

Appendix F

WDC STA Phase 3 - Queue Analysis Plots

Appendix F Contents

MQ 001 P3.002 Revised Allocations PN AM
MQ 002 P3.002 Revised Allocations PN PM
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MQ 004 P3.004 Revised Allocation Bridge Sensitivity AM
MQ 005 P3.004 Revised Allocation Bridge Sensitivity PM
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MQ 007 P3.005 Revised Allocation Warwick Town PM
MQ 008 P3.006 Revised Allocation P&R AM
MQ 009 P3.006 Revised Allocation P&R PM



Legend

- less than -5 vehicles
- between +15 and +30
- between +30 and +50
- greater than +50

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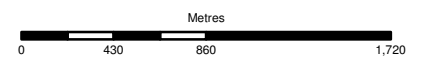
P1	08-04-13	MG	JE	JE
Issue	Date	By	Chkd	Appd

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Client
Warwickshire County Council

Job Title
**Warwick District
Strategic Transport Assessment**



**P3.002 Revised Allocations PN
2028 AM 0800-0900
Average Maximum Queue**

Scale at A3

N.T.S.

Job No
211439-19

Drawing Status
Information

Drawing No
MQ 001

Issue
P1



Legend

- less than -5 vehicles
- between +15 and +30
- between +30 and +50
- greater than +50

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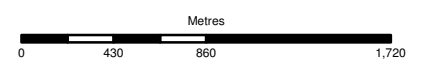
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Issue	Date	By	Chkd	Appd

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Job Title
**Warwick District
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**P3.002 Revised Allocations PN
2028 PM 1700-1800
Average Maximum Queue**

Scale at A3

N.T.S.

Job No
211439-19

Drawing Status
Information

Drawing No
MQ 001

Issue
P1



Legend

- less than -5 vehicles
- between +15 and +30
- between +30 and +50
- greater than +50

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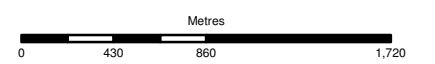
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Issue	Date	By	Chkd	Appd

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Job Title
**Warwick District
Strategic Transport Assessment**



**P3.003 Revised Allocation plus Schools
2028 AM 0800-0900
Average Maximum Queue**

Scale at A3

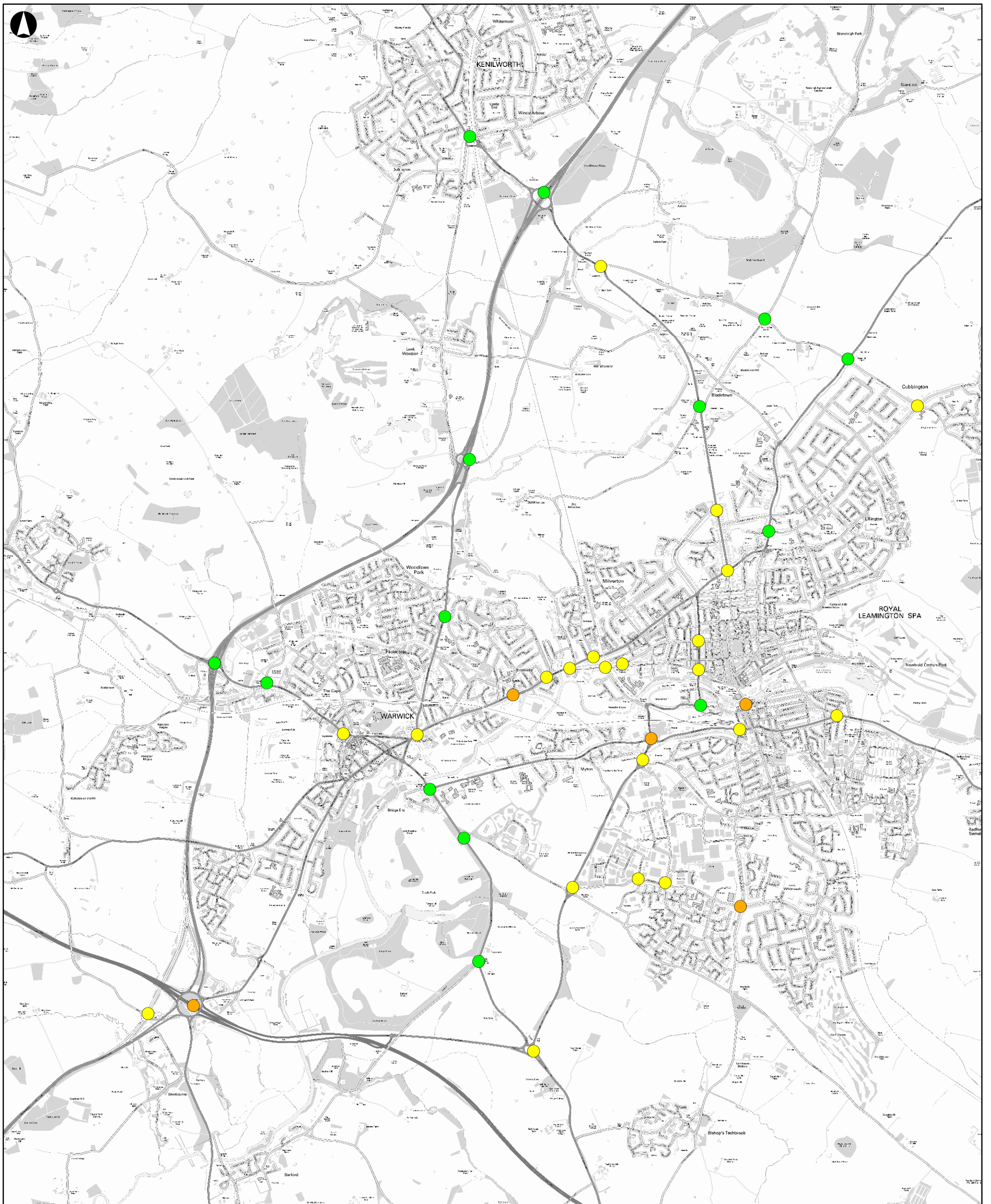
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Job No
211439-19

Drawing Status
Information

Drawing No
MQ 001

Issue
P1



Legend

- less than -5 vehicles
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- between +30 and +50
- greater than +50

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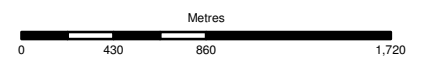
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Issue	Date	By	Chkd	Appd

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**Warwick District
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**P3.004 Revised Allocation Bridge Sensitivity
2028 AM 0800-0900
Average Maximum Queue**

Scale at A3

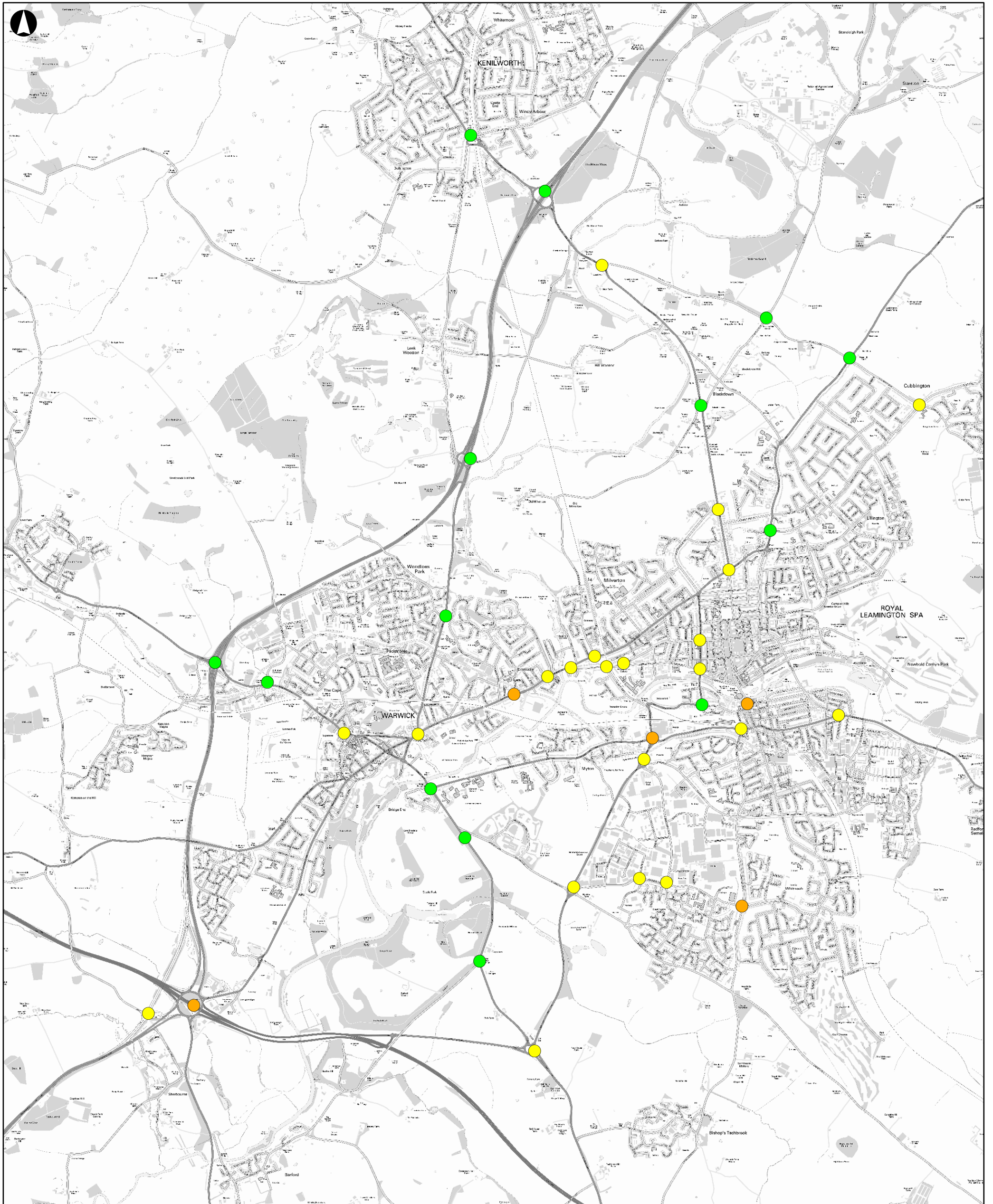
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Job No
211439-19

