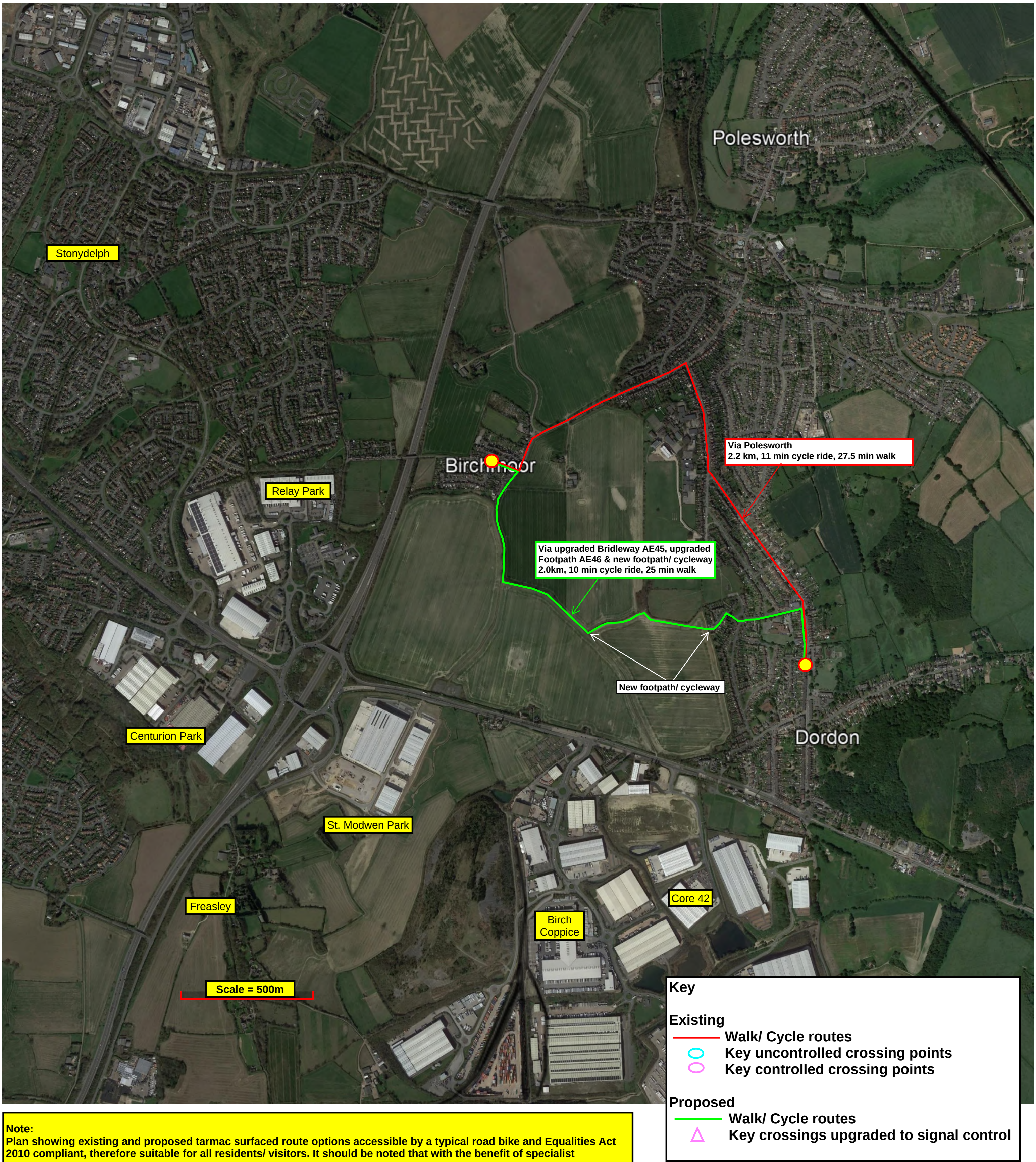
APPENDIX M CONNECTIVITY PLANS

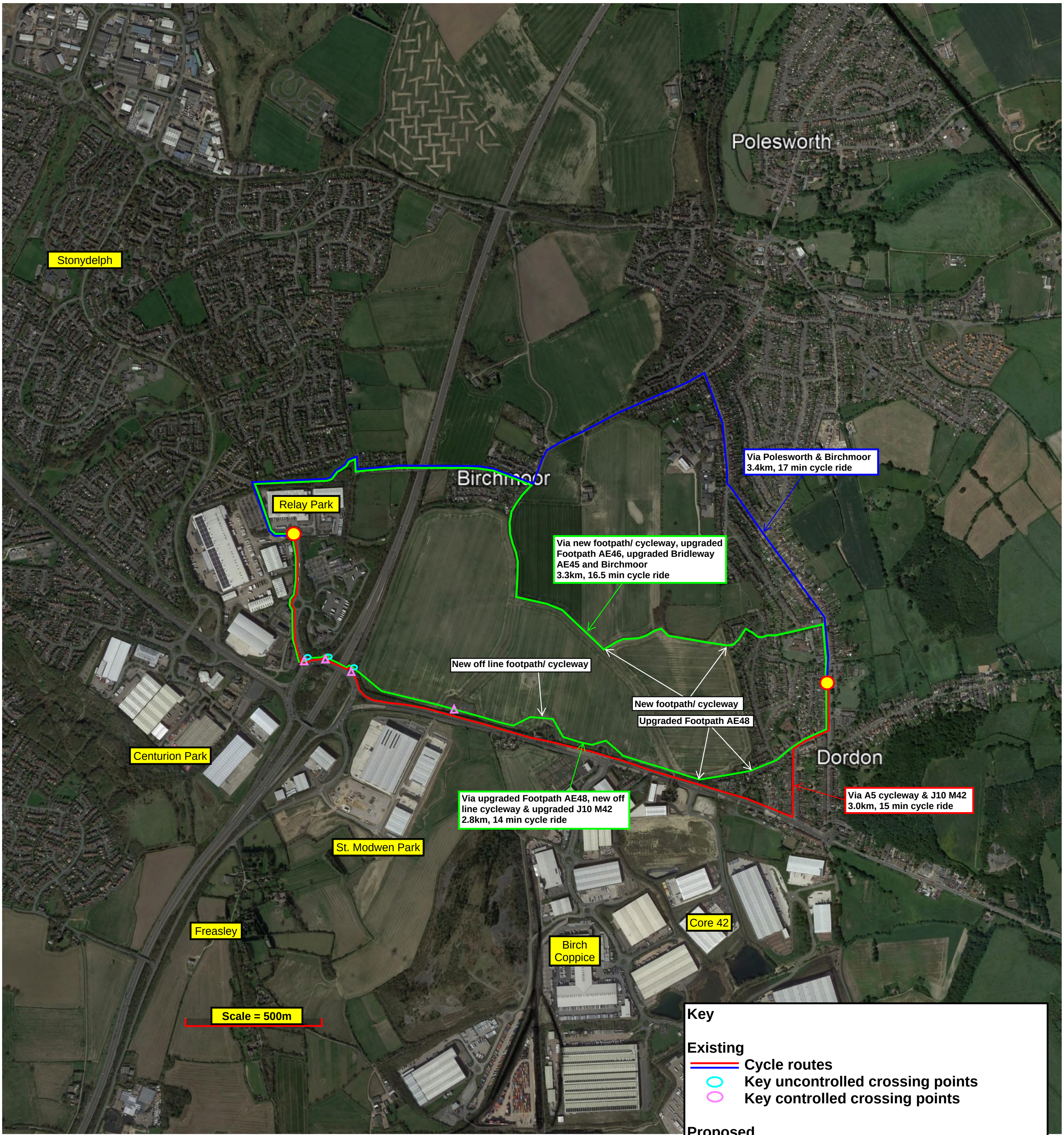
Community Integration Route Plan: Birchmoor to Dordon



Note:
Plan showing existing and proposed tarmac surfaced route options accessible by a typical road bike and Equalities Act 2010 compliant, therefore suitable for all residents/ visitors. It should be noted that with the benefit of specialist equipment, such as an off-road bike, other existing route options would be open to some (but not all). However, the use of these existing routes is not practicable for all residents/ visitors (such as those with physical and mobility impairments).

