Local Pinch Point Fund

Department for Transport

Expression of Interest Form: 2021/22 and 2022/23 proposals

This form is for proposals to be funded by DfT in 2021/22 and 2022/23. Proposals should demonstrate the benefit to local businesses, and improvements to productivity on completing the project. The proposal should indicate the range of funding sought from the Department for Transport, e.g. £5 million to £10 million, £10 million to £15 million, or over £15 million.

The closing date for Expressions of Interest is **31 January 2020**.

For proposals submitted by components of a Combined Authority a separate EOI form should be completed for each one, then the CA should rank them in order of preference.

Applicant Information

Local authority name: Worcestershire County Council (WCC)

Manager Name and position: Tina McLaughlin, Team Leader, Transport Infrastructure Commissioning Team

Contact telephone number:01905 844998 **Email address:** TMcLaughlin2@worcestershire.gov.uk

Postal address: **E&I Directorate**
Worcestershire County Council
County Hall
Spetchley Road
Worcester

Postcode WR5 2NP

Please Note: Worcestershire County Council is submitting two Local Pinch Point Expression of Interest forms for two separate schemes.

The scheme covered in this form, 'South Worcester Active Travel and Public Transport Corridors – Powick Hams to Malvern, and Kemspey to the Ketch, is ranked second.

The scheme covered in the other form, 'Evesham Transport Strategy Phase 2' is ranked as the number one priority.

SECTION A – Description of works

A1. Name of proposal: South Worcester Active Travel and Public Transport Corridors – Powick Hams to Malvern, and Kemspey to the Ketch

A2. Geographic area:

Please provide information about the location of the proposal (in no more than 50 words)

The Powick Hams to Malvern and Kempsey to the Ketch commuter routes, which mirror the A449 and A38 key corridors, will provide direct active travel and public transport choices on these busy commuting corridors (please see attached location plans in Appendix 2a, Appendix 2b, Appendix 7a and Appendix 7b).

OS Grid Reference:
Powick Hams to Malvern 383483, 252030 – 379414, 248456
Kempsey to the Ketch 385310, 251423 – 385346, 249966

A3. Description of existing problems and how the proposal would address them. Please set out which other options have been considered:

Increasing realistic travel choice is critical to enable our economy to diversify and grow. Nationally and at the local level, evidence and experience consistently proves that even small shifts away from single-occupancy car use to walking, cycling and passenger transport can deliver significant improvements to traffic flow and wider benefits, including reduced ambient air pollution which improves public health.

Active Travel Corridor Improvements
An 'Active Travel Corridor' can be defined as a continuous walking and cycling route, normally mirroring a busy highway route (such as the A449 in Worcestershire) to create a safe, comprehensive, integrated network linking residential areas with key trip attractors, including schools, rail stations, town centres and employment locations.

Typically, Active Travel Corridors involve extensive surfacing, signage, lighting and public realm improvements to create an attractive and coherent network and are specifically designed to offer realistic and attractive alternatives to car use.

The A449 and A38 are busy transport corridors, which link the town of Great Malvern and the large commuter village of Kempsey respectively with the Worcester Southern Link Road (A4440), Worcester City Centre, the M5 (Junction 7) and a range of strategic destinations.

Significant development growth is planned for the local area, as set out in the South Worcestershire Development Plan (SWDP – www.swdevelopmentplan.org). In particular, circa 56ha land is being developed at North-East Malvern (Newland) which will incorporate 800 dwellings and 10ha of employment-generating uses.

Without focussed investment in alternative travel choices, this planned growth will result in an uplift in travel demand which will be met entirely by the car, delivering an unsustainable uplift in vehicular traffic and exacerbating congestion experienced on these key arterial routes.

Recognising this, Worcestershire County Council has invested in upgrades to rail infrastructure on the Malvern to Worcester corridor (A449) and is investing heavily in a major scheme ***(with funding received from the DfT)*** to fully dual the Worcester Southern Link Road (A4440) from Powick Hams to the M5, to provide capacity for growth.

This bid focuses on providing safe, separated active travel corridors for cycling and walking which mirror these busy commuter routes, which will integrate with the City of Worcester's existing established active travel networks at the Worcester Southern Link Road (A4440). These proposed corridors will directly complement recent investment in this area, providing genuine travel choice alternatives for those making shorter (under 10km) trips.

Powick to Malvern Active Travel Corridor (ATC)
Worcestershire County Council and Sustrans have long desired the creation of a new stretch of the National Cycle Network to link Malvern and Powick Hams (for Worcester). This proposed route corridor would be approximately 6 kilometres long (from outskirts of Malvern to outskirts of Worcester, at Powick Hams) and would become part of the National Cycle Network Route 46 (Please see Appendix 2a).

Of all the routes Sustrans wishes to see created in the West Midlands, this specific section enjoys the strongest public interest, and this has intensified further since the adoption of the South Worcestershire Development Plan and commencement of the dualling of the Worcester Southern Link Road, which includes a comprehensive package of improvements for active travel modes.; one of these improvements being a new walking and cycling bridge at Powick Hams. Please see Appendix 3 which details the walking and cycling bridge at this location.

At just 6 kilometres long, the distance between Worcester (Powick Hams) and Malvern is eminently suitable for regular cycle-commuting. Further, providing the link between Worcester (which is already well connected to the National Cycle Network) and Malvern will also increase the opportunities for both recreational cycling and cycle tourism. There is much interest in recreational cycling locally, witnessed by both towns having their own thriving cycling clubs. Local groups have been lobbying MPs, Local Members and Officers for many years for improved cycling provision to link Malvern to Powick Hams.

A feasibility report undertaken in 2012 by Sustrans, which included the results of consultation on the potential cycle route improvements along this corridor, concluded that opportunities for utilising the A449 as well as spurs off to Old Malvern Road and Hawthorne Lane were possible (please reference the location plan for this route). Other options which were explored included the use of Jennet Tree Lane from Callow End; this was not pursued as it was deemed there would be far less usage of this route than the A449 and spur routes.

Route improvement costings were drawn up in 2013/14 and revised in 2018 to understand likely budgets. At the same time, significant business case development work was undertaken to identify a preferred route option for this corridor. Appendix 1a illustrates the preferred scheme, which this bid seeks to fund. This would deliver a continuous, safe and attractive corridor route mirroring the busy A449 corridor, with spurs using quieter on-road routes to provide alternatives to cater for all types of cyclists.

The proposals, which we are seeking funding for, focus on off-road facilities on the A449 accompanied by potential on-road facilities which would require substantial segregation considering the speed and volumes using this road, with spurs using quieter on road routes providing an alternative along more challenging sections of the A449. This would provide a comprehensive cycle route for all types of cyclists giving the opportunity to commute more sustainably and therefore impacting on the volumes of car users, improving air quality and encouraging active travel thus impacting on the Obesity agenda.

The proposed Malvern to Powick Active Travel Corridor scheme is critical to supporting development at North-East Malvern (Newland) which would incorporate 800 homes and 10ha of employment land. This quantum of development could sustain more than 1800 jobs and generate nominal Gross Value Added (GVA) in the region of £97m per annum upon completion. In addition to that the proposed ATC scheme will significantly build upon the current investment the DfT are making on the Large Local Major (LLM) scheme of dualling Worcester Southern Link Road (A4440 SLR) from Powick Hams to the M5. The DfT's LLM scheme also incorporates significant enhancement to the cycle route along the SLR and

at Powick Hams junction. ***Therefore, a successful pinch-point ATC scheme together with DfT's SLR scheme will deliver a much more attractive and direct route between the Newland's development and Worcester.***

Kempsey to Ketch Active Travel Corridor

The South Worcestershire Development Plan promotes significant development in the Kempsey area. This will increase the size of this village dramatically, as well as increasing the density of people living along the A38 corridor between the Ketch (Worcester) and Kempsey (Please see Appendix 2b). This proposed route corridor would be approximately 1.6 kilometres long.

A wider project to link Worcester to Kempsey via on and off-road routes focusing on riverside paths has been through a feasibility assessment. This has identified several options for providing on and off-road networks of links between Diglis Bridge and just north of the City boundary. This will largely follow the Severn Way, a long-distance footpath, following the River Severn. Various short linkages have been identified to join to residential areas from this footpath. This is a joint venture between Worcestershire County Council and Worcester City Council and will provide access from the A4440 into Worcester. Please see Appendix 4 which shows the wider route proposals linking Kempsey to Worcester.

When the route reaches the A4440 at the Ketch, a number of issues have been identified which mean that the riverside route cannot be used to extend southwards to Kempsey. It is also recognised that this route needs to be attractive to commuting, and so must be usable in all weathers between Kempsey and the Ketch.

The A38 between Worcester (the Ketch) and Kempsey, was formally the main trunk route between Birmingham and Bristol. As a result, it is significantly wider than many A-roads of similar grade/importance elsewhere. The Design Manual for Roads and Bridges requires A-roads of this class to be of a minimum width of at least 6 metres. Along this stretch, the road is considerably wider, fluctuating between 7.2 and 10 metres. As a result, there is excellent opportunity to create a high quality, level and partially lit active travel corridor route direct from Kempsey to the Ketch (for Worcester), for which this bid seeks funding. Please see Appendix 5 which details the route alongside the A38.

Worcestershire County Council has already secured Section 106 contributions towards pursuing both of these vital active travel corridors, which offer significant potential to deliver travel choice alternatives on some of the most congested transport corridors in Worcestershire.

Public Transport Corridor Improvements

The recently adopted Worcestershire Passenger Transport Strategy has been developed to support Worcestershire's Local Transport Plan 4. The Strategy sets out how Worcestershire County Council, working with its partners, aims to make passenger transport improvements for the benefit of all Worcestershire residents.

Passenger transport services form the 'backbone' of Worcestershire's transport networks. It is widely recognised that the most successful economies boast strong, well-integrated passenger transport networks which enable the efficient movement of people. This is particularly important in growing economies such as Worcestershire, where significant growth is planned. The Strategy will look at ways for residents and visitors to access services across Worcestershire. It recognises that passenger transport plays a key part in supporting this access

One of the key aims of the strategy is to provide good network coverage, operating times, frequency of the service and network integration while still achieving best value. The two key objectives are:

Information and Infrastructure: This objective will ensure that information is provided in the most appropriate way and considers the requirements of the Bus Services Act (2017). We will also look at appropriate levels of infrastructure provision (e.g. Bus shelters) across the network.

Modal Integration: This objective focuses on the need to consider all methods of passenger transport to achieve improved integration. This will include consideration of accessibility of services and cost-effective passenger transport options.

Powick to Malvern and the Kempsey to Ketch Public Transport Corridors

There are currently a number of services that travel through the proposed Powick to Malvern as well as the Kempsey to Ketch Corridor. Key Elements of the proposal include:

- Provision of Real Time Passenger Information (RTPI) display boards at key stops along Powick to Malvern, as well as Urban Traffic Control system upgrades to ensure the benefits of RTPI are linked into wider traffic management systems;
- Provision of RTPI display boards at key stops along Kempsey to Ketch Corridor, as well as Urban Traffic Control Intelligent Traffic Light Priority (TLP) system upgrades to ensure the benefits of RTPI are linked into wider traffic management systems;
- Development of next generation of Transport Hubs promoting all "sustainable modes of transport" – linked to changes in publicity and promotion of sustainable schemes to aid modal shift; and
- The provision of QR Codes and Near Field Communication at key bus stops on all upgraded corridors, significantly enhancing access to Real Time Passenger Information.

Intelligent Traffic Light Priority (TLP)

It is proposed to develop an Intelligent Traffic Light Priority (TLP) system, to improve operational/journey time reliability, which will include assessment of how the benefits of investment in a TLP system can be measured accurately.

One of the key benefits of a Real Time Information systems is the ability to give buses 'intelligent' TLP at selected junctions. Traditionally physical bus lanes have been used, but these require large areas of road-space which can alienate other road users when they see what could be called a waste of 'empty' space. The ability to build physical bus lanes along these corridors is unlikely along the corridors highlighted within this application.