Drawing Status
Information

Drawing No
MQ 004

Issue
P1



Legend

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- between +30 and +50
- greater than +50

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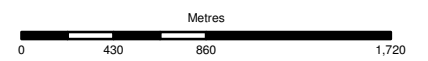
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Issue	Date	By	Chkd	Appd

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**P3.004 Revised Allocation Bridge Sensitivity
2028 PM 1700-1800
Average Maximum Queue**

Scale at A3

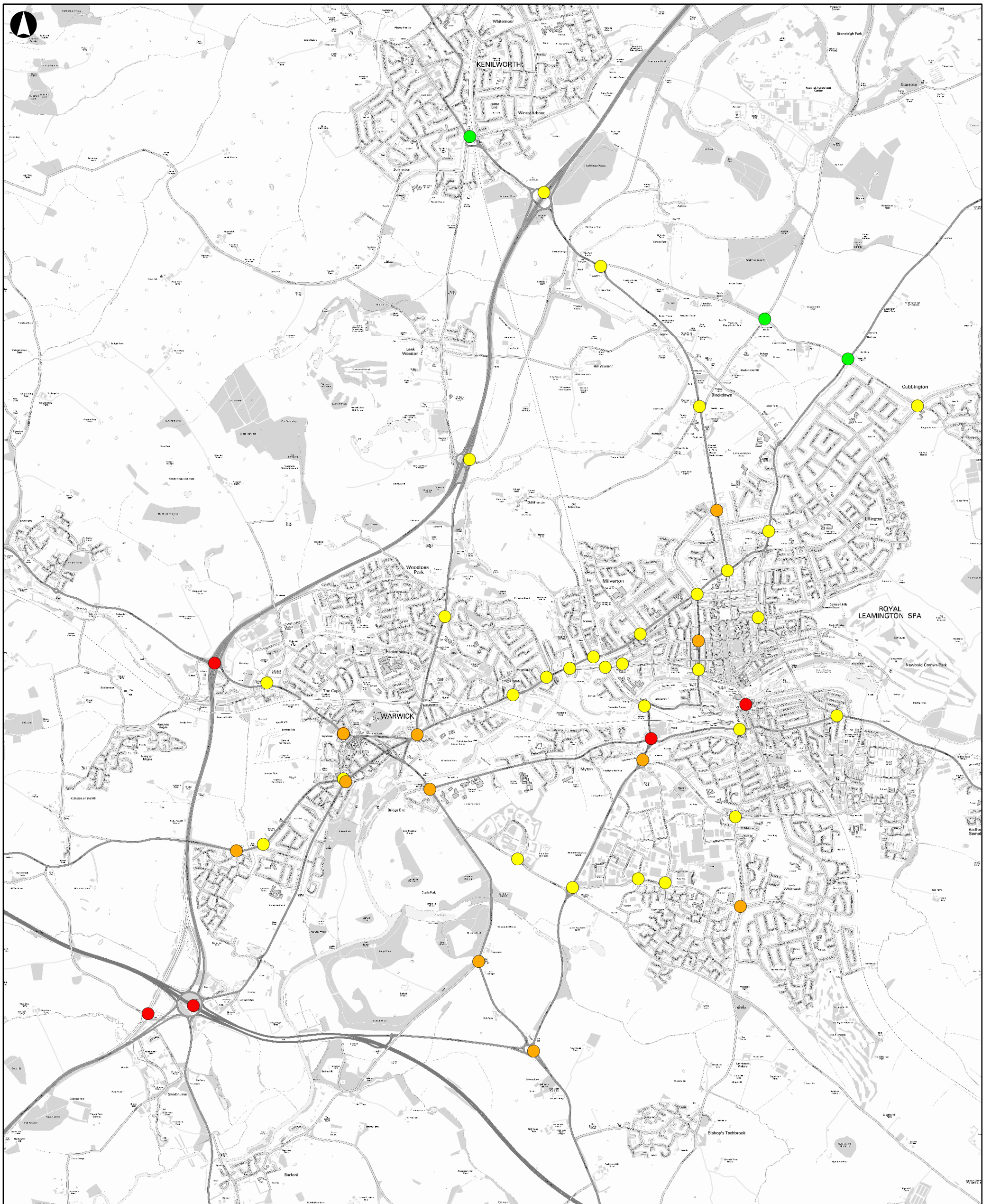
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Job No
211439-19

Drawing Status
Information

Drawing No
MQ 005

Issue
P1



Legend

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- between +15 and +30
- between +30 and +50
- greater than +50

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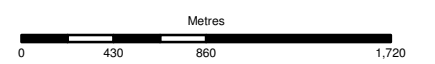
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Issue	Date	By	Chkd	Appd

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Strategic Transport Assessment**



**P3.005 Revised Allocation Warwick Town
2028 AM 0800-0900
Average Maximum Queue**

Scale at A3

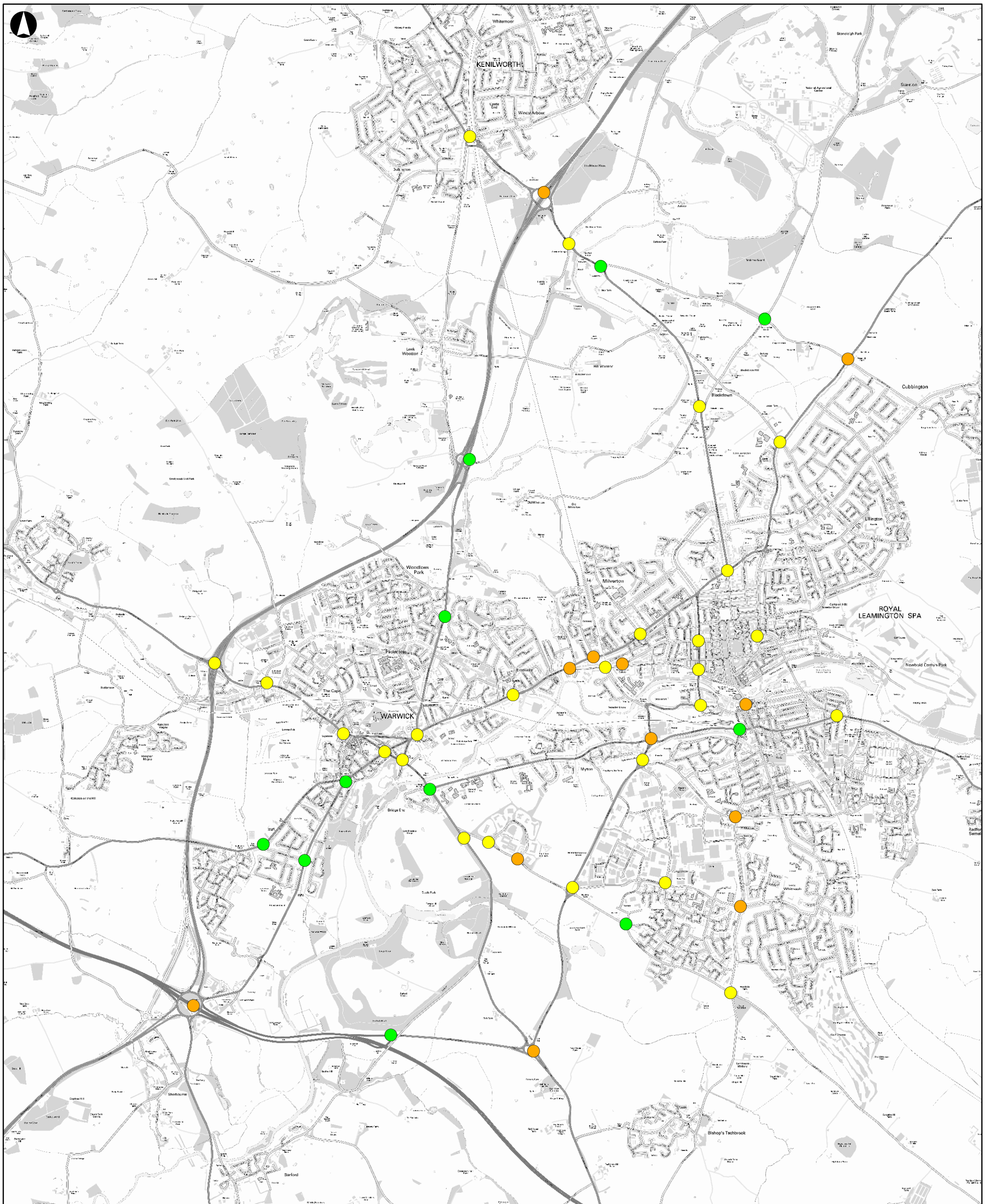
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Job No
211439-19

Drawing Status
Information

Drawing No
MQ 006

Issue
P1



Legend

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- between +15 and +30
- between +30 and +50
- greater than +50

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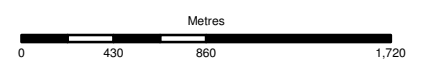
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Issue	Date	By	Chkd	Appd

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**P3.005 Revised Allocation Warwick Town
2028 PM 1700-1800
Average Maximum Queue**