TETRA TECH

Commuter Point-to-Point Plan: Dordon to Relay Park



Key

Existing
- Cycle routes
- Key uncontrolled crossing points
- Key controlled crossing points

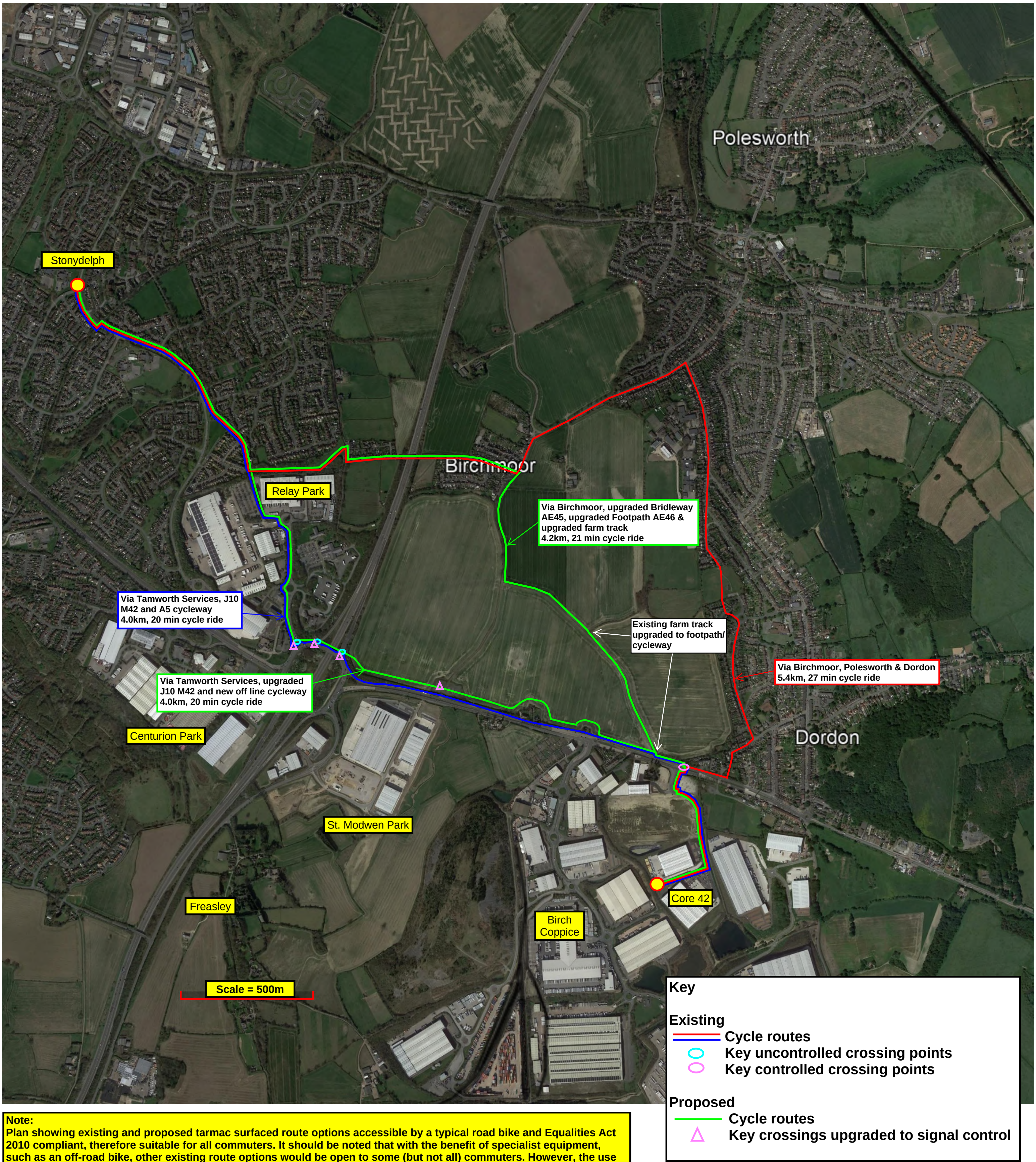
Proposed
- Cycle routes
- Key crossings upgraded to signal control

Note:
Plan showing existing and proposed tarmac surfaced route options accessible by a typical road bike and Equalities Act 2010 compliant, therefore suitable for all commuters. It should be noted that with the benefit of specialist equipment, such as an off-road bike, other existing route options would be open to some (but not all) commuters. However, the use of these existing routes is not practicable for all commuters (such as those with physical and mobility impairments) or certain jobs/positions where there is an imperative to arrive clean and/or shower facilities are not readily available.

The existing and proposed routes shown are in excess of the typical 2km maximum walking distance for commuters, so possible walking routes are therefore not shown on this plan.