Selective TLP using Real Time Information Systems can be used to give priority only to buses that are running late, but a configurable time. Instead of using physical trigger loops in the road, virtual trigger loops can be defined based on GPS co-ordinates, and as the Real Time Information System knows whether a bus is running early, on time or late, a priority request can be made accordingly.

Early generation Real Time Information Systems used communications between the bus and the local traffic signal controller to request TLP, but this relied on additional hardware on the bus and in the local traffic signal controller which increased costs, complexity, and could be a weak link in the chain. The Worcestershire Real Time Information System will use central TLP instead, where the central Real Time Information System will communicate directly with the Urban Traffic Control system to request priority using Real Time Information Group (RTIG, see Appendix 7c) standards. If a junction is not connected to the Urban Traffic Control system, it can have TLP added using an Outstation Transmission Unit for Urban Traffic Control communication, without having to have full Urban Traffic Control application. It should be noted that a request for TLP is made to the Urban Traffic Control system, but depending on the configuration, traffic conditions, and other requests, a request for priority may not be granted.

These virtual trigger loops need to be set up for each junction using Real Time Information Group standards, and these are plotted in a computer aided design package such as AutoCAD. These need to be imported into the Real Time Information System and into the bus On-Board Units / Electronic Ticketing Machines. As a bus will typically transmit its location every 30 seconds, but this is not normally enough to generate good TLP. By storing the location of the trigger loops on the On-Board Units /

Electronic Ticketing Machine, this enables an 'instant' TLP request to be made when the bus passes a defined virtual trigger loop.

The traffic signal controller configuration will need to be amended for each junction to accept the TLP request and to define how it is to be actioned if granted. A reporting function is being sought within Trapeze's Novus RT software to record the number of times TLP requests are made in terms of junctions and services for user-defined periods.

Possible Solutions (to be fully defined at the next stage of bid submission):

1) Trip Speed
   a. Define corridors into and out of city – (how do we do this?) OR simple urban / rural.
   b. Average vehicle speed (mph)
   c. Trip time per mile – passenger perception
   d. Peak vs off peak
   e. Comparison to 'typical' day (same day type, past 4 weeks, 1-hour time window? – defined alongside WCC)

2) Air Quality – (need to calculate proxy)
   a. Define area to be measured – 'geofence'
   b. Record length of time within area – need to know entry and exit
   c. Calculate proxy for air quality based on Euro rating from fleet list (what format do we need fleet list in?)
   d. Count of number of vehicles within zone – by Euro rating
   e. Comparison to 'typical' day (same day type, past 4 weeks, 1-hour time window? – defined alongside WCC)

3) Traffic Light Priority KPI's WORCESTER (*This is the key element*)
   a. Define Junction Movement Groups (e.g. arranged into corridors)
   b. Display the Junction Groups graphically
   c. High level stats – No. and % of messages received, sent, and acknowledged by UTC. Split per Operator if required
   d. Measure for Traffic Light Priority performance - Percentage of actions in each category for each group and global
      i. Request denied
      ii. No action required – Signals already on green
      iii. Green phase held
      iv. Green phase 'hurry' on other movements
   e. Trip time measures as described above – to include variability in trip time
   f. Comparison to 'typical' day (same day type, past 4 weeks, 1-hour time window? – defined alongside WCC)

4) Exceptions – all of the above categories– a way to point out the worst performing services, stops, signs, corridors, TLP Junction Group.

Proposed Schemes

In summary the proposed schemes are:

- Powick Hams to Malvern Active Travel Corridor;
- Kemspey to the Ketch Active Travel Corridor;
- Powick Hams to Malvern Public Transport Corridor; and
- Kemspey to the Ketch Public Transport Corridor.

The total project cost is estimated at £5.3M. With £1.4M (26%) of match funding assembled, the total request for Local Pinch Point funding is £3.9M.

Please also see letters of support for from First, Malvern Hill Area of Outstanding Natural Beauty (AONB), Malvern Hill District Council (MHDC), Sustrans and Worcestershire Local Enterprise Partnership (WLEP) in Appendix 1.

SECTION B – The Business Case

B1. The Financial Case – Project Costs and Profile

Please indicate the anticipated cost of the proposal in the table below. **Figures should be entered in £000s** (i.e. £10,000 = 10).

Funding profile (Nominal terms)

Powick to Malvern Active Travel and Passenger Transport Corridor

£000s	***2021-22***	***2022-23***	***Total***
DfT Funding Sought	*1,100*	*1,490*	*2590*
LA Contribution	*200*	*200*	*400*
Other Third Party Funding	*-*	560	560
Total	*1,300*	*2,250*	*3,550*

Kempsey to Ketch Active Travel and Passenger Transport Corridor

£000s	***2021-22***	***2022-23***	***Total***
DfT Funding Sought	*-*	*1,367*	*1,367*
LA Contribution	*-*	*190*	*190*
Other Third Party Funding	*-*	*243*	*243*
Total	*-*	*1,800*	*1,800*

Combined Corridor Enhancements

£000s	***2021-22***	***2022-23***	***Total***
DfT Funding Sought	*1,100*	*2,857*	*3,957*
LA Contribution	*200*	*390*	*590*
Other Third Party Funding		*803*	*803*
Total	*1,300*	*4,050*	*5,350 (circa 26% is LA and 3rd party contribution)*

Notes:
1) Department for Transport funding will be granted in the 2021-22 and 2022-23 financial years but local highway authorities may carry that funding over to following financial years if necessary.
2) There is no specific amount for a local contribution by the local authority and/or a third party but if additional funding is proposed please state what this is expected to be.

_____
_____

B2. Timetable

Proposed start date **April 2020/21**

Estimated completion date **March 2022/23**

B3. Further information in support of the proposal

At this Expressions of Interest stage we will be looking at the impact of the proposal on traffic congestion, and its benefit to local residents and businesses. For example, details about the level of congestion on the route, delays at junctions, and evidence of queuing in the peak hours.
You should set out the wider strategic benefits that the proposal is expected to address.

Appendix 6 provides active travel corridor policy context in the form of the route identified under Local Transport Plan 4. Albeit the details on congestion relief on the A449 and the A38 will be worked out in the next stage of the bid submission, the introduction of the two Active Travel Corridors are aimed to assist in facilitating:

- Relieve congestion;
- Enable and promote growth;
- Enhance journey time reliability;
- Address deteriorated ambient air quality (and associated noise pollution); and
- Improve all aspects of road safety.

Regarding the Passenger Transport Corridor, it should be noted that the proposed scheme will impact specific parts of a journey. These may often be represented through use of quality factors that effectively reduce the generalised cost of certain journey elements e.g. a passenger may experience a reduction in perceived wait time where real time passenger information systems are provided at a bus stop, and hence a reduction is made to the wait time part of that journey. Appendix 8 and Appendix 9 show the analysis of the proposed public transport routes and highlights the issues with reliability of the service using the Worcestershire Real Time Information System. It has been observed that on an average bus journeys were taking 20-30% longer than the scheduled time of the trips. These delays will be quantified/monetised in the next stage of submission.

In summary, the benefits that the proposed measures will deliver include:

Reduced Waiting time: the proposed scheme will provide significant passenger waiting time and cost benefits. A full assessment of benefits and costs is not appropriate at this Expression of Interest stage, but experience gained from delivering similar packages of work suggests the proposed measures will represent a very good value for money scheme;

Increased journey time reliability: the particular focus will be on improved timetable compliance for bus services, but with the parallel benefit of corridor-long traffic management that will benefit all road-users;

Improved options for pedestrians and cyclists: the proposed walking and cycling infrastructure will give people the opportunity to swap short car journeys for active travel, with all the health, pollution and congestion benefits that will be derived from that. Albeit, we have not monetised the physical activity benefits but will do in the next stage of submission.

SECTION C: Declarations

C. Senior Responsible Owner Declaration	
As Senior Responsible Owner for [*South Worcester Active Travel and Public Transport Corridors – Powick Hams to Malvern, and Kemspey to the Ketch*] I hereby submit this request for approval to DfT on behalf of [*Worcestershire County Council]* and confirm that I have the necessary authority to do so. I confirm that [*Worcestershire County Council*] will have all the necessary powers in place to ensure the planned timescales in the application can be realised.	
Name: Nigel Hudson	Signed: 
Position: Head of Strategic Infrastructure & Economy, Worcestershire County Council	

Submission of Expression of Interest:

The deadline for the Expression of Interest submission is 5pm on **31 January 2020**
Successful proposals for EOIs in the Local Pinch Point Fund are to be funded by DfT in 2021/22 and 2022/23.

There are two phases to the application process:
- this Expression of Interest stage where we will assess the proposal based on the eligibility criteria as set out in Section 3 of the published Guidance.
- for authorities successful in passing to Phase 2, we will expect a further and detailed submission. Further guidance will be issued to the successful authorities when they are notified

An electronic copy only of the EOI should be submitted to:

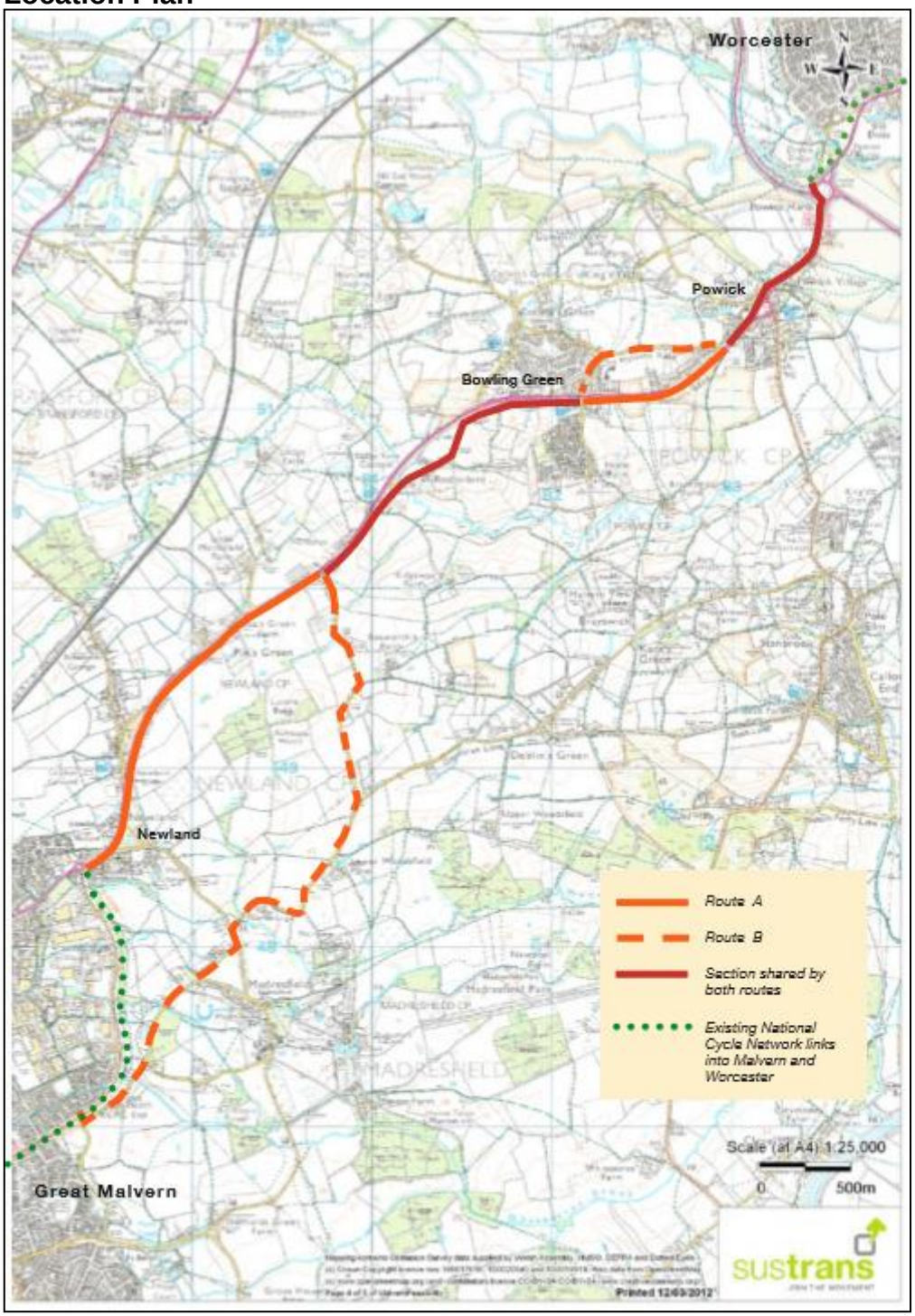
LT.Plans@dft.gov.uk copying in Paul.O'Hara@dft.gov.uk

