

Additional Information on Congestion

WORCESTERSHIRE NETWORK EFFICIENCY PROGRAMME

Summary

The Panel wish to receive an update on the Network Efficiency Programme as part of its previous, current and future work programmes.

The Cabinet Members and Officers from the Economy and Infrastructure Directorate have been invited to attend.

Background

Since the original £5m Budget allocation back in February 2017, the role of Worcestershire Network Efficiency Programme (WNEP) Manager has been created to investigate the original list of sites across the County. These ranged from the complexity of full junction redesigns, corridor treatments, traffic signal upgrades, zebra crossing improvements, to the more simplistic solutions of removing pinch points or obstructed signal loop detection with traffic regulation orders (TRO) and other traffic management (TM) tools.

Alongside prioritisation of these locations, assessment of sites, option analysis and detailed designs, WCC also submitted two separate bids for the DfT National Productivity Investment Fund (NPIF) - £3.2m for the A44 east-west axis at Worcester and £3.4m for Walking and Cycling improvements across Bromsgrove. Both proposals were successful in being awarded monies later in the autumn, meaning that the congestion fund increased to £11.6m for the two-year period of April 2018 to March 2020.

Completed Sites

- A442 Worcester Road, Kidderminster – re-open dual carriageway offside lane, improvements to circulatory island, approach signing and enhanced signal phasing at A4420 Hoobrook link
- A4185 Warwick Highway/Icknield Street Drive, Redditch – widened the southern approach arm to the Warwick Highway roundabout, to introduce increased capacity
- A441 Astwood Bank – removal of parking on detection loops to improve signal efficiency, particularly during school times
- Worcester Road, Bromsgrove – removal of pinch points along AQMA corridor to allow freer traffic flow
- Hanbury Road/Queen Street, Droitwich – removal of parking on approach and additional loop work to streamline signal phasing and increase capacity
- Shrub Hill Road/Tallow Hill/Midland Road, Worcester – upgraded signal equipment and amended signal stages have improved junction flows.
- A44 London Road, Worcester – introduction of yellow box markings to remove hindrance of right turning vehicles for major flow

Current Sites

- A44 London Road, Worcester – ongoing TRO process to remove obstructive parking that hinders free flow and capacity, as well as right turn facility/ offset centre line improvements along corridor
- A38 Droitwich Road, Worcester - ongoing TRO process to remove obstructive parking that hinders free flow and capacity
- A448 Kidderminster Road, Bromsgrove - ongoing TRO process to remove obstructive parking that hinders free flow and capacity
- A451 Stourport Road, Kidderminster – assessment of junctions is being considered through Modelling work across the Town to establish priority of works/solutions
- A441 Ran Tan island, Redditch – works are linked to ongoing Warwickshire CC modelling works and Redditch eastern gateway proposals
- Bilford Road/Astwood Road, Worcester – works ongoing along LTP4 W! corridor assessment (Rainbow Hill to Blackpole) through consultants
- A4440 Grange Way/Newtown Road/Pershore Lane roundabout – TM signing and lining solutions being drawn up for summer implementation
- A449/A450 Black Bridge, Torton – being considered as part of A450 Corridor Capacity Enhancements (A450CCE) work
- A448 Parkside jct, Bromsgrove – enhanced Traffic Signal scheme being considered in conjunction with Bromsgrove DC and developer requirements
- A38/A448 Slideslow Island – part of MSB Phase 2 works
- A450/A448 Mustow Green Island – part of A450CCE assessment and MRN submission
- ASDA/Pheasant Street, Worcester – two phase signalised crossing currently with Consultants for RSA and detailed design
- Abbey Bridge, Evesham – ongoing TRO to enhance approaches, as well as signal upgrades as part of Corridor works

Future Sites

- A448 Market Street, Bromsgrove – Modelling works commence Spring 2019 to assess this key Town corridor
- A38 Bath Road, Worcester - TRO process to remove obstructive parking that hinders free flow and capacity
- A449 Malvern Link to Great Malvern - TRO process to remove existing and potential obstructive parking that hinders free flow and capacity