TETRA TECH

Commuter Point-to-Point Plan: Stonydelph to Core 42

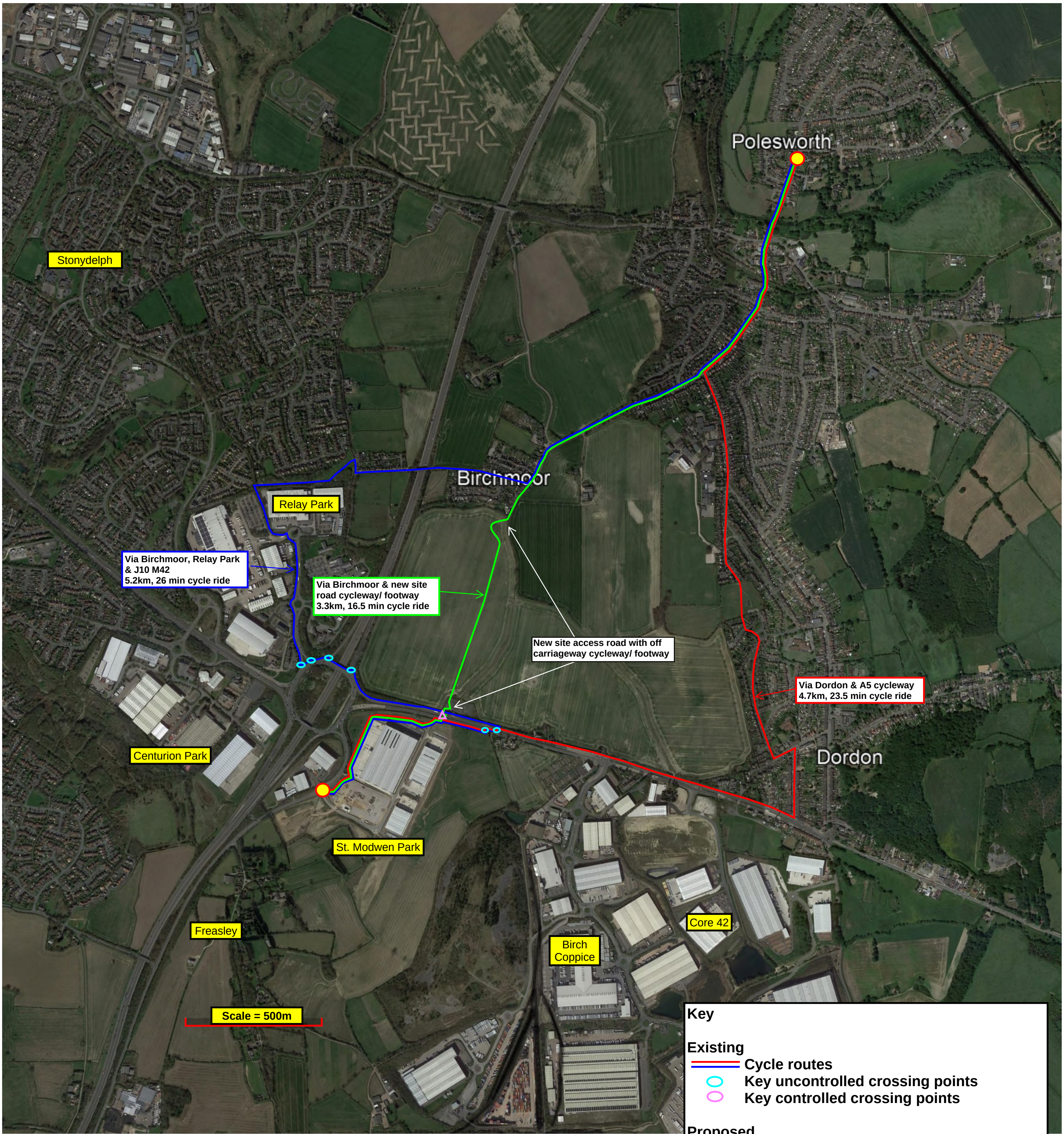


Note:
Plan showing existing and proposed tarmac surfaced route options accessible by a typical road bike and Equalities Act 2010 compliant, therefore suitable for all commuters. It should be noted that with the benefit of specialist equipment, such as an off-road bike, other existing route options would be open to some (but not all) commuters. However, the use of these existing routes is not practicable for all commuters (such as those with physical and mobility impairments) or certain jobs/positions where there is an imperative to arrive clean and/or shower facilities are not readily available.

The existing and proposed routes shown are in excess of the typical 2km maximum walking distance for commuters, so possible walking routes are therefore not shown on this plan.

TETRA TECH

Commuter Point-to-Point Plan: Polesworth to St. Modwen Park



Key

Existing
- Cycle routes
- Key uncontrolled crossing points
- Key controlled crossing points

Proposed
- Cycle routes
- Key crossings upgraded to signal control

Note:
Plan showing existing and proposed tarmac surfaced route options accessible by a typical road bike and Equalities Act 2010 compliant, therefore suitable for all commuters. It should be noted that with the benefit of specialist equipment, such as an off-road bike, other existing route options would be open to some (but not all) commuters. However, the use of these existing routes is not practicable for all commuters (such as those with physical and mobility impairments) or certain jobs/positions where there is an imperative to arrive clean and/or shower facilities are not readily available.

The existing and proposed routes shown are in excess of the typical 2km maximum walking distance for commuters, so possible walking routes are therefore not shown on this plan.

TETRA TECH

APPENDIX N MDS TRANSMODAL REPORT

Rail Terminal Connectivity Statement

November 2021

MDS Transmodal

Ref: 220053r_rail_final

CONTENTS

1. INTRODUCTION

1.1 This technical report has been prepared to support *Hodgetts Estates* who are submitting proposals for a new strategic industrial warehousing scheme on land to the north-east of Junction 10 of the M42. Up to 100,000 square metres of new high-bay logistics and industrial floor space is proposed for the site. The scheme has been planned from the outset to operate successfully as a standalone road-based logistics warehousing facility, and accompanying documents demonstrate market need for such and that it is acceptable and deliverable in planning application traffic terms. The logic for locating the facility in this location is clear, J10 of the M42 being the nexus of the M42 motorway and the A5 trunk road, both major freight corridors, as well as its close proximity to *Birmingham Intermodal Freight Terminal (BIFT)* at *Birch Coppice Business Park* (around 500m) and *Hams Hall Rail Freight Terminal* (15km)

1.2 Notwithstanding this position, due to its close proximity to *Birch Coppice Business Park*, the proposed warehouse development can also in practice be classified as rail-served. Occupiers will be able to access the *BIFT* facilities on the same basis as those currently located within the business park. A higher proportion of the resultant traffic can therefore be expected to arrive or depart using rail via Birch Coppice than might otherwise be the case. The purpose of this technical note, therefore, is to explain why this situation arises, and to demonstrate the benefits of rail connectivity that will potentially accrue to future warehouse occupiers at the planned development and wider society. These added benefits, while not central to the planning justification, provide additional support for the proposed development.

1.3 The significance of this position is that Government planning policy promotes the location of logistics facilities at sites which offer genuine modal choice to shippers. This is for two principal reasons:

- It creates the conditions where rail freight can become cost competitive when compared with road haulage. Shippers utilising rail freight under these conditions can therefore expect to accrue financial (productivity) benefits (so called user benefits); and
- It promotes mode shift to rail freight. Rail freight is recognised as being a substantially more sustainable mode of transport, which generates wider societal benefits when compared with road haulage. Emissions of greenhouse gases (GHG), for example, are significantly lower on tonne-km basis, which is particularly important given internationally binding national commitments to reduce and ultimately become a net-zero GHG emitter.

1.4 The proposed development will therefore conform with the Government's current policy with respect to promoting modal choice and the location of large scale logistics facilities.

2. PLANNING POLICY – SUPPORT FOR RAIL FREIGHT

2.1 Planning policy alongside the proposed scheme's acceptability and deliverability in planning terms is addressed in accompanying documents. However, by way of background it is worth briefly setting out current planning policy with respect to rail-served freight/logistics developments.

National Planning Policy Framework

2.2 National planning policy for England is set out in the *National Planning Policy Framework (NPPF)*. This was originally published by the *Department for Communities and Local Government (DCLG)* in March 2012 and then revised and reissued reissued in February 2019 and July 2021 (by the renamed *Ministry of Housing, Communities and Local Government* or *MHCLG*).

2.3 Section 9 of the NPPF provides for transport policies that facilitate sustainable development but also contribute towards wider sustainability objectives. In particular, it notes that significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes (Para 105). This can help to reduce congestion and emissions, and improve air quality and public health. It notes that plans and decisions should identify and protect, where there is robust evidence, sites and routes which could be critical in developing infrastructure to widen transport choice and realise opportunities for large scale development (Para 106c). It also stipulates that plans and decisions should recognise the importance of providing adequate overnight lorry parking facilities, taking into account any local shortages, to reduce the risk of parking in locations that lack proper facilities or could cause a nuisance (Para 109).

National Planning Statement for National Networks

2.4 On a similar basis, the *National Planning Statement (NPS) for National Networks*, published by the *Department for Transport (DfT)* in December 2014, includes the Government's current policies concerning the development of *Strategic Rail Freight Interchanges (SRFIs)*. It is considered to be the principal policy document concerning the development of rail-served warehousing and logistics facilities. While the proposed Junction 10 scheme is being progressed through the planning system as a stand-alone road-based development, as will be demonstrated below it would in practice be a rail-served site (it will be able to access Birch Coppice's rail terminal facilities at *BIFT* on the same basis as those currently located within the business park).

2.5 The NPS states that the aim of SRFIs is to optimise the use of rail in the freight journey through the co-location of freight and distribution activities (Para 2.44). Further, the NPS states that the users of warehousing and distribution services are increasingly looking to integrate rail into their transport operations. This will require the logistics industry to develop new facilities that need to be located alongside the major rail routes, close to major trunk roads as well as near the conurbations that consume the goods (Paragraph 2.45).

