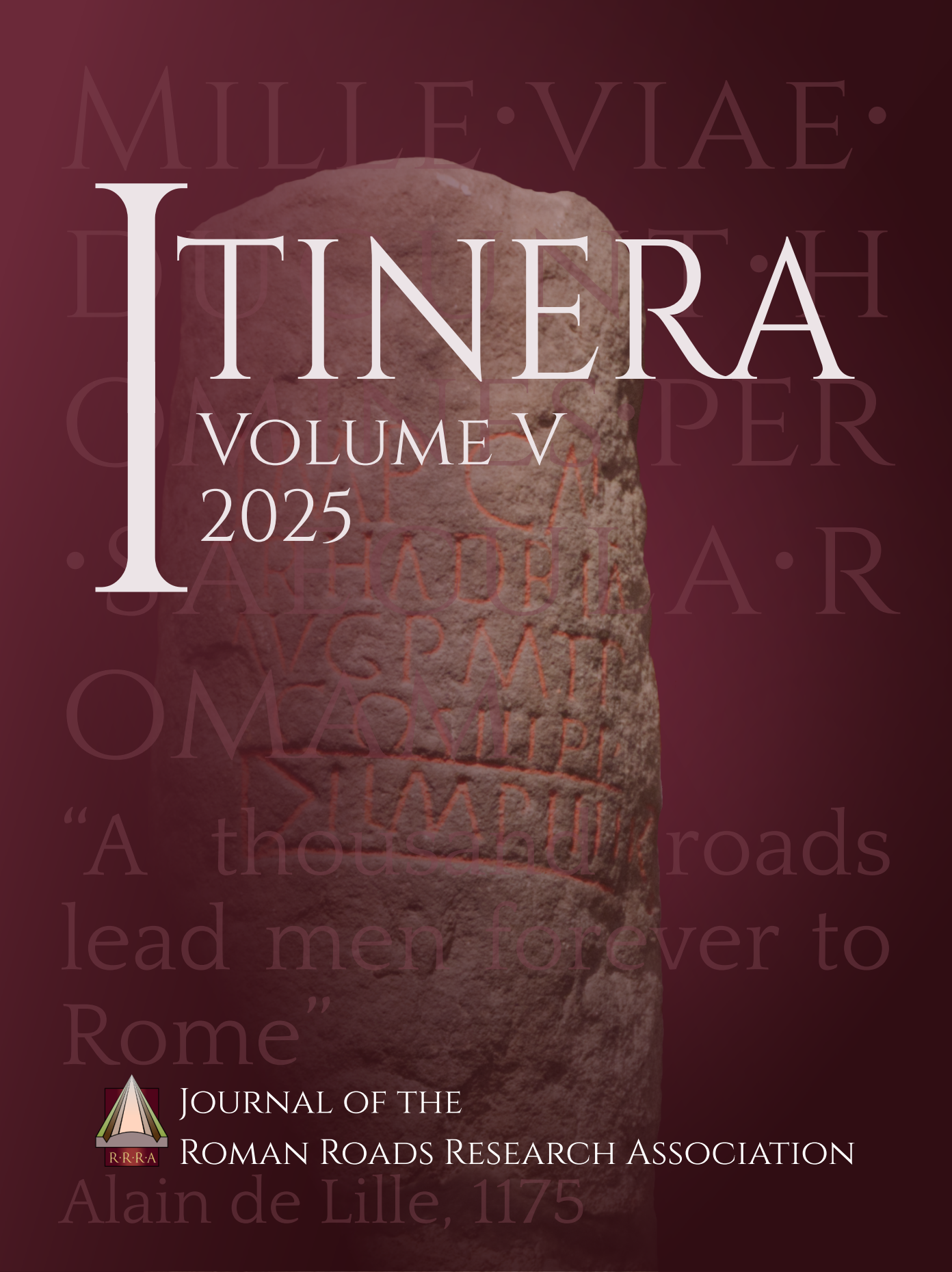


ITINERA

Volume V
2025

"A thousand roads lead men forever to Rome"

Alain de Lille, 1175

Journal of the
Roman Roads Research Association

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Neil Buckley
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Paul Wood

Contact Roman Roads Research Association

If you are interested in Roman roads or would like to know more contact us via our web site https://romanroads.org or by mail to one of the below;

Mike Haken (Chair) mike@romanroads.org

Dave Armstrong (Secretary) dave.armstrong@romanroads.org

Peter Webb (Membership Sec.) membership@romanroads.org

Rob Entwistle (*Itinera* Editor) rob.i.entwistle@gmail.com

Chris Webb (*Itinera* Sales) itinerasales@romanroads.org

Editorial

Robert Entwistle



Welcome to the 2025 edition of *Itinera*, Volume V. *Itinera* continues to hold a unique position among academic journals of Roman studies, with roots in both the academic and grassroots communities. We focus upon the study of Roman roads, transport technology and systems of surveying. We welcome reports and contributions from all researchers able to extend knowledge in these areas to professionals and the public alike, through the format of a formal academic paper.

Volume V, if slenderer than the bumper 2024 edition, is typical in its range of papers. Thus, Wayne Kirk extends our knowledge of Roman Northamptonshire in the light of modern findings, through a wide-reaching paper appraising its road network. Mike Luke, well respected for his excavations and publications on Roman Bedfordshire, shows how a developed understanding of the 'small town' of Sandy leads to an improved appreciation of the local roads. The same theme of road networks is explored in a different way by Keith Abbott, who argues that minor roads and trackways are seriously under-represented in our present appreciation of Roman roads.

Neil Godfrey, by contrast, addresses a wholly different issue: the relationship between roads and Romano-Celtic temples, with roads providing not only transport and passing clients, but also planned landscapes within which temples stood. My own paper is different again, examining ancient surveying methods through the features of extant surveyed works, classical literary sources, and modern surveying techniques. This methodological paper ends my series of papers on Long-distance Alignments. We are also pleased to have a paper from an independent researcher, Paul Smith – one of our own members – presenting his thesis of a road formed over time, from the Iron-Age into the Roman period and beyond.

In this volume we further welcome two authoritative papers from leading academics in Romania, demonstrating the growing understanding of Roman roads in a part of the empire that has received limited attention in the UK. In understanding the growth of road networks in a territory newly brought within the empire we see the link between conquest and road construction, and reflect on the impact of recent political change upon research.

As always, I warmly celebrate the work of our academic advisors and our willing team of volunteers who carry out many critical functions: proofreading, creating the Index, reporting updates from across the country, and managing distribution of printed copy. *Itinera* would not be possible without the willing labours of these individuals, and above all without the editorial team who manage the life of our journal across the year. The process moves from gathering papers and archaeological updates, through review, selection, editing and typesetting, through to final publication. Dr Mike Bishop – writer, publisher and archaeologist – was a founder member of our editorial team, guiding us through the formative first four years of our existence. His expert advice on publishing and all matters Roman helped steer us through a period when everything was new. His international contacts extended knowledge of our journal to contributors as far away as Spain (and most recently) Romania. *Itinera* owes him a great debt as he moves on to other things this year.

With Mike leaving, we are delighted to have welcomed to our team Professor James Gerrard of the University of Newcastle. James Gerrard brings great academic distinction, strengthening us with his experience and calm judgements. Already he has inspired the initiative of an annual Prize for the best Dissertation reflecting Roman Transport studies. Details of the prize (readily available on request)

have been distributed through SALON and the RRRA Newsletter and will shortly be available on the RRRA website. We hope to see this prize awarded for the first time in 2025.

I take this opportunity of warmly welcoming submissions, projected or actual, for Volume VI of Itinera, from all corners of Britannia and the wider empire. You will find '*Notes for Contributors*' on the RRRA website.

In the meantime, I invite you to enjoy everything within Volume V.

Robert Entwistle

(Hon Editor, *Itinera)*

rob.i.entwistle@gmail.com

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A Lidar Based Appraisal of the Roman Roads in Northamptonshire

by Wayne Kirk
waynejkirk@gmail.com

Abstract

This paper appraises the routes and likelihoods of Roman roads in Northamptonshire based primarily on their appearance on lidar data, but also referring to evidence from excavation, county HER records, aerial photography and crop marks. The paper builds on the work already undertaken by the author in the Kettering area (Kirk 2024) which has demonstrated this approach is viable for detecting unknown Roman roads in the Northamptonshire countryside. The work identifies several new Roman roads and alternate routes for existing roads and questions the existence of some routes in the south of the county, as previously identified by the Viatores (1964).

Introduction

The use of lidar data to determine the routes of Roman roads is now well accepted and works especially well in highland regions where arable agriculture is not so prevalent. It should be recognised however, that for the lidar data to detect a Roman road, it needs to have been built with an *agger* and that *agger* must have survived over 1500 years of agriculture, weathering, flooding, robbing and quarrying.

Northamptonshire is a relatively lowland area with elevations ranging from 0 to around 220m and sits on Jurassic age bedrocks. Although the area has generally been extensively farmed, there are several regions of ancient forest land, e.g. Rockingham, Salcey, Whittlewood, which have delayed the onset of intensive agricultural activity and improved the chances that a lidar detectable *agger* has been preserved.

Using techniques such as lidar hill-shading and Local Relief Models (LRMs), features with as little as 10-20cm elevation change can be detected. This, combined with the fact that Roman roads tend to have straight alignment segments and run between known sites of Roman settlement, is the key to identifying possible Roman roads and distinguishing them from other raised linear features seen such as medieval field headlands, pipelines, disused post-medieval roads etc.

Another key tool available is the Historic England National Mapping Programme of archaeological features which is available through the Aerial Archaeology Mapping Explorer. Aerial photographs and the historic imagery on Google Earth, allows crop marks from the ditches either side of the *agger*

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and parchmarks caused by the remains of the *agger* to be identified, and is especially useful where the *agger* has been damaged or destroyed and cannot be seen on lidar imagery.

Other data sources include the county Historic Environment Records (HERs), historic maps, the Historic England aerial photo explorer and previous research papers, primarily available through the ADS.

It is worth noting that several of the roads studied in this paper run along river valleys, which poses particular problems for the lidar techniques. Firstly, the roads often roughly follow the course of the meandering river, meaning straight sections are shorter and sometimes not even straight. Secondly, the roads are likely to have been inundated by flooding numerous times in the last 1500 years, masking any lidar response. These lowland areas have also been farmed and quarried for hundreds of years and unless the road has been proven by excavation, identification and verification of such routes is difficult.

The Starting Point(s)

Fig. 1 shows the Roman roads and main settlements in Northamptonshire and the surrounding counties as identified on the OS 2016 map of Roman Britain. Only 6 proven roads are identified in Northamptonshire; Watling Street (RR1); *Bannaventa* to Duston (RR17); *Lactodurum* (Towcester) to

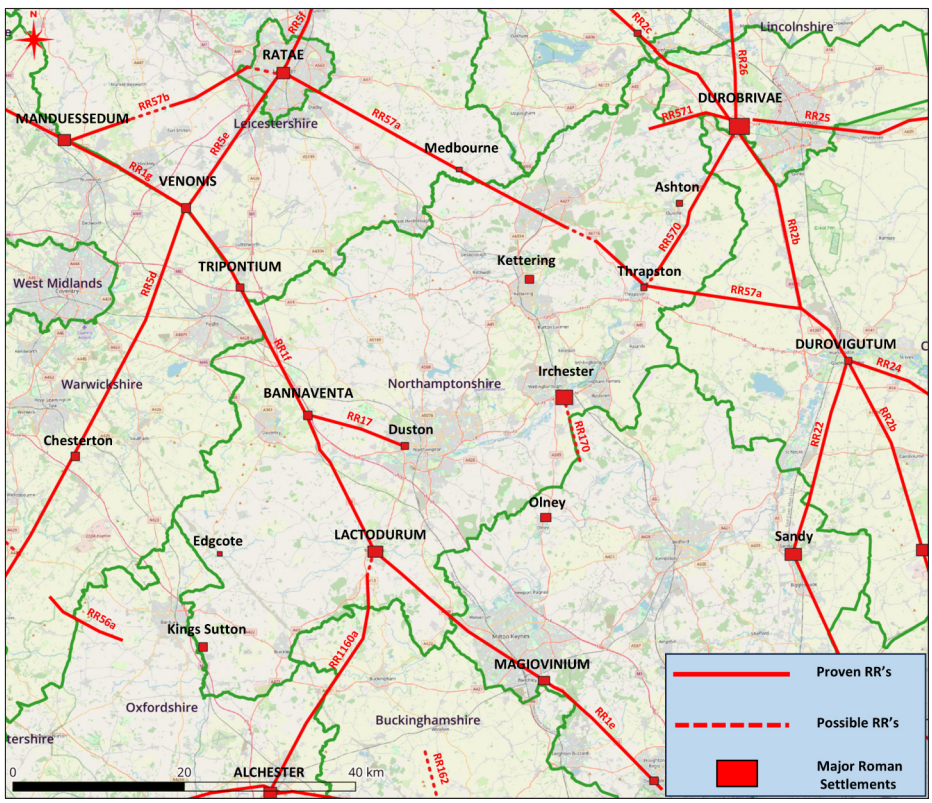


Fig. 1. Roman roads from Ordnance Survey 2016 Map of Roman Britain

Alchester (RR160a); Thrapston to *Durobrivae* (RR 570); the so called Via Devana (RR57a); Ermine Street to King's Cliffe (RR571) and the possible route from Irchester to the south (RR170). The total distance of Roman roads (definite) in the county is approximately 104 km with an additional c. 15km of Roman roads (possible).

As well as the roads listed above, the Roman road system in Northamptonshire is also significantly influenced by Ermine Street (RR2) which lies to the east of the county and is one of the major Roman communications routes in Roman Britain.

