the remnants of the former Checkerhouse Station platforms on the site as they would have to be reconstructed. The former station location is therefore not a key factor in deciding the optimum location for a new station and instead the location of the existing signals (as their relocation could add significant additional costs) and the accessibility of the new station from the new community should be the key drivers.

5.2.6 In terms of timetabling, demand on the line is driven by Sheffield for commuting, with trips to Lincoln being more for leisure purposes and the station would be well placed at a mid-point between Worksop and Retford to function effectively.

5.2.7 At present two trains per hour use the line, one to/from Gainsborough and one to/from Lincoln. The Gainsborough train is slow and stops at all stations, and with a 30-minute turnaround time at Gainsborough, there is unlikely to be a detrimental effect on longer distance patronage of proving an additional stop at Morton.

5.2.8 The Lincoln train however is fast and there would be ramifications in terms of the impact on longer distance travellers, as a result of the slower journeys an additional stop would create. However, the provision of a Park and Ride site could improve the case for a new stop on the Lincoln service (at the expense of the longer distance trips).

Network Rail

5.2.9 A tele-conference was held with Stephen Hind, the Route Enhancement Manager at Network Rail on 27 August 2019. In principle Network Rail support the new station if it can be demonstrated that there is capacity on the line to accommodate scheduled services.

5.2.10 It was noted that whilst a station may have historically been on the site, the previous station location may not be the most appropriate for a modern station and so all options should be considered.

5.2.11 The closure of the three level crossings on the Sheffield to Lincoln Line close to the site would be welcomed.

5.2.12 Finally, it was estimated that a new station in the broad location identified on the Sheffield to Lincoln Line, including the provision of a lift or ramps, would cost in the region of £10-15m.

Nottinghamshire County Council

5.2.13 A tele-conference was held with Kevin Sharman, the Transport Strategy Team Leader at the County Council on 27 August 2019 with a follow up call on 12 August 2020. He too expressed support for the concept of the station as a means of encouraging more sustainable travel in the area.

5.2.14 He stated that the reason many of these schemes do not 'get off the ground' is because of line capacity and if enough slack is available within the current timetable, then the station could be a deliverable proposition.

5.2.15 It was stated that the line has seen several improvements recently, including new services and a reduction in journey times, and this could complement these changes.

Highways England

5.2.16 Eri Wong is the Spatial Planning Manager at Highways England with responsibility for managing the operation of the A1 near the Garden Village site, and a meeting was held on 7 August 2020. In principle Highways England would support the provision of sustainable transport provision on the site, including the station, subject to understanding the potential impacts on the operation of the Five-Ways (Apleyhead) junction on the A1. The extent to which it operated as a Parkway Station may have a bearing on this.

5.3 Capital Costs

Station Costs

5.3.1 The Sheffield - Lincoln line is very amenable to the addition of a station in this area, being both straight and almost flat. As the railway is generally at the same level as the adjacent land, embankments and cuttings are of minimal height, and some appear to be formed mainly of spent ballast from previous rail use. This will help minimise the costs of construction.

5.3.2 The minimum specification for the station includes:

- Two x Four-Car Platforms.
- Accessible footbridge (with lifts) to enable access to the (Eastbound) platform to the north.
- Ticket machine (one at the entry to the station may be enough).
- Shelters, benches, lighting, security, poster-based and real-time timetable information on both platforms.

5.3.3 There will also need to be money spent on a station building (to include toilets) and the approach to the station, with a turning circle, bicycle rack and some car-parking spaces required. Even if the Garden Village is designed to be based on walking and cycling, some passengers may drive to the station from surrounding villages. Railway regulations also require a small number of parking spaces for the mobility-impaired to be provided. The installation of electric car charging points should also be considered.

5.3.4 To provide some indicative costs, we have used several sources of information, including stations recently built at Low Moor, Apperley Bridge & Kirkstall Forge (all in West Yorkshire). Based on those types of project, we would expect the direct railway-specific station works to cost around £3.5m. Of this, around half would be for the platforms, a third for the buildings, and the remainder for lighting / telecoms etc.