2.6 The NPS notes that the Government's vision is for a sustainable transport system that is an engine for economic growth. The NPS consequently states that the transfer of freight from road to rail has an important part to play in reducing greenhouse gas emissions and addressing climate change (Paragraph 2.53). To facilitate this modal transfer, the NPS concludes that a network of SRFIs is needed across the regions, to serve regional, sub-regional and cross-regional markets. The NPS concludes that a reliance on existing rail freight interchanges and on road-only based logistics is neither viable nor desirable. The Government has therefore concluded that there is a compelling need for an expanded network of SRFIs (Paragraphs 2.54-2.56 and Table 4).

3. RAIL-SERVED LOGISTICS WAREHOUSING

3.1 Rail-served logistics warehouses fall into two types. The first type involves the installation of rail sidings along one side of the warehouse (normally one of the long sides) or even into the warehouse itself. Cargo is transferred directly between railway wagons positioned in the sidings and the warehouse using fork-lift trucks or similar lifting equipment, thereby avoiding the need to use road transport. Such facilities are only suitable (and economic) when handling commodities which tend to move in full train-load volumes (train of at least 400m length). Consequently, their use is fairly niche and normally associated with semi-bulk cargoes such as steel or forest products moved in conventional box or flat wagons. Consumer goods normally move in much smaller (less than train-load) volumes but more frequently. *ProLogis Park* in Coventry (Kerseley), due to a condition of its planning consent, had such sidings installed alongside a number of the warehouses. The site has never handled regular services and is currently not receiving trains.

3.2 The second type of rail-served logistics warehousing is where they are located within close proximity to an intermodal terminal, and connected to the terminal by ‘internal’ roads which tend to be privately owned and maintained (although this is not the case at Hams Hall where the internal site roads are adopted by the local highway authority).

3.3 An intermodal terminal is a set of railway sidings where containers and other types of intermodal units are lifted to and from railway wagons using fixed overhead or mobile lifting equipment. Goods conveyed in intermodal units arrive by train at the terminal, from where they are subsequently transferred to the warehousing by means of a short distance shunt via the internal roads using yard tractors and skeletal semi-trailer equipment. Yard tractors are designed to haul semi-trailers away from the public road network, such as within port estates, at large distribution centres and rail terminals. They are highly manoeuvrable and can lift/drop trailers quickly and efficiently. An example of such equipment is provided in the picture below.

Picture 1: Yard Tractor and Semi-trailer

3.4 This type of rail connectivity is possible due to the 'off public highway' connectivity and generates the following benefits:

- Vehicles which operate entirely within private land are currently able to operate with lower operating costs, meaning terminal to warehouse transfer costs are lower (see below);
- Drivers of yard tractors do not need to be fully qualified HGV licence holders (though operators would need to provide training), meaning wage rates are generally lower. It also means operators are not impacted by the current significant shortage of HGV drivers;
- Yard tractor equipment is cheaper to purchase or lease when compared with road-legal HGVs; and
- As the container is already 'on-site', there is no public highway network congestion to negotiate. Consequently, there is no requirement to build in any buffer time to ensure 'just-in-time' delivery time-windows are met, meaning the yard tractor equipment can be utilised more intensively when compared with road-legal HGVs serving off-site origins/destinations.

3.4 The implications of this position are explored in the following section. Developments over the past two decades have seen multiple warehouse new-builds 'cluster' around an intermodal terminal within a single rail-served site. In planning terms these have become known as *Strategic Rail Freight Interchanges (SRFIs)*, and include facilities at *DIRFT* (near Crick, Northants), *East Midlands Gateway* (Kegworth, Notts), *Hams Hall* and *Birch Coppice Business Park*. This clustering has the effect of concentrating large freight volumes at one location, thereby generating a critical mass capable of attracting viable intermodal rail freight services from a variety of origins (rail freight is generally only economically viable in train lengths over c400m).

3.5 For consumer cargo (i.e. that which passes through warehouses of the type proposed), intermodal rail is the more attractive option. As these goods generally move in smaller volumes, intermodal rail allows individual shippers to move goods at less than train-load volumes (e.g. single or a few containers at one time); a full-length train comprising containers from multiple shippers. For this reason, warehouses which are rail-served by means of being within close proximity to an intermodal terminal are the preferred type of connectivity. In contrast to directly rail-connected warehouses, where SRFIs have been developed, intermodal train services have been quickly established. For example, *East Midlands Gateway*, which officially opened in February 2020, has recently announced a fifth daily service (to/from Felixstowe, to complement the existing services from Felixstowe, Southampton and Liverpool).

3.6 *Birch Coppice Business Park* was originally developed by IM Properties at the end of the 1990s. It initially consisted of a single directly rail-connected warehouse (VW spare parts), though today it is a full-scale SRFI accommodating a modern intermodal terminal operated by *Maritime Transport* (known as *BIFT*) and a significant quantum of warehouse floor space. On a typical weekday, the terminal receives three trains/day from the Port of Felixstowe and two trains/day from the Port of Southampton. The table below summarises the key characteristics of the site.

	Birmingham International Rail Terminal (BIFT), Birch Coppice Business Park, Tamworth.
Railway Line	Birmingham-Derby Main Line
Loading Gauge	W10
Terminal Operator	Maritime Transport
Number sidings and train length	6 x reception sidings - varying length up to 530m 4 x 340m terminal sidings
On-site warehousing	Circa 450,000 sqm across +25 occupiers, including at Core 42 Business Park
Additional Information	Loading using overhead gantry cranes.

3.7 It is interesting to note that the original directly rail-connected warehouse, designed to handle cargo in conventional box wagons rather than intermodal, resulted from a planning consent condition, albeit it never received regular train services. Since the development of the intermodal terminal, the SRFI has grown to handle 5 trains/day as described.

3.8 The proposals are on the opposite side of the A5 to the existing Birch Coppice SRFI. The gate-to-gate public road network distance between the two sites is likely to be around 500m (i.e., the distance on the public road network connecting the respective private estate roads).

3.9 The site is also a short distance from the Hams Hall SRFI (circa 15km via the M42). Originally developed by Powergen in the late 1990s, it accommodates a modern intermodal terminal operated by *ABP Connect*. The table below summarises the key characteristics of the site. On a typical weekday, the terminal receives three trains/day from the Port of Felixstowe and daily trains from the ports of Southampton and London Gateway.

Terminal Name and Location	Hams Hall, near Coleshill.
Railway Line	Birmingham to Nuneaton/Derby
Loading Gauge	W10
Terminal Operator	ABP Connect
Number sidings and train length	2 x reception sidings 775m 4 x 400m terminal sidings
On-site warehousing	Circa 320,000 sqm
Additional Information	Loading using mobile reach stackers. Internal site roads are adopted highway.

3.10 However, given the distance from the application site via the public road network (M42), transfers of containers to/from Hams Hall would need to be undertaken by road-legal HGVs. In this case, it would be a standard articulated HGV, comprising a tractor unit hauling a skeletal semi-trailer. An example is provided in the picture below.

Picture 2: Tractor Unit and Semi-trailer

3.11 When compared with yard tractors within an SRFI, the terminal to off-site warehouse transfer process (whether in this case to Hams Hall or more generally) has the following disadvantages:

- Drivers need to be fully licenced and qualified HGV drivers (significantly higher wage rates and current recruitment issues due to shortages of fully qualified drivers);
- Road-legal HGV equipment is more expensive to purchase or lease when compared with yard tractors; and

- Buffer time has to be built into schedules to ensure 'just-in-time' delivery time-windows are met therefore meaning the equipment is potentially utilised less intensively.

3.12 Overall, transfer costs from terminal to warehousing which is not rail-served are substantially higher. This issue is addressed in the following section of this report.