Scale at A3

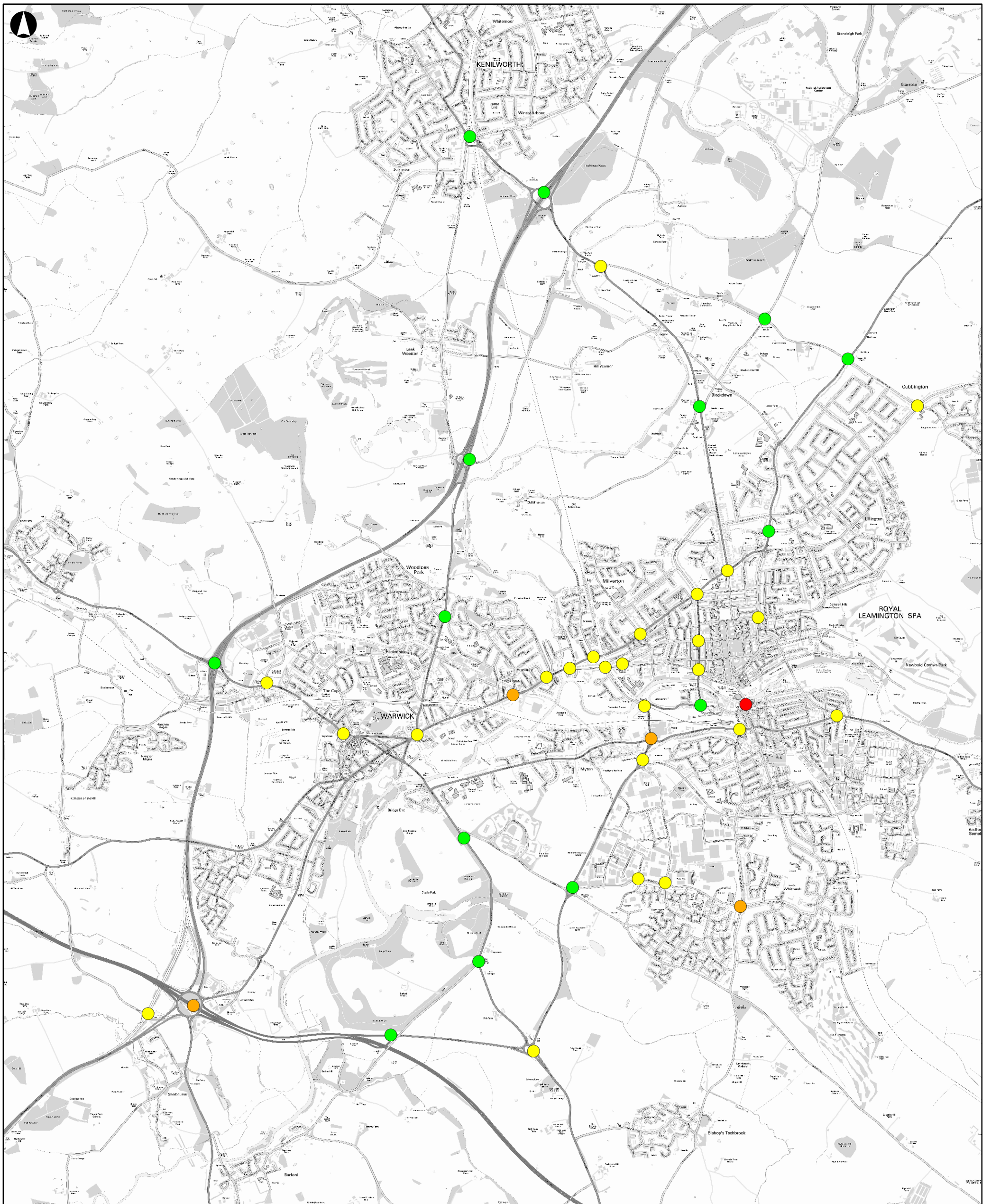
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Job No
211439-19

Drawing Status
Information

Drawing No
MQ 007

Issue
P1



Legend

- less than -5 vehicles
- between +15 and +30
- between +30 and +50
- greater than +50

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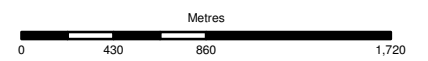
P1	08-04-13	MG	JE	JE
Issue	Date	By	Chkd	Appd

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Job Title
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**P3.006 Revised Allocation P&R
2028 AM 0800-0900
Average Maximum Queue**

Scale at A3

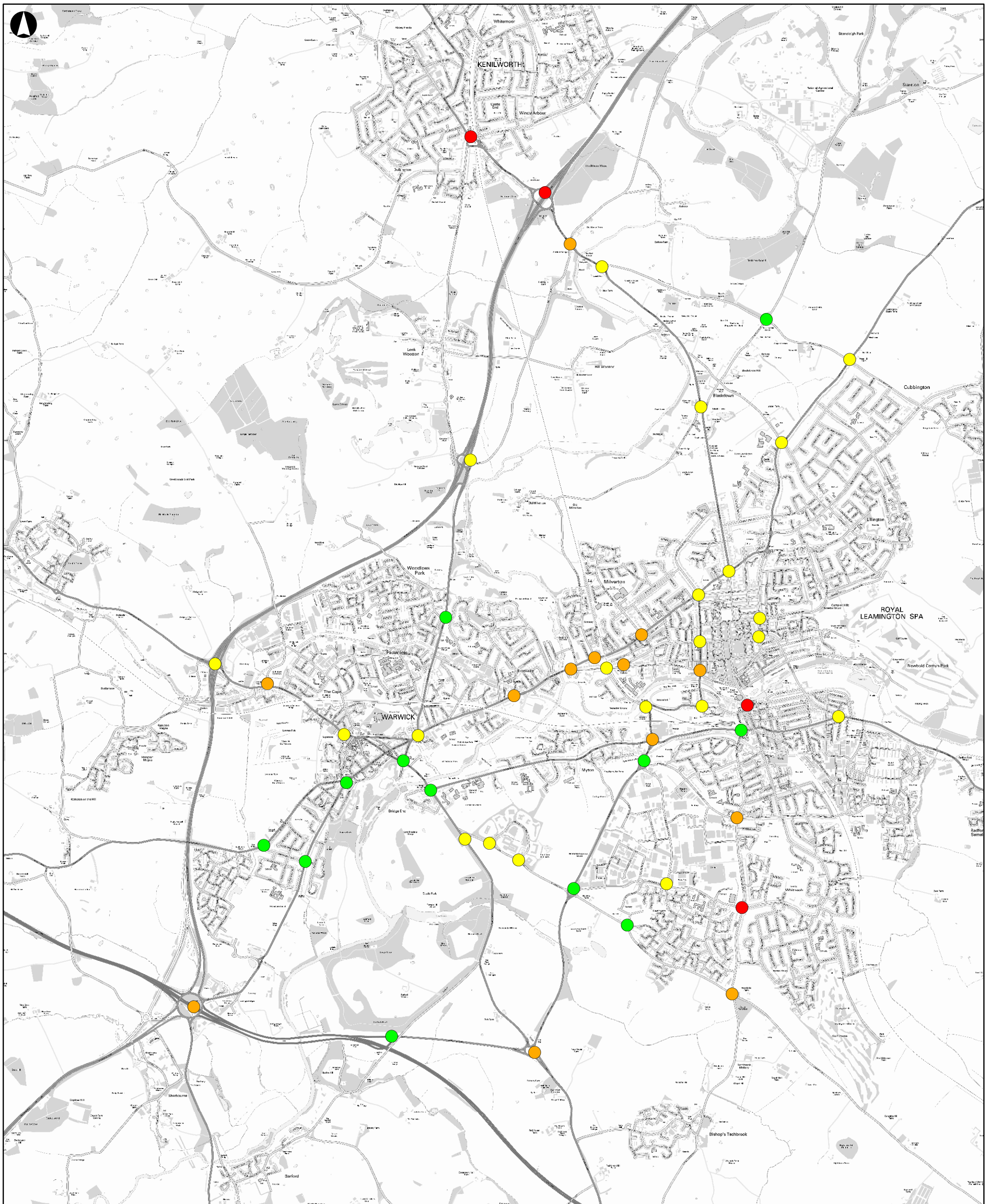
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Job No
211439-19

Drawing Status
Information

Drawing No
MQ 008

Issue
P1



Legend

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- between +30 and +50
- greater than +50

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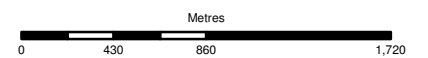
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Issue	Date	By	Chkd	Appd

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**P3.006 Revised Allocation P&R
2028 PM 1700-1800
Average Maximum Queue**

Scale at A3

N.T.S.

Job No
211439-19

Drawing Status
Information

Drawing No
MQ 009

Issue
P1

Appendix G

WDC STA Phase 3 - Journey
Time Analysis Plots

Appendix G Contents

MD 001 P3.002 Revised Allocations PN AM

MD 002 P3.002 Revised Allocations PN PM

MD 003 P3.003 Revised Allocation plus Schools AM

MD 005 P3.004 Revised Allocation Bridge Sensitivity AM

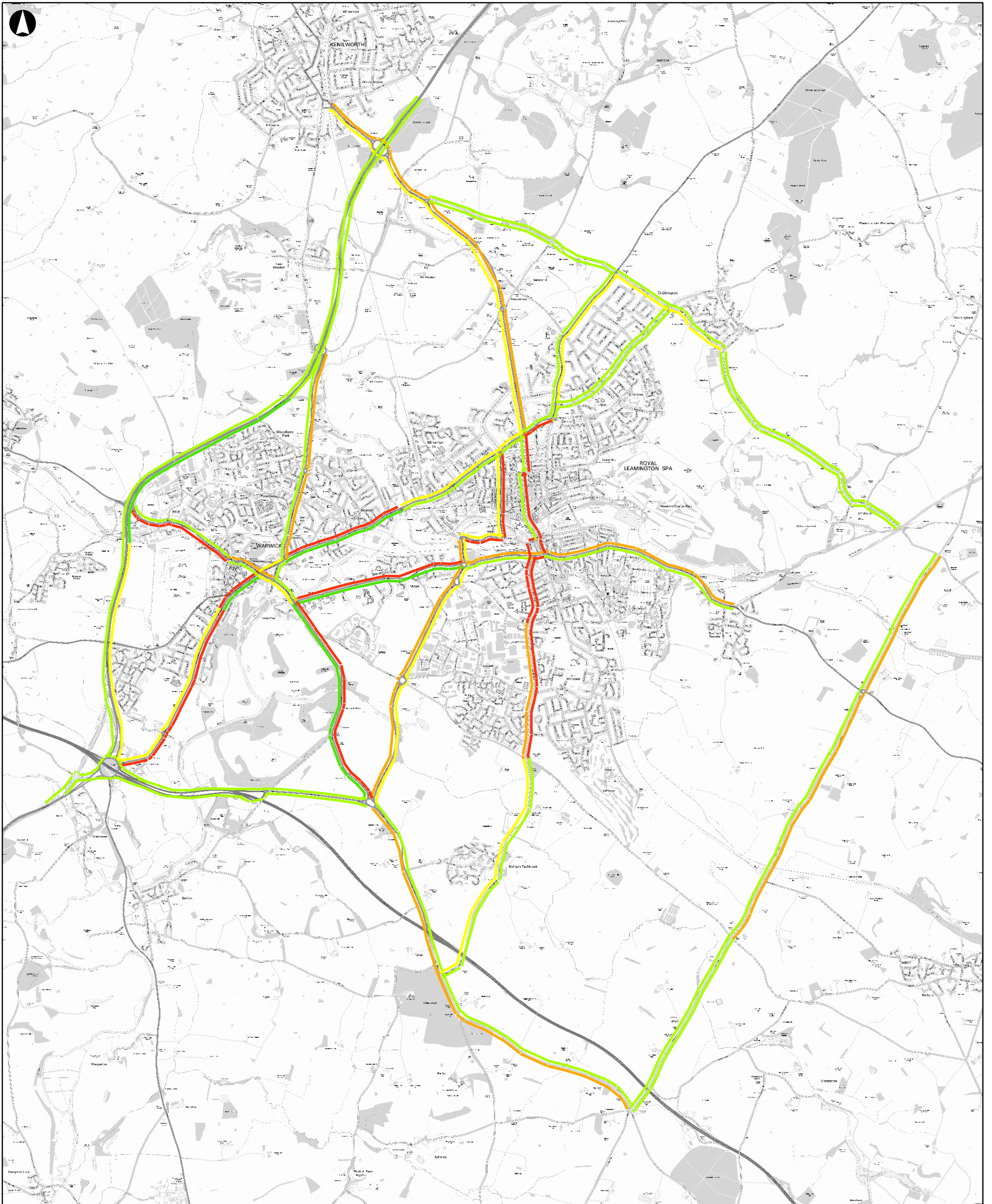
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MD 007 P3.005 Revised Allocation Warwick Town AM