Appendix 1 – Letters of Support

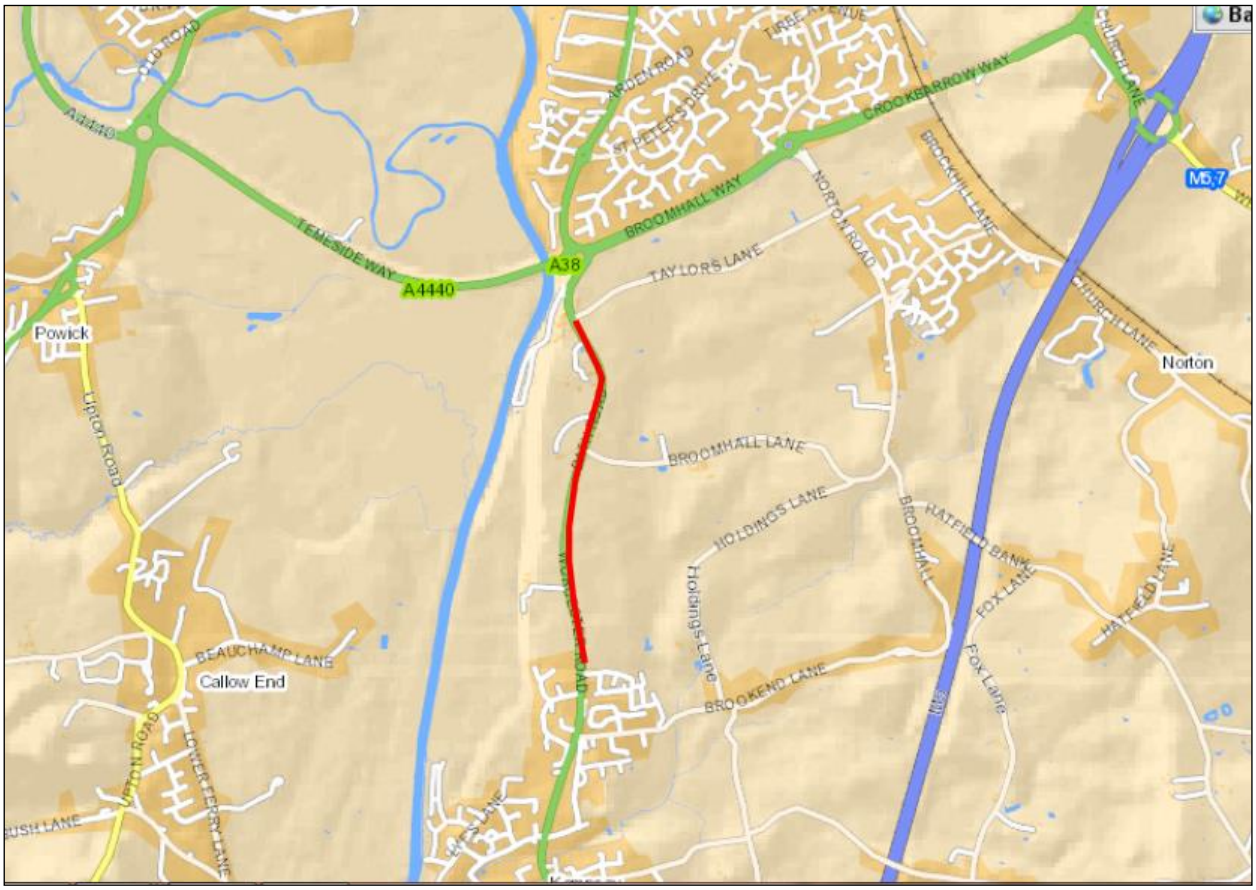
Letters of support have been received from the following organisations:

- First
- Malvern Hills Area of Outstanding Natural Beauty (AONB)
- Malvern Hill District Council (MHDC)
- Sustrans
- Worcestershire Local Enterprise Partnership (WLEP)

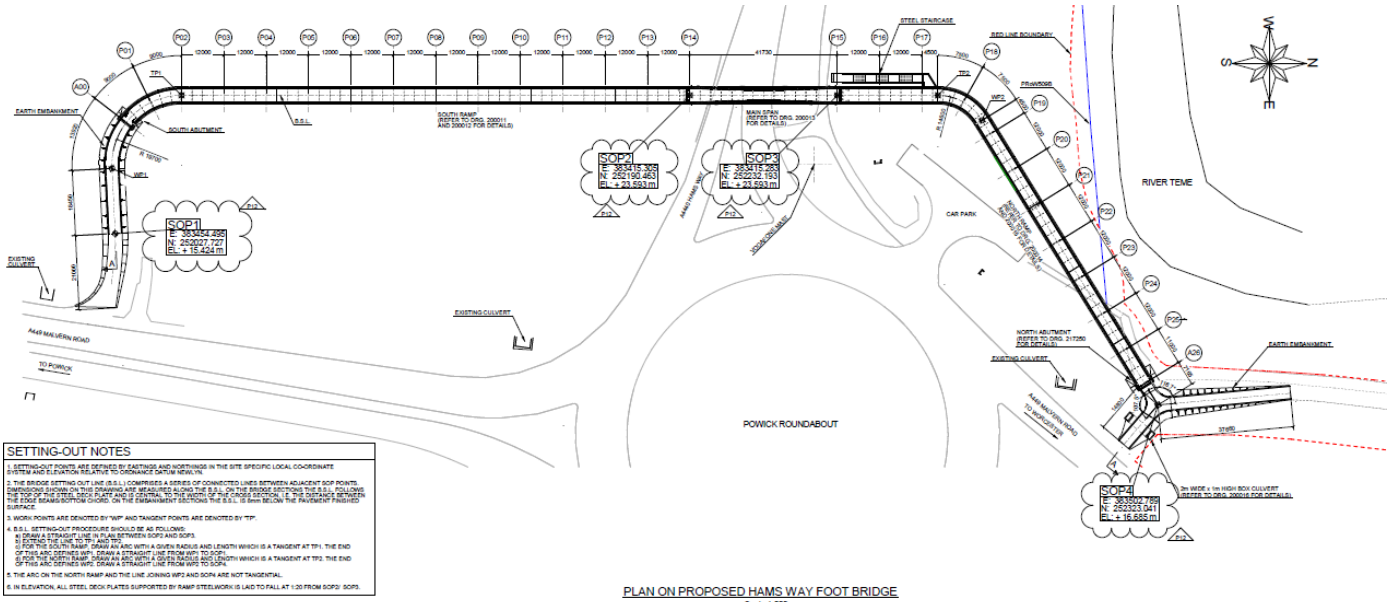
Appendix 2a – Proposed 'Route A' and 'Route B' between Malvern and Powick
Location Plan



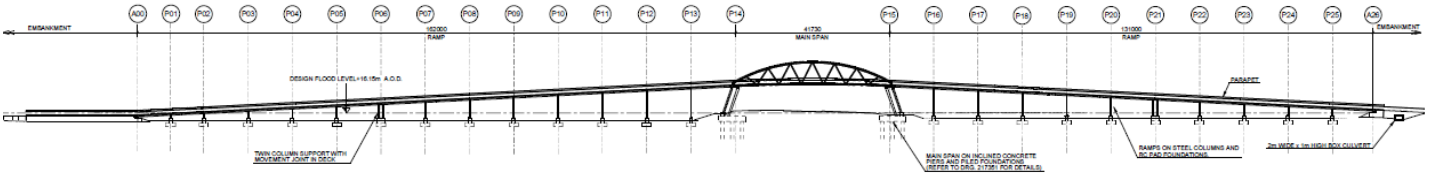
Appendix 2b: Proposed Kemspey to Ketch Location Plan (route denoted by the red aligment)