4. RAIL CONNECTIVITY – LOGISTICS OPERATOR BENEFITS

Use of Yard Tractors on the Public Road Network

4.1 While yard tractors (as described in the previous section) have been designed to haul semi-trailers on private land (such as between intermodal terminals and warehousing within SRFIs), under limited circumstances they can also be operated on the public highway (defined as roads maintained at public expense). In these situations, they are classed as *'works trucks'* and are defined under the Construction and Use Regulation as:

> *"A motor vehicle (other than a straddle carrier) designed for use in private premises and used on a road only in delivering goods from or to such premises, to or from a vehicle on a road in the immediate neighbourhood, or in passing from one part of any such premises to another or to other private premises in the immediate neighbourhood"*

4.2 When operated on the public highway, a works truck needs to be licenced with the DVLA and pay Vehicle Excise Duty (VED). While certain derogations exist for 'works trucks', by and large they must conform to the requirements of the Construction and Use Regulations when operating on the public highway, particularly with respect to being within gross vehicle weight limits, having a speedometer (if they can exceed 25mph), fitment of suitable brakes and appropriate lighting (headlights, indicators etc..). Note that the definition requires the vehicle to be 'designed for use in private premises', meaning that former road-going vehicles used as 'shunters', such as old tractor units, cannot be classed as works trucks.

4.3 The term *'immediate neighbourhood'* in the works truck description is not defined in terms of distance. It is regarded as a matter of judgement for the operator and ultimately would be for a Court to determine. However, given the location of the application site on the opposite side of the A5 to Birch Coppice (gate-to-gate around 500m) and that Revenue and Customs have to date adopted 1km when permitting the use of rebated fuels on public roads (see below), the proposed warehouse development clearly falls within the description of the term 'immediate neighbourhood'. On that basis, yard tractors which operate internally within the *Birch Coppice Business Park* (to/from *BIFT*) will also be able to access the site on the same terms (under the works truck conditions).

4.4 In addition to their lower purchase/lease costs, there are currently two important exemptions for works trucks when used on the public highway which when compared with the use of standard road-legal HGVs can generate a significant operating cost advantage.

4.5 Firstly, works trucks can be legally driven on a standard Category B 'car' driving licence when on the public highway. They are classed as an 'exempted goods vehicle'; the driver must be aged 21 or older and have held a Category B driving licence for at least two years (albeit for health and safety reasons operators would need to ensure adequate training had been provided to the driver). Drivers of road-legal HGVs must hold a vocational driving licence (Category C+E for articulated HGVs) and possess a Driver Certificate of Professional Competence (Driver CPC) qualification. Consequently, wage rates for fully qualified HGV drivers (C+E licence plus Driver CPC) are significantly higher than for yard tractor operatives. This is significant in light of the identified (and well publicised) shortage of qualified HGV drivers nationally[1].

4.6 Secondly, VED rates are significantly lower for a works truck. Currently it is only £165 per annum, compared with the full rate of £1,200 for a standard articulated HGV.

4.7 Vehicles such as yard tractors which operate entirely within private land have also been able to use fuel where a much lower rate of excise duty has been charged. For diesel powered vehicles, the fuel is referred to as 'rebated diesel' or 'red diesel' (after the colour of the dye which is added to distinguish it from the full duty paid version). However, the Chancellor of the Exchequer announced in the March 2021 Budget that most rebated diesel exemptions are to be removed from April 2022 onwards, even on vehicles operating entirely on private land. That includes yard tractors.

4.8 Drawing the above together, it can be concluded that the proposed warehouse development adjacent to Junction 10 can in practice be classified as rail-served (effectively it will be 'inside' the SRFI). Occupiers will be able to access *BIFT* on the same basis as those currently located within the SRFI (i.e., using work trucks). The implications of this position in terms of transport/transfer costs are explored below.

[1] Letter to Prime Minister from Road Haulage Association, 23 June 2021

Transfer Costs to and from BIFT

4.9 The internal shunting operation between *BIFT* and the surrounding warehousing (within the SRFI and the application site) would most likely adopt the 'drop trailer' method. A loaded container on a skeletal semi-trailer would be shunted from the rail terminal to its destination warehouse, and positioned at the appropriate loading dock. The yard tractor/works truck would then leave the container/semi-trailer combination at the loading dock for discharge, and subsequently collect an empty container/semi-trailer combination, ideally from another loading dock or nearby warehouse, before returning to the rail terminal. The yard tractor therefore 'keeps moving' and a round-trip out from and back to the rail terminal is able to shunt two containers.

4.10 Occupiers with a sufficiently high volume of incoming/outgoing freight via the *BIFT* may elect to invest their own yard tractor/works truck, either purchase outright or lease. The annual leasing costs (including maintenance) for a typical yard tractor/works truck that is used in ports and rail terminals is around £25,000. Vehicle Excise Duty (so that it can operate as a 'Works Truck' on the public highway network, as per above) is £165 per year. Annual driver wages, including on-costs, would be around £32,000 per driver. It is assumed that overheads would equate to around 25% of the yard tractor fixed costs. Total annual fixed costs would therefore total around £111,500 per annum for each yard tractor operated, assuming two drivers per vehicle. A skeletal semi-trailer would cost around £6,000 per annum to lease. Duty paid diesel (excluding VAT) currently costs around £1.19 per litre and fuel consumption is around 1.4km/l (4 mpg) for a yard tractor. Once tyre wear is accounted for, the running costs for the yard tractor/works truck and semi-trailer combination would be around £0.90 per km.

4.11 Given the scale of the Birch Coppice SRFI, it is likely that a driver would be able to undertake 7 x drop/collect round-trips as described within an 11 hour shift (i.e., between 1.25-1.5 hours per round trip once shunting, waiting time, paperwork and statutory breaks etc. are accounted for). This equates to 14 round-trips per 24 hour period for each yard tractor/works truck, shunting a total of 28 containers to or from *BIFT*. Assuming a dwell time of around 4 hours at each warehouse, a skeletal semi-trailer would therefore undertake 2 x round-trips per driver shift. Terminals such as *BIFT* generally operate 5.5 days per week (i.e., Saturday AM), equating to 275 days per annum.

4.12 On that basis, the total costs per round-trip (assuming an average round-trip distance is 6km) will be approximately £40 or £20 per container shunted. Once the operator's margin is accounted for, this would equate to a rate per shunt of around £22. This is shown in the table below.

Table 4.1: Yard Tractor/Works Truck Transfer Costs with SRFIs

Red Diesel			
Yard Tractor/Works Truck		Days pa	275
Annual lease inc maint & ins	£25,000	Round trips/day - yard tractor	14
VED	£165	Round trips/day - semi-trailer	4
Driver wages - 2 x £32k inc NIC	£64,000		
Overheads (25%)	£22,291	*Fixed cost round trip*	
Total pa	£111,456	Yard tractor	£29
		Semi-trailer	£5
Skeletal semi-trailer		*Total*	*£34*
Annual lease inc maintenance	£6,000		
		Running costs per km	£0.90
		Distance/round trip (km)	6
		Running costs	£6
		Total cost per round trip	**£40**
		Total cost per container	**£20**

4.13 In contrast, for a road-legal 6x2 tractor unit the annual leasing costs (including maintenance) is around £33,000. Vehicle Excise Duty is £1,200 per year. Annual driver's wages, including on-costs, in this case would be around £42,000 per driver. Once other operating costs are accounted for and overheads (again, it is assumed that overheads would equate to around 25% of the tractor unit fixed costs), annual fixed costs would therefore total around £154,000 per annum for each tractor unit operated - £42,500 more than the yard tractor option. The lease of the skeletal semi-trailer would again be on top of this. Assuming fuel consumption is around 2.5km/l (7 mpg), once tyre wear is accounted for the running costs for the road legal tractor unit and semi-trailer combination would actually be lower at around £0.54 per km.