MD 008 P3.005 Revised Allocation Warwick Town PM

MD 009 P3.006 Revised Allocation P&R AM

MD 010 P3.006 Revised Allocation P&R PM



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- > -15%
< +15%
- +15%
- +25%
- +50%

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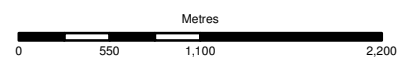
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Issue	Date	By	Chkd	Appd

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Job Title
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Strategic Transport Assessment**



P3.002 2028
Revised Allocations PN AM
Percentage Difference Mean Delay

Scale at A3

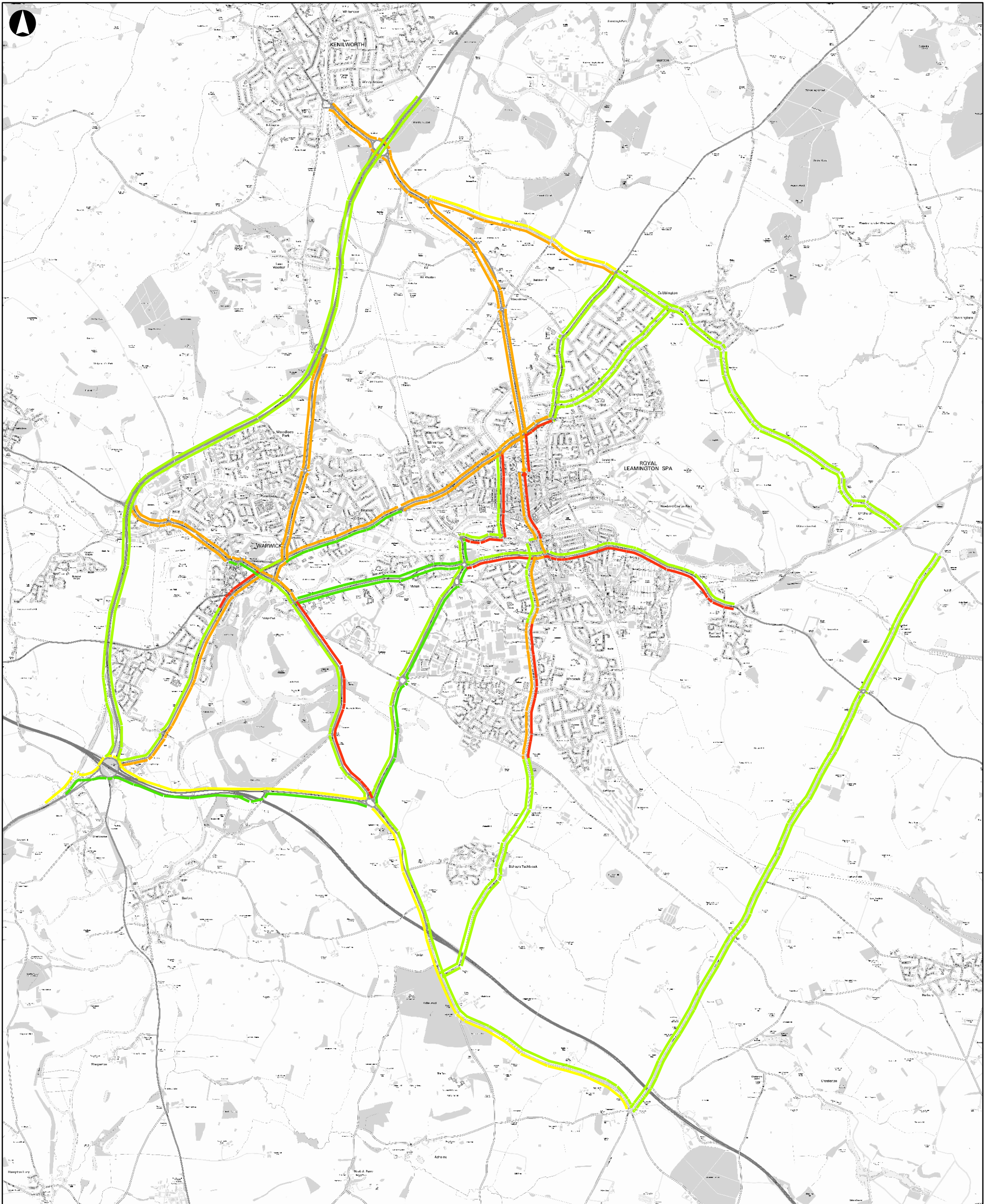
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Job No
211439-19

Drawing Status
Information

Drawing No
MD 001

Issue
P1



Legend

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- +25%
- +50%

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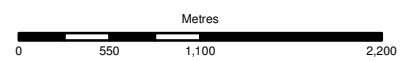
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Issue	Date	By	Chkd	Appd

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Job Title
**Warwick District
Strategic Transport Assessment**



P3.002 2028
Revised Allocations PN PM
Percentage Difference Mean Delay

Scale at A3

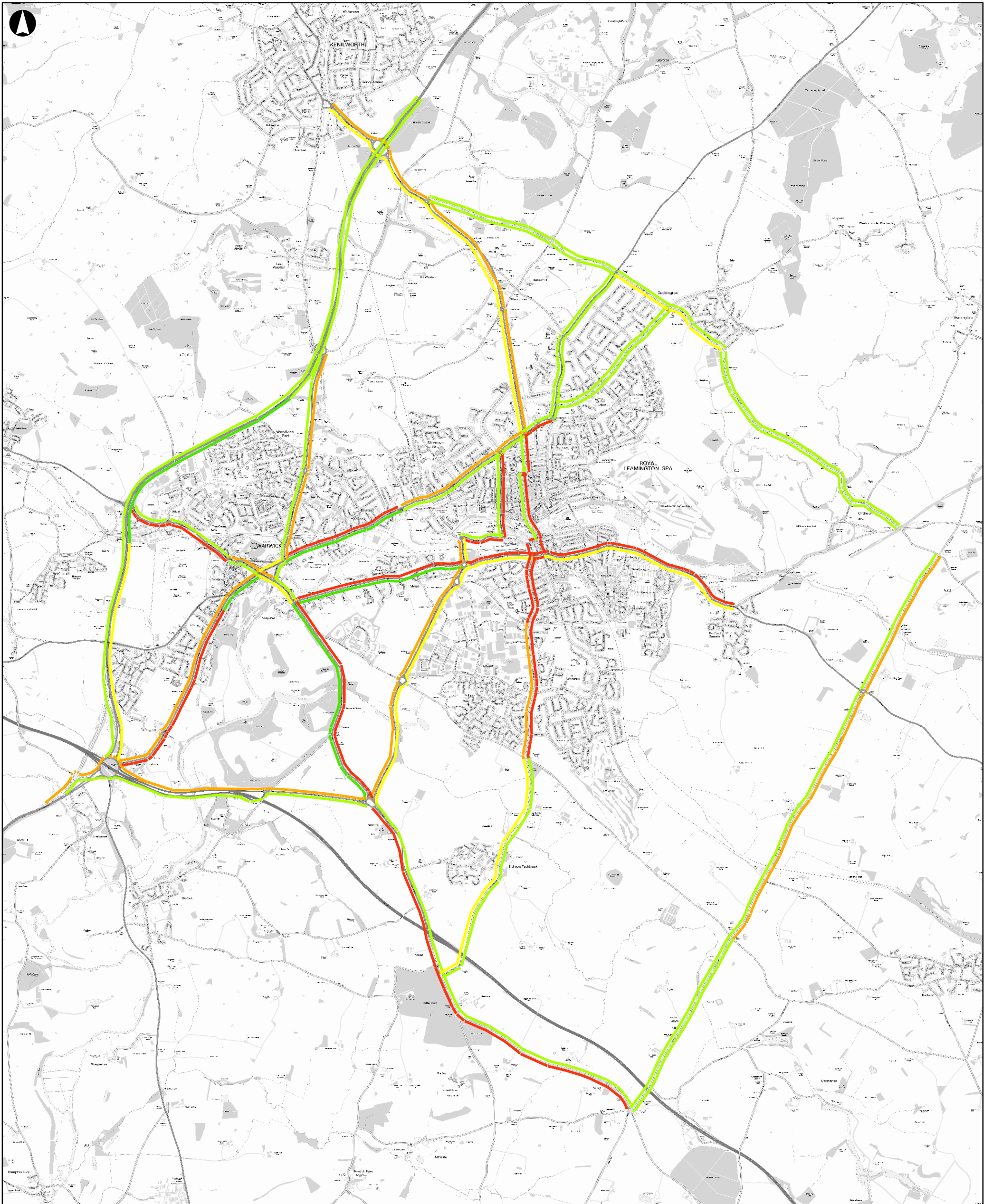
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211439-19