NPIF Bromsgrove Progress

(Further details available at www.worcestershire.gov.uk/NPIF)

In the first quarter of 2018, before the initial NPIF monies were released, a route audit of the main nine cycle and walking links was carried out. This allowed us to determine a priority for works to be carried out, a change of thinking for those proposals that required land acquisition, or a change of route etc, so that we could hit the ground running. Subsequently, in the first 12 months of this 2 year spend, as well as detailed design of the more intricate crossing improvements that are referenced later, we have also already completed

- 74% of the required dropped crossings for routes
- 67% of the upgraded street lighting of the corridors
- 14% of the carriageway patching
- 12% of the necessary footway widening
- 14% of the route signing

We will also be carrying out works to improve rideability over existing gulley covers, as well as lining the designated routes to enhance the experience of all users, both on cycle and foot.

Moving on to the larger improvement elements of this initiative, we have already completed the first major crossing improvement at Windsor Street, widening and upgrading this zebra crossing to the east of the Town centre.

Other sites have reached detailed design, such as;

- Worcester Road/Hanover Street – the plan being to remove the zebra crossings and introduce a controlled signalised toucan which can manage the high flows of pedestrian traffic which hinder the free flow of the route to the south, being an AQMA
- Market Street/Bus Depot signals – widening of the existing pedestrian bridge by the depot, as well as improved crossing facility by the supermarket, which ties into the widened cycle links approaching from the south
- Kidderminster Road/Sanders Park – widening of pavements for cycle/pedestrian activity, improved toucan crossing, drainage solutions and link into Sanders Park links
- Birmingham Road (near Travis Perkins) – widening of pavements and enhanced toucan crossing facility
- Broad Street –

NPIF Worcester Progress

(Further details available at: www.worcestershire.gov.uk/NPIF)

Before talking about the **Big Three** schemes of Croft Road, City Walls/Sidbury and St Johns, it is worth reflecting on the major " behind the curtain" signal works that have been happening in the last year along this key A44 corridor:

- Comer Rd – validation of the existing signals to improve green timings
- New Road island – MOVA upgrade to enhance flexible working of varying traffic flows (to be linked with St Johns scheme)
- New Road (bridge) crossing – works carried out during flood alleviate scheme to improve technology
- North Parade crossing – upgraded to Puffin facility
- Dolday/Croft Road – new MOVA installation to improve detection intelligence
- Deansway crossing – MOVA upgrade to incorporate facility into signal system
- Copenhagen Street signals – MOVA upgrade to synchronise signals into system
- Seabright/Wylds Lane – cabling improvements and validation to increase capacity
- Waitrose junction – technology and pedestrian improvements to increase green time for A44

We also intend to introduce at Dolday/The Butts signals near to the Crowngate depot exit. This will allow us to introduce new MOVA equipment and additional camera detectors facing the depot, to improve bus journey times/reduce delays as well as the flow through the junction itself. These works are scheduled for June time, following the completion of the first of the Big Three schemes, as below.

Croft Road zebra crossing has for a long time been referenced as the most hated crossing in the County. However, as you may be aware, we started work on this improvement in early April, with a programme to complete by the end of May 2019. The intention of the scheme is to replace the zebra with a signal controlled Toucan crossing, which is capable of dealing with the 2000+ pedestrians and nearly 200 cyclists that currently use this facility to cross the busy A449. By incorporating a signal controlled crossing, we are able to reduce the frequency of the traffic being halted, whilst still allowing the heavy pedestrian cycle flows to continue in a more concentrated manner. The location can also be absorbed into the current SCOOT system across the City, meaning that traffic flows can be managed far more efficiently. We are also removing the mini-roundabout and returning the car park access to a minor road T-junction, so that the A449 flow does not have to give way to emerging car park traffic another hindrance to free flow.