4.14 Consider a transfer operation from *BIFT* to warehousing within the vicinity of the SRFI but beyond the 'works truck' limitations (as described). Such an operation would see a container road haulier collect the unit from the rail terminal and transport it to the destination warehouse. It would then wait with the container at the loading dock while it is discharged before returning it to the terminal. Assuming this round-trip operation takes 3.5 hours (waiting, travel time, discharge etc..), the total costs per round-trip (assuming an average round-trip distance is 15km) will be around £116 per container. Once the operator's margin is accounted for, this would equate to a rate per container moved of around £130. This is shown in the table below.

4.15 Clearly, being rail-served 'results in significantly lower transfer costs between rail terminal and warehouse.

Table 4.2: Road Legal-HGV Transfer Costs Beyond SRFIs

Road Legal HGV			
Tractor			
Annual lease inc maint & ins	£33,000	Days pa	275
VED	£1,200	Hours pa	5,000
Driver wages - 2 x £42k inc NIC	£84,000		
Overheads (25%)	£29,550	Fixed cost per hour	£30.75
Total pa	£147,750	Running costs per km	£0.54
Skeletal semi-trailer		Fixed cost (3.5 hours)	£108
Annual lease inc maintenance	£6,000	Running cost (15km)	£8
		Total	**£116**
Total Fixed Costs pa	£153,750		

User Benefits

4.16 Consider the example of deep-sea maritime containers being transported from the Port of Southampton to a distribution centre in the Tamworth area. The shipper would have the option of using intermodal rail freight (via *BIFT*) or road haulage direct from the port to warehouse.

4.17 A typical intermodal freight trains costs around £12 per train-km to operate (fixed costs plus fuel) on a siding-to-siding basis. Based on this rate plus a further £1,500 per train to account for other fixed costs (shunting, wagon down-time etc..), the total train cost for the 240km trip between Southampton and BIFT would be in the region of £4,400. Assuming a mean loading of 36 containers per train, that equates to a port gate to *BIFT* sidings rate of £122 per container. The port at Southampton would charge around £35 per container to load to rail. Terminal lift charges at BIFT are around £25 per container, plus £22 for a local shunt within or close by to the Birch Coppice estate. Assuming the destination warehouse is within the Birch Coppice SRFI (and by extension the application site), total port to warehouse costs are therefore estimated to be in the region of £204 per container.

4.18 For a destination beyond Birch Coppice, a local road haul is estimated (from above) to be around £120. For an off-site destination, total port to warehouse costs are therefore estimated to be in the region of £300 per container.

4.19 The same trip by road haulage would most likely take around 6.5 hours once waiting time at the port and warehouse are accounted for. On the basis of the fixed and running costs stated

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above, the total port to warehouse costs are also estimated to be in the region of £290 per container. This is shown in the table below.

Table 4.3: Estimated Intermodal and Road Haulage Costs Southampton to Tamworth

Rail			Road		
Cost per train-km	£12		Travel time + waiting	6.5	hrs
Distance	240	km	Distance	240	km
Containers/train	36				
Train cost	£2,880		Fixed cost	£200	
Other fixed costs	£1,500		Running cost	£94	
Total Costs	£4,380		***Total cost***	***£293***	
SRFI Rail-served					
Train cost/container	£122				
Port handling - rail	£35				
Terminal lift	£25				
Internal shunt	£22				
Total cost	***£204***				
Off-site					
Cost/container	£122				
Port handling - rail	£35				
Terminal lift	£25				
Local road haul	£120				
Total cost	***£302***				

4.20 This analysis demonstrates that one of the main factors which renders rail freight cost competitive against road haulage is the ability to locate distribution centres in rail-served locations. Where this occurs, shippers are able to accrue financial benefits (which in transport economics and appraisal are termed *user benefits*). In the costed example above, rates to a rail-served warehouse from a deep-sea port (in this case Southampton) are around *£80 per container less* when compared with road haulage. For a warehouse located away from a rail-served site, transport rates are broadly comparable. Given that future occupiers at the application site will be able to access *BIFT* on the same basis as those currently located within the SRFI (as described), they will consequently be able to accrue these user benefits. A proportion of the resultant traffic at the planned development can therefore be expected to arrive or depart using rail via Birch Coppice (BIFT), and this is addressed in the following section.

4.21 Shippers will therefore consider other factors (speed, delivery times, etc..) when deciding which mode to use. For reference, intermodal rail's market share into the Midlands from the Port of Southampton is currently around 45%. It is also worth noting that 250km is the approximate 'break even' distance above which intermodal rail freight should offer a more cost competitive solution where one end of the trip is rail-served (in this example the Port of Southampton, but several of the UK's main container ports including London Gateway, Teesport and Felixstowe all also exceed this distance).

4.22 It is worth noting that Maritime Transport already runs several yard tractors/works trucks from *BIFT* so in reality there will be no cost associated with leasing these, making the option much more cost effective for prospective site occupiers. Furthermore, given the short distance journeys involved in shunting between *BIFT* and the application site, the work load involved allows the yard tractors/works trucks to be adapted to low cardon technologies such as fully electric (EVs) or hybrid electric vehicles, which have a limited range at present. This, in turn, would save on VED making the use of *BIFT* even more cost effective whilst also saving carbon.

5. WIDER SUSTAINABILITY BENEFITS

5.1 In addition to the potential user benefits described above, rail freight is recognised as being a more sustainable mode of transport, generating wider societal benefits when compared with road haulage. Modal switch to rail from road generates lower levels of pollutants (improved air quality), causes fewer accidents and leads to less wear/tear on road surfaces. Emissions of greenhouse gases (GHG), in particular, are significantly lower on tonne-km basis, which is particularly important given internationally binding national commitments to reduce and ultimately become a net-zero GHG emitter.

5.2 The Department for Transport (DfT) has monetised the wider societal benefits of moving goods by rail freight rather than road haulage (which in transport appraisals are termed mode shift benefits (MSBs) or non-user benefits). On a weighted average basis, MSBs are currently valued by the DfT at £0.34 per HGV-km removed from the road network. For the Port of Southampton to BIFT example flow presented above, moving the container by rail rather than road haulage would therefore generate around £82 in wider non-user benefits. This section of the report has therefore estimated the potential mode-shift to rail resulting from the proposed development being 'rail-served' (as described) alongside the wider non-user benefits, with a particular focus on the estimated reduction in GHG emissions.

Traffic Volumes and Distribution

5.3 The starting point of this assessment was the forecast HGV trip generation to/from the proposed warehouse units during the peak hours, as agreed by *Bancroft Consulting* with the various highway authorities. Then using TRICS data, these were expanded upon to estimate that over the 12-hour period 07:00 to 19:00, *627 HGVs* will depart the site, as follows:

- 157 HGVs to the South East of the site (A5);
- 33 HGVs to the North East of the site (M42);
- 338 HGVs to the North West of the site (A5); and
- 99 HGVs to the South West of the site (M42).

5.4 An equivalent level for incoming traffic is also forecast. For the purposes of this wider benefits exercise, these 12-hour figures needed to be translated into an estimated 24-hour total[2]. This was based on observed traffic flows (by means of a survey) at the Swan Valley warehousing development in Northampton, data which subsequently formed the basis of the accepted trip generation analysis for the East Midlands Gateway SRFI Development Consent Order

[2] Warehouses such as that planned for the application site will receive and despatch HGVs 24 hours per day, whereas the highway traffic assessment is principally concerned with daytime traffic flows measured against network capacity during the busy daytime period.

examination. This suggests that 56.8% of observed HGV arrivals and departures took place during the 07:00 to 19:00 time period. Consequently, the agreed 12-hour figure has been scaled by 1/0.568 to establish an estimated 24-hour total. On this basis, the planned warehousing at the application site can expect to despatch *1,104 HGVs per 24-hour period* (with an equivalent level for incoming traffic).