Drawing Status
Information

Drawing No
MD 002

Issue
P1



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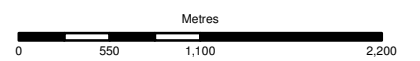
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Issue	Date	By	Chkd	Appd

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Job Title
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Strategic Transport Assessment**



**P3.003 2028
Revised Allocation plus Schools AM
Percentage Difference Mean Delay**

Scale at A3

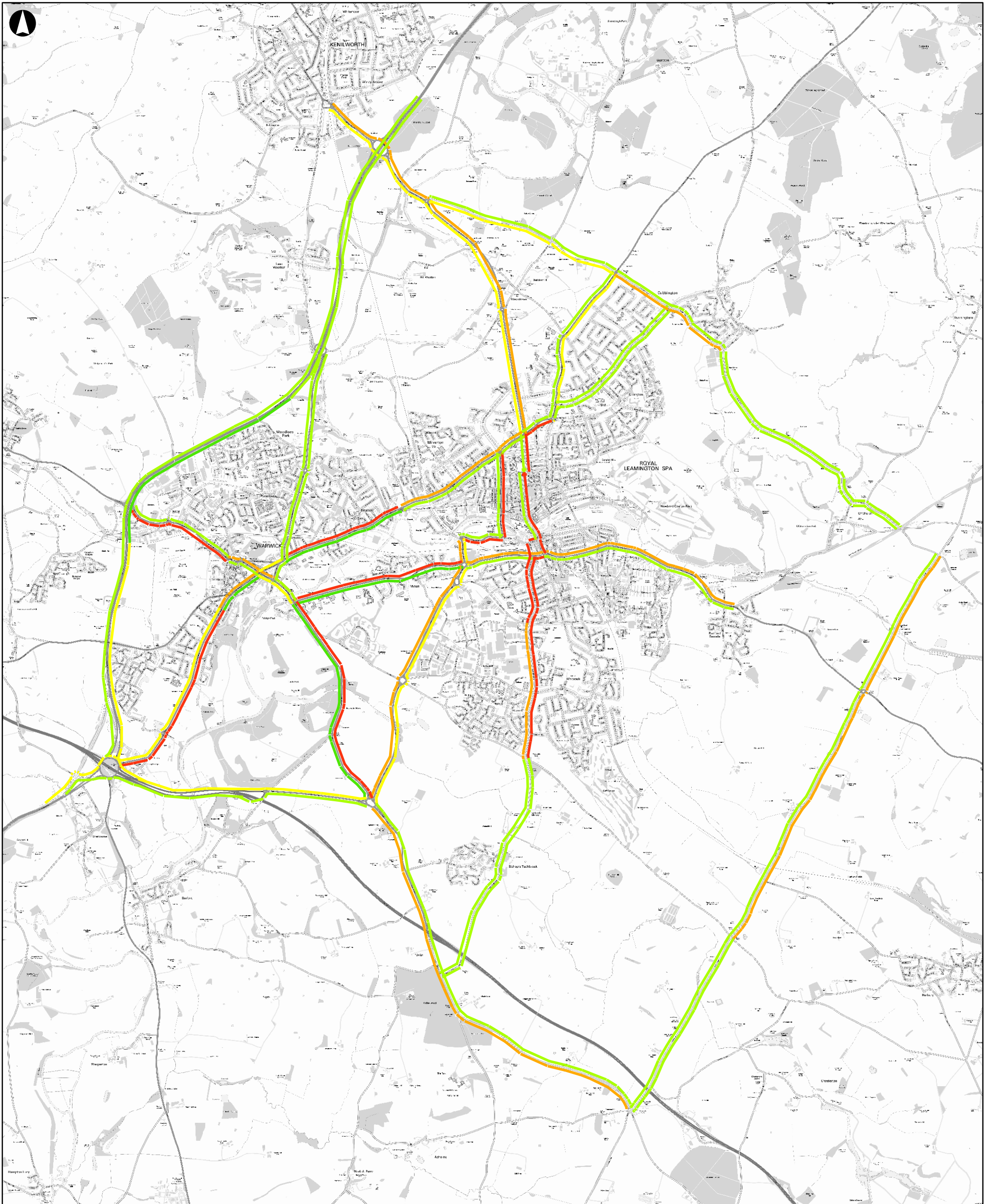
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Drawing Status
Information

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MD 003

Issue
P1



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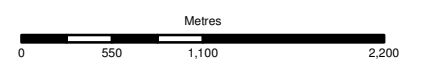
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Issue	Date	By	Chkd	Appd

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Job Title
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Strategic Transport Assessment**



P3.004 2028
Revised Allocation Bridge Sensitivity AM
Percentage Difference Mean Delay

Scale at A3

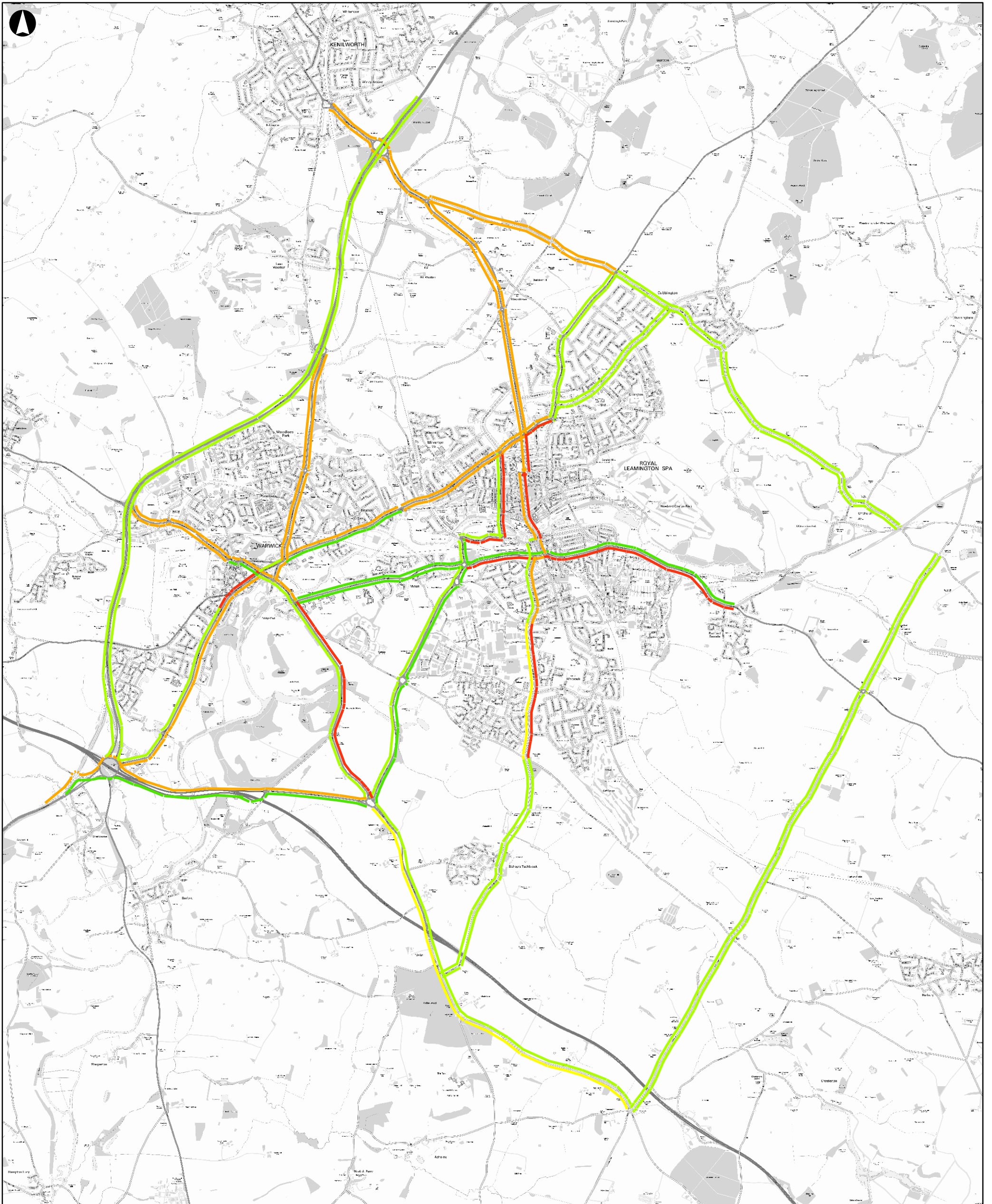
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Job No
211439-19

Drawing Status
Information

Drawing No
MD 005

Issue
P1



Legend

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- +50%

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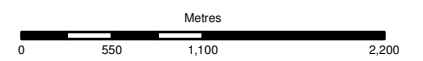
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Issue	Date	By	Chkd	Appd

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Job Title
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P3.004 2028
Revised Allocation Bridge Sensitivity PM
Percentage Difference Mean Delay