Moving into the summer, we will be concentrating on the City Walls Road/Sidbury junction, where the A44 and A38 meet, just to the south of the City. These aging signals have given 40+ years of good service (where normal signal life cycles are 15 years) so a simple upgrade of the technology at these junctions will make substantial change and improvement. The signals currently work as two standalone junctions so as the City Walls flow runs south into Sidbury, you regularly then sit in a queue to join Commandery Road (Bath Road). Modern technology allows these two junctions to be linked, thereby improving the communication and intelligence of these signals, so that the varying flows of two busy A-class routes can be flexibly managed, depending on local conditions. The scheme will also introduce a new two phase controlled crossing across Commandery Road to improve walking connectivity from the east, as well as improving between the car parks, Commandery and Porcelain museum tourism attractions that generate pedestrian activity in the area. The DfT funding of this scheme also allows us to improve street lighting, pavements and carriageways throughout the area – similar to an extension of the Cathedral Plaza scheme of recent years.

The St Johns Scheme will see improvement to carriageway widths for traffic travelling in both directions. We intend to remove unnecessary traffic refuges to achieve this by introducing new signal controlled crossing facilities down the bank at New Road island – these can be incorporated into the current stages of the signals so this will minimise additional delays to journey times, and be enhanced by the confidence drivers are given with the more standard width lanes along the A44. Further simplification of the junction with Henwick Road will be achieved by closing off Bush Walk from St Johns and constructing an access point from St Clements Estate. Relocating the bus stop towards Lloyds Bank at the widened section of carriageway will further aid this. Further upgrades to signal equipment throughout the site will allow the junction to function more efficiently. Again DfT funding will allow us to create a more aesthetic street scene, with enhanced block paved footways, which will encourage pedestrian activity, along with the new plaza-style paved area at the closed off Bush Walk. This site being the final piece of the A44 signalised jigsaw, allowing us to validate the entire route and delivering improved journey times, reduced congestion and better options for the public.

Second WNEP £5m Budget allocation

When the Budget was ratified in February 2019, there were four specific locations detailed for assessment and recommendation. Progress has already commenced on some as detailed below.

- **A38 Upton** – This junction improvement has been considered for some time now, with scheme designs drawn up several years ago. The location has now been given a Project Manager who is revisiting the options, re-costing them for today's construction prices and this work will be available for dissemination in the coming months.
- **A449 Hoobrook Roundabout, Kidderminster** – following the success of the works last May, this junction has been functioning far better, with noticeably reduced congestion and delays on the A449 south and A442 north approaches. However, at the time of the A4420 Hoobrook link being constructed, other options were being discussed for consideration. As detailed above, we are currently modelling many junctions across the Town's network, so that we can evidence which junctions are working well and not so well in Kidderminster. Improvements will be made to this roundabout to provide increased capacity or improvement on one or more of its arms.
- **Evesham** has been referenced for investment and as well as the limited solutions available to assist the town in the short term, aided by the modelling work over the last two or so years, we will be assessing what solution can meet the needs of this historical riverside. In the imminent future, we are going to improve the current signalised corridor from Davies Road to Greenhill inclusive. This will add to the works already carried out at the crossing just south of the Avon Street junction where the frequency of the call for the crossing has been lessened, allowing traffic travelling north to south, and vice versa, to flow more freely. We will also be assessing options around reduced movements at signalised junctions etc based on the outcomes of the modelling and we should be in a position to discuss this later in the year.
- **Bromsgrove** is the fourth area highlighted for consideration and as mentioned, we are looking to model the town later this year to see where improvements can make real change. We already have a possible solution for the Parkside signals, but we need to establish how the junctions south of this at Recreation Road, Church Street, St Johns Street and Waitrose mini island can work more cohesively to improve fluidity along the A448 and old A38 routes to its north and south.