Appendix 3 – Powick Hams walking and cycling bridge link to route

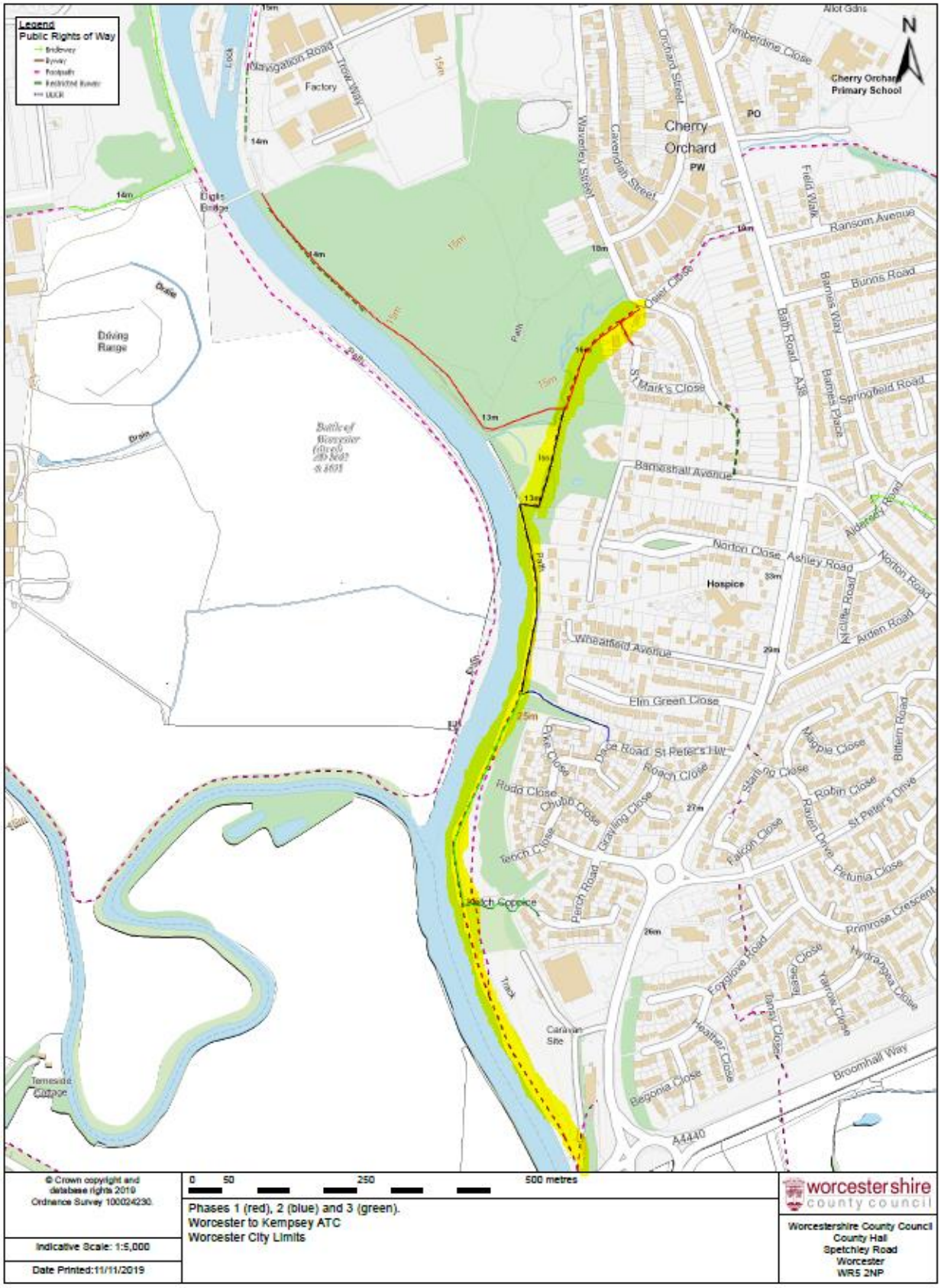


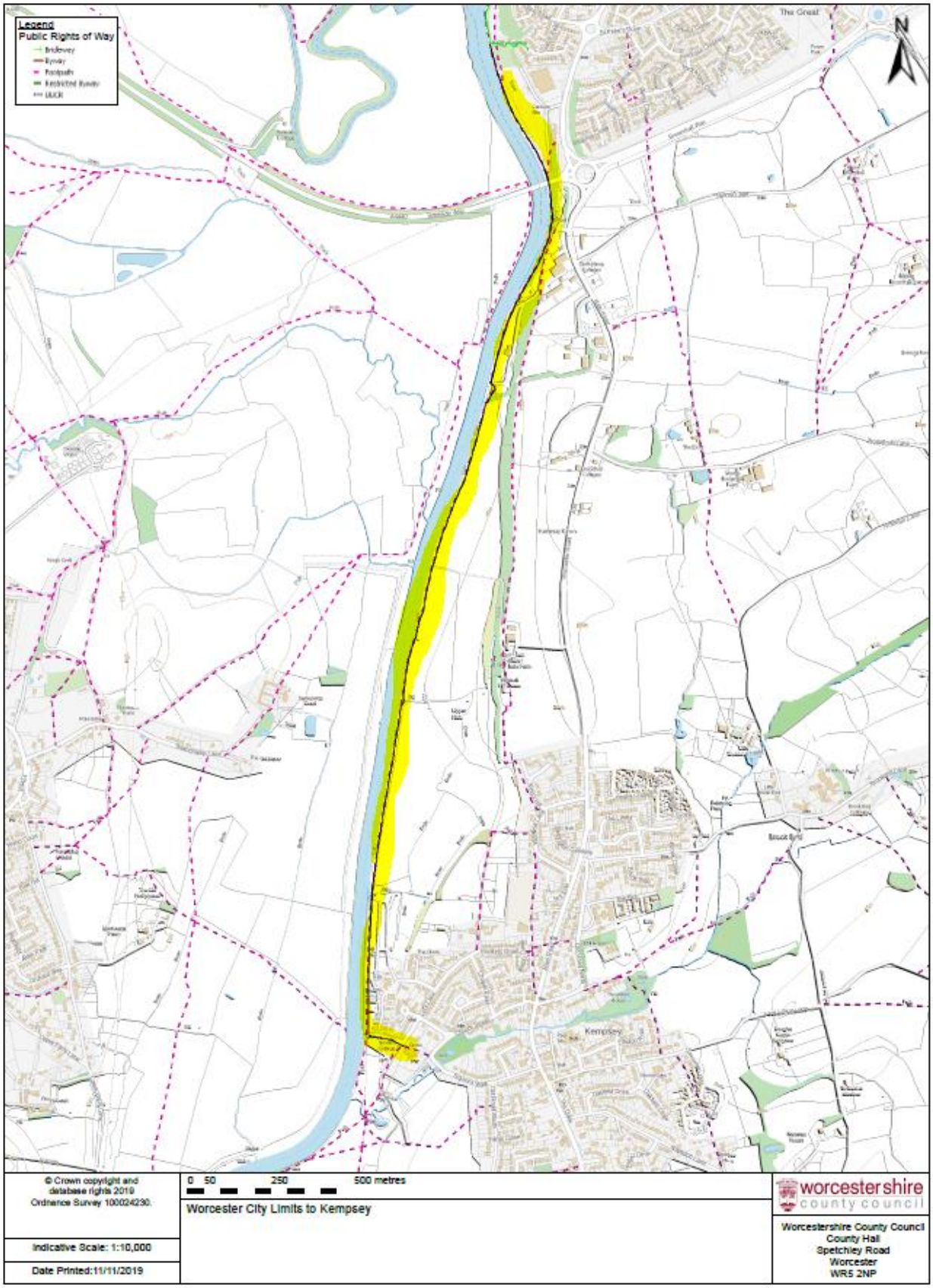
PLAN ON PROPOSED HAMS WAY FOOT BRIDGE
Scale 1:500



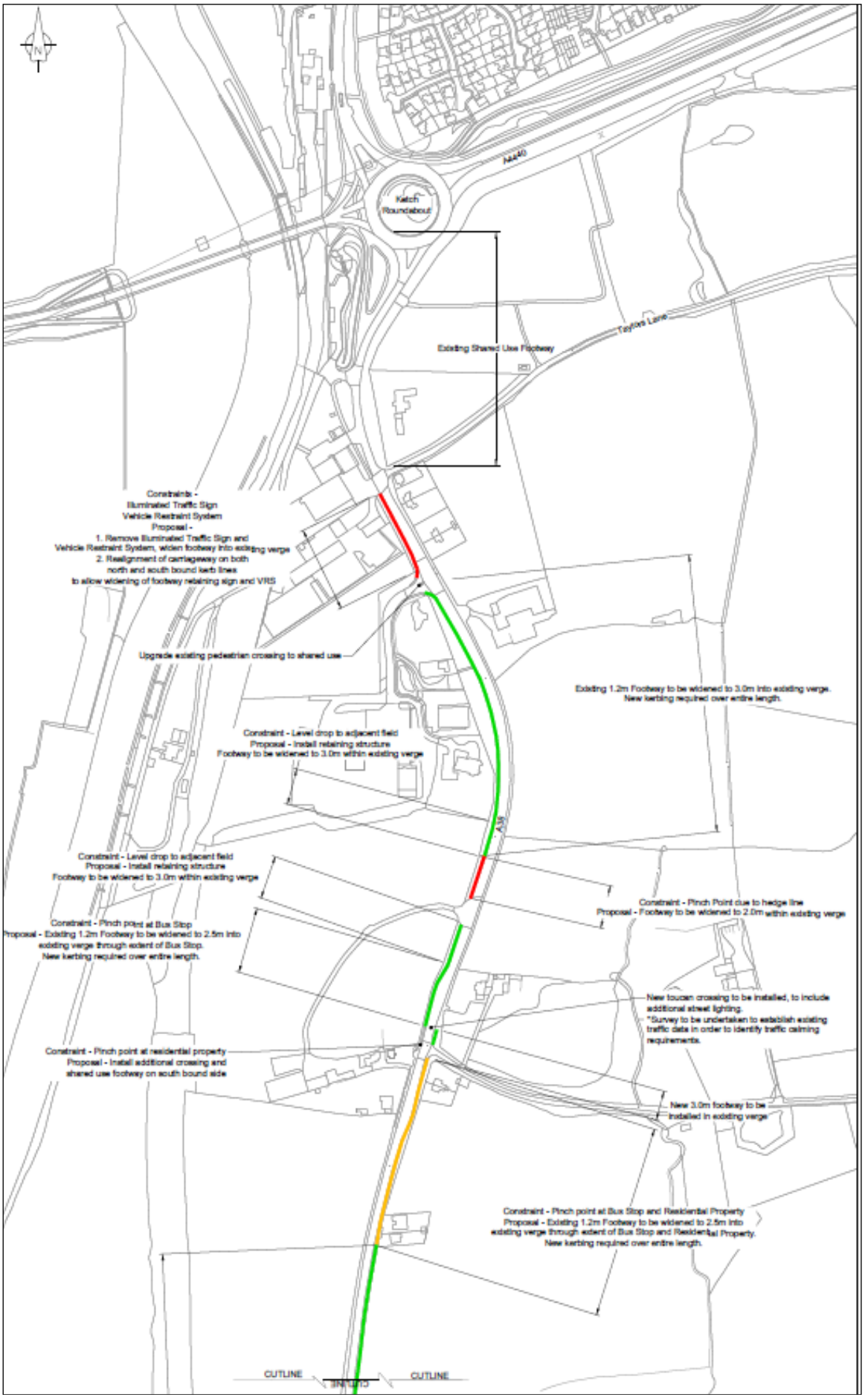
DEVELOPED SECTION A - A

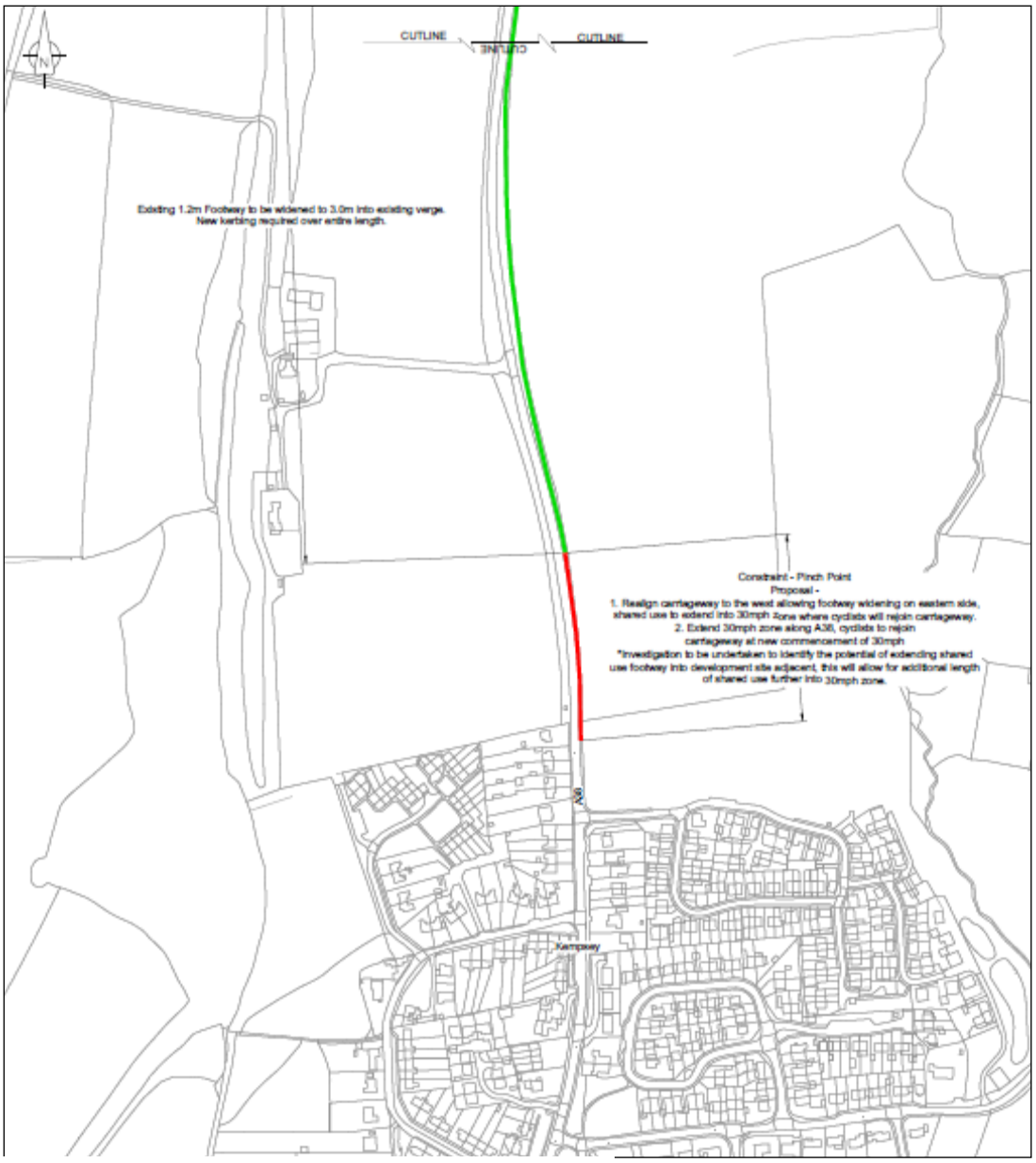
Appendix 4 – Kempsey to Worcester wider route proposals