Scale at A3

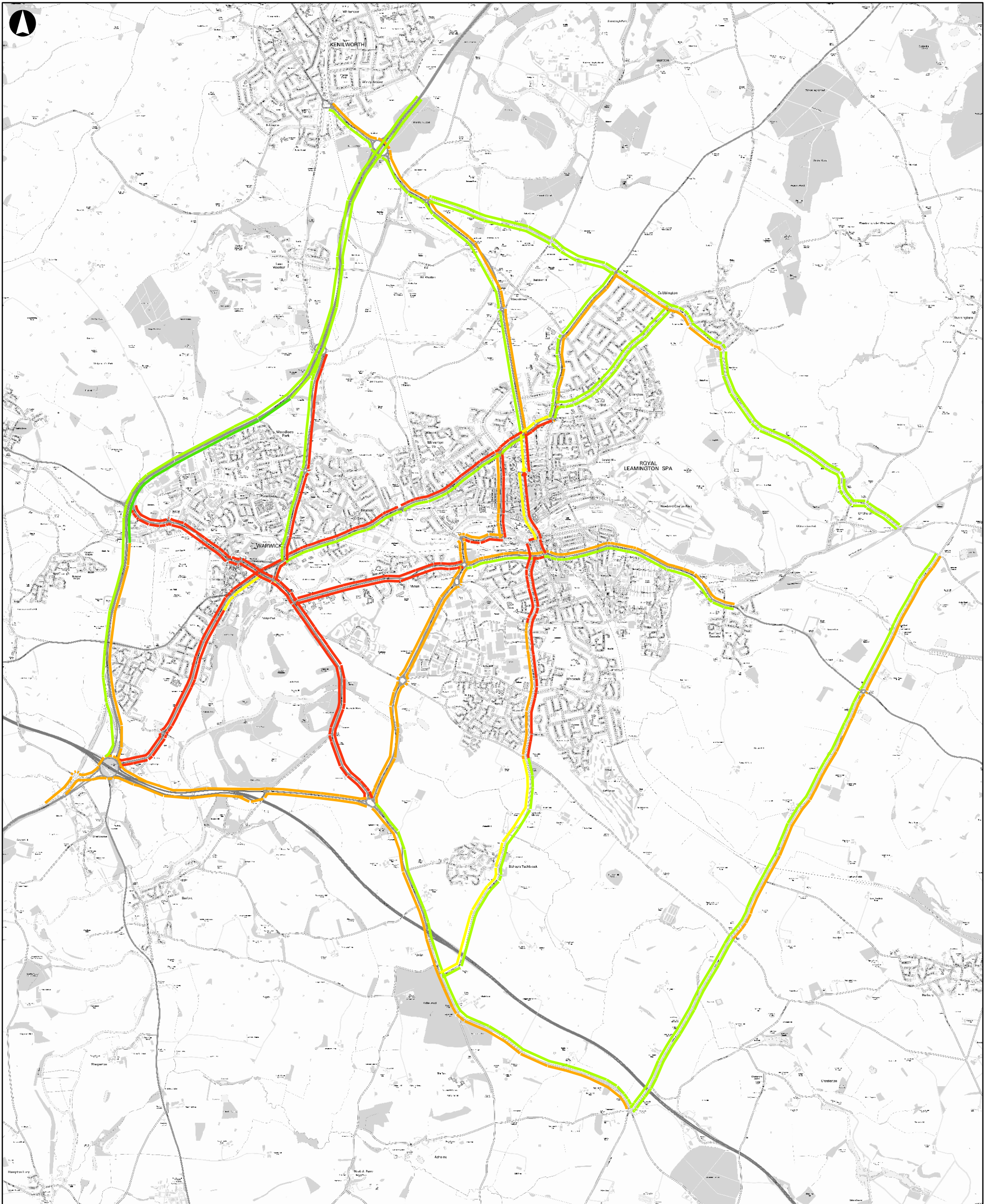
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Job No
211439-19

Drawing Status
Information

Drawing No
MD 006

Issue
P1



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- +15%
- +25%
- +50%

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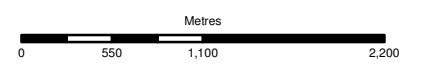
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Issue	Date	By	Chkd	Appd

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Job Title
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**P3.005 2028
Revised Allocation Warwick Town AM
Percentage Difference Mean Delay**

Scale at A3

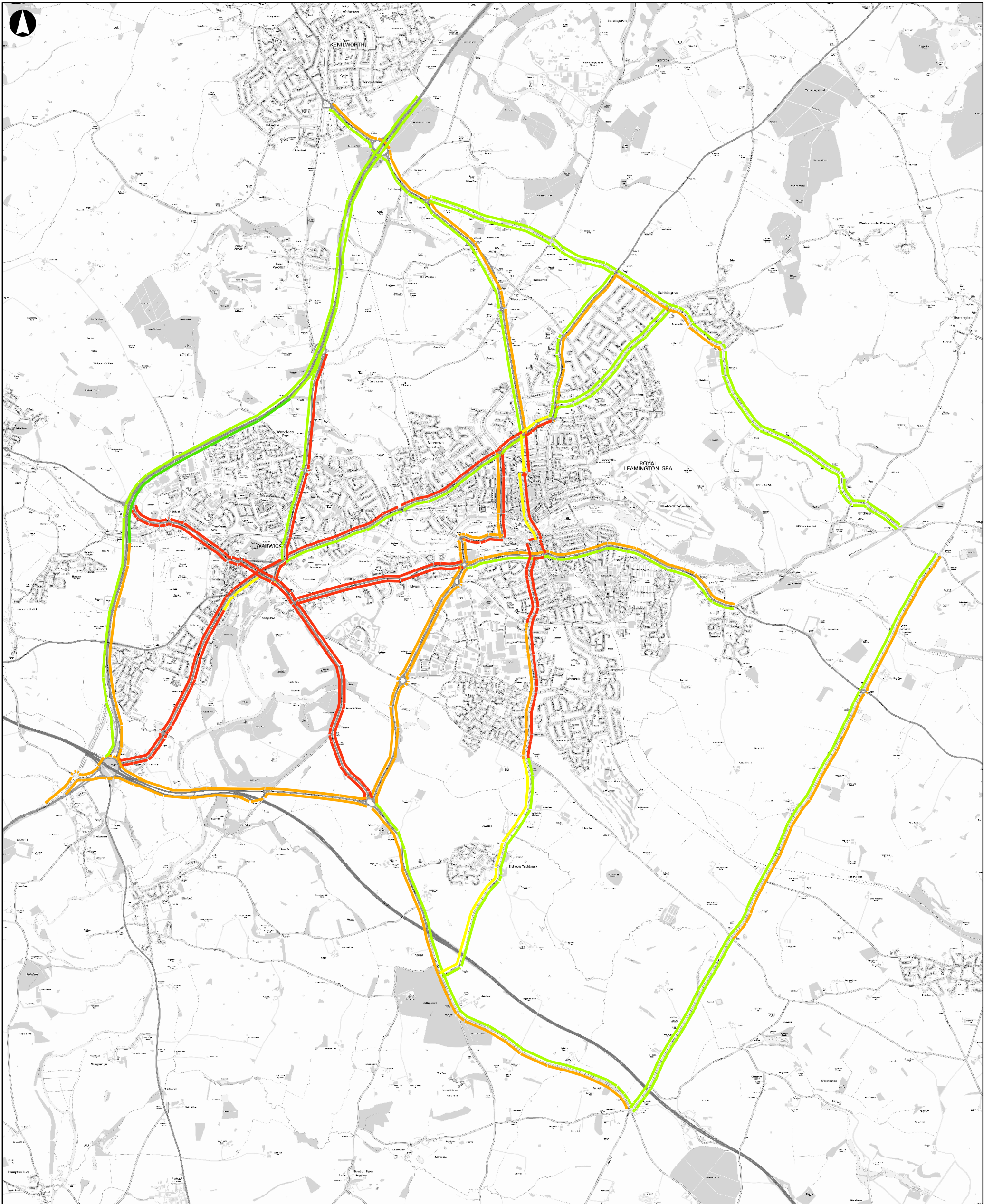
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Job No
211439-19

Drawing Status
Information

Drawing No
MD 007

Issue
P1



Legend

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- > -15%
< +15%
- +15%
- +25%
- +50%

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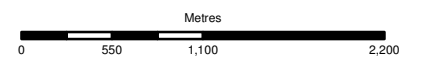
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**P3.005 2028
Revised Allocation Warwick Town PM
Percentage Difference Mean Delay**

Scale at A3

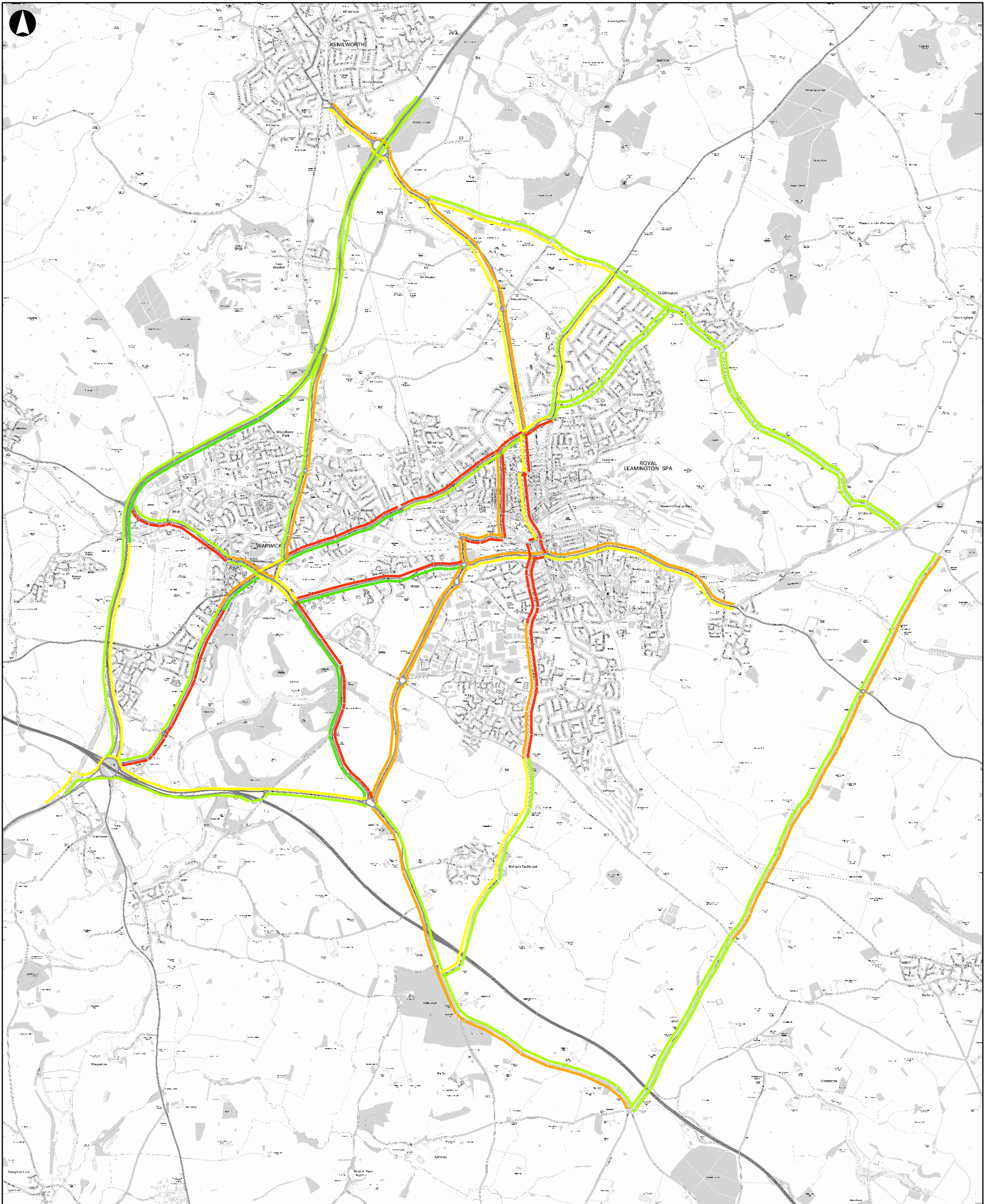
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Job No
211439-19