TRANSPORT TELEMATICS (Including Smart Traffic Signals)

'Transport telematics' refers to the use of technology, such as intelligent traffic signals, traffic flow detectors, cameras, communications and sensors to better manage traffic demand and improve efficient use of available capacity.

'Smart' Traffic Signals are signal sets that are connected to a central control system via the Internet. In the most simple and widespread form, they provide live fault monitoring with a controller being connected via GPRS.

In Worcester, most traffic signals in the City Centre are controlled using SCOOT. The signals connect to a live central system for both fault monitoring, traffic flow detection and control strategy setting. SCOOT has been around for a long time, but has been subject to regular upgrades to the central system over its 30 years of operation and the system is now connected to broadband Internet via a 'wireless mesh' network, which also connects other ITS equipment within the city.

MOVA is an intelligent traffic signal controller. In the majority of locations this is employed as a standalone system that is not connected to the Internet, and so not strictly 'smart'. The latest MOVA controllers have a Web User interface option and have more reporting and logging functionality for traffic managers. The latest MOVA controllers can also be set up as a linked where two or more junctions/crossings are in very close proximity. This is most commonly used on signalised roundabouts. MOVA does not have strategy setting options like SCOOT, but has the significant advantage of being a rapidly adaptive controller and can make changes every cycle to meet traffic flow conditions. This gives MOVA control an advantage during unplanned incidents (such as flooding or a major sporting event, for example).

SCOOT is not a rapidly adaptive controller, as it is controlling a network of signals. Rapid changes are not supported to prevent network destabilisation. SCOOT provides synchronised platooning of traffic from one set of signals to another using both live detection and its vast historic database to maximise flow. SCOOT strategies allow the traffic manager to set priority approaches to give further benefit to certain directions. This can be very beneficial for major planned or predicted incidents and events.

Recent upgrades to the signals across Worcester have upgraded the SCOOT detection and added MOVA detection to allow both control options. They have also been upgraded with pedestrian detection.

The Worcester Intelligent Transport Systems (ITS) network has recently included live camera coverage of all traffic signal junction arms and additional live traffic flow loop detection on strategic links to provide a city-wide picture of traffic flow conditions both at signal junctions and along key links. This was a DfT grant-funded project. The traffic engineer will be able to:

- view the traffic conditions across the network in real time;
- receive system alerts if conditions change significantly from expected - the new system recording key link flows calculates minute by minute traffic flow averages;
- implement strategies or change control method and view the impact of these strategies and changes both live and from the recorded the minute by minute flow data for detailed analysis and review.

Full testing of this system will begin this Autumn once the Sidbury junction has been upgraded. As Sidbury carries the highest flows of the City's SCOOT traffic signals network, it must be fully upgraded before any meaningful strategy and control impact testing can begin.

Future Developments in Traffic Signal Control

- Artificial Intelligence-Based Signal Control – Worcestershire County Council are involved in a development group for Artificial Intelligence traffic signal control, led by Vivacity, who have significant government funding for research and development in this area. This has potential to change signal control dramatically.
- GLOSA - Green Light Optimal Speed Advisory – A Government funded research and development project costing over £20million, led by Transport for the West Midlands. This involves trialling vehicle to signals infrastructure connectivity along A45 Coventry Rd. Drivers optimise their speed to approach traffic signals on green using smartphone app or in car tech. Jaguar Land Rover is developing vehicle to infrastructure technology in conjunction with this project, also with significant government funding. This initiative is likely to be particularly good for delivering journey time savings and emissions along a defined route corridor.
- Transport for London/Siemens Research and Development 'Future SCOOT' – This is based on a new Real Time Optimiser (RTO) system to revolutionise the 30-year-old Urban Traffic Control (UTC) system in London and will be made commercially available once testing in London is complete. Transport for London will be making money from future sales, as well as Siemens being the sole manufacturer. For Worcestershire County Council to take advantage of this, it would require purchase of the Siemens SCOOT system, as Worcestershire currently has the Dyniqq SCOOT system.