Legend
Public Rights of Way
Bridleway
Byway
Footpath
Restricted Byway
UCR
N
The Great
Kempsey
© Crown copyright and database rights 2019 Ordnance Survey 100024230.
0 50 250 500 metres
Worcester City Limits to Kempsey
worcestershire county council
Worcestershire County Council
County Hall
Spetchley Road
Worcester
WR5 2NP
Indicative Scale: 1:10,000
Date Printed:11/11/2019

Appendix 5 – Kempsey to Ketch outline proposals



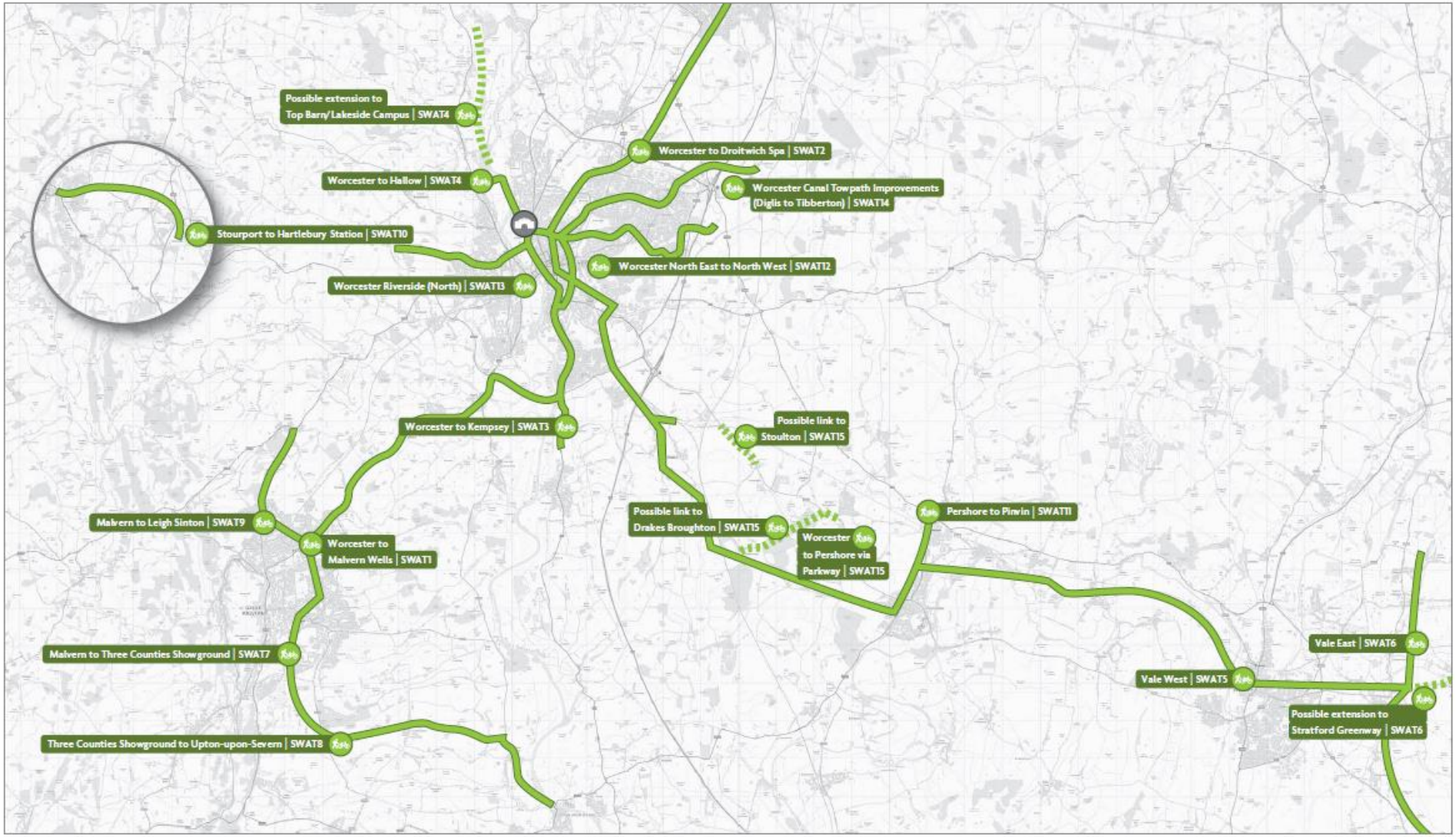


Key:

- Proposed 3.0m Wide Shared Use Foot / Cycleway
- Proposed 2.5m Wide Shared Use Foot / Cycleway
- Proposed 2.0m Wide Shared Use Foot / Cycleway

Appendix 6

Strategic Active Travel Corridor Schemes for South Worcestershire

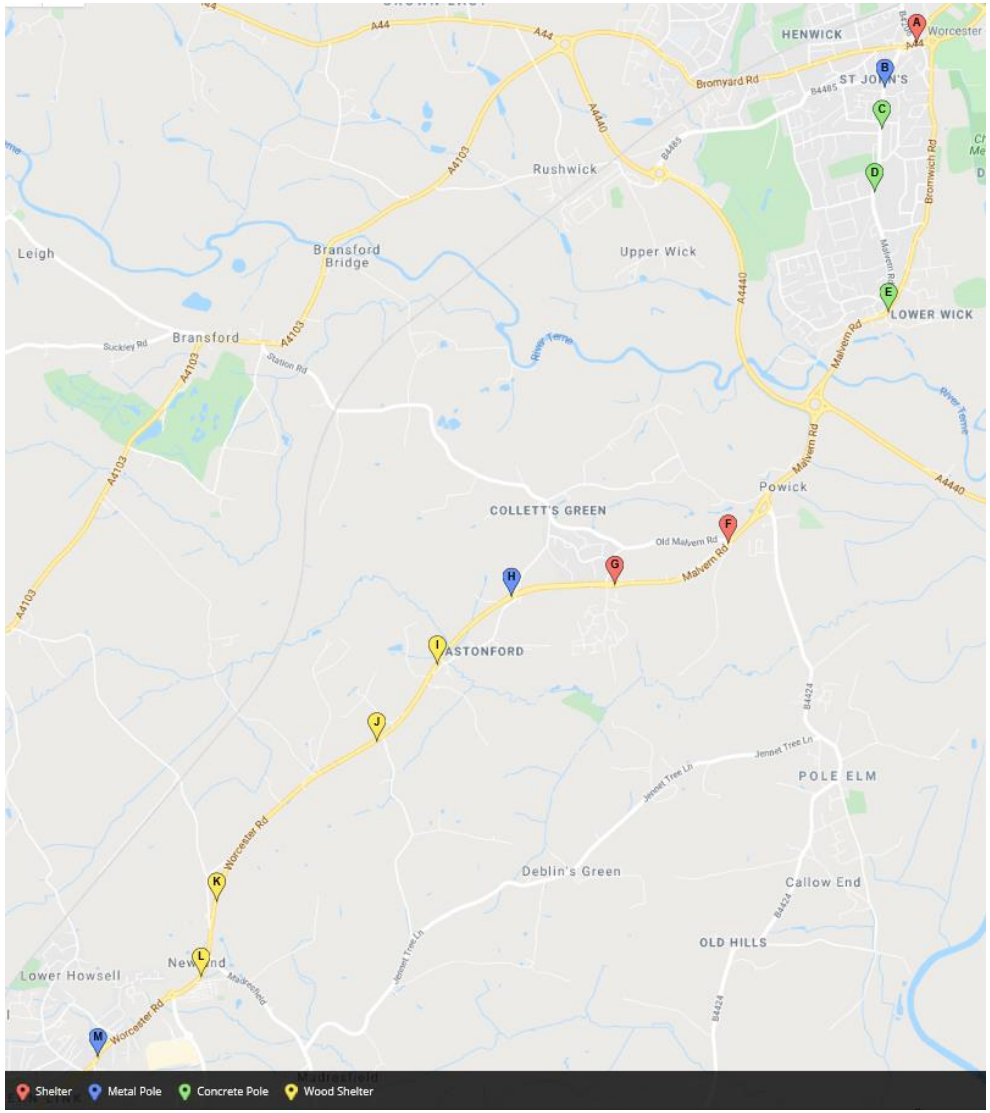


Strategic Active Travel Corridor Schemes for South Worcestershire

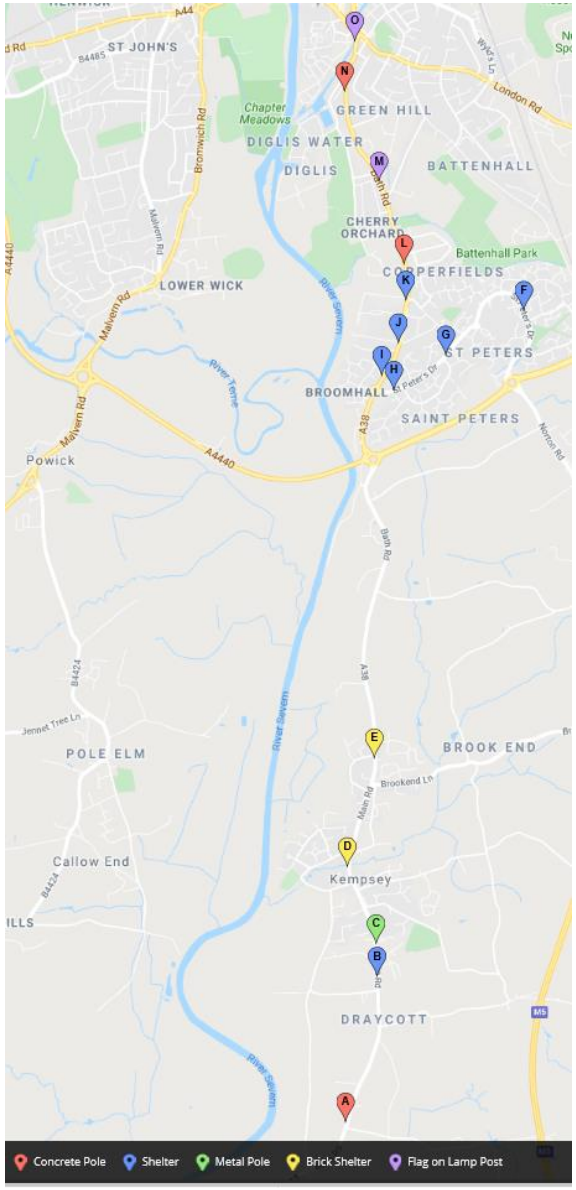
This package is expected to include (subject to definition):

ID	Scheme Name	Potential Funding Sources	Description
SWAT1	Worcester to Malvern Wells (NCN41) Active Travel Corridor	LTP/Developer	An 'Active Travel Corridor' is systemic investment in walking and cycling links along the corridor to create a safe, comprehensive, integrated network linking residential areas with key trip attractors, including schools, rail stations, town centres and employment locations. This will include surfacing, signage, lighting and public realm improvements to create an attractive and coherent network. Secure cycle parking and sheltered secure cycle parking will be considered.
SWAT2	Worcester to Droitwich Spa Active Travel Corridor		
SWAT3	Worcester to Kempsey Active Travel Corridor		
SWAT4	Worcester to Hallow Active Travel Corridor, including possible extension to Top Barn Farm/ Lakeside Campus, to be developed in partnership with the University of Worcester		
SWAT5	Vale West Active Travel Corridor (Pershore-Wyre Piddle-Fladbury-Charlton/Cropthorne-Evesham)		
SWAT6	Vale East Active Travel Corridor Development and Improvements (Evesham-Badsey-Offenham-Littletons-Harvington-Wickhamford-Childswickham-Broadway -Bretforton/Honeybourne (potential for Stratford Greenway))		
SWAT7	Malvern to Upton-upon-Severn Active Travel Corridor Phase 1 (Malvern to Three Counties Showground)		
SWAT8	Malvern to Upton-upon-Severn Active Travel Corridor Phase 2 (Three Counties Showground to Upton-upon-Severn)		
SWAT9	Malvern to Leigh Sinton Active Travel Corridor		
SWAT10	Stourport to Hartlebury Station (Leapgate Line) Active Travel Corridor		
SWAT11	Pershore to Pinvin Active Travel Corridor (including access to Pershore Station to allow safe passage for walkers and cyclists)		
SWAT12	Worcester North East- North West Active Travel Corridor (Lower Broadheath to Worcester Six, via new river bridge)		
SWAT13	Worcester River Severn Active Travel Corridor (Sabrina Bridge to Kepax)		
SWAT14	Worcester - Canal Towpath Active Travel Corridor Improvement Scheme (Diglis to Tibberton)		
SWAT15	Worcester-Parkway-Pershore Active Travel Corridor, including possible links to Stoulton and Drakes Broughton		