5.5 The Swan Valley traffic survey was utilised as that particular development has a broadly similar quantum of floor space (c135,000 sqm) to that planned for the application site, a range of warehouse and manufacturer occupiers and that the 24-hour distribution of traffic subsequently formed the basis of the accepted traffic generation rates at the East Midlands Gateway examination. Also, for the avoidance of doubt, these 24-hour traffic figures (as described) have been estimated purely to establish the potential mode shift to rail and the wider non-user benefits. As noted, Bancroft Consulting's previously agreed peak-hour rates should be adopted for any highway capacity assessments.

5.6 The total HGV arrivals and departures over the 24-hour period will include both loaded and empty re-positioning movements (Bancroft Consulting's figures include both loaded and empty HGVs). For example, a loaded outbound departure to a retail outlet or another distribution centre might return empty (albeit conveying empty roll cages/pallets or waste packaging). Likewise, a loaded arrival from a supplier would realistically depart empty, potentially to collect a backload from another warehouse in the vicinity.

5.7 The table below therefore shows the total estimated 24-hour flows to and from the application site once empty arrivals and departures are accounted for. In this case, we have assumed that 75% of loaded inbound HGVs subsequently depart empty (25% collecting a backload directly from the site), and likewise that 75% of loaded outbound HGVs will return to the site empty. On this basis, the Junction 10 site is estimated to attract 631 loaded HGVs per 24-hour period (and likewise a similar level of departing loaded HGVs).

Table 5.1: Summary of Estimated 24-hour HGV Arrivals and Departures

HGVs			
Loaded inbound	631	Empty Outbound	473
Empty inbound	473	Loaded outbound - backload	158
		Loaded outbound - empty in	473
Total inbound	1,104	Total outbound	1,104
Total per 24-hours	***2,209***		

Source: Bancroft Consulting (agreed peak-hour flows), expanded to 24-hour based on TRICS data and Swan Valley observed traffic flows

5.8 The MDS Transmodal *GB Freight Model (GB Freight Model)*[3] provides an origin-destination matrix of loaded warehousing traffic to/from the site's zone (MSOA: E02006469; North Warwickshire 002: Dordon, Hurley & Wood End). This includes both domestic and unitised port traffic. The imported proportion of incoming cargo to the zone in this case is set at 33%. This is potentially conservative as some warehouses, particularly those operating as National Distribution Centres typical of the area (e.g., Aldi National Distribution Centre at Atherstone), will be handling significantly higher proportions of imported cargo; this is typically more suitable to rail, particularly if moved through one of the rail-served deep-sea container ports.

5.9 The estimated loaded 24-hour HGV traffic in each of the 4 directions has subsequently been distributed nationally in-line with the GB Freight Model's origin-destination matrix of loaded warehousing traffic for the Dordon zone. This is shown in the table below differentiated by standard geographical regions.

Table 5.2: Estimated Distribution of Application Site Loaded Warehouse Traffic by Region

	Loaded HGVs	
GB Region	From Dordon	To Dordon
North East	2	2
North West	127	144
Yorkshire & the Humber	11	14
East Midlands	111	67
West Midlands	238	168
Eastern	40	86
Greater London	25	7
South East	29	95
South West	12	10
Wales	14	22
Scotland	23	15
Total	**631**	**631**

Source: GB Freight Model, based on Table 5.1

5.10 On the basis that all loaded traffic moves by road haulage i.e., assuming initially that no traffic arrives/depart by rail via *BIFT* (this is 'corrected' below), derived from the GB Freight Model's highway assignment module the total daily loaded HGV-km is estimated to be as follows:

- 98,180 HGV-km for loaded inbound HGVs;

[3] Comprehensive freight analytical tool developed/maintained by MDST that models current and forecasts future freight flows by mode, Origin-Destination and commodity grouping. Produces forecasts for, amongst others, DfT, Network Rail, TfN and Midlands Connect.

- 70,933 HGV-km for loaded outbound HGVs; and
- 169,113 HGV-km total for loaded HGVs.

5.11 This represents an average length of haul (ALOH) of 156km for loaded inbound HGVs and 112km for loaded outbound HGVs. For the empty HGVs arriving and departing (Table 5.1 above), these are assumed to have repositioned empty for 25km prior to arriving or following departure from the site. This equates to *23,663 HGV-km per* 24-hour period (i.e., 473 X 2 directions x 25km). The total HGV-km are therefore *192,776 HGV-km* per 24-hour period (i.e., 169,113km + 23,663km).

5.12 However, as described above future occupiers at the application site site will be able to access *BIFT* on the same basis as those currently located within the SRFI, and subsequently accrue user-benefits for some flows. A proportion of the traffic estimated in Table 5.2 above can therefore be expected to arrive or depart using rail freight via BIFT (modal shift). Using the GB Freight Model's mode assignment module, the level of traffic that could be expected to arrive or depart by rail freight has subsequently been estimated (including the origin and destinations). One of the main components of GB Freight Model is the cost-based mode choice calculation which, for every origin to destination, works out the cheapest rail route (including local road hauls at either end). It then calculates the road versus rail trunk haul mode share based on a Logit model. This mode share calculation approach has therefore been applied to the loaded traffic distribution described above. This is shown in the table below.

Table 5.3: Estimated Mode Split at the Proposed Junction 10 Warehouse Development

	Loaded HGV-equivalent units				
	By Rail		Remaining by Road		Rail mode share
GB Region	From Dordon	To Dordon	From Dordon	To Dordon	(Both directions together)
North East	1	0	1	2	20%
North West	8	8	119	136	6%
Yorkshire & the Humber	1	0	10	14	5%
East Midlands	2	1	109	66	2%
West Midlands	3	2	235	166	1%
Eastern	4	38	36	48	33%
Greater London	2	0	23	6	8%
South East	3	12	26	83	12%
South West	2	1	10	9	13%
Wales	1	1	13	21	7%
Scotland	19	11	4	4	79%
Total	**46**	**76**	**585**	**555**	**10%**

Source: GB Freight Model

5.13 On that basis, around 76 loaded inbound HGV-equivalent units can be expected to arrive by rail via *BIFT* across the 24-hour period. The equivalent for loaded outbound is 46 HGV-equivalent units. Combined, rail therefore equates to 122 loaded HGV-equivalent units (sum of both directions) across the 24-hour period. This suggests just over 3 'works trucks' shuttle movements per hour between BIFT and the application site when spread evenly across the 24-hour period (as described in Section 4, in each case delivering a loaded container and returning to *BIFT* with a loaded outbound or empty container). Overall, the rail mode share for all cargo, when simply measured in terms of the number of HGV-equivalent units passing through the gate, is 7% for outgoing traffic and 12% for incoming traffic (10% for both directions combined). When measured in terms of unit-km i.e., also accounting for distance moved, the rail mode share is estimated to be around 21%.

Reduction in GHG Emissions

5.14 The *Department of Business, Energy and Industrial Strategy (BEIS)* publishes conversion factors in order that those organisations required to can calculate and report their GHG emissions[4]. The current figure for an average laden articulated HGV is 0.91569kg CO_2e per HGV-km. Therefore, on the basis that all cargo moves by road haulage, the total of 192,776 HGV-km per 24-hour period (as per above) equates to GHG emissions of 176,523kg CO_2e (i.e., 192,776km x 0.91569). Assuming the equivalent of 300 operating days per year, this equates to *53,000 tonnes of* CO_2e *per year*.