Drawing Status
Information

Drawing No
MD 008

Issue
P1



Legend

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< +15%
- +15%
- +25%
- +50%

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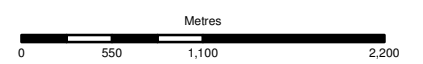
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Job Title
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**P3.006 2028
Revised Allocation P&R AM
Percentage Difference Mean Delay**

Scale at A3

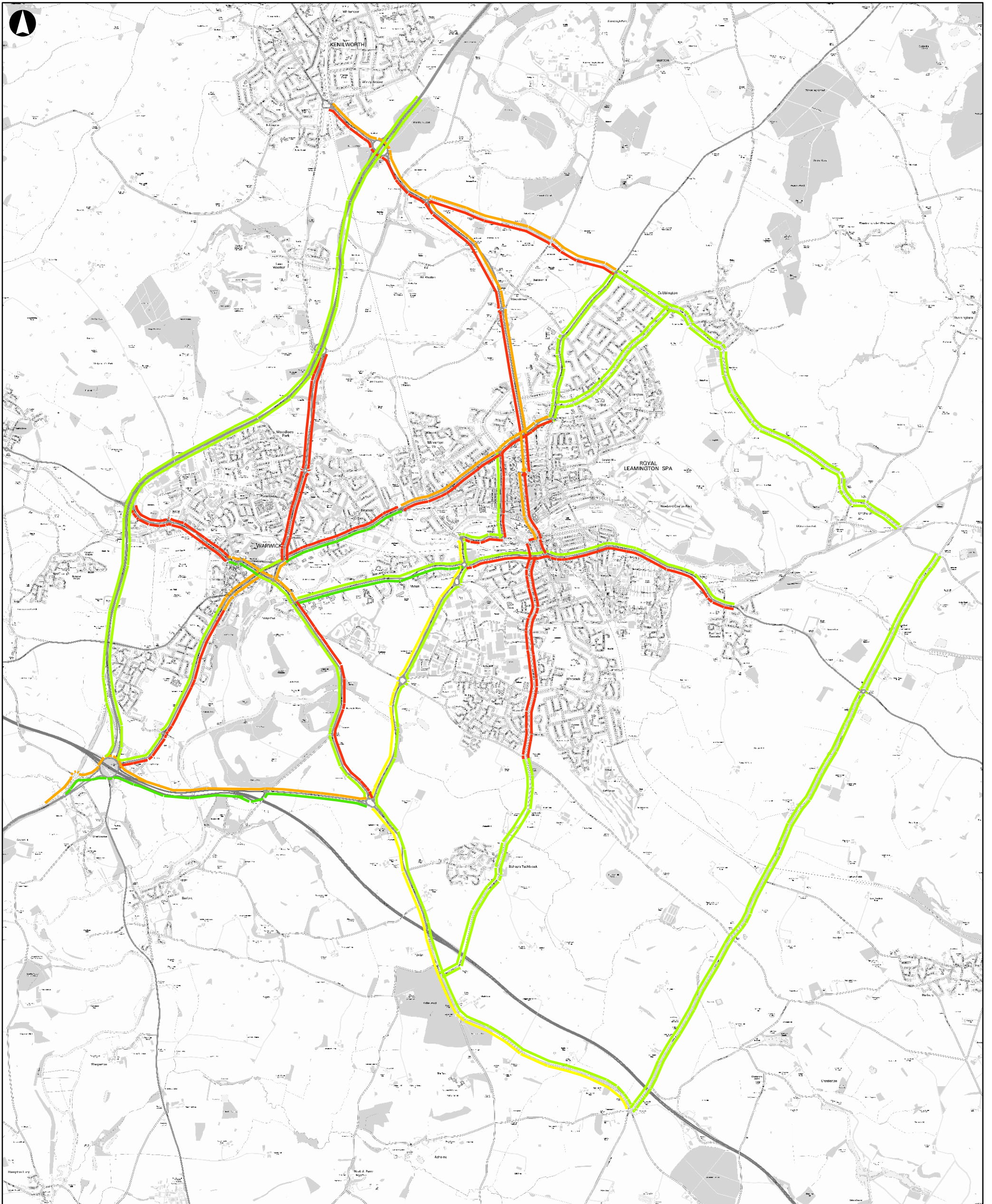
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Job No
211439-19

Drawing Status
Information

Drawing No
MD 009

Issue
P1



Legend

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- > -15%
< +15%
- +15%
- +25%
- +50%

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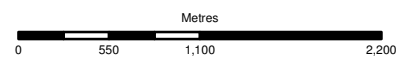
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Issue	Date	By	Chkd	Appd

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**P3.006 2028
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Percentage Difference Mean Delay**

Scale at A3

N.T.S.

Job No
211439-19

Drawing Status
Information

Drawing No
MD 010

Issue
P1

Appendix H

Sustainable Transport Technical Note

Technical Note



Project title WDC Strategic Transport Assessment Phase 3

Prepared by Adrian Hart

Date 21/05/13

Subject WDC Core Strategy

Introduction

It is critical that sustainable transport improvements form part of the mitigation package to support the housing and employment growth proposals within the District. Such improvements will:

- Contribute towards the delivery of sustainable development within the District;
- Maximise the number of journeys made by sustainable transport modes from trips generated as a result of new development;
- Reduce the impact of car based travel on the local and strategic highway network;
- Deliver an integrated approach to transport provision to serve new development; and
- Contribute towards the aims and objectives of the District Council's Garden Towns, Villages and Suburbs Prospectus.

Sustainable transport is an umbrella term which includes provision of bus services, bus infrastructure, park and ride, access to rail services, walking, cycling and behavioural measures (Smarter Choices). This note sets out what sustainable transport improvements will be sought through the planning process to support development generally within the District. Specific measures to mitigate major development in South Warwick/Leamington Spa are also described in more detail.

Public Transport

Introduction

Public transport has an important role to play in supporting new development by providing real travel choice to residents and employees. This in turn can help mitigate the overall impact of development on the highway network by reducing the number of car trips generated as a result of growth.

Improvements to public transport can include service enhancements and investment in infrastructure. Further details of these are set out below.

Improvements to Bus Services – General

The County Council may require financial contributions towards the provision of improvements to bus services as part of all significant new development. This will generally take the form of either enhancements to existing bus services which fall within 400m walking distance of the site, or for larger sites the provision of new standalone bus services which deliver direct access to the development in question. Contributions will be sought for a minimum of five year period, net of fare box revenue. Alternatively, developers may wish to contract new or enhanced bus services directly with an operator rather than pay a contribution. Such requirements will be agreed as part of the planning process and conditioned accordingly.

New or enhanced bus services should ideally provide a minimum of a 15 minute frequency serving the development between 0630 – 1900 from Monday to Saturday, with a 30 minute frequency in evenings and on Sundays.

Improvements to Bus Services – South Warwick/Leamington Spa

As has been raised in previous submissions by the County Council, the concentration of large scale development in the South Warwick/Leamington Spa area should facilitate the conditions required to support the introduction of a small network of new and/or enhanced services that stand a reasonable chance of becoming commercially viable over time.

As such, the County Council has developed an outline specification and costing for enhancing the existing Service 68 (Cubbington to Hatton Park via Leamington Spa and Warwick) and providing a new 20 minute frequency bus service serving the proposed major development in this area. These will deliver suitable links between the new development and Warwick/Leamington Spa town centres, as well as other key trip attractors such as nearby employment areas and Leamington Spa rail station. Figure 27 within the main report provides a plan showing the proposed routes of these bus services.

Extension of Service 68 and ensuring a consistent and reliable 30 minute frequency will require the provision of an additional vehicle, at a cost of around £130,000 per year for five years. The proposed new 20 minute frequency service linking the area with Leamington Spa town centre will require three buses, at a cost of around £130,000 per bus per year for five years.

The following breakdown provides a broad indication of the level of contributions towards the delivery of these new/enhanced bus services:

- Year 1 - £416,000 (80% of total contribution)
- Year 2 - £374,400 (assuming 10% reduction due to increased revenue)
- Year 3 - £336,960 (assuming a further 10% increase in revenue)
- Year 4 - £303,264 (assuming a further 10% increase in revenue)
- Year 5 - £272,938 (assuming a further 10% increase in revenue)

This gives a total contribution of £1,703,562.

This figure will be divided by the total number of dwellings and possibly the quantum of employment delivered in the area, giving a per dwelling/per m² of residential/ employment contribution. For example if this were based upon the current thinking for housing levels in the area (2,671) and didn't make an allowance for employment floorspace, this calculation would give a per dwelling contribution of £638.

Bus Infrastructure

The principal areas of infrastructure associated with bus service improvements are bus stops, shelters, laybys, information and priority measures.

In relation to bus stops, we would expect these to be well located in relation to the surrounding development (for example in terms of local service centres and schools), with a maximum walk distance of no more than 400m from any point within the development. In most cases bus stop poles with flags and timetable cases should be sufficient. At key stops, consideration should be given to providing a bus shelter. A commuted sum will be required for a period of five years to cover the maintenance costs of each shelter provided. Bus stop laybys are generally not required unless it is necessary for a vehicle to wait for some time at a particular point in its journey (for example at the beginning or end of a route).

The County Council does not generally require Real Time Information (RTI) to be provided at bus stops and within bus shelters. However, liaison with site promoters will be undertaken to discuss the possible provision of supporting underground infrastructure, should RTI be pursued at some point in the future.