Appendix 7a: Proposed Powick to Malvern Public Transport Location Plan



Appendix 7b: Proposed Kemspey to Ketch Public Transport Location Plan

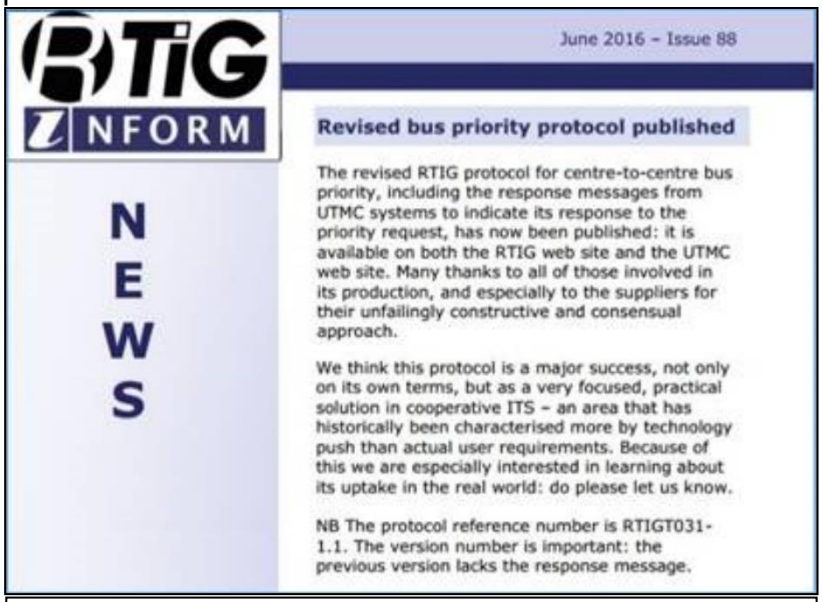


Appendix 7c: Proposed Traffic Light Priority (TLP)

RTIG 1.1

The Real Time Information Group (RTIG) is a trade body for public transport technology stakeholders.

RTIG T031 (centre-to-centre transit signal priority -TSP- request protocol) is an over-air data protocol used for passing bus priority requests between real-time systems and urban traffic control (UTC) providers.


RTIG INFORM NEWS

June 2016 – Issue 88

Revised bus priority protocol published

The revised RTIG protocol for centre-to-centre bus priority, including the response messages from UTMC systems to indicate its response to the priority request, has now been published: it is available on both the RTIG web site and the UTMC web site. Many thanks to all of those involved in its production, and especially to the suppliers for their unfailingly constructive and consensual approach.

We think this protocol is a major success, not only on its own terms, but as a very focused, practical solution in cooperative ITS – an area that has historically been characterised more by technology push than actual user requirements. Because of this we are especially interested in learning about its uptake in the real world: do please let us know.

NB The protocol reference number is RTIGT031-1.1. The version number is important: the previous version lacks the response message.

Figure 6: RTIG's release of T031 version 1.1

By introducing a means for UTMC/UTC supplier systems to provide responses to a TSP request, RTIG's June 2016 update of T031 (version 1.1) represents a significant enhancement over the previous version. Version 1.0 had no provision for such responses and therefore any request for priority that was passed to the UTMC/UTC was a "fire-and-forget" operation. Version 1.1 also contains fixes to several 1.0 ambiguities but the main drive of the revision was to enable UTMC/UTC responses.

How RTIG T031 1.1 works

Version 1.1 of the protocol was delivered with an associated XML schema that included two new message structures:

- rtig_tlpack (TLP Acknowledgement)
  This is an acknowledgment structure that the receiver can use to send an immediate acknowledgement that is has received a request. It includes a sequence number referencing the original request, a timestamp (receipt), and a quality flag (indicating the level of validation that has been performed).

- rtig_tlpresult (TLP result)
  This is an option result structure that the receiver (UTC) can send asynchronously once the result of the request is known. It includes a sequence number (like the acknowledgement), and timestamps indicating the time the decision was taken and the time the bus cleared the junction. It also includes a "result" code (no action; priority granted, or; priority not granted), and a detailed description field.

The benefits over 1.0

1. The performance of TSP systems is often measured by the time (elapsed) that it takes for a request to be delivered by the bus and to be actioned. The advent of the TLP acknowledgement structure (rtig_tlpack) means that systems using RTIG T031 v1.1 are able to measure more accurately the end-to-end lifecycle of a request, from the moment the bus registers that it has hit a junction zone to the point at which the UTC system confirms it received the message. Previously there was no indication as to if (or when) the UTC had received the request.

2. One of the problems with TSP systems has been that it isn't straightforward to measure effectiveness. The upgrade means that systems will now be able to provide information regarding how many of the requests for priority actually resulted in a change in the light sequence at controlled junctions. They will also be able to present information on what changes were made.

Junction Movement Group Functionality

The requirement for Junction Movement Groups has grown out of various requirements to provide the user with more control over the way that the filtering of Traffic Light Priority (TLP) requests are managed. While many systems are limited by only having the ability to define default configuration that is applied to all TLP requests (irrespective of junction or movement), this functionality allows for selected junction movements to be grouped and then those groups to be assigned specific (and distinct) configuration parameters to control message filtering and prioritisation.

How Junction Movement Group Functionality works

An interface is provided that allows selections of junction movements to be allocated to groups: this interface allows for groups to be fully managed (created, edited, and deleted). Groups can be named to allow them to be referenced.

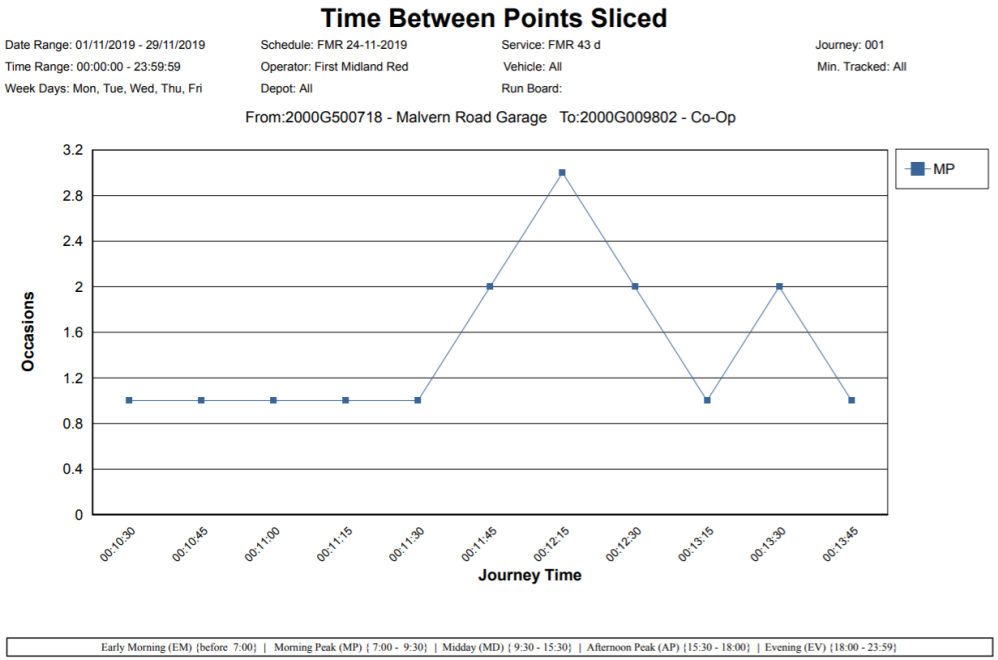
Each group is assigned filters that are used to determine if an incoming individual TLP request belongs to it. These filters should often include (but are not be limited to) Operator, Service, and Time-of-Day constraints.

Benefits of TLP

The benefits of functionality like Junction Movement Groups lies in the ability to control the way that pre-emption messages are handled for specific selections of junction movements. In situations where detailed analysis is being undertaken to measure improvements in route performance resulting from TLP changes, it is desirable to be able to adjust the way TLP is configured for different collections of junction movements specifically. For example, this functionality allows for a series of controlled corridors to be defined and handled distinctly if required.

Appendix 8: Powick to Malvern PT Delay Assessment

Routes at 2000G500718 Malvern Road Garage (Worcester Road):
FMR 43
FMR 44
FMR S43
FMR S44
All serve 2000G009802 Co-Op (Worcester Road). With the exception of S43, they all divert into Malvern Retail Park to serve Morrisons.

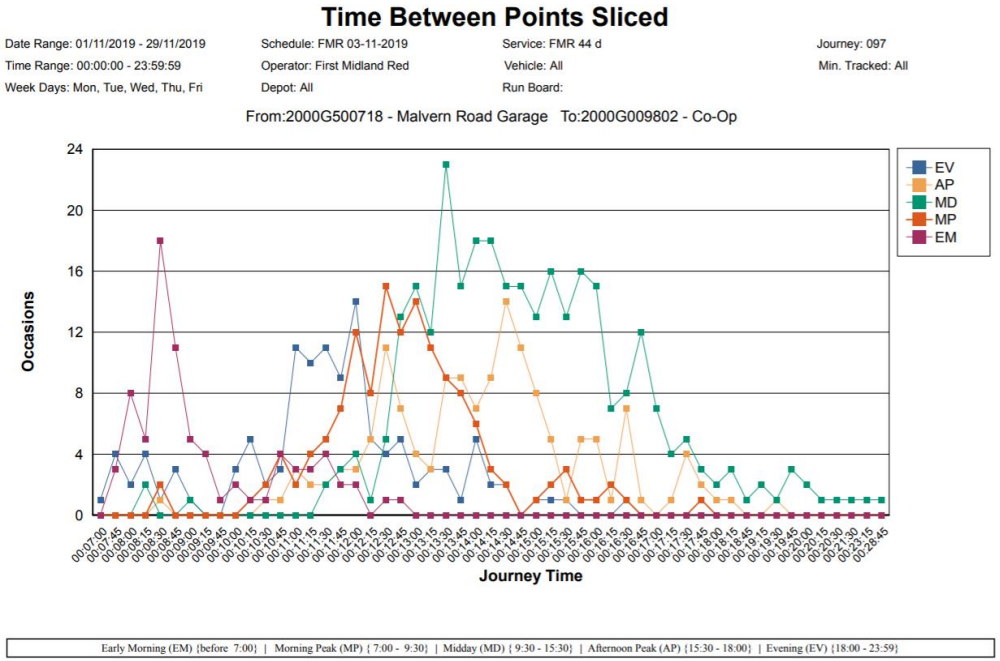


Service 43 goes via Morrisons and is scheduled to take 12 minutes. It averaged 12 minutes 8 seconds

Performance at individual stops along the Powick to Malvern Link corridor were:

Service 43						
Event Point Abbrev	Event Point Name	C	E	L	not tracked	% Late
2000G000107	Crowngate Bus Station	18	1	1		5%
2000G005381	Bull Ring	12		7	1	35%
2000G500718	Malvern Road Garage	9		8	3	40%
2000G500717	Telephone Box	10		7	3	35%
2000G502044	Old Malvern Road	10		9	1	45%
2000G502031	Hospital Lane	10		9	1	45%
2000G502042	Sparrowhall Lane	10		10		50%
2000G502033	Halfway House	10		10		50%
2000G502034	Pin's Green	10		8	2	40%
2000G502035	Newland Court	9		9	2	45%
2000G502036	Stocks Lane	9		8	3	40%
2000G502038	Madresfield Turn	10		8	2	40%
2000G009900	Morrisons Store	9		9	2	45%
2000G502580	Isobel Harrison Gardens	8		10	2	50%
2000G502600	Lower Howsell Road	9		9	2	45%
2000G009802	Co-Op	8		10	2	50%
		161	**1**	**132**	**26**	41%

Crowngate and Bull Ring are included to show if lateness occurred before Powick



Overall the trips for service 44 from Wildwood Drive, averaged 13 minutes 20 seconds between the Powick Garage and Malvern Link Co-Op, however, the first and last trips do not serve Morrisons. These trips are scheduled to take 10 minutes and averaged 8 minutes 39 seconds. Trips via Morrisons averaged 13 minutes 50 seconds.