5.15 On a per tonne-km basis, rail transport has lower carbon emissions than the equivalent road transport. Therefore, a switching of appropriate movements from road to rail can be expected to result in a reduction in GHG emissions. For rail freight, the BEIS conversion factors only provides a per tonne-km value. This is 3.1 times lower than that for the average laden articulated HGV, meaning that the like-for-like figure for movements by rail freight is 0.29492kg CO_2e per HGV-equivalent km. The total of 122 loaded HGV-equivalent units (sum of both directions) across the 24-hour period equates to *34,915 HGV-equivalent km*, with an ALOH of 286km. This equates to GHG emissions of 10,297kg CO_2e per 24-hour period directly associated with rail freight transport or just under *3,100 tonnes* CO_2e *per annum* assuming 300 operating days. However, for rail freight the estimation also needs to consider the emissions derived from:

- Lifting equipment at the terminals and ports; and
- Local road hauls and 'works truck' shunting between BIFT and the application site.

[4] www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020
Outputs are reported as kilograms of carbon dioxide equivalent (kg CO_2e)

5.16 Container lifting operations (to/from rail wagons) at each end of the journey will involve either a reach stacker or a terminal gantry crane. Compared to the transport legs, the GHG emissions will be very small and these have been estimated these to be the equivalent of 1km of HGV haulage (at the BEIS conversion factor for average laden HGV).

5.17 We have assumed 6km of 'works truck' shunting at BIFT per unit moved (at the BEIS conversion factor for an average laden HGV). For non-port rail traffic, a local road haul from the destination terminal to the cargo's final destination is assumed at a distance of 40km. As with road journeys direct from the application site, it is assumed that there will be an additional 75 empty movements associated with every 100 loaded movements, each travelling 25km. Therefore, for each non-port loaded rail unit moved there are 65.75 HGV-km of GHG emissions to include in the calculation (i.e., 6km + 1km + 40km + (75% X 25km) = 65.75 HGV-km), again at the BEIS conversion factor for an average laden HGV. For each port loaded rail unit moved, there are 7 HGV-km of GHG emissions to include (i.e., 6km + 1km = 7km).

5.18 Due to the estimated modal shift from road to rail, the GB Freight Model forecasts that the remaining loaded road journeys to and from the application site are as follows:

- 555 HGVs inbound to the site with an ALOH of 141km, equating to 77,981 HGV-km daily;
- 585 HGVs outbound from the site with an ALOH of 96km, equating to 56,217 HGV-km daily; and
- Daily total of *134,198 loaded HGV-km*.

5.19 The associated empty HGV movements are *21,375 HGV-km*, calculated on the same basis as the 'road only' served site (i.e. (585+554) x 75% x 25km). The total HGV-km are therefore 155,573 *HGV-km* per 24-hour day (i.e., 134,198km + 21,375km). The estimated GHG emissions associated with the forecast road and rail freight volumes (Table 5.3) is therefore shown in the table below, and subsequently compared with the 'road only' figure calculated earlier.

Table 5.4: Estimated GHG Emissions at Junction 10 Site

		GHG Emissions (CO_2e) per 24-hours
Road and Rail		
Rail	34,915 HGV-equiv km x 0.29492kg CO_2e	10,297kg CO_2e
Non-port	72 HGV-equiv units x 65.75km x 0.91569kg CO_2e	4,335kg CO_2e
Port	50 HGV-equiv units x 7km x 0.91569kg CO_2e	320kg CO_2e
Remaining Road	155,575 HGV-km x 0.91569kg CO_2e	142,458kg CO_2e
Total		*157,410kg CO_2e*
Road Only		
Road	192,776 HGV-km x 0.91569kgCO_2e	*176,523kg CO_2e*
		GHG Emissions (CO_2e) per annum*
Road		*52,957 tonnes CO_2e*
Road and Rail		*47,223 tonnes CO_2e*
Saving		***5,734 tonnes CO_2e***

**300 operating days per annum*

Source: GB Freight Model and BEIS Conversion Factors

5.20 On this basis, it is estimated that the modal shift from road to rail will generate a saving of just under **5,800 tonnes of carbon dioxide equivalent per annum**. To put that figure into context, it is broadly the same amount of carbon dioxide equivalent produced by around *2,750 typical mid-sized diesel powered cars* during the course of a year (on the basis that a typical mid-sized diesel car generates around 130g CO_2e per km and will on average cover 16,000km/c10,000 miles per annum)[5].

Non-User Benefits

5.21 Further, from the above forecasts the overall reduction in loaded HGV-km to and from the application site resulting from this modal shift is estimated to be around 34,915 HGV-km per 24-hour period (i.e., 169,113 HGV-km – 134,198 HGV-km). Assuming 300 operating days per annum, this represents a reduction of 10.4 million HGV-km over the course of a year. Based on the current MSB rate (weighted average) of £0.34 per HGV-km removed from the road network, this represents total non-user benefits to the country of around *£3.5 million per annum*.

[5] 0.130kg CO_2e x 16,000km = 2,080kg per annum (i.e., 2.08 tonnes) for each car. 5,734 tonnes/ 2.08 tonnes = 2,756 cars

6. SUMMARY AND CONCLUSIONS

6.1 The proposed road-based warehouse development is justifiable and deliverable in both planning and road traffic terms, based on the overarching identified need for logistics development in this location. However, due to the application site's close proximity to *Birmingham Intermodal Freight Terminal*, the proposed development can also in practice be classified as rail-served, and a proportion of the resultant traffic can therefore be expected to arrive or depart using rail freight. The purpose of this technical note is to explain why this situation arises, and to demonstrate the benefits of rail connectivity that will would be accrued by future warehouse occupiers at the application site and wider society.

6.2 Government planning policy (NPPF and NPS for National Networks) promotes the location of logistics facilities at sites which offer genuine modal choice to shippers. This is for two principal reasons:

- It creates the conditions where rail freight can become cost competitive when compared with road haulage, generating so called user benefits; and
- Rail freight is recognised as being a more sustainable mode of transport, generating wider societal benefits (non-user benefits) when compared with road haulage.

6.3 Developments over the past two decades have seen multiple warehouse new-builds 'cluster' around an intermodal terminal. In planning terms, these have become known as *Strategic Rail Freight Interchanges (SRFIs)* and it includes the warehousing and rail terminal developed at *Birch Coppice Business Park*. The proposed scheme is on the opposite side of the A5 to the existing Birch Coppice SRFI; the gate-to-gate distance via the public road network will be around 500m.

6.4 While yard tractors have been designed to haul semi-trailers on private land (such as between intermodal terminals and warehousing within SRFIs), under limited circumstances they can also be operated on the public road network. In these situations, they are classed as *'works trucks'*. It was demonstrated that the proposed warehouse development falls within the 'works truck' conditions and can therefore in practice be classified as rail-served (effectively it will be 'inside' the SRFI). Occupiers will be able to access *BIFT* on the same basis as those currently located within the SRFI.

6.5 It was subsequently shown that, for certain flows, future occupiers located at the application site would be able to accrue user benefits when using rail freight via *BIFT*. A proportion of the resultant traffic at the planned development can therefore be expected to arrive or depart using rail via *BIFT*. Given that position, analysis has forecast (using the GB Freight Model) that around 10% of loaded inbound and outbound traffic could be expected to move by rail freight via *BIFT*. It was subsequently estimated that the forecast modal shift from road to rail will, in terms of GHG emissions, generate a saving of just under *5,800 tonnes of carbon dioxide equivalent per annum*. Based on the current MSB rate (weighted average) of £0.34 per HGV-km removed from the road network, the forecast modal shift equates to annual non-user benefits of around *£3.5 million* to the nation but focused locally to the site.

6.6 It is therefore concluded that while the proposed road-based warehouse development is not dependent on access to *BIFT*, the plans conform with the Government's current policy with respect to the location of large scale logistics facilities, promoting modal choice and the transition to net-zero GHG emissions and as such, will generate several user and non-user benefits planning benefits, when compared to a site that is not rail-served.