5.3.5 Added to these will be contractors' preliminary works costing another £1m, and other project management costs (including detailed design, and Network Rail's costs), also in the region of £1m. At this early stage of cost development, a further 60% contingency for risk (£3.3m) should be allowed, together with the need to allow for optimism bias (for "unknown unknowns"). However, at present we are not aware of any need for any track or other infrastructure works.

5.3.6 We would therefore recommend planning for a total budget allowance of £10m and aim to bring the project in for less than this. This estimate doesn't include for any land acquisition costs since they have been assumed to form part of the wider site assembly process.

Car Park Costs

5.3.7 The cost of the car park is subject to the number of spaces which would be provided and if provision would take the form of a surface level car park, a decked, or multi-storey facility. A surface level car park provides the least expensive solution, but a multi-storey makes more efficient use of the land.

5.3.8 The average cost of an above ground multi-storey car parking space in the Midlands was estimated at £642 per square metre in 2018[6]. The average size of a car parking space in the UK is 2.4m wide by 4.8m long. Therefore, if a 250-space multi-storey car park was provided it would equate to circa £3m (taking into account internal circulate space).

5.3.9 The size of the car park required will be subject to further analysis to determine forecast parking demand, and costs could be reduced if further analysis demonstrates that fewer spaces are required. For example, the provision of 80 spaces at surface level could be as little as £400,000.

Level Crossing Closure

5.3.10 The closure of the level crossing on the B6420 Mansfield Road would require extensive consultation, and with legal fees and internal railway management time, is likely to cost in the region of £50k - £100k, before any physical works are considered.

5.4 Revenue & Maintenance Costs

5.4.1 The identification of potential revenue generated by the new station requires several assumptions to be made. The first is in terms of the annual patronage generated by the station, which as detailed within Section 3.3, is estimated to be between 42,000 and 175,000 per annum.

5.4.2 Secondly, it is assumed that the average fare per trip will be £5, broadly reflecting the average of the fares to/from Sheffield and Lincoln. These two assumptions combined would generate a revenue income from residents of between £210,000 and £875,000 per annum.

5.4.3 Offsetting this to an extent, would be a loss of income from through passengers already on the trains, who would have their journey time increased. A brief examination of the generalised cost of a typical passing journey from Retford to Sheffield[7] shows that the 90 seconds of additional journey time would add about 1% to such journeys.

5.4.4 As the journeys selected for extra stops are in quieter trains with an average load of 20 passengers assumed, the total number of passengers affected annually is approximately 20 trains per day x 2 directions x 330 equivalent days x 20 passengers, or around 264,000 per annum.

5.4.5 The response rate to (elasticity of) changes in generalised cost is around -2, implying that 2% of these passengers might be discouraged from travelling, or just over 5,000 passengers per annum. Even at an average fare of £10, this should only prejudice £50,000 revenue.

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[6] https://www.statista.com/statistics/601728/car-park-building-cost-uk-2016/

[7] Generalised cost is a concept which permits the numerical estimation of journey difficulty and is widely recognised as the basis for passenger behaviour. Using typical parameter weightings (as shown, for instance, in the Passenger Demand Forecasting Handbook), a journey from Retford to Sheffield might constitute 2x10 mins of access time, 2x11.25 mins of waiting time for a half-hourly service, a 45- minute journey time, 2x15 mins of egress time and a £5 fare at a £10/hour Value of Time, plus a couple of minutes of other items, totalling 150 generalised cost minutes.

5.4.6 The marginal costs of station operation would be expected to be around £50,000 per annum and train operation in the region of a further £300,000 per annum[8].

5.4.7 Taking the approximate mid-point of the estimated revenue generation, the net financial contribution of the station annually would therefore be around £500,000 less £50,000, £50,000 and £300,000, or in the order of £100,000 p.a. The Net Present Value of that is c. £2.5m, which would provide a significant contribution towards the cost of the station, even before other benefits (notably time savings) are added into an economic appraisal.