Averages during the day were:

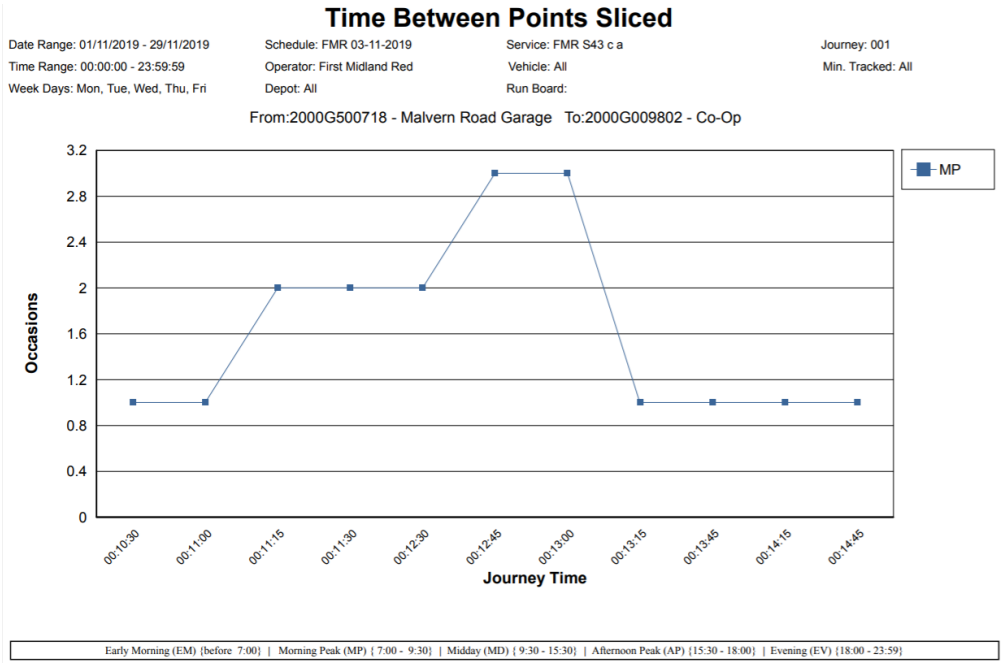
Trips	Garage	Co-Op	Sch. Mins	Ave. Mins
	06:58	07:10	00:12	0:11:17
plus 07:34-14:49	07:19	07:35	00:16	0:14:08
	08:20	08:38	00:18	0:12:48
15:11-18:19	15:11	15:28	00:17	0:14:17
18:57-21:57	18:57	19:11	00:14	0:11:43

The early morning and last night trip that do not serve Morrisons were compliant as follows:

Service 44							
Event Point Abbrev	Event Point Name	C	E	failed trip	L	not tracked	% Late
2000G000108	Crowngate Bus Station	77	1	3	1	2	1%
2000G005381	Bull Ring	76		3	4	1	5%
2000G500718	Malvern Road Garage	79		3	1	1	1%
2000G500717	Telephone Box	75		3	4	2	5%
2000G502044	Old Malvern Road	78		3	1	2	1%
2000G502031	Hospital Lane	78		3	1	2	1%
2000G502042	Sparrowhall Lane	76		3	2	3	2%
2000G502033	Halfway House	76		3	1	4	1%
2000G502034	Pin's Green	74	1	3	1	5	1%
2000G502035	Newland Court	69	6	3	1	5	1%
2000G502036	Stocks Lane	68	8	3	1	4	1%
2000G502038	Madresfield Turn	72	4	3	1	4	1%
2000G502580	Isobel Harrison Gardens	70	5	3	2	4	2%
2000G502600	Lower Howsell Road	69	6	3	1	5	1%
2000G009802	Co-Op	73	2	3	3	3	4%

With the day trips showing:

Event Point Abbrev	Event Point Name	C	E	failed trip	L	not tracked	% Late
2000G000108	Crowngate Bus Station	469	11	47	286	43	33%
2000G005381	Bull Ring	406	1	47	336	66	39%
2000G500718	Malvern Road Garage	339	4	47	395	71	46%
2000G500717	Telephone Box	337	14	47	387	71	45%
2000G502044	Old Malvern Road	362	16	47	363	68	42%
2000G502031	Hospital Lane	376	14	47	337	82	39%
2000G502042	Sparrowhall Lane	345	3	47	372	89	43%
2000G502033	Halfway House	363	3	47	354	89	41%
2000G502034	Pin's Green	333	2	47	377	97	44%
2000G502035	Newland Court	348	3	47	365	93	43%
2000G502036	Stocks Lane	313		47	400	96	47%
2000G502038	Madresfield Turn	338	1	47	390	80	46%
2000G009900	Morrisons Store	279		47	468	62	55%
2000G502580	Isobel Harrison Gardens	303		47	450	56	53%
2000G502600	Lower Howsell Road	307		47	447	55	52%
2000G009802	Co-Op	322	5	47	419	63	49%
		5540	**77**	**752**	**6146**	**1181**	45%

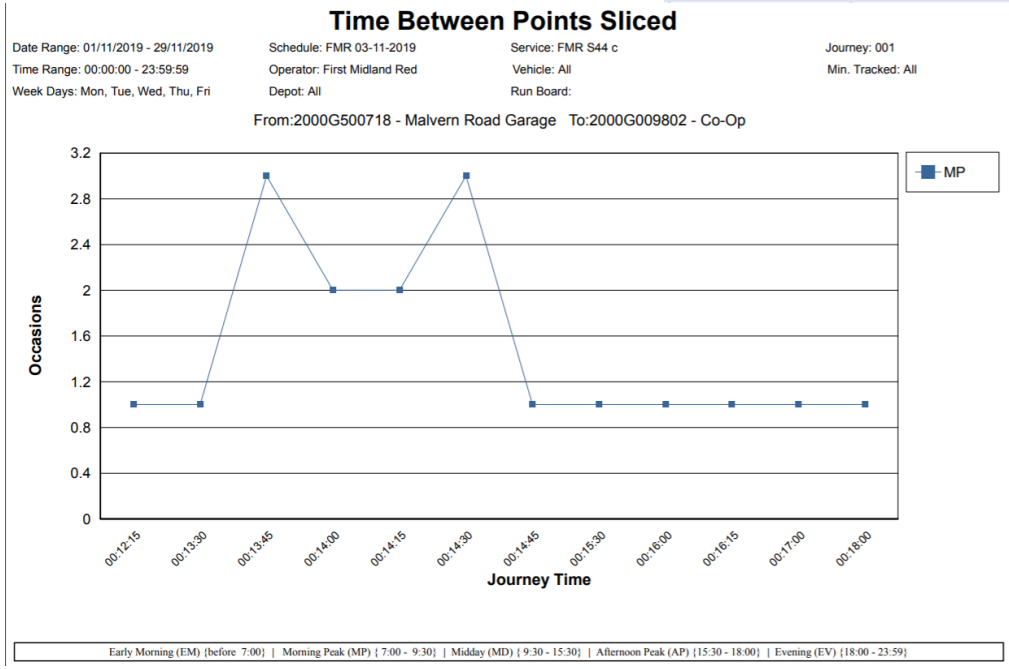


The S43 runs from Crowngate. It is scheduled to take 14 minutes from Powick garage to Malvern Link Co-Op. The average was 12 minutes 31 seconds

Even though the trips averaged quicker than scheduled, the trips ran late:

Service S43

Event Point Abbrev	Event Point Name	C	L	not tracked	% Late
2000G000107	Crowngate Bus Station	15	3	2	15%
2000G005381	Bull Ring	16	3	1	15%
2000G500718	Malvern Road Garage	9	9	2	45%
2000G500717	Telephone Box	10	8	2	40%
2000G502044	Old Malvern Road	10	8	2	40%
2000G502031	Hospital Lane	10	8	2	40%
2000G502042	Sparrowhall Lane	10	8	2	40%
2000G502033	Halfway House	11	8	1	40%
2000G502034	Pin's Green	11	8	1	40%
2000G502035	Newland Court	11	8	1	40%
2000G502036	Stocks Lane	10	8	2	40%
2000G502038	Madresfield Turn	10	8	2	40%
2000G502580	Isobel Harrison Gardens	10	9	1	45%
2000G502600	Lower Howsell Road	11	9		45%
2000G009802	Co-Op	10	10		50%
		164	**115**	**21**	38%



The S44 runs from Wildwood Drive and calls at Morrisons. The scheduled time from Powick to Malvern Link Co-Op is 18 minutes against an average of 14 minutes 42 seconds.

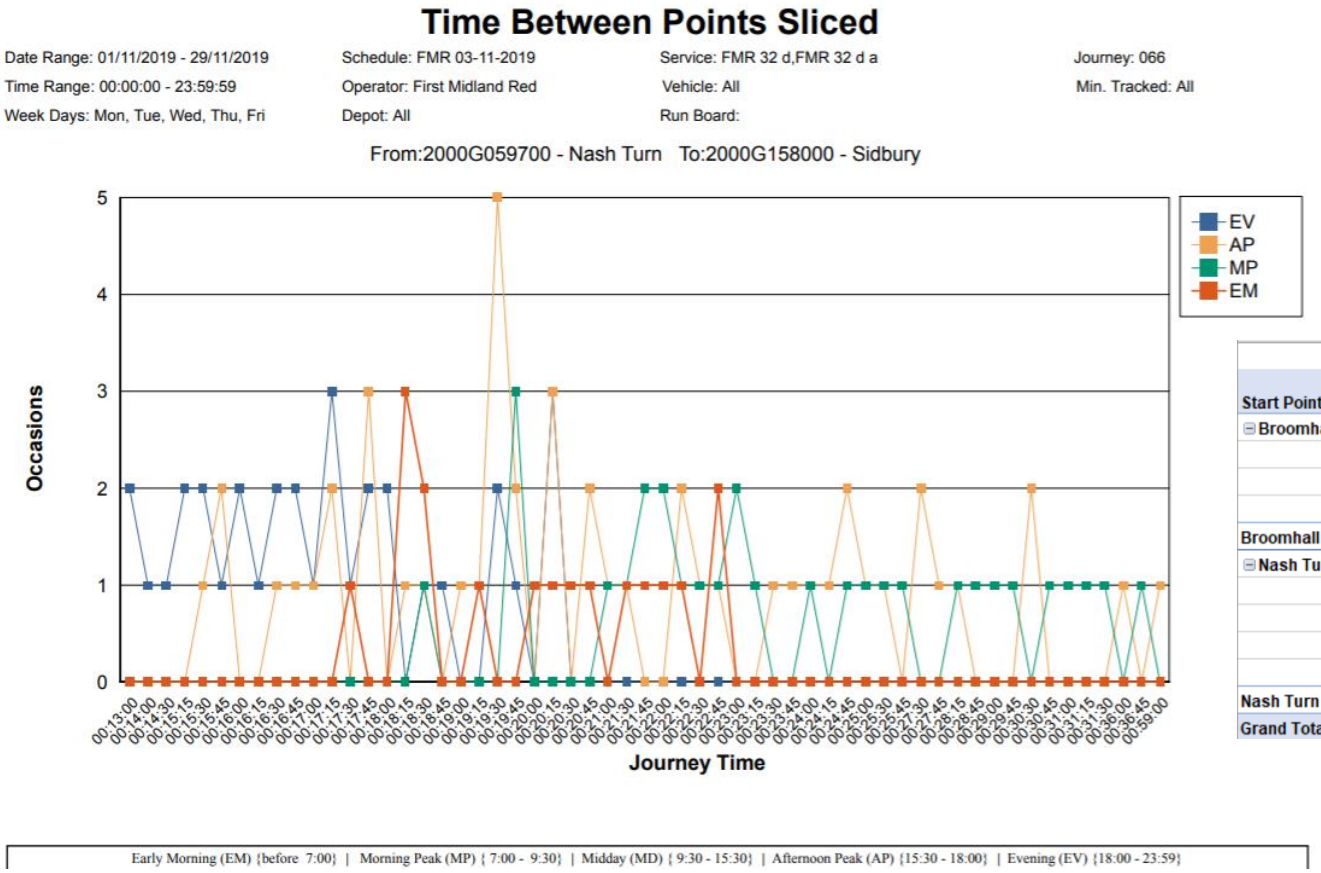
As with the S43 the trip duration does not match the event compliance:

Service S44

Event Point Abbrev	Event Point Name	C	E	L	not tracked	Grand Total	% Late
2000G000909	Wildwood Drive	16		2	2	20	10%
2000G006629	Sidbury	8		11	1	20	55%
2000G000107	Crowngate Bus Station	11		8	1	20	40%
2000G005381	Bull Ring	6		13	1	20	65%
2000G500718	Malvern Road Garage	3		16	1	20	80%
2000G500717	Telephone Box	5		14	1	20	70%
2000G502044	Old Malvern Road	5		14	1	20	70%
2000G502031	Hospital Lane	9		11		20	55%
2000G502042	Sparrowhall Lane	8		11	1	20	55%
2000G502033	Halfway House	8		11	1	20	55%
2000G502034	Pin's Green	8		11	1	20	55%
2000G502035	Newland Court	7		12	1	20	60%
2000G502036	Stocks Lane	7		12	1	20	60%
2000G502038	Madresfield Turn	8		11	1	20	55%
2000G009900	Morrisons Store	7		12	1	20	60%
2000G502580	Isobel Harrison Gardens	9	1	9	1	20	45%
2000G502600	Lower Howsell Road	9	1	9	1	20	45%
2000G009802	Co-Op	11	1	6	2	20	30%
		145	**3**	**193**	**19**	**360**	54%

Appendix 9: Kempsey to Ketch PT Delay Assessment

Routes at 2000G059700 Nash Turn (Main Road, Kempsey):
AST 332
FMR 32
FMR 332
FMR 333
All serve 2000G158000 Sidbury (Commandery Road) however Aston's 332 has not tracked to be useful



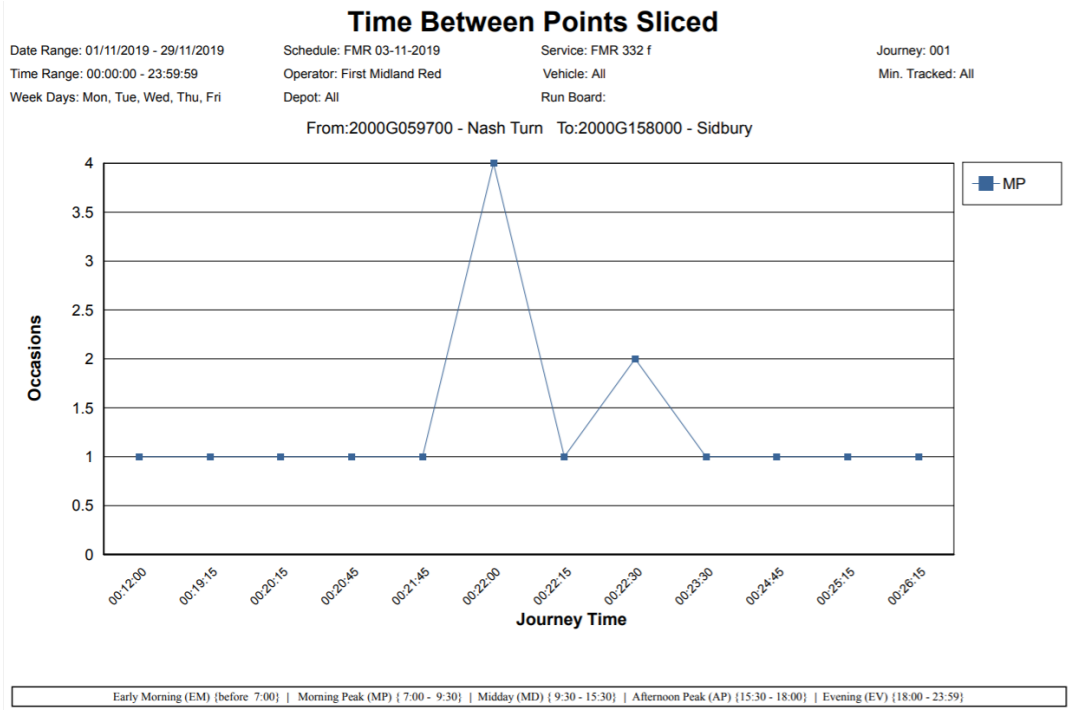
Service 32

Start Point Name	Event Point Abbrev	Event Point Nan	C	E	failed trip	L	not tracked	% Late
Broomhall Green	2000G006600	Broomhall Green	237	2	18	124	40	29%
	2000G006616	Norton Road	223	41	18	123	16	29%
	2000G006626	The Albion	216	37	18	130	20	31%
	2000G158000	Sidbury	211	39	18	134	19	32%
Broomhall Green Total			**3231**	**284**	**252**	**1857**	**270**	32%
Nash Turn	2000G059700	Nash Turn	80	1	12	60	15	36%
	2000G006600	Broomhall Green	76		12	61	19	36%
	2000G006616	Norton Road	66	24	12	54	12	32%
	2000G006626	The Albion	61	30	12	52	13	31%
	2000G158000	Sidbury	61	28	12	54	13	32%
Nash Turn Total			**1488**	**252**	**252**	**1190**	**346**	34%
Grand Total			**4719**	**536**	**504**	**3047**	**616**	32%

Across all trips, the average journey time between the Nash bus stop (the start of all trips recorded) at Kempsey and Sidbury, Worcester was 21 minutes 17 seconds.

The service operates a longer scheduled trip at 07:52 and a shorter one at 19:04 so individual trip performances were:

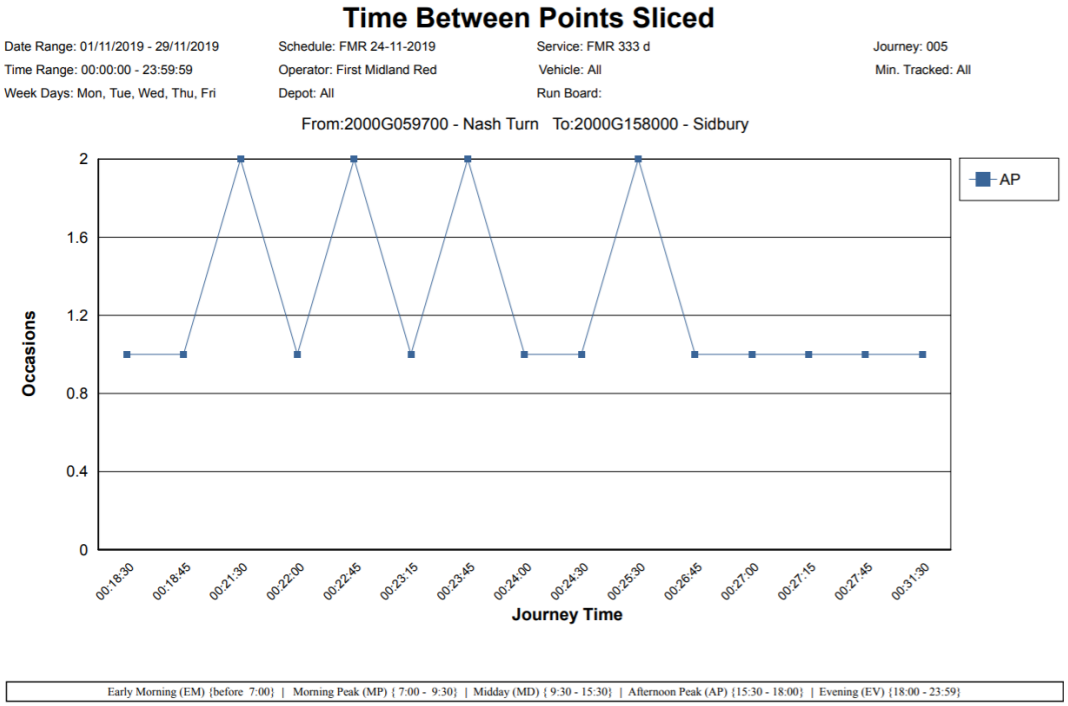
Nash	Sidbury	Sch. Mins	Ave. Mins
06:52	07:14	00:22	0:20:12
07:22	07:44	00:22	0:22:49
07:52	08:16	00:24	0:27:16
16:44	17:06	00:22	0:22:00
17:04	17:26	00:22	0:25:28
17:34	17:56	00:22	0:20:08
18:14	18:36	00:22	0:18:06
19:04	19:22	00:18	0:16:03



The trips are scheduled to take 24 minutes but averaged 22 minutes 28 seconds (excluding the trip on Monday 18th which only ran for 12 minutes)

Performance at individual stops along the Kempsey to Worcester corridor were:

Service 332						
Event Point Abbrev	Event Point Name	C	E	L	not tracked	% Late
2000G059700	Nash Turn	13		3	5	14%
2000G059698	Pixham Ferry Lane	14		4	3	19%
2000G059998	Florence Close	13		5	3	24%
2000G500672	Village Hall	13	1	4	3	19%
2000G059696	Windmill Lane	10		6	5	29%
2000G500669	Hatfield Turn	13		3	5	14%
2000G156600	Clerkenleap	11	1	3	6	14%
2000G006600	Broomhall Green	14	2	2	3	10%
2000G006610	Farne Avenue	16	1	2	2	10%
2000G006608	St Peter's Tesco	17		2	2	10%
2000G006605	Bittern Road	17		2	2	10%
2000G006692	Kestrel Drive	14	3	2	2	10%
2000G059500	St. Peter's Island	17		3	1	14%
2000G006614	Elm Green Close	15	2	3	1	14%
2000G006616	Norton Road	13	4	3	1	14%
2000G006618	Bunns Road	17		3	1	14%
2000G006620	St. Mark's Church	14	3	4		19%
2000G006622	Cherry Street	12	5	4		19%
2000G006625	The Hill Avenue	16	1	4		19%
2000G006626	The Albion	12	5	4		19%
2000G158000	Sidbury	12	5	4		19%
		293	33	70	45	16%



The 333 service operates from Upton and from Hanley Castle High School along this corridor.

The 15:35 from the school is scheduled to take 27 minutes to get to Sidbury. It averaged 26 minutes and 10 seconds from 1st to 30th November.

The 15:40 from Upton is scheduled to take 24 minutes to get to Sidbury. It averaged 21 minutes and 51 seconds.

Performance at individual stops along the Kempsey to Worcester corridor were:

Service 333								
Start Point Name	Event Point Abbrev	Event Point Name	C	E	failed trip	L	not tracked	% Late
Hanley Castle High	2000G059700	Nash Turn	7		2	3	8	15%
	2000G064500	Norton Barracks	9		2	5	4	25%
	2000G006600	Broomhall Green	9	1	2	7	1	35%
	2000G006616	Norton Road	9	1	2	5	3	25%
	2000G006626	The Albion	8	3	2	7		35%
	2000G158000	Sidbury	9	1	2	6	2	30%
New Street	2000G059700	Nash Turn	8		2	1	10	5%
	2000G006600	Broomhall Green	17		2	2		10%
	2000G006616	Norton Road	8	10	2	1		5%
	2000G006626	The Albion	6	12	2	1		5%
	2000G158000	Sidbury	5	13	2	1		5%
Grand Total			**411**	**147**	**90**	**172**	**101**	19%