A considerable amount of work has been undertaken by the County Council to identify and test a number of potential bus priority measures to assist the operational reliability and attractiveness of bus services to/from the proposed major development area to the South of Warwick and Leamington Spa.

From the proposed southern Park and Ride facility (see below for further details) towards Leamington Spa rail station and town centre, the following bus priority measures have been identified and tested within the traffic modelling assessment:

- Bus loop detectors at the exit of the Park and Ride site and at the junction onto the Heathcote Farm development site distributor road;
- Bus lane northbound along the Heathcote Farm development site distributor road as far as the junction of Gallows Hill/Heathcote Lane;
- Bus gate at the junction of the Heathcote Farm development site distributor road with Gallows Hill/Heathcote Lane (to facilitate left and straight on bus movements);
- Bus lane on the exit from the Land west of Europa Way development site northbound, with a bus gate to provide access onto the A452 Europa Way. Bus loop detectors for the reciprocal movement from the A452 Europa Way south into the Land west of Europa Way development;
- Bus lane northbound around the western edge of the Shires Retail Park roundabout, with corresponding southbound bus lane provided as part of the hamburger design through the centre of the roundabout;
- Bus detector loops on each approach to the main access to the Ford Foundry development (Morrisons);
- Queue detector loops on all approaches to the proposed Old Warwick Road/ Lower Avenue/Spencer Street/Bath Street gyratory system; and
- Bus detector loops on the approaches to all three main junctions on the Parade (Regent Street, Warwick Street and Clarendon Avenue).

From the proposed southern Park and Ride facility towards Warwick town centre, the following bus priority measures have been identified and tested within the traffic modelling work:

- Bus loop detector on the approach to Banbury Road from Gallows Hill/Heathcote Lane with associated bus lane;
- Bus loop detectors on all approaches to the Banbury Road/Myton Road junction; and
- Bus loop detectors at the junction of St Nicholas Church Street/Castle Hill.

There are limited further opportunities for bus priority in Warwick due to the constrained nature of the other principal junctions within the town centre.

Figure 28 within the main report provides further details regarding the location of the bus priority measures set out above. An initial assessment has been carried out regarding the impact of the bus priority measures on vehicle journey times and network performance. The findings of this work are detailed in the main report.

Further opportunities for bus priority provision elsewhere within the District will be sought as a result of new development.

Park and Ride

The County Council has previously highlighted the opportunity for some form of Park and Ride in the vicinity of the A452 Heathcote roundabout to be delivered as a result of development in the South Warwick/Leamington Spa area. As part of on-going discussions with developers, an area of land has been identified to the south west of the Heathcote roundabout which would be set aside for a Park and Ride facility (see Figure 27 within the main report for details). This would be served by the enhanced Service 68 and new bus services to/from Leamington town centre described above.

An opportunity exists for a complimentary northern Park and Ride facility to be provided to further mitigate the impact of development planned within the District. Even with growth focussed in South Warwick/Leamington Spa, the modelling work undertaken by the County Council indicates that the A452 corridor (which already carries significant volumes of traffic throughout the day and particularly at peak times) will come under further pressure as a result of growth. Work undertaken previously by the County Council as part of the SPARK Major Public Transport scheme proposals suggested that an optimum location for a northern Park and Ride site would be between A46/A452 Thickthorn roundabout and the A452/B4113 Blackdown roundabout. It is anticipated that the facility would be served by some or all of the existing bus services which currently use this corridor, thus delivering a highly attractive frequency of service for users. This would ideally be accompanied by bus priority measures along the route, particularly at key pinch points.

It is anticipated that any Park and Ride facility provided within the District would be constructed, owned and operated in perpetuity by the District Council as an off-street car park, given that as an Authority it controls a significant proportion of the off-street car parks in both Warwick and Leamington Spa town centres and sets the parking charges therein. Any costs associated with the subsidy and operation above and beyond the funding provided by developers towards the bus services associated with the Park and Ride facility would also fall on the District Council.

It is suggested that the District Council carry out further work to understand some of the more detailed aspects of the proposals for Park and Ride, such as demand forecasting (including town centre parking charge sensitivity testing), likely construction and site operating costs, bus subsidy costs and consideration of operational issues.

Access to Rail Services

The principal access points to the rail network for those living or working in the District are Warwick, Warwick Parkway, Leamington Spa and Coventry. The smaller station facilities at Hatton, Lapworth and Claverdon provide important secondary facilities for local residents and the surrounding rural areas. The County Council is currently in the process of seeking funding to deliver a new station at Kenilworth as part of the NUCKLE Phase 2 proposals. These will build on the Phase 1 improvements that are currently being delivered between Nuneaton and Coventry, which include service frequency enhancements, new stations at Bermuda and Arena, platform extensions at Bedworth and a new bay platform at Coventry.

The principal rail head which will serve the majority of the development proposed in the Core Strategy will be Leamington Spa, which currently benefits from direct rail services to London Marylebone, Banbury, Oxford, the South Coast, Solihull, Birmingham New Street, the North West and the North East. High

frequency, rapid access from the proposed major growth sites in South Warwick/Leamington Spa to the rail station would be provided via the new bus services described earlier in this note, linking the proposed southern Park and Ride facility with the town centre.

Walking and Cycling

General

It is essential that high quality pedestrian and cycle routes are provided to and within all new development sites that come forward in the District.

Internal provision for pedestrians and cyclists should deliver good access to local service centres, schools and open spaces/play areas. The County Council's preference is that pedestrians and cyclists should generally be accommodated on streets rather than routes segregated from traffic. Short pedestrian and cycle only links are acceptable if well-designed where they provide short cuts or opportunities for leisure cycling or walking. Routes should also be provided as part of new 'green' corridors, with suitable links to them from within the development. Good connections to the external pedestrian and cycle network should also be provided.

In terms of other pedestrian and cycle infrastructure, crossing facilities should be considered where flows will justify such provision. Toucan crossings may be required on key cycle routes. Pedestrian/cycle signage should also be considered, particularly in terms of links to the National Cycle Network and important local facilities such as rail stations. We would expect to see good quality cycle parking provided at local service centres, schools and open spaces/play areas within development sites.

The cycle network within the Warwick/Leamington Spa area is reasonably well developed, although there are a number of missing links which would help to reinforce the overall network. Whilst some progress has been made recently to expand the cycle network within Kenilworth (including the Connect2 scheme), further investment is required to deliver a number of important routes. The single most important inter-urban cycle route which is currently missing within the District is a dedicated facility between Kenilworth and Leamington Spa (often referred to as K2L). The traffic modelling work which has been undertaken has demonstrated that there will be further pressure on the A452 as a result of growth, which reinforces the need for investment in sustainable transport measures such as this within the corridor.

As part of the £2m which has been identified for sustainable transport improvements, we would envisage a proportion of this being used towards wider enhancements to the cycle network in the District. The following schemes would deliver a number of missing links and therefore allow more seamless journeys to be made by bike:

- Kenilworth to Leamington Spa (K2L) - Provision of a shared foot/cycleway alongside the A452 from Kenilworth St Johns Gyratory to Leamington Spa. A feasibility study has recently been completed by the County Council to identify the most appropriate specification for the scheme, including options for a new pedestrian/cycle structure at Chesford Bridge. The cost of the scheme is estimated to be between £1.4-1.7m, depending on what bridge structure is delivered at Chesford.
- A445 Emscote Road, Warwick - Completion of the Emscote Road cycleway from Warwick to Leamington Spa. This will make use of the facilities for cyclists which will be delivered as part of the forthcoming Portobello Bridge and Rugby Road improvements, and also

connecting to the new cycle facilities on Princes Drive delivered by the Ford Foundry development.

- A429 Coventry Road, Warwick - Completion of the Coventry Road cycleway from Leek Wootton to Warwick town centre, part of which has been delivered between Leek Wootton and the Woodloes roundabout (Spinney Hill/Primrose Hill).
- Leek Wootton to Kenilworth - Provision of a shared foot/cycleway alongside the Warwick Road between Leek Wootton and Kenilworth St Johns Gyatory.
- Cubbington / north Lillington to Leamington Spa town centre - via Cubbington Road or a suitable alternative route.
- Working with Warwick District Council to provide links through open spaces such as Victoria Park and St Nicholas Park to connect with existing cycle infrastructure and provide convenient and attractive cycle routes.
- Whitnash to Radford Semele - Provision of an enhanced link for pedestrians and cyclists between Church Lane, Whitnash and the village of Radford Semele. This route could potentially be delivered as part of the proposed development to the south of Sydenham.

The above schemes are initial ideas and should not be considered as an exhaustive list of schemes. The County Council will seek contributions towards full or partial funding of these improvements through the proposed CIL Charging Schedule or other funding mechanisms to secure contributions from developers.

Improvements for Pedestrians and Cyclists – South Warwick/Leamington Spa

In a similar way to public transport provision, a critical mass of development in the South Warwick/Leamington Spa area should provide the circumstances whereby a meaningful internal and external network of pedestrian and cycle routes can be delivered as a result of growth.

In terms of external access, links to the following will be required:

- The schools on Myton Road;
- Warwick Town Centre;
- Warwick Technology Park;
- The employment areas to the east of Europa Way (Tachbrook Business Park, Queensway Trading Estate and Heathcote Industrial Estate);
- Shires Retail Park;
- Ford Foundry site (Morrisons);
- Leamington Spa Town Centre;
- Leamington Spa Rail Station; and
- Warwick Gates and Whitnash.

Where possible, these links should maximise use of the existing pedestrian/cycle network, in particular the facilities on Myton Road, Old Warwick Road, Queensway the Grand Union Canal towpath and the Banbury Road/Heathcote Lane/Gallows Hill route which serves Warwick Technology Park and Warwick Gates.

Smarter Choices

In order to reinforce the investment in public transport, walking and cycling described in this section of the report, the County Council would expect to see the parallel deployment of a range of behavioural measures (also known as Smarter Choices) as part of the growth proposals across the District.

Examples of such measures include:

- Workplace Travel Plans (in respect of sites generating in excess of 100 jobs);
- Sustainable Travel Packs for new residents;
- Personalised travel planning;
- Travel awareness campaigns;
- Public transport information and marketing;
- Car clubs;
- Car sharing schemes; and
- Teleworking, teleconferencing and home shopping.

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