5.5 Impacts of the Phasing of Development

Demand from Residents

5.5.1 It is recognised that the Garden Village will be constructed over a considerable timeframe, even beyond the end of the emerging Local Plan period. This will have implications on the demand and viability of the station.

5.5.2 The revenue and maintenance costs will remain relatively consistent regardless of the extent of station use, but the income to cover these will vary considerable depending upon the level of patronage, the vast majority of which will be derived from the population of the new community in the long term.

5.5.3 The rail passenger demand from a phased development would not only depend upon the *quantity* of houses built, but also significantly upon their *type*, and their exact *location* within the overall site. Higher density development built immediately next to the station will generate more passengers than 5-bed houses built 500m from the station.

Demand Generated by Employment Provision

5.5.4 Even so, given that only broad passenger assumptions can be made at this stage, and the small number of houses which are likely to come forward in the short to medium term, the station may require revenue support in order to be viable until greater number of dwellings are constructed and patronage increases, unless the planned employment on the site and as part of the adjacent Apleyhead allocation generate sufficient demand in the interim period to negate financial support.

5.5.5 Further work would be required to understand the additional demand generated by employment land allocations associated with the Garden Village once the types of job to be created becomes clear.

5.5.6 To avoid the need for subsidy, the station will have to generate 256 trips (or 128 two-way trips) per day to cover the £400,000 of annual overhead costs detailed in Section 5.4. based upon the following calculation:

- Revenue required to cover overhead costs = £400,000
- Estimated average cost per trip = £5
- Individual trips required= 80,000
- Divided by days operational per year @ 313 (assuming Monday to Saturday service)
- Required daily patronage = 256 (or 128 return trips).
- This increases to 318 trips per day based upon a Monday to Friday service.

5.5.7 If demand fails to reach these levels, it would be difficult to expect Northern (or the DfT) to provide extra stops on the semi-fast Lincoln services, given that the number of passengers lost may not be outweighed by those gained.

[8] The marginal fuel and maintenance cost associated with the extra braking & acceleration.

6.0 Summary

6.1.1 There are several options through which mass transit could be provided to serve the potential Morton Garden Village, but none offer the benefits of a heavy rail station on the Lincoln to Sheffield Line. Locating the station at the heart of the new community within easy walking and cycling reach will embed not just a sustainable transport ethos but provide a real and attractive alternative to the private car.

6.1.2 The proposed size of the Garden Village is such that sufficient demand could be generated by the completed development to justify the level of investment required to deliver a new station and changes to train timetables and scheduling, and suggested revisions to these demonstrate the possibility to accommodate two trains per hour.

6.1.3 However, the ability to successfully provide a viable station with high standards of frequent service provision is heavily dependent upon the timely delivery of enough housing numbers.

6.1.4 It may therefore be more appropriate to focus on the provision of enhanced bus services between Retford and Worksop in the short term, with delivery of the station in the longer term. However, the downside of this approach is the 'slack' that is currently available in the Lincoln to Sheffield Line timetable may be lost in the longer term due to other changes on the line. This could undermine the ability to cater for a new stop at Morton.