Some settlements are apparently not served by roads e.g. Kettering, Kings Sutton & Olney but this is now being infilled. Kirk (2024, 339-355) has looked at the Roman roads surrounding Kettering and work by many other authors has suggested that a more extensive network exists (e.g. Margary 1973 & Viatores 1964).

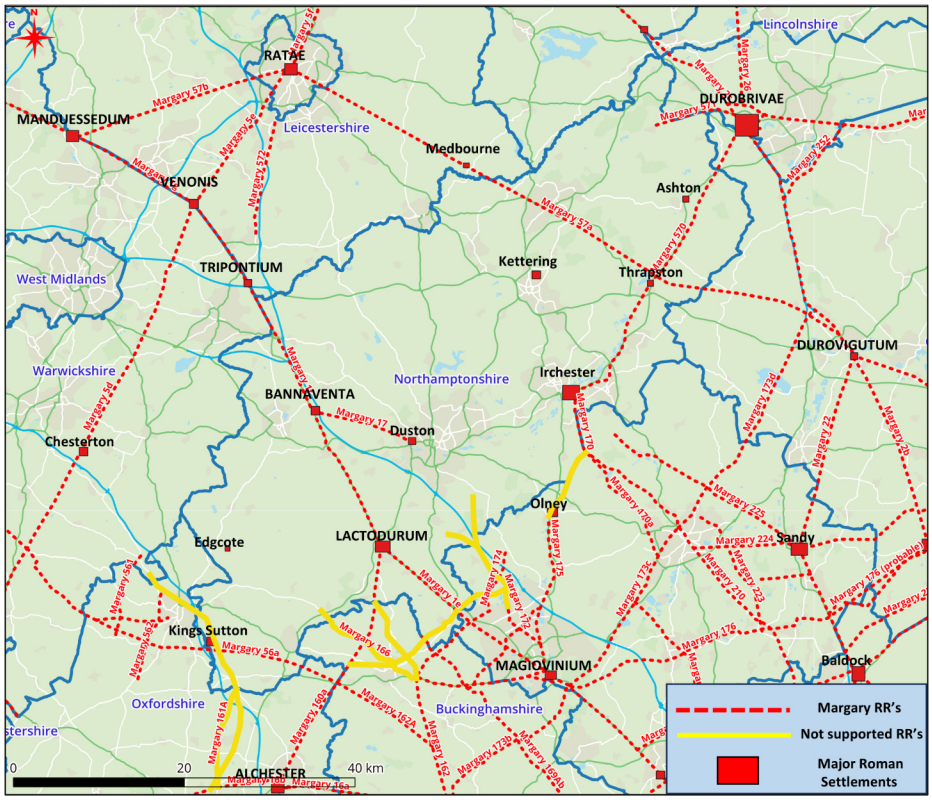


Fig. 2. Roman roads from Mike Bishop's website 'The Secret History of the Roads of Roman Britain' based on Margary 1973. The roads in and entering Northamptonshire were studied. Those not supported in the study are shown in yellow. Those outside the county were not examined.

Fig. 2 shows the Margary road network taken from Bishop's website; The Secret History of the Roads of Roman Britain who quotes '*This is Margary's network from his final 1973 edition of Roman Roads in Britain and incorporates his three different categories of road plus the Viatores' roads (many of which have been called into question, but that is beyond the scope of this humble website).*'

Apart from the extension of RR570 from Thrapston to Irchester and RR175 from Olney to Dungee Corner, the Margary and OS 2016 road networks are very similar in northeast Northamptonshire. The network in the southwest of the county is quite different, with a series of roads entering the county from Buckinghamshire and Oxfordshire, primarily defined by the Viatores (Viatores 1964). The Viatores did not look in detail at these proposed roads far into Northamptonshire or their ultimate destinations, as it was outside of the remit of their study. As will be seen, some of these roads have lidar support but the majority do not and are questioned or discounted by the local HERs and other authorities. Those roads examined but not supported are shown in yellow in Fig. 2 and will be covered later in the text.

The Roman Roads Supported by this Study

Fig. 3 presents an updated picture of the network in and around Northamptonshire, based on this and previous work by the author (Kirk 2024), the OS 2016 Map and a couple of roads in the area reviewed by David Ratledge (2024). Also shown on the image are the locations of proven and possible villas, identified by searching through the county HER records. As was shown in the work by Kirk (2024), these were often important in the routing of the road network as well as the major Roman settlements.

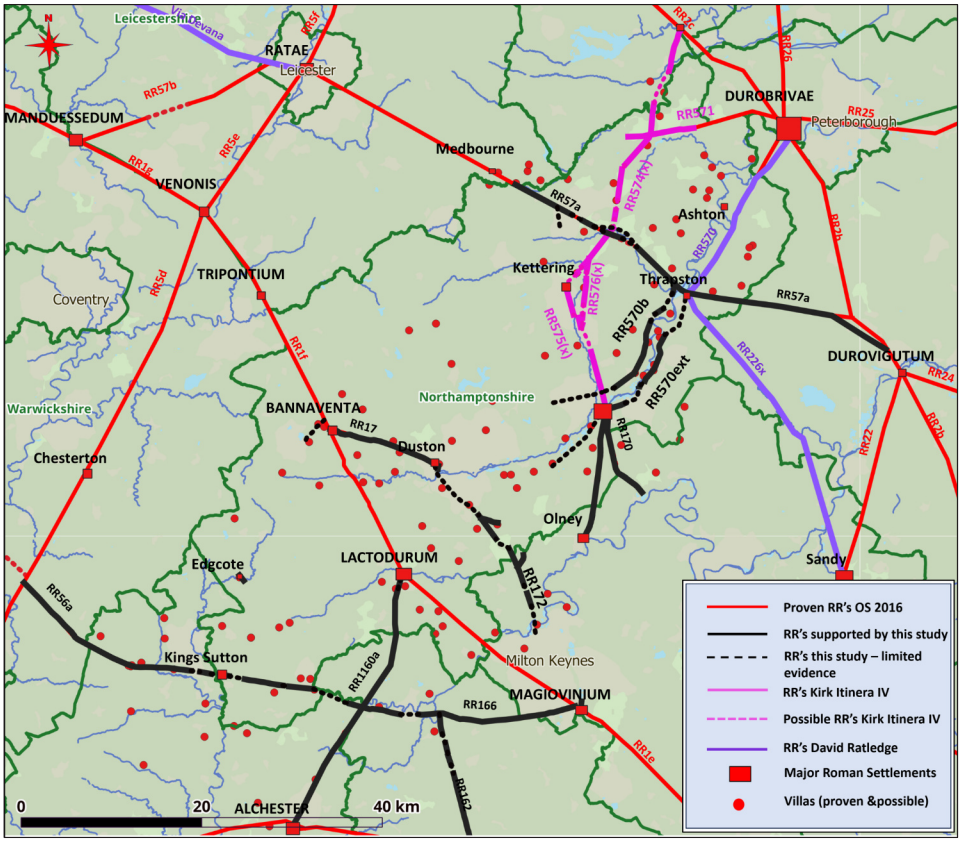
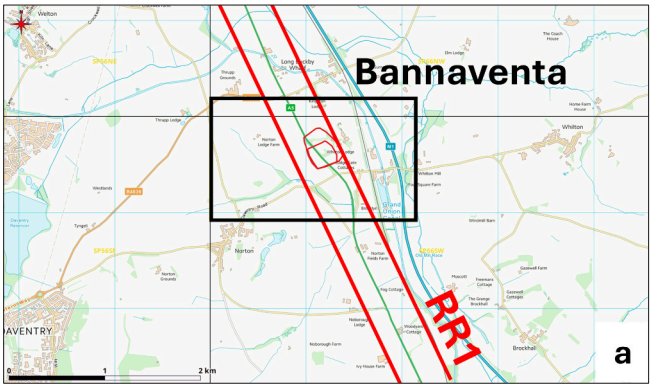
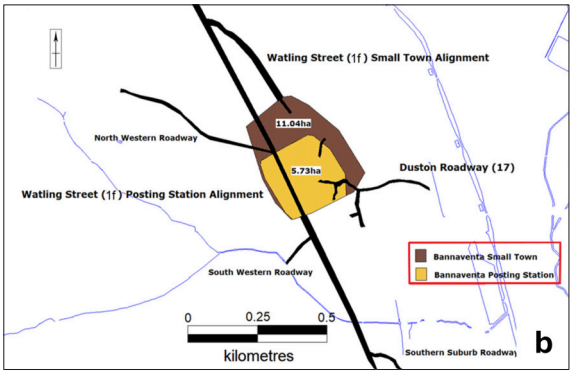


Fig. 3. Roman Roads supported by this study.

Watling Street - RR1f and area around *Bannaventa*



The course of Watling Street is well defined so will not be examined here, other than the section around *Bannaventa* where it is joined by RR17 and several other possible "*side roads*" (Young 2021, 73-106). Fig. 4 shows the layout of the *Bannaventa* as described by Young compared with a lidar LRM image covering the town and its surroundings. The yellow box indicates the area covered by Young's image.



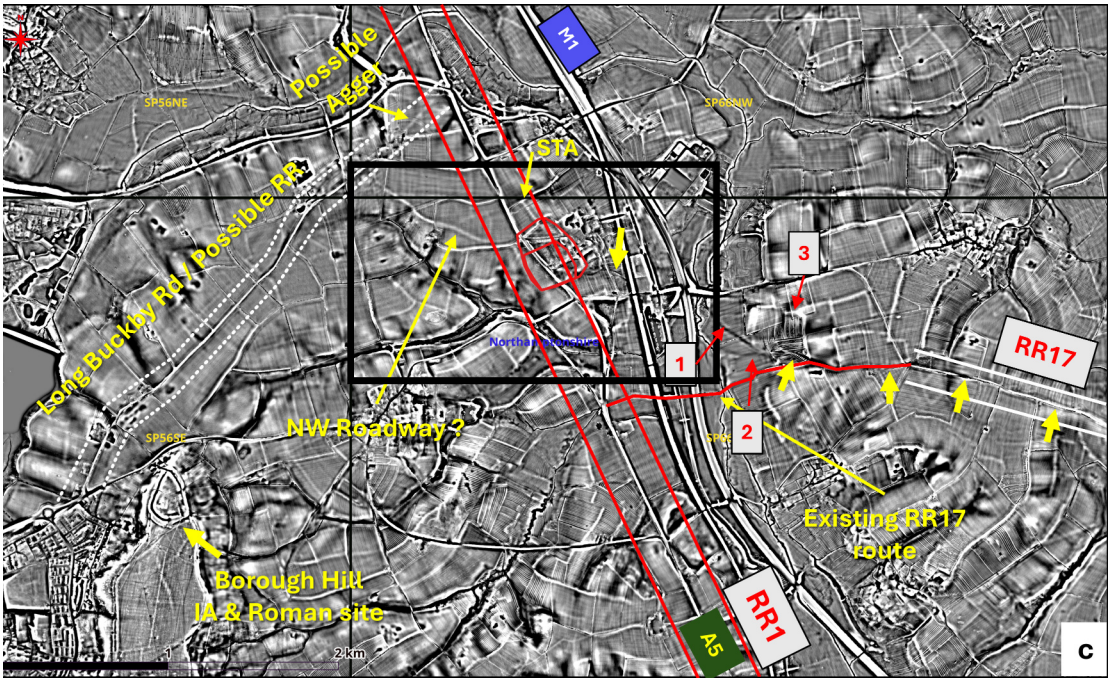


Fig. 4. (a), above, OS location map (b), left, Bannaventa summary map from Young 2021 and (c), below, lidar LRM image from surrounding area. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

Much of RR1 (Red parallel lines on Fig. 4) is concealed under the A5 modern road but through the south of the town it is in open fields. The Roman road through the settlement is not well imaged on the lidar data, suggesting it may have been subsequently destroyed.

The route labelled by Young as '*Watling Street Small Town Alignment*' (STA), is visible on the lidar LRM just north of the settlement. Also visible is a linear feature in the region of the 'North Western Roadway' but this is slightly to the south of the roadway. This may mean that the feature is unrelated i.e. a medieval headland or that there is a slight error in georeferencing. The lidar feature continues northwest towards Long Buckby Road but cannot be traced beyond. The nearby deserted medieval village of Thrupp (RCHME 1981, 153-4) was geophysically surveyed between 2014 and 2017 by the CLASP group (Young *et al.* 2019). No sign of a Roman road coming from the southeast was identified in the survey, but it may have been destroyed by later activity. It is reported that there are Iron Age and Roman landscape features underlying the medieval remains which would support the possibility the lidar feature is Roman.

A Roman origin for Thrupp may also be supported by a straight linear feature seen on lidar imagery from SP 6032 6538 to SP 6052 6559 that continues northeast where Long Buckby Road turns more east-west to a junction with Watling Street. This short section has the lidar characteristics of an *agger* (a raised and straight linear feature seen on the imagery) and may be a Roman road from Watling Street that connects to Thrupp and possibly onto the Roman sites at Borough Hill and beyond.

The South Western Roadway is not seen on the lidar, nor is the Southern Suburb Roadway, so these are probably not significant long distance routes.

Bannaventa-Duston RR17

RR17 can be seen approaching *Bannaventa* from the southeast along the ridge from Duston. The road then descends into the stream valley near Whilton Locks. The route identified by Margary (1973) (thin red line on Fig. 4) has the road turning almost east-west at around SP 6260 6400 and heading to a junction with RR1 at SP 6148 6374, following the parish boundary. This is not well supported by the lidar or *Bannaventa* investigation. On the lidar image, a curving cutting/holloway can be seen (1) coming from the base of the ridge and heading northwest towards the sinuous road identified as RR17 during the *Bannaventa* investigations (Young 2021, 73-106). The preferred route for RR17 as it approaches the town is highlighted by the yellow arrows, but definition of the route is impacted by the railway, M1 motorway and the canal

There is another, fainter low feature (2) heading more east-west emanating from the same point at the base of the ridge, which may be another road spur.

A third possible route is supported by a linear feature (3) on the edge of the ridge. This is slightly misaligned with RR17 and there is no obvious connection back to the more accepted section under the modern road seen on the lidar LRM imagery, but this remains another option.

Once RR17 has climbed onto the ridge it continues in an almost straight line heading for the Roman settlement at Duston, which is a distance of c.12.1 km. The Roman road underlies the modern surface of the aptly named *''Roman Road*'' for most of the route but near Little Brington and Nobottle Woods there are a couple of places where the two may diverge. The first location (1) on Fig. 5 is just south of Little Brington near St. John's Church Tower SP 6634 6338 where a lidar linear extends to around SP 6660 6330. This may be a headland, as the field clearly contains ridge and furrow but following it would straighten a slight kink in the modern road course.

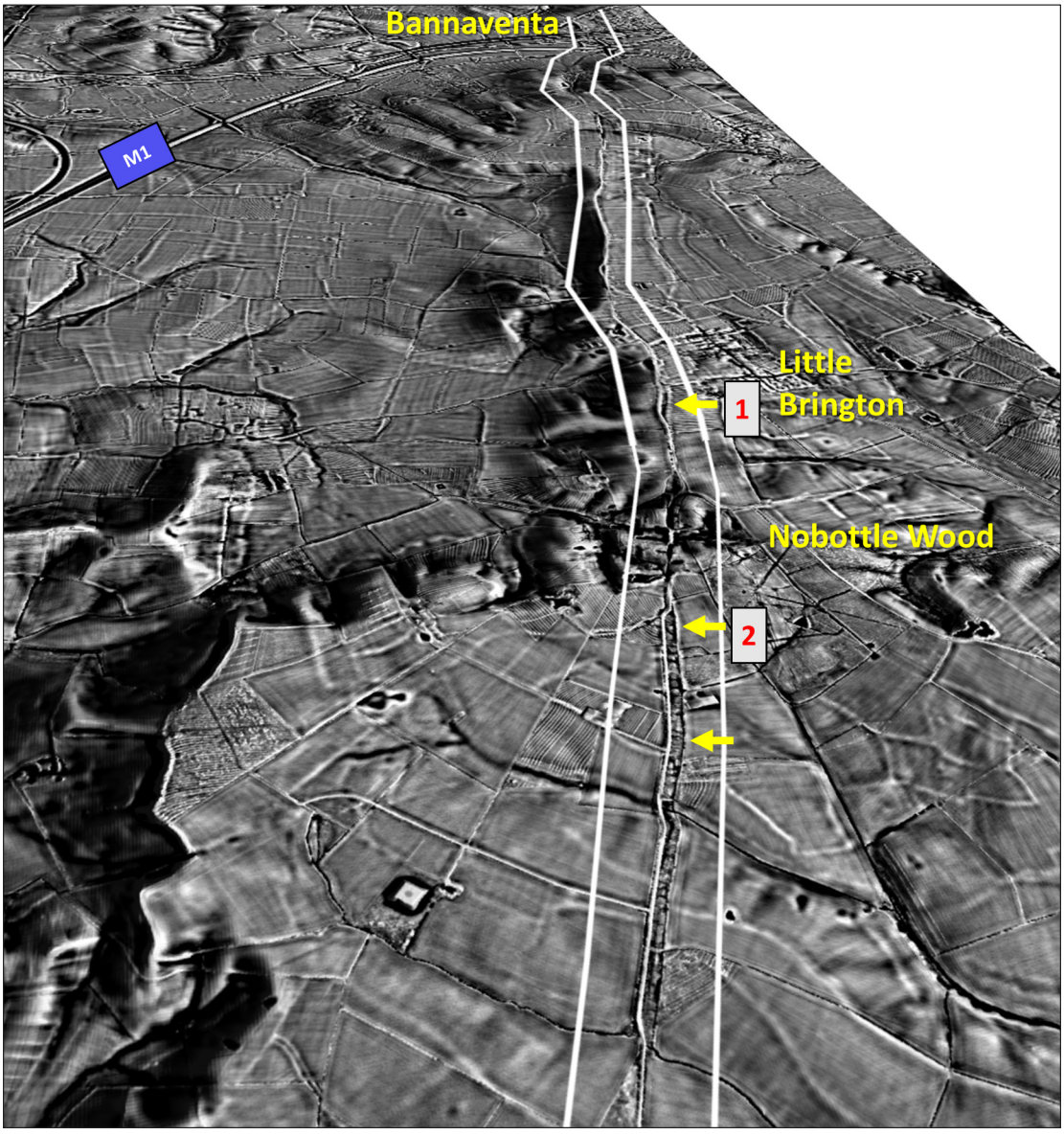


Fig. 5. RR17 lidar Shaded LRM looking NW towards Bannaventa. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

The second location (2) on Fig. 5 lies in Nobottle Belt. A clear lidar linear feature parallels the course of the modern road between SP 6750 6290 and SP 6890 6240 for c. 1500m and coincides with the parish boundary between Brington and Harlestone. This may be part of a parish boundary bank but again choosing this course would slightly straighten the Roman road.

As the Roman road approaches Duston, it follows Berrywood Road until that curves to the south. Beyond here, the course is lost on the lidar data but continues straight and has been found in several

places by excavation. For example (Burnham *et al.* 1997, 427) describe the Roman road being exposed at SP 718 613 and SP 724 611 where a layer of stone 20ft wide was observed.

The Duston Roman settlement is described in the Northamptonshire Extensive Urban Survey (Taylor *et al.* 2002, 7) which states that occupation started in the mid-late first century AD and expanded in the early second century. The town layout is little known due to ironstone quarrying, but fragmentary evidence suggests it lay along two roads, RR17 and a road pointing in the direction Towcester to the southwest (Northants HER 2395/1/1).

RCHME Northants Vol.5 (1985, 249-266) reports a road running southwest-northeast across the site which had side ditches flanking it around SP 7315 6035. Despite much searching the wider area on the lidar data, a road running from Duston to Towcester has not yet been identified, so is not included in this study.

A possible northwestern extension of the Roman road passing through Salcey Forest and heading towards Duston from the southeast is covered later in the text.

Lactodurum (Towcester) to Alchester - RR160a

Area around the Town

RR160a from *Lactodurum* (Towcester) to Alchester is already well defined and accepted over most of its course, although a couple of sections are more difficult to discern within Northamptonshire.

Excavations in Towcester have revealed that the Roman town growth was focussed around Watling Street and the Alchester Road, which was constructed in the AD70s and was flanked by settlement along its frontages A 620m stretch of the RR160a in southwest of Towcester was excavated and is shown in Fig. 6a as the yellow line. Here, the road measured 10m wide and is constructed with pebble and limestone metalling of a depth of 12-15cm, with a sand foundation.

Lactodurum; other Roman Roads

The excavation of the 670m road section also revealed a branch road to the southeast, running in the general direction of Fleet Marston that appears to be a late addition to the town's road network constructed in the late third century AD (Taylor *et al.* 2002, 11-21). No evidence of the side road can be found to the south of Towcester on the lidar data and it may be simply a link to the Wood Burcote villa and settlement just to the south.

Taylor *et al.* also stated that there may be a Roman road that heads in the direction of Kings Sutton, which is thought to follow the line of the modern Brackley Road west from the town. An investigation to the rear of Sponne School (yellow circle Fig. 6a), suggests that it was already in use by the late 1st century AD (Northants HER 726/3). The initial line of Brackley Road out of Towcester is indeed straight and heads for the Roman villa site at Mileoak (Northants HER MNN11525), so may well have Roman origins but despite extensive searching on the lidar data, a convincing route further towards Kings Sutton or Edgcote is yet to be identified.

A Roman road from Towcester heading north towards Duston has long been suspected (Taylor *et al.* 2002, 11-21) but nothing convincing has so far been identified. There have been several recent archaeological investigations to the north-west of Towcester, none of which have identified a Roman road. The only evidence of support is from the 1880s, when Dryden noted an extensive spread of material running north-east from the Railway Station (north of the present town) towards Gayton in the direction of Duston (Taylor *et al.* 2002, 14).

Other possible eastward routes from Towcester towards the Roman settlements at Irchester and Olney have also been investigated on the lidar data, but again nothing convincing has yet been identified.

RR160a Beyond *Lactodurum*

The route of the RR160a immediately southwest of Towcester is identified as "*Possible*" on the 2016 OS Roman Map but the lidar data confirms the route. The lidar LRM image in Fig. 6a shows a series of linear features heading from the urban area towards Swinneyford Farm Roman Villa (Northants HER MNN8512) with a clear section between SP 6866 4675 and SP 6844 4614. The Roman road then turns due south around SP 6839 4566 and heads for the border with Buckinghamshire. The road route here

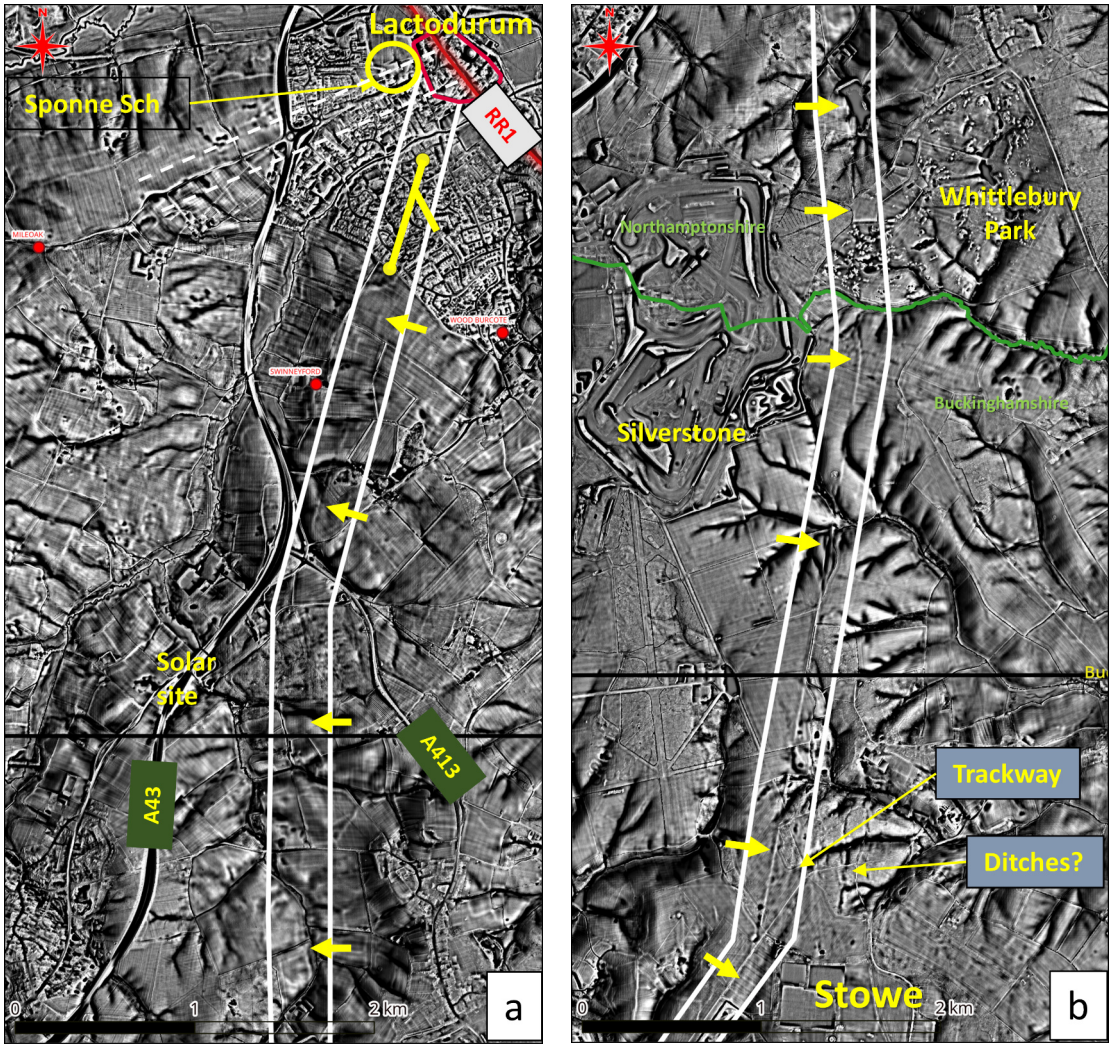


Fig. 6. RR160a lidar Shaded LRM. (a) section from Lactodurum (Towcester) to Whittlebury. (b) section from Whittlebury to Stowe. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

is not well shown by the lidar but the parish boundary between Silverstone and Whittlebury and some field boundaries appear to overlie the course through Shacks Barn Solar site.

The route is lost for a couple of hundred metres before reappearing clearly on the west side of the lake in the West Park Farm campsite. It is not clear through the Whittlebury Hall golf course but reappears just across the Buckinghamshire border combined with a slight change in direction to the south-southwest at SP 6849 4180 (Fig. 6b).

The road then heads to Stowe before a further direction change to the southwest at around SP 6786 3835, just to the south of the modern road. The area around this turning point has several other features identified on the lidar with the area often having a "*mottled*" appearance, as if it has been affected by minor quarrying or similar.

Approximately 160m east of RR160a and parallel to it, is a series of subtle raised trackways extending from around SP 6805 3860 to SP 6814 3922 for around 650m. This might be a feature related to the Stowe Gardens landscaping or could possibly be an alternative older routing for the road.

The section between the Northamptonshire border and Stowe has an excellent lidar response with an *agger* height of up to 30cm preserved. The excellent preservation is probably due to the fact that the area was once part of Whittlewood Forest and the area has not been subsequently heavily impacted by agriculture.

The continuation of the road southwest beyond Stowe is outside the remit of this study but its course to Water Stratford and then onwards to Alchester is easy to discern.

RR56a and Roman Roads in Southwest Northamptonshire

Fig. 7 shows the updated map of the Roman roads in the southwest of the county from this study. The major proposed change is a re-routing of RR56a, which is interpreted to run from a junction with the Fosse way, through the Swalcliffe Lea Roman site, then through Kings Sutton Roman Town. Beyond Kings Sutton Roman Town the route is different and more northerly to that previously accepted, passing through Evenley Hall and skirting to the south of Buckingham by following the Great Ouse River and onto a junction with RR166 near the Roman crossing identified at Thornborough. Several of the Viatores routes have been studied (yellow roads) but are not supported by the lidar. Also, the

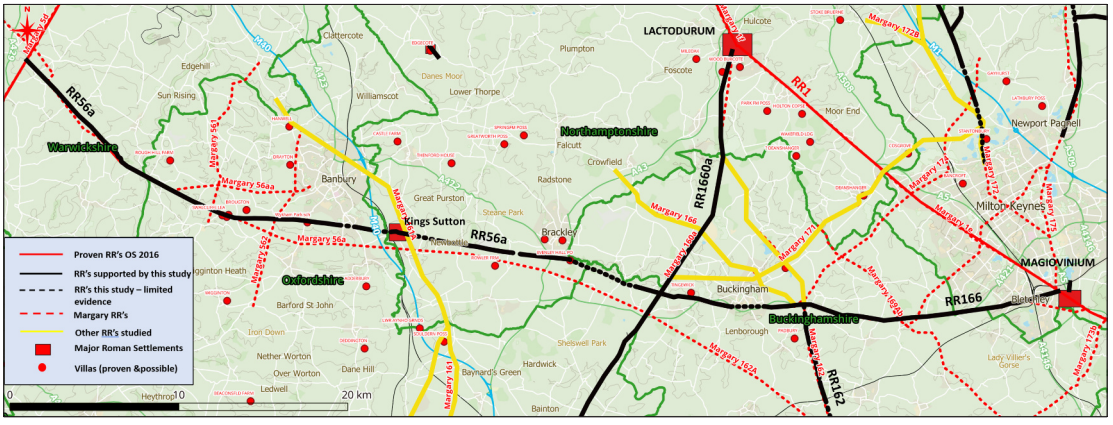


Fig. 7. Updated map of Roman roads in SW Northamptonshire

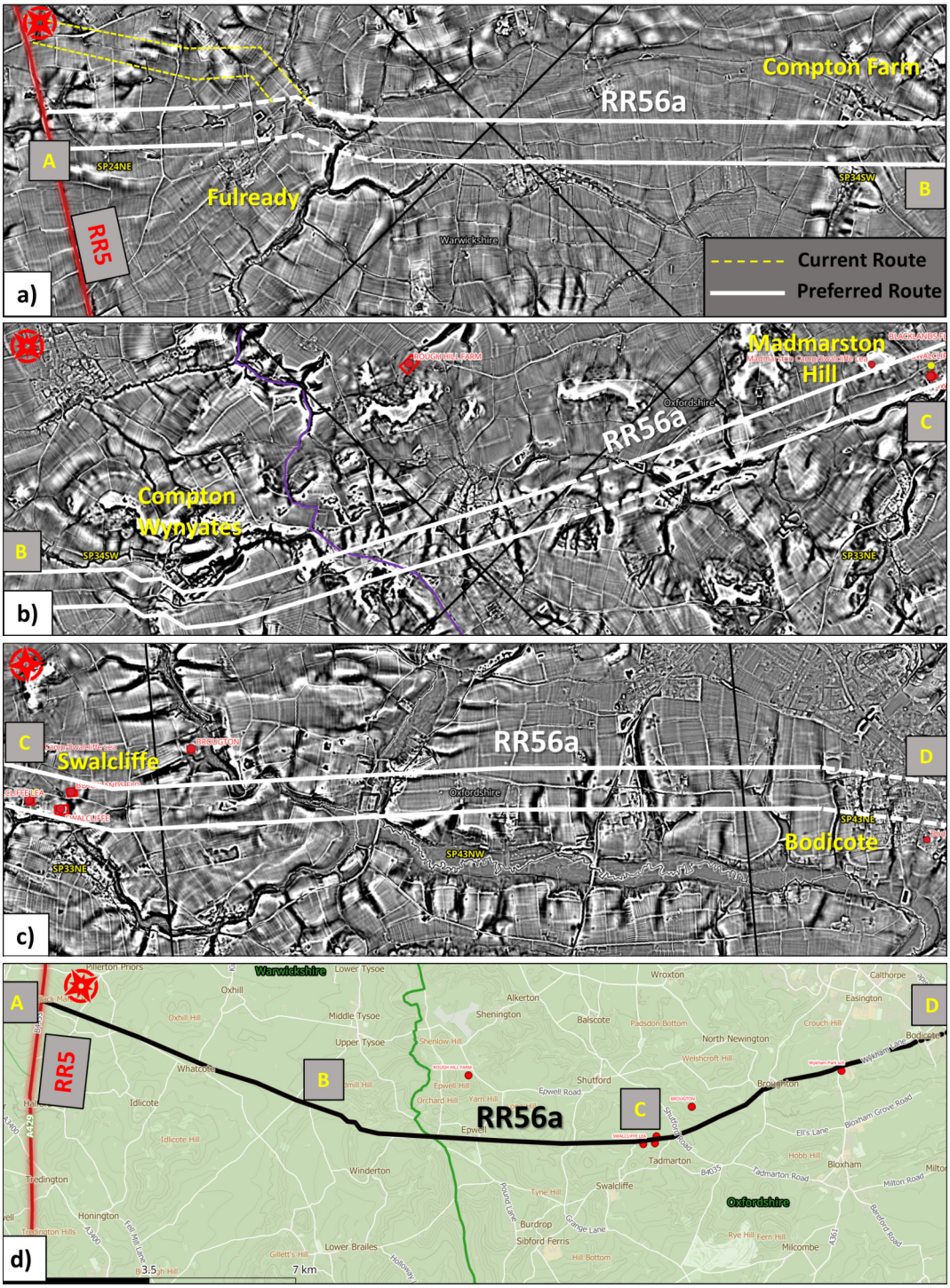


Fig. 8a-d. RR56a lidar LRM panels and route overview from Fosse Way to Bodicote. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

area around Edgcote has been examined to find a long-distance route from the known road at the site (HER 1443/1/1) but this has so far proved elusive.

RR56a - Fosse Way to Bodicote section

Lidar LRM panels and the route overview for RR56a from the Fosse Way to Bodicote just south of Banbury are shown in Fig. 8a-d.

The lidar data suggest a possible different interpretation to Margary (1973, 153) for the intersection with the Fosse Way. There is a clear lidar linear coming from the southeast running to the northeast of Whatcote. This then meets a stream valley and does a slight dog-leg. The current interpretation has the road turning almost due north-south and heading towards Pillerton Priors before turning northwest again and joining the Fosse Way where Banbury Road (A422) makes an intersection.

An alternative interpretation would be for the road to continue its northwest alignment and follow a lidar linear to meet the Fosse way near SP 2730 2763 labelled point A in Fig. 8a. Note the OS 2016 Roman map marks route of RR56b through Ettington to Fosse way as possible, so the intersection location is not clear coming from the west.

Around and beyond Whatcote, the Roman road follows a consistent linear lidar signal across fields from SP 2918 4568 to SP 3263 4211 where it climbs the hill at Compton Wynyates (Fig. 8b). There is a possible section of preserved *agger* from SP 3447 4067 to SP 3483 4047 in open fields west of Epwell. It runs mostly along field boundaries and then to the south of Madmarston Hill and the Roman settlement at Swalcliffe Lea (Oxfordshire HER 2444). The road has been excavated here and is reported to be 25ft wide with a surface of tightly laid cobblestones.

The section from Swalcliffe Lea to Bodicote (C-D) is shown in Fig. 8c. The road follows field boundaries from SP 3973 3833 to SP 4040 3828 where it reaches a small area of quarrying. The route then possibly turns north to cross a stream at Fulling Mill and then into Broughton Castle grounds. An alternative crossing is around SP 410 383 to align with straight section of agger (beneath ridge and furrow) visible on lidar imagery coming from the east of Broughton. This alignment would have it heading for a Roman site identified on the Oxfordshire HER (24185). Continuing almost east-west there is a possible section of *agger* from SP 4210 3825 to SP 4302 3823 where it then joins Wykham Lane.

The Roman road then underlies Wykham Lane, past the possible villa at Wykham Park School, until it diverges to a more southerly route with a possible *agger* from SP 4523 3794 to SP 4564 3788. There are hints of *agger* under modern housing to Weeping Cross road which then continues to a junction with Oxford Road.

RR56a - Around Kings Sutton Roman Settlement

From Oxford Road, the Roman road is interpreted to follow a series of field boundaries towards a crossing point of the river Cherwell near the site of Twyford Mill and then onto the Roman settlement north of Kings Sutton (Fig. 9).

Kings Sutton Roman settlement has had little excavation (Taylor 2002, 6). It is interpreted to have been extensively occupied by the 2nd century AD with settlement focussed around the road network. Figure 9 shows an overlay of the town outline and roads on the lidar data. Evidence for the road network comes from aerial photographs, with an attempt to excavate the road at SP 4982 3734 not able to identify it, probably due to quarrying (Taylor 2002, 8). The lidar data also does not identify any

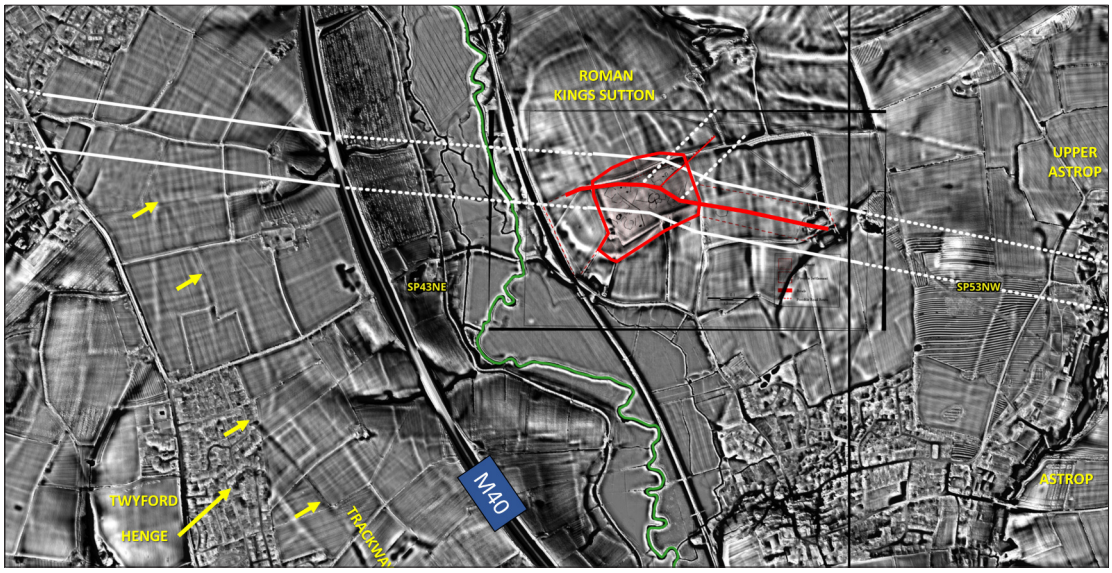


Fig. 9. Lidar LRM image around Kings Sutton Roman settlement with overlay from Taylor 2002. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

agger associated with the road. A second road leaving the settlement to the northeast has also been identified (Taylor 2002, 7) but again this is not seen on the lidar and any continuation has been destroyed by quarrying.

The projected course of the major road heads east-southeast for Upper Astrop and Newbottle but there are no clear lidar linear features. The current interpretation (Margary 1973, 154) has the road turning south-southeast for Astrop and Newbottle Spinney, where it joins Green Lane to Charlton, but no Roman road remains have been identified in this area. RCHME Northants Vol.4 (1982, 177-183) states that '*much of the alleged route follows enclosure tracks which show no sign of antiquity*'.

Two other features to notice in Fig. 9, are the circular feature/possible henge identified under a housing estate in Twyford (Oxfordshire HER 28508) and a possible pre-historic trackway running Northwest-southeast. The identification of the henge feature illustrates the power of lidar being able to "*see*" older features through the modern "*noise*" of built-up areas.

RR161 and 161a – Not supported Roman Roads near Kings Sutton

Margary RR161 and RR161a are both postulated to leave Akeman Street (RR16b) just north of Kirtlington taking slightly different routes to rejoin just north of Souldern. Routes heading for RR16 and the Tackley crossing are possible, but it would be more likely for any road to connect Kings Sutton directly to Alchester, unless they were servicing settlements along the course of the River Cherwell which are not observed.

RR161a reportedly leaves Akeman Street (RR16) on the "*The Portway*" north of Kirtlington (Fig. 10a) which has straight sections and runs due north for around 4km to near where the road meets the B4030. Here the Portway bends and veers around the western edge of Heyford Airfield (Fig. 10 b) and then along field boundaries past the possible Roman villa at Souldern. The road is then supposed to

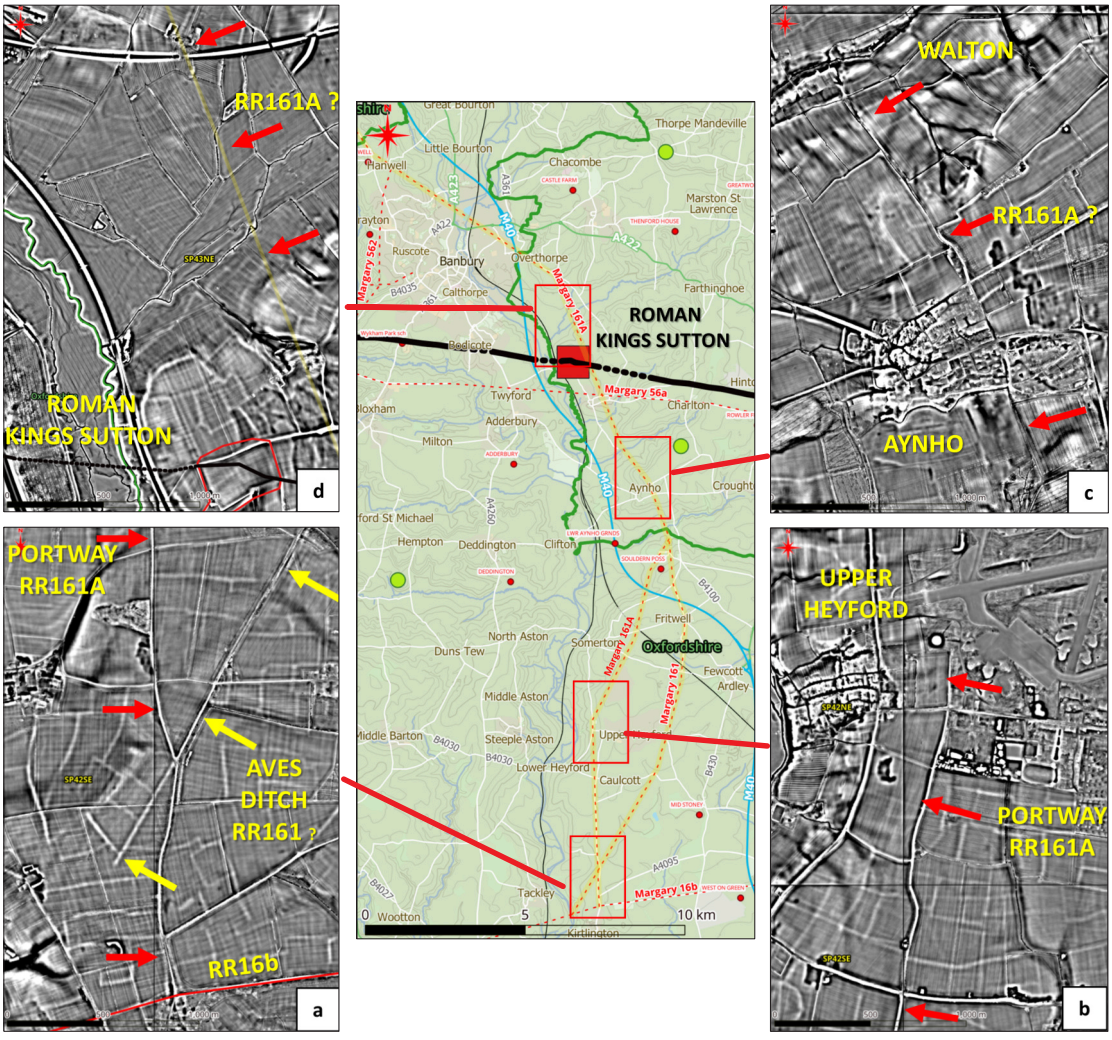


Fig. 10. Map and lidar examples for Margary Roman roads RR161 and RR161a. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

turn west of north following field boundaries to Aynho (Fig. 10c) and then bend further to the west through the deserted medieval village at Walton, before heading to Kings Sutton Roman settlement, where it is not observed by current archaeological investigations (Fig. 10d).

The RCHME do not take a supportive view of this road (RCHME Northants Vol.4 1982, 177-183) and no supportive evidence is seen in the Northants HER record (HER 55/1). The lidar picture is mixed, but there is nothing definitive to identify it as a Roman road. Where the Portway road curves near the intersection with Aves Ditch there is no evidence for an *agger* continuing straight across the fields (Fig. 10a). Similarly, the Portway south of Heyford Airfield (Fig. 10b) does not have the character of a Roman road, with no remnant *agger* sections observed between the 'unnecessary' bends. The section between Aynho and the deserted medieval village at Walton Grounds is reasonably straight and has some raised sections, hollow-ways and cuttings (Fig. 10c), but proving this is Roman in origin is difficult, as it is known to be the medieval road between the two villages (RCHME Northants Vol.4

1982, 177-183). The road is not recorded in the archaeological evaluation of Kings Sutton (Taylor 2002) and there is no evidence of a Roman road continuing north towards Warkworth (Fig. 10d).

In summary, until a section of this road is archaeologically investigated, it is difficult to accurately define its age. As stated above, one might expect a road to run between Kings Sutton Roman Town and Alchester and parts of this route may be represented above.

RR161 is shown in Fig. 10 leaving Akeman Street just to the east of the Tackley crossing and following Aves Ditch (Oxfordshire HER 8925) to the northwest. Recent work has concluded that the Ditch is in fact an Iron Age boundary e.g. (Hart *et al.* 2010, 133-164) and does not have a Roman origin, despite its straight alignment. The lidar data (Fig. 10a) clearly show that Aves Ditch/RR161 does not reach Akeman Street but abruptly terminates around SP 4980 2112. Excavations in the area support this conclusion (Slater 1937, 202), leading some to suggest it is an unfinished Roman road. This is not supported by the archaeological evidence, so it is discounted as being a Roman. It should be noted that the lidar reveals several interesting linear features which have similar responses and may have a similar origin around both ends of Aves Ditch, indicating the structure may be more extensive but this is not covered any further here.

RR56a Kings Sutton to Evenley – an alternative route

As discussed above, the accepted route of RR56a beyond Kings Sutton Roman settlement is not supported by archaeological analysis (e.g. RCHME Vol.4 1982 & Northants HER 6915/1). Analysis of the lidar data suggests a possible alternative route continuing in a straight alignment from the

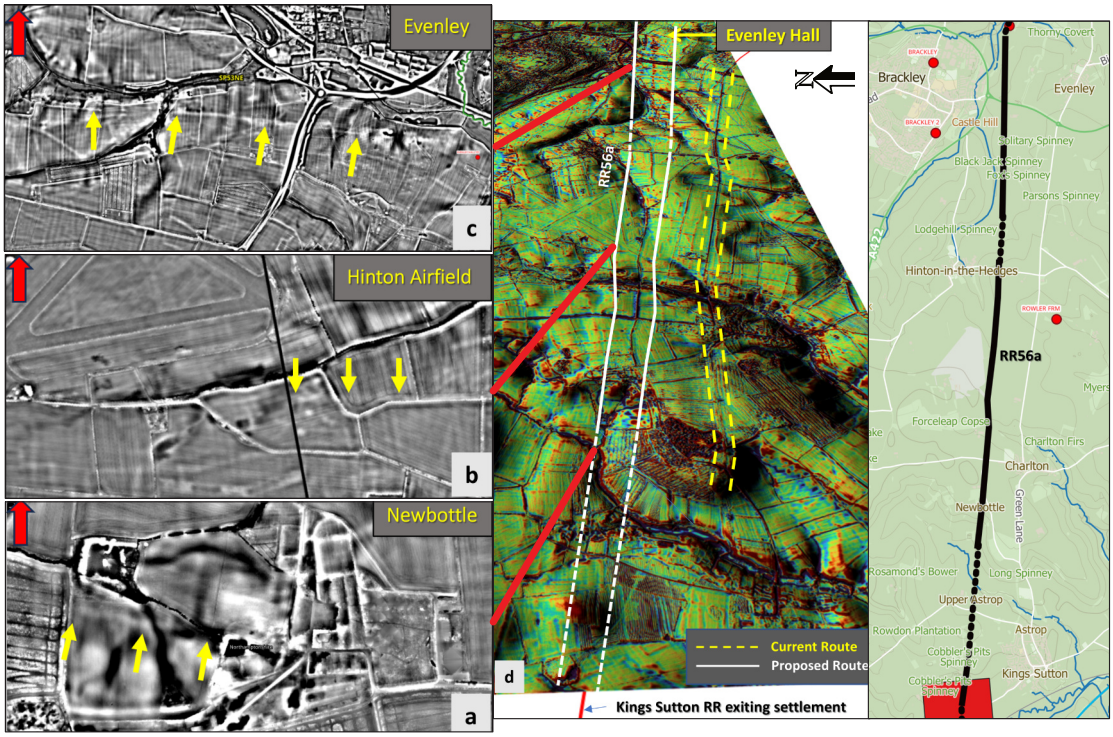


Fig. 11. (a)-(c): lidar LRM examples, OS overview map and (d) 3D lidar perspective for RR56a between Kings Sutton Roman settlement and Evenley Hall. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

settlement road to the Roman site at Evenley Hall. Fig. 11d looks from west to east and highlights the key lidar features of the proposed route.

There is no lidar response from Kings Sutton Roman road immediately to the east of the settlement but projecting the cropmarks leads to the village of Newbottle. Here a faint linear lidar response on the correct alignment can be seen (*Fig.11a*) from SP 5183 3696 to SP 5254 3682 which coincides with a crop mark on historic Google Earth Imagery (5/24/2009). This feature maybe related to the earthworks associated with Newbottle deserted medieval village but other evidence on the same alignment suggests it may have earlier origins.

Beyond Newbottle, the Roman road underlies the road running to Forceleap Farm and then follows the southern boundary of Hinton Airfield. A section of preserved *agger* in open fields may be present between SP 5474 3645 to SP 5534 3636 and is shown in Fig. 11b. A linear feature visible on lidar imagery is then seen running for over 2.8km from SP 5652 3618 to SP 5937 3588 and the Roman site at Evenley Hall grounds (Fig. 11c). It should be noted that the British Geological Survey identify a series of east-west trending faults in this area, but they do not consistently align with the lidar feature.

The Roman site at Evenley has only had minor excavation but has been extensively metal detected and field walked (Northants HER 141 & 141/0/1). Substantial amounts of Roman material dating from 1st to 4th century AD have been found over a wide area, with possibly a temple or villa on the site (RCHME Northants, Vol.4 1982, 49-53). Two large hoards were also discovered in 1826 and 1854 and boundaries, ditches and enclosures have been discovered by the NMP (HER 141/0/3). This may be a more substantial Roman site than is currently recognised.

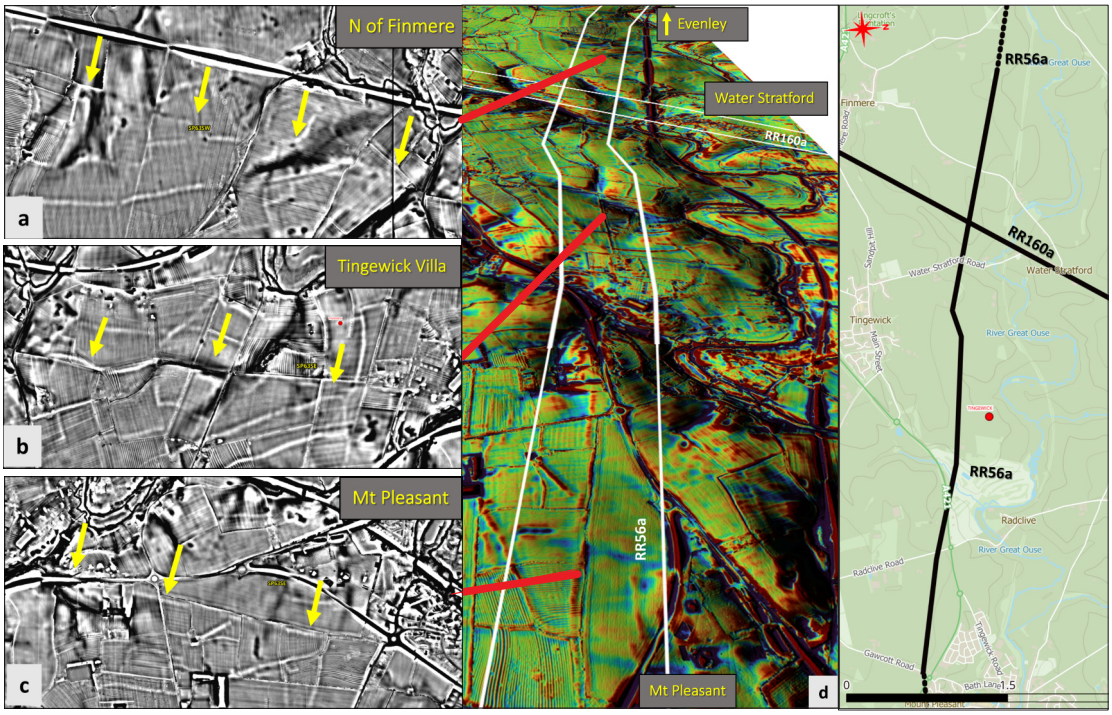


Fig. 12. (a-c) lidar LRM examples, OS overview map and (d) 3D lidar perspective for RR56a between Evenley Hall and Mount Pleasant, Buckingham. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

The route immediately beyond Evenley Hall is not obvious and there is the possibility that the Roman road crosses the River Great Ouse nearby and heads to a junction with RR160a north of Water Stratford. However, the lidar suggests that the road may stay south of the river and follow its course to the south of Buckingham (Fig. 12a-d). The first potential feature is around SP 6054 3528 where a 60m embankment crosses a small dry stream valley.

This is part of a linear feature visible on lidar running for c. 1.5km, which appears to be a series of pits and short positive features north of Finmere (Fig.12a), running roughly parallel to the former railway line to a junction with RR160a at around SP 6490 3380. Beyond the junction, there is a slight dog leg before continuing to the south of Tingewick Villa (Bucks HER 0008700000) and on through Buckingham Golf Course (Fig. 12b). From here, the route picks up a series of field boundaries, which are recorded as a municipal boundary on the OS Six Inch 1830s-80s maps but is shown as a road on Jefferys' 1770 map of Buckinghamshire (Fig. 12c). The route is lost through the Mount Pleasant area of Buckingham, but it probably makes for a junction with RR166 (which comes from Fenny Stratford) around the Roman crossing of Padbury Brook at Thornborough (Fig. 13).

RR166 *Magiovinium* (Fenny Stratford) to Thornborough

Based on the work above, this may either be considered an extension of RR56a or a Roman road in its own right. Much of it underlies modern roads, so lidar cannot inform us a great deal about its likelihood or route. However, there are couple of places where the modern A421 road curves or bends and features can be seen following a straighter course (Fig. 13*)* and Roman roads have been excavated at Bourton Grounds around Thornborough Bridge (Bucks HER 0017700000) & (Johnson 1975, 3-56).

The Bourton grounds site records significant Roman activity, with two barrows dated to the late 2nd century AD, a Romano-British temple, cemetery and series of roads and trackways. The map inset in Fig. 13 is an enhanced version of Fig. 12 from Johnson's paper showing that two east-west roads were found on both sides of the River Twin (or Padbury Brook) and a third road was found on the east side of the river heading southeast-northwest and may be associated with RR162. The larger northern road is interpreted to have been established by the time of the Roman conquest evidenced by the presence of *''native vessels"* dating to the first half of the 1st century AD. The southern of the roads consists of small limestone blocks laid upon a clay *agger* which is 3.5m in width and has been dated to late 1st century AD. Despite some uncertainty in dating, it is clear that an east west Roman road crossed Padbury Brook. Nothing can be seen on lidar at the excavation site due to the modern A421 but extrapolating the orientation of the excavated roads leads to some patchy linear lidar features in Bourton grounds (Fig. 13.1) which may be the remnants of the Roman road heading for a junction/ continuation with RR56a near Mount Pleasant, Buckingham. This is supported by an area of Roman finds in these fields and especially Bucks HER 0671700000 where a possible Roman road is mentioned.

A section of possible preserved *agger* is shown in the area of Linford Stables (Fig. 13.2*),* running from SP 7616 3251 to SP 7804 3221. A road is shown on Jefferys' 1770 map of Buckinghamshire in the same location, indicating that it probably predates enclosure.

The Roman road is interpreted to run under the A421 until a final section of linear lidar response lying south of the A421 running from SP 8000 3244 to SP 8037 3247 (Fig. 13.3). Field walking in this area has discovered some Roman pottery (Bucks HER 0008000000) but no road has yet been identified. The Roman road is then conjectured to follow the course of Buckingham Road through Bletchley and onto Fenny Stratford and a junction with Watling Street, just north of *Magiovinium*.

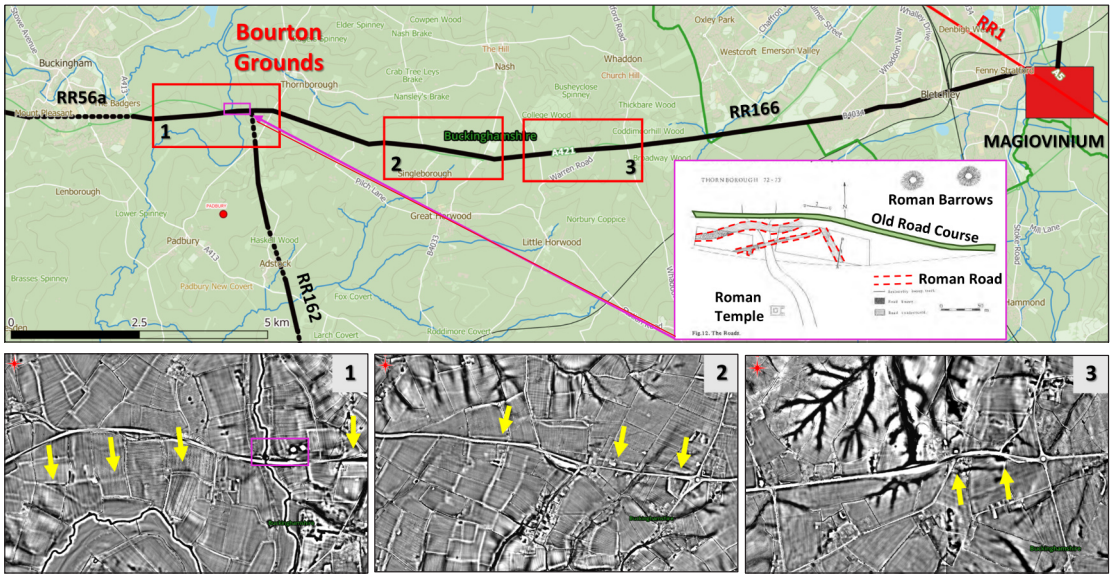


Fig. 13. Lidar LRM examples, overview map and Bourton excavation summary Roman road map (modified from Johnson 1975) for RR166/RR56a between Buckingham and Magiovinium. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

RR162 Fleet Marston to Bourton Grounds

The third road identified at the Bourton Grounds site (Fig. 13) heading to the southeast was traced for 45m by probe surveying and resistivity survey along with a trial excavation (Johnson 1975, 3-56). It has metalling 8-10m wide and is interpreted to be late 1st century AD. The road is not seen on lidar, possibly due to remnant ridge and furrow masking it. The direction indicates this is probably RR162 (or a spur off it) which heads south to Fleet Marston. Although only categorised as possible on the 2016 OS Roman Map, the lidar offers strong support for this road over most of its length. The same cannot be said for the section of RR162 thought by the Viatores to run north from Boughton Grounds. This is not well supported by the lidar imagery and will be discussed in the next section.

Initially, the route is hidden by ridge and furrow and quarrying at Coombs Quarry but appears to be represented by a footpath. From Coombs Quarry, the road then probably underlies Adstock Road before heading across the fields to the north of Pear Tree Farm (Fig.14). A faint linear lidar feature can be seen from where Adstock road curves to the east to around SP 7360 3098.

The course through Adstock is not clear but the lidar response returns just to the south of the village around SP 7398 2982 to SP 7415 2914 and heading towards Addington. Here, the road passes through Street Mary's church and continues south of the village along a hollow-way to cross Claydon Brook near South Lake and a disused railway line.

The Roman road then runs to the west of Claydon Brook towards Claydon sub-station but the lidar response is not clear until SP 7489 2648 to SP 7500 2614 where a possible section of preserved *agger* is observed. A disused railway then complicates the picture but the raised linear feature reappears

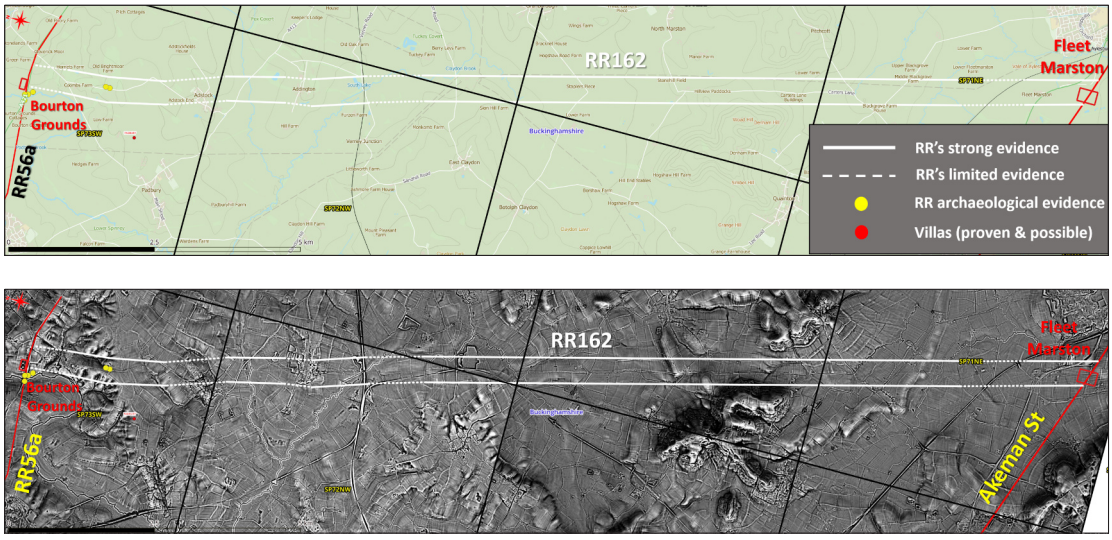


Fig. 14. Lidar shaded LRM and OS overview map for RR162 between Fleet Marston and Bourton Grounds. Lidar data ©Environment Agency copyright and/or database right 2024. All rights reserved.

around SP 7514 2545. After crossing a small stream, a cutting is observed at around SP 7524 2503 before the road course is shown by field and parish boundaries for c. 2.6km to Stonehill Farm.

Beyond Stonehill Farm, the road underlies Carters Lane for c. 3km until it meets Blackgrove Road. It then crosses fields with a good lidar response from SP 7688 1873 to SP 7715 1772. The approach to Fleet Marston Roman site and Akeman Street is not clear on lidar but the road course is marked by cropmarks and has been found by excavation, where it is reported to be made of flint gravel in silty matrix which is 6.62m wide and 0.17m thick (Lythe 2009).

Bourton Grounds area - other possible Roman Roads RR162, RR166 & RR171

Fig.15 shows the Roman roads around Bourton Grounds taken from taken from Margary 1973. The roads highlighted in yellow are those examined during this study as they impact on Northamptonshire.

RR162 heading north from Bourton Grounds is not well supported by lidar or searches of the HER Records. The lidar LRM does not have any convincing evidence of the road heading north to cross the Great Ouse. There is a small section of possible raised linear feature l from near Foxcott Wood Farm, but it is not clearly connected to anything beyond. A possible Roman road with braided sections of is reported in Foxcote Wood in the HER records (Bucks HER 0203400000) but nothing convincing is seen on the lidar data. An alternative northern extension for RR162 would be to follow the northeast trending hollow-way of the deserted part of Thornborough village (Bucks HER 0054500000) and then link to RR174 which may in future be identified as Roman in origin.

RR166 is shown on Margary's map to come from the east and then to turn northwest at Bourton Grounds and head towards Page Hill, Buckingham. Again, nothing is seen on the lidar data which

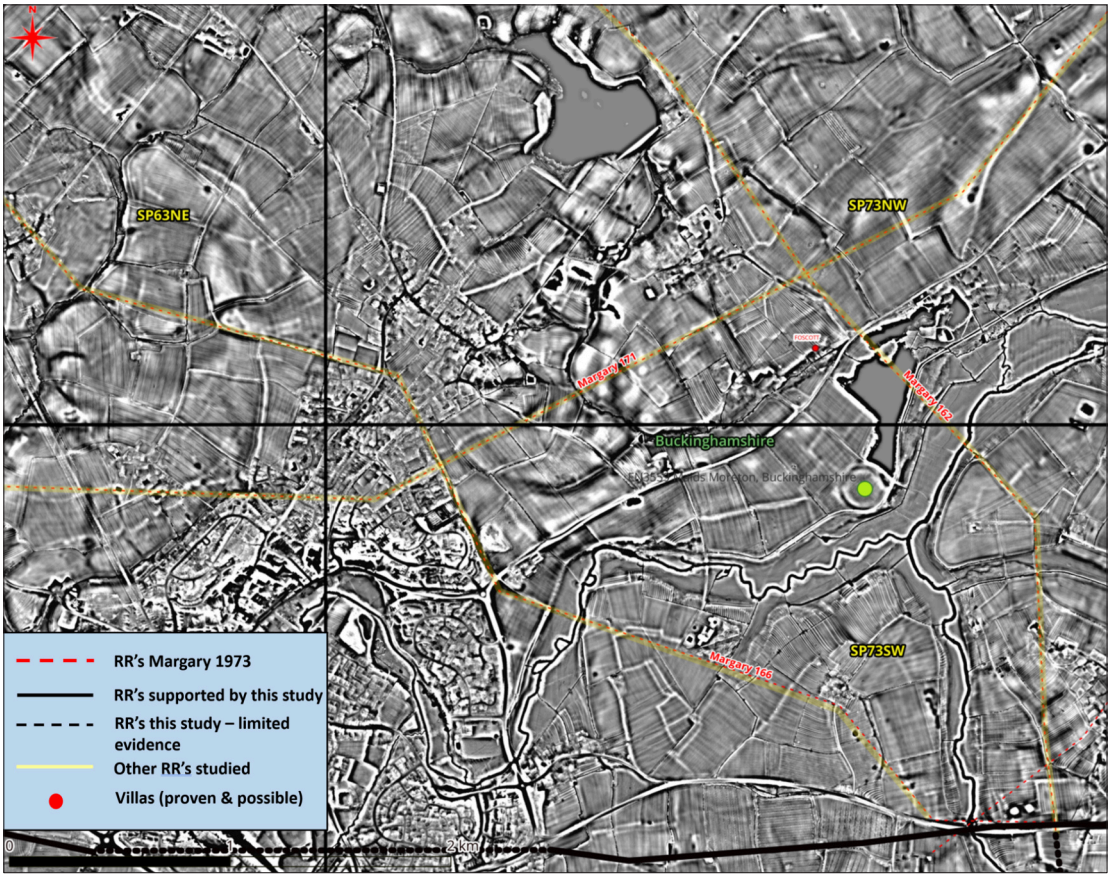


Fig. 15. Lidar LRM with Margary 1973 Roman roads around Bourton Grounds. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

supports this route or is seen in the HER records. The preferred interpretation is that the road continues straight across Padbury Brook to meet with RR56a as discussed above.

RR171 reportedly comes from a junction with RR1 at Old Stratford, Deanshanger, through the north of Buckingham to a junction with RR160a near Water Stratford (Viatores 1964, 316-322). The area along the proposed route SW of Deanshanger Roman Villa has been relatively recently archaeologically evaluated e.g. (Wolf and Whelan 2022, Brown 2022, Cotswold Archaeology 2015) and no substantive evidence of a Roman road identified. As observed elsewhere in this study, a Roman road running alongside a major river is very feasible, but until it is found by excavation it is difficult to positively identify.

RR172 *Magiovinium* to Duston – an alternative route

RR172 is reported as coming from *Magiovinium*, through what is now Milton Keynes and, across the Great Ouse at Haversham, through Hanslope Park and onto Spinney Lodge Farm in Hanslope (Viatores 1964, 324-7). Here the road is shown to divide into RR172a, which goes through Salcey Forest

and terminates at Piddington Roman Villa and RR172b which heads NW towards Hartwell and Ashton. Neither of these roads is well supported by lidar, so must be questioned, but a clear lidar linear feature is observed nearby which shows the true route of the road. This RR172 alternate route heads from Haversham towards Roman sites at Wootton and presumably the Duston settlement.

The route through Milton Keynes is obscured by the town's developments and not confirmed by modern data, but it appears traceable on the lidar heading north from Stantonbury (Fig. 16). The road

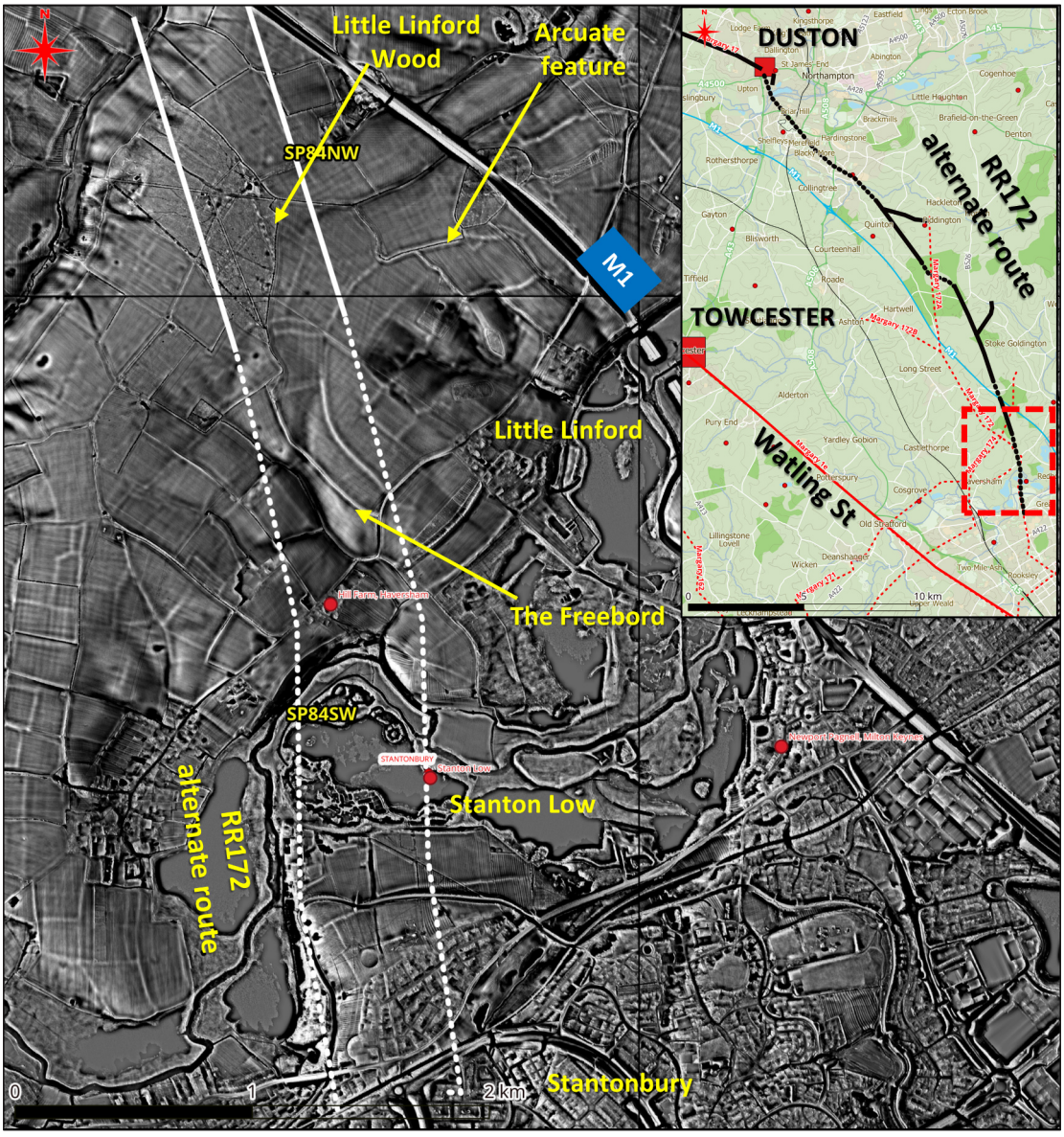
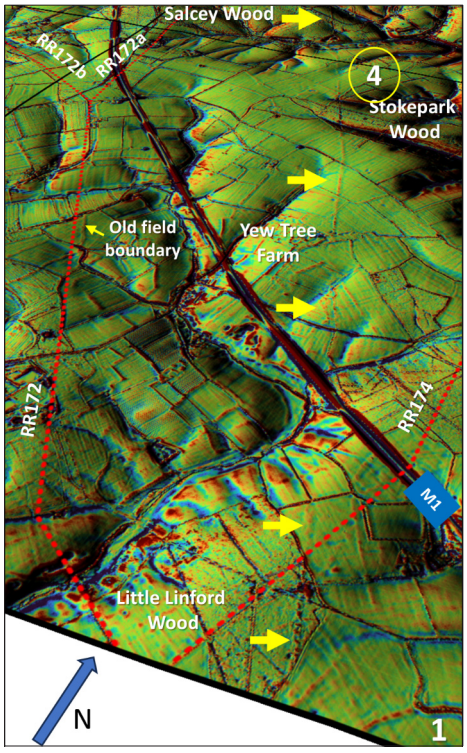
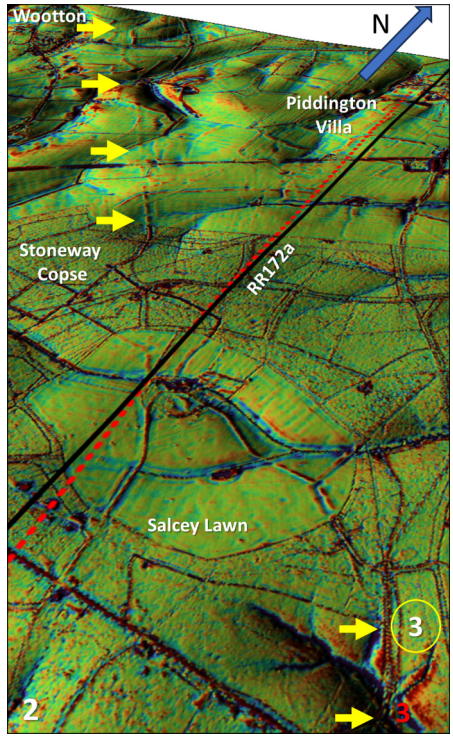


Fig. 16. Shaded lidar LRM showing new route for RR172 leaving Milton Keynes. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.





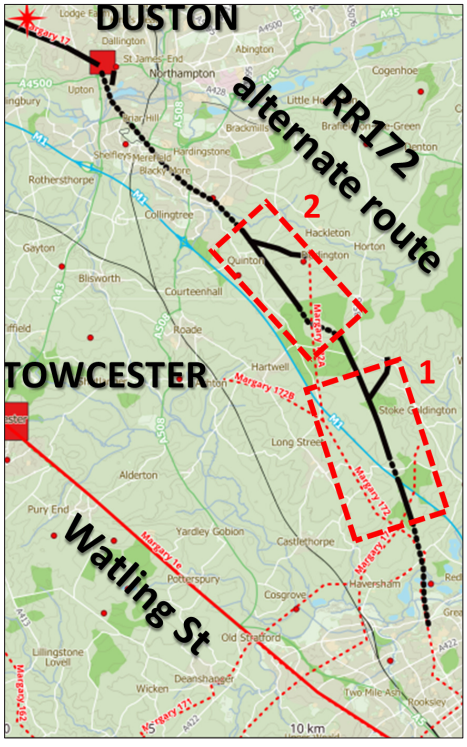
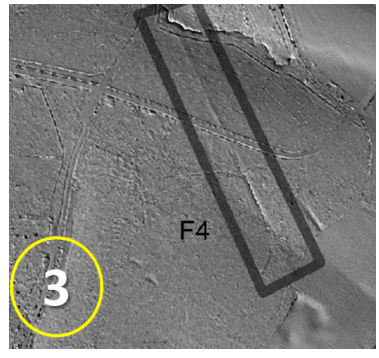


Fig. 17. 3D perspective views of RR172 and Salcey Forest lidar insert 1. Little Linford Wood to Salcey Forest. 2. Salcey Forest to Wootton. 3. Extract from Salcey Forest lidar survey (Simmonds 2011, Fig. 16). photo of agger in Stokepark Wood. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.





runs north along Saxon Street before crossing Marlborough Street and a dis-used railway. Here it enters Stanton Low Park and appears as a hollow-way heading towards the Stanton Low Roman site and the River Great Ouse. The river crossing is presumed near Haversham Mill where the Viatores indicate there was a ford. The road is then reported to run along a feature called '*the Freebord*' (Viatores 1964, 324-7) which does appear raised, but it is slightly curved and out of alignment with the course of the Roman road further north in Little Linford Wood.

The area around Little Linford has an interesting lidar feature, with an arcuate boundary of c. 1100m diameter located at the head of a dry valley system to the north of the village. This may be just a series of medieval headlands or possibly something of more significance. A lidar linear feature is also seen heading northwest-southeast past Little Linford, which may be part of the Roman road system.

The Viatores route for RR172 takes it towards Hanslope Park but the lidar data show that a more north-north-west course through Little Linford Wood is more correct. A raised linear lidar feature running for c. 750m from SP 8347 4513 to SP 8322 4587 is observed before transforming into a hollow-way as it passes through dry stream valleys close to the M1.

Fig. 17.1 shows 3D perspective views of the lidar LRM from Little Linford Wood to Salcey Forest and Salcey Forest to Wootton Fig. 17.2. The new route for RR172 is highlighted by the yellow arrows with the Viatores routes for RR172(a, b) and RR174 also shown in red.

The Roman road can be seen heading northwest from the M1 to Yew Tree Farm where the clarity of the lidar response to the *agger* improves around SP 8261 4754 and a cropmark is also noted on the Northants NMP. The road then continues straight on the lidar and is supported by cropmarks on Google Earth 2017 imagery as it approaches Stokepark Wood after a minor change of direction. Here, there are cuttings as streams are approached and a section of well-preserved *agger* in the woods (Fig. 17.4*)*. The lidar and cropmarks can be confidently traced past Stokelodge Farm and into Salcey Forest for a short section.

The Viatores RR174 is not visible on lidar and no archaeological evidence has been identified, so is not currently supported (Fig. 17.1). Viatores RR172 is shown taking a more westerly route north towards Salcey Forest. Their proposed route lacks lidar support until a section to the west of Woad Farm which is formed by a kink in Newport Way and then an old field boundary. A linear feature is also seen on lidar imagery near Spinney Lodge, but this section is more curvilinear than straight, so may not be a Roman road. Jefferys' Northamptonshire 1779 map shows the curvilinear section of RR172 is a trackway heading into Salcey Forest. Beyond this area, there is no lidar, crop mark or modern archaeological evidence to support the routes of either RR172a or RR172b. As indicated elsewhere in this volume, the label RR172(x) has been reserved for this route following the protocol laid out in Armstrong (2021, 282). In addition, and the previous allocation of RR172 to the Margary/Viatores route along with RR172a and RR172b are withdrawn being considered as currently disregarded until further evidence is presented.

Fig. 17.2 shows the proposed alternative route of RR172 entering Salcey Forest from the south-east, to the east of Salcey Lawn. The Roman road is then seen exiting the forest towards the northwest, through Stoneway Copse on a slightly different alignment. Fig. 17.3 is taken from a lidar survey completed over Salcey Forest (Simmonds 2011, 14). The survey revealed pre-medieval features including rectangular enclosures (some of which may be Roman) and importantly a c.400m long southeast-northwest oriented linear feature which crosses Forest Road. To the south of Forest Road,

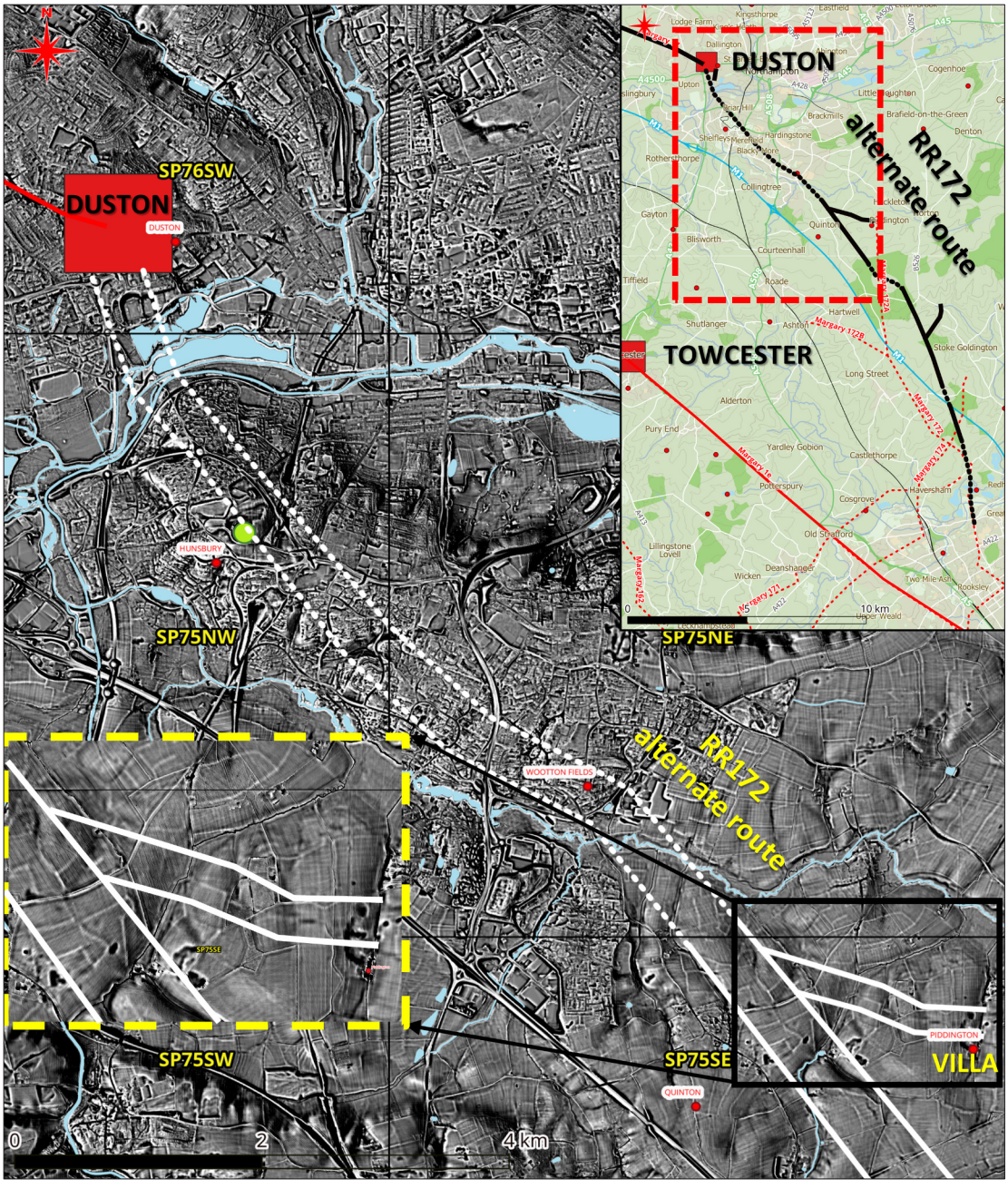


Fig. 18. Shaded lidar LRM of RR172 from Salcey Forest to Duston with Piddington Villa road inset. Lidar data @ Environment Agency copyright and/or database right 2024. All rights reserved.

it is observed as an earthwork bank flanked by a ditch c. 3.5m wide with the bank up to 0.15m high and the ditch measuring 0.3m deep. To the north, it is a low wide bank measuring up to 7m wide and

0.15m high. This feature is in direct alignment and continuation with the lidar linear coming from Stokepark Wood.

The route across Salcey Lawn is not confirmed, due to the presence of many tracks, ditches and banks of different ages which are observed. There are also pipelines servicing a reservoir and medieval park boundaries which complicate the route definition. A possible small section of road has been identified in a valley around SP 8119 5195 which appears to be where it turns northwest towards the Garden cottage (M. Haken pers. com.). It is clear though that a Roman road leaves the forest to the northwest, through Stoneway Copse and heads for the Roman sites at Wootton. The Roman road is mentioned in Morton's Natural History of Northamptonshire 1712, who observed a straight road, paved with pebbles, heading SE-NW, which "*discontinued*" near the Great Lodge (in the centre of Salcey Lawn) but reappeared beyond the Lodge to the northwest but was narrower than to southeast. He surmised it was heading from Newport Pagnel to Northampton, which is generally supported by this study.

The Roman road towards Wootton is seen both on the lidar data and as cropmarks (Northants HER MNN125444). It is less distinct than to the southeast of the forest, which may be due to it being narrower than the southern section, as suggested by Morton. Fig. 18 shows the route heading towards Wootton and then the presumed route to Duston. The lidar response of the road disappears just to the south of Wootton Brook but it is presumed the road then passes near to the Wootton Fields Roman site, past Hunsbury Roman Villa to cross the Nene near to Duston Mill. A crossing here looks reasonable, as there are spurs of high ground descending into the river valley from both sides, which minimises the amount of flood prone marshy ground to cross.

Also shown in Fig. 18 is a zoomed inset around Piddington Villa. The quarrying and excavation around the villa site can be seen along with a possible link road which joins the villa to the main route of RR172. A series of linear hollows and banks probably represent the course of a service road.

Roads around Irchester and Thrapston

This section deals with Roman roads which are focused on the Roman settlements of Thrapston and Irchester and which are highlighted in Fig. 19.

RR570ext Irchester to Thrapston

Margary 1973 indicated that the continuation of RR570 from Thrapston to Irchester was probable but that further assessment was needed. Since that time, significant excavation of the Roman sites beside the Nene and near the modern A45 have now defined the road location in specific locations and combined with the lidar data, the route can be more confidently identified.

Fig. 20 shows the route of RR570ext and key supporting excavations. Also highlighted (as yellow dots) are locations of Roman roads have been identified by excavation or geophysics from the investigations in the area.

Occupation of Irchester Roman Town began in the 1st century AD, initially as an unenclosed settlement which was subsequently enclosed (late 2nd century AD) by an earthen rampart, a stone wall and defensive ditches (Morris & Meadows 2012, 2). This enclosure was important for the surrounding road network, as it was cut off from the internal network (Butler *et al.* 2010, 3) and was

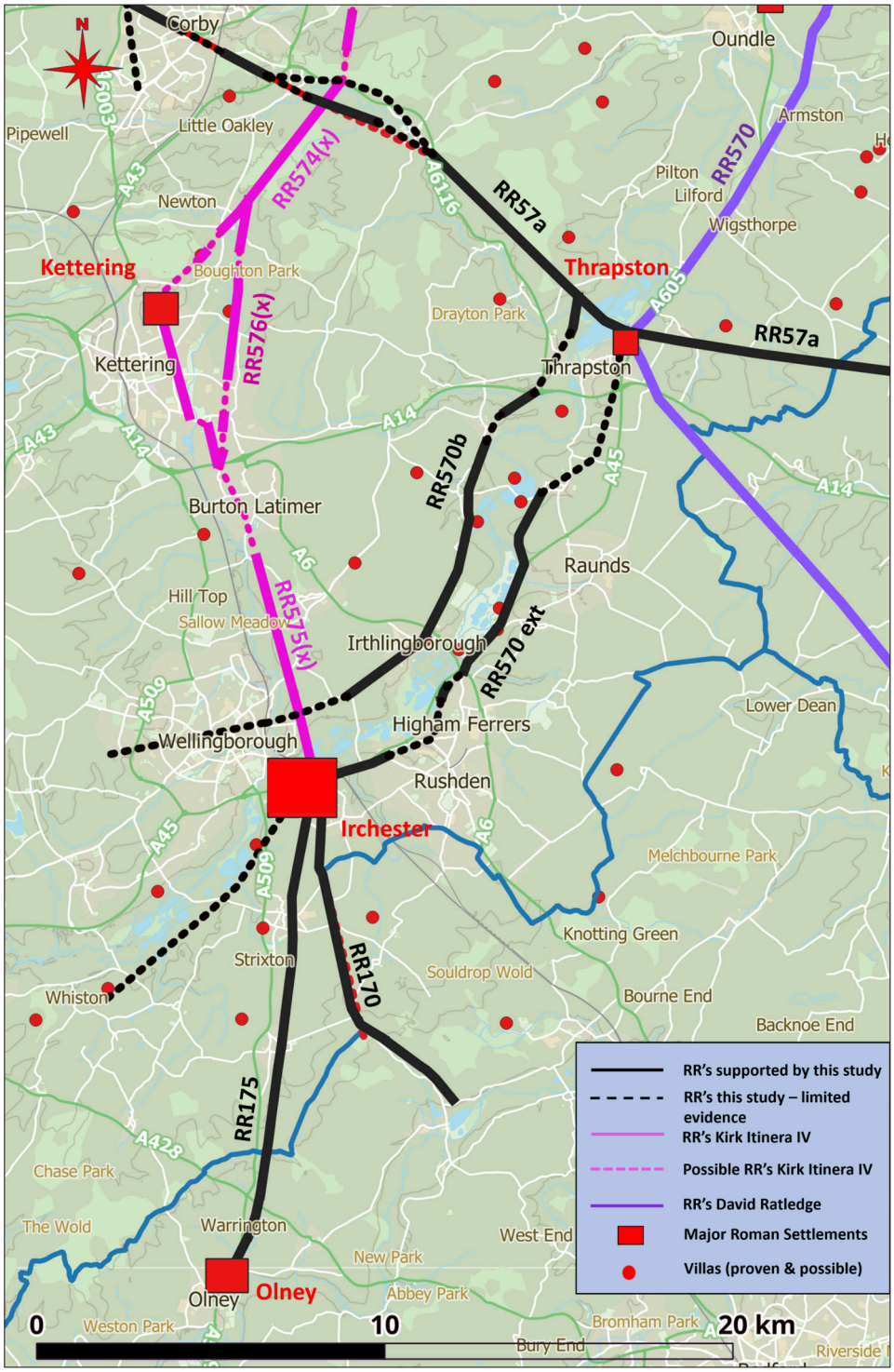


Figure 19. Roman roads around Irchester and Thrapston

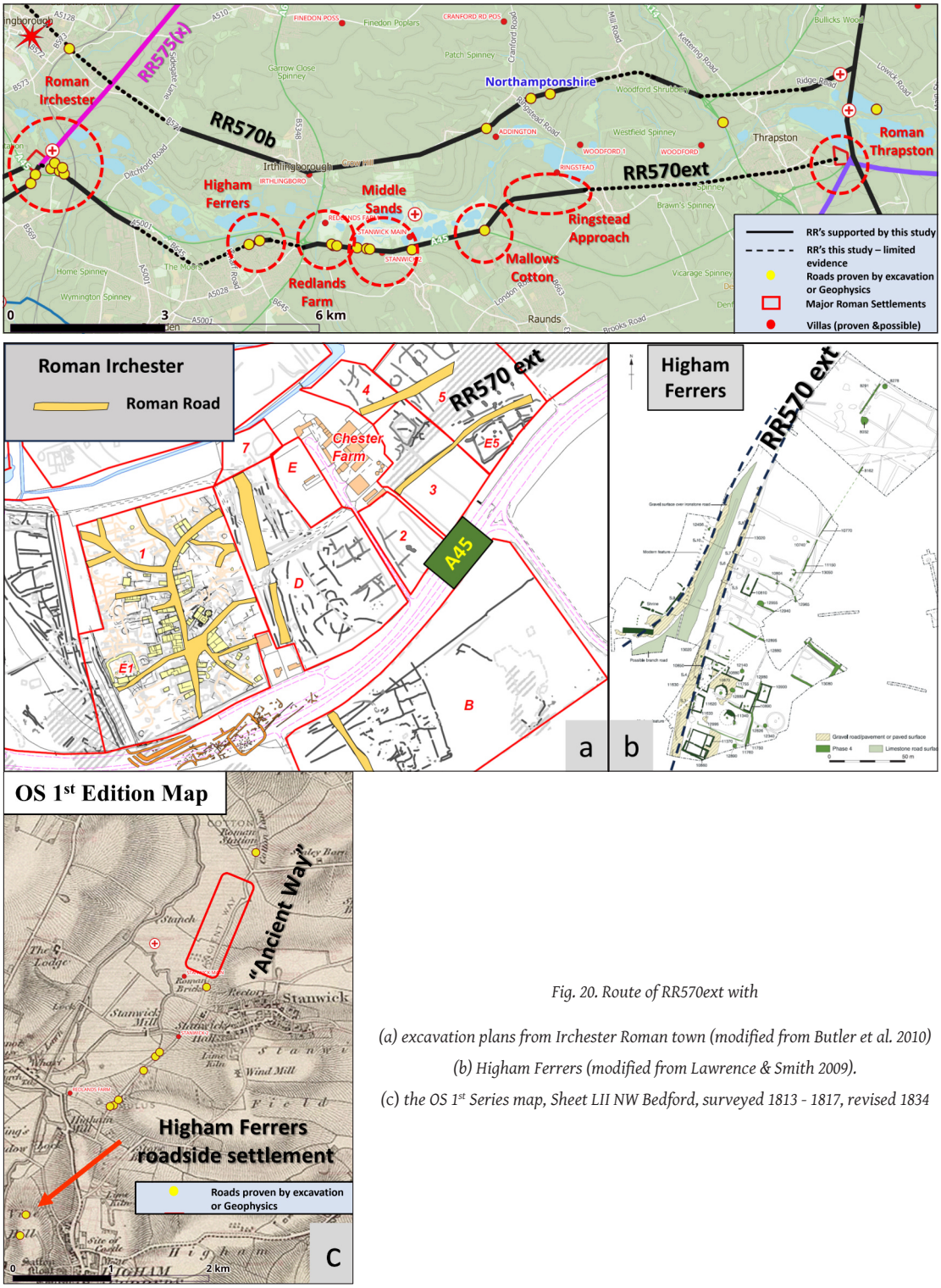


Fig. 20. Route of RR570ext with

(a) excavation plans from Irchester Roman town (modified from Butler et al. 2010)

(b) Higham Ferrers (modified from Lawrence & Smith 2009).

(c) the OS 1st Series map, Sheet LII NW Bedford, surveyed 1813 - 1817, revised 1834

likely re-arranged at the same time. This means there is probably more than one phase of roads in the immediate vicinity of the town