Appendix A - Potential Schedule Timings

Current Eastbound

		5P01	5P64	2P01	2P05	1L31	2L90	1L33	2P13	1L37	2P15
		SHF-RET	SHF-LNC	SHF-LNC	SHF-RET	DON-LNC	BNY-GNB	DON-LNC	SHF-GNB	LDS-LNC	SHF-GNB
		empty	empty								
	from										
Sheffield	a					06:31:30	06:48	07:34		08:34	
	plat	DSS	1A	1B	1B	4A	3B	1B	4A	5B	1A
	d	05:31	05:34	05:45	06:10	06:35:30	06:58	07:37:30	07:54	08:37:30	08:53
Darnall				05:50:30		06:44	07:04		08:00:30		08:58:30
Woodhouse				05:55:30		06:49:30	07:09:30		08:06		09:04
Kiveton Bridge				06:02		06:56	07:16		08:12:30		09:10:30
Kiveton Park		*05:45*	*05:52*	06:05	06:25:30	06:59:30	07:19:30	*07:51:30*	08:16	*08:51:30*	09:14
Shireoaks				06:09:30		07:04:30	07:24		08:20:30		09:18:30
Worksop	a			06:13	06:33	07:08:30	07:28	07:58	08:24:30	08:58	09:22:30
	d	*05:53*	*05:58:30*	06:14	06:34	07:09:30	07:29	07:59	08:25:30	08:59	09:23:30
Bassetlaw GV											
Retford	a	06:04:30		06:23	06:49	07:18:30	07:38:30	08:08:30	08:35	09:08	09:33
	d		*06:06:30*	06:24:30	06:56	07:19:30	07:39:30	08:09:30	08:36	09:09	09:34
					retn to SHF						
Gainsborough C	a						07:54		08:51		09:49
Gainsboro L Rd	d		*06:18:30*	06:39:30		07:34:30		08:24:30		09:24	
Saxilby	d			06:51		07:46		08:36:30		09:36	
Lincoln	a		06:38:30	07:07		07:57		08:46:30		09:47:30	
	plat										
to form			06:43	07:23		08:26		09:30		10:30	
										then every half-hour	

Proposed Eastbound

		5P01	5P64	2P01	2P05	1L31	2L90	1L33	2P13	1L37	2P15
		SHF-RET	SHF-LNC	SHF-LNC	SHF-RET	DON-LNC	BNY-GNB	DON-LNC	SHF-GNB	LDS-LNC	SHF-GNB
		empty	empty								
	from										
Sheffield	a					06:31:30	06:48	07:34		08:34	
	plat	DSS	1A	1B	1B	4A	3B	1B	4A	5B	1A
	d	05:29:30	05:32:30	05:45	06:08:30	06:35:30	06:58	07:37:30	07:54	08:37:30	08:53
Darnall				05:50:30		06:44	07:04		08:00:30		08:58:30
Woodhouse				05:55:30		06:49:30	07:09:30		08:06		09:04
Kiveton Bridge				06:02		06:56	07:16		08:12:30		09:10:30
Kiveton Park		*05:43:30*	*05:50:30*	06:05	06:24	06:59:30	07:19:30	*07:51:30*	08:16	*08:51:30*	09:14
Shireoaks				06:09:30		07:04:30	07:24		08:20:30		09:18:30
Worksop	a			06:13	06:31:30	07:08:30	07:28	07:58	08:24:30	08:58	09:22:30
	d	*05:51:30*	*05:57*	06:14	06:32:30	07:09:30	07:29	07:59	08:25:30	08:59	09:23:30
Bassetlaw GV				06:19	06:37:30	07:14:30	07:34	08:04	08:30:30		09:28:30
Retford	a	06:03		06:24:30	06:47:30	07:20	07:40	08:10	08:36:30	09:08	09:34:30
	d		*06:05*	06:26	06:54:30	07:21	07:41	08:11	08:37:30	09:09	09:35:30
					retn to SHF						
Gainsborough C	a						07:55:30		08:52:30		09:50:30
Gainsboro L Rd	d		*06:17*	06:41		07:36		08:26		09:24	
Saxilby	d			06:52:30		07:47:30		08:38		09:36	
Lincoln	a		06:37	07:08:30		07:58:30		08:48		09:47:30	
	plat										
to form			06:41:30	07:21:30		08:24:30		09:30		10:30	
										then every half-hour	

Current Westbound

		1Y97	1L36	2P62	1L40	2P64	1L44	2P66	1L48
		RET-NOT	RET-LDS	LNC-SHF	LNC-LDS	GNB-SHF	LNC-LDS	GNB-SHF	LNC-LDS
				arr empty					
	a			06:38:30	07:07		07:57		08:46:30
	plat								
Lincoln	d			06:43	07:23		08:26		09:30
Saxilby	d			06:52	07:32		08:35		09:39
Gainsboro L Rd	d			07:04:30	07:44:30		08:47:30		09:51:30
Gainsborough C	d					08:16		09:16	
		arr empty							
Retford	a	06:04:30		07:18:30	07:56:30	08:31	08:59:30	09:31	10:05:30
	d	06:13	06:56	07:19:30	07:57:30	08:32	09:00:30	09:32	10:06:30
Bassetlaw GV									
Worksop	a	06:24:30	07:07:30	07:30	08:07:30	08:42:30	09:11	09:42:30	10:17
	d	06:25:30	07:08:30	07:31	08:08:30	08:43:30	09:12	09:43:30	10:18
Shireoaks		06:30	07:13:30	07:35:30	08:13	08:48	09:16:30	09:48	
Kiveton Park		06:35	07:19	07:40:30	08:18:30	08:53:30	09:22	09:53:30	*10:24*
Kiveton Bridge		06:38:30	07:22:30	07:44	08:21:30	08:56:30	09:25	09:56:30	
Woodhouse		06:44:30	07:29	07:50:30	08:28	09:03		10:03	
Darnall		06:49:30	07:34:30	07:56	08:33	09:08:30		10:08:30	
Sheffield	a	06:56	07:41:30	08:03	08:41:30	09:18	09:41:30	10:17	10:41:30
	plat	8A	4B	1A	3A	3B	3B	3B	3B
	d	07:02	07:47		08:45		09:45		10:45
	to	Nott	Leeds		Leeds		Leeds		Leeds
								then every half-hour	

Future Westbound

		1Y97	1L36	2P62	1L40	2P64	1L44	2P66	1L48
		RET-NOT	RET-LDS	LNC-SHF	LNC-LDS	GNB-SHF	LNC-LDS	GNB-SHF	LNC-LDS
				arr empty					
	a			06:37	07:08:30		07:58:30		08:48
	plat								
Lincoln	d			06:41:30	07:21:30		08:24:30		09:30
Saxilby	d			06:50:30	07:30:30		08:33:30		09:39
Gainsboro L Rd	d			07:03	07:43		08:45		09:51:30
Gainsborough C	d					08:14:30		09:14:30	
		arr empty							
Retford	a	06:03		07:17	07:55	08:29:30	08:58	09:29:30	10:05:30
	d	06:11:30	06:54:30	07:18	07:56	08:30:30	08:59	09:30:30	10:06:30
Bassetlaw GV		06:19:30	07:02:30	07:25	08:02:30	08:37:30	09:06	09:37:30	
Worksop	a	06:24:30	07:07:30	07:30	08:07:30	08:42:30	09:11	09:42:30	10:17
	d	06:25:30	07:08:30	07:31	08:08:30	08:43:30	09:12	09:43:30	10:18
Shireoaks		06:30	07:13:30	07:35:30	08:13	08:48	09:16:30	09:48	
Kiveton Park		06:35	07:19	07:40:30	08:18:30	08:53:30	09:22	09:53:30	*10:24*
Kiveton Bridge		06:38:30	07:22:30	07:44	08:21:30	08:56:30	09:25	09:56:30	
Woodhouse		06:44:30	07:29	07:50:30	08:28	09:03		10:03	
Darnall		06:49:30	07:34:30	07:56	08:33	09:08:30		10:08:30	
Sheffield	a	06:56	07:41:30	08:03	08:41:30	09:18	09:41:30	10:17	10:41:30
	plat	8A	4B	1A	3A	3B	3B	3B	3B
	d	07:02	07:47		08:45		09:45		10:45
	to	Nott	Leeds		Leeds		Leeds		Leeds
								then every half-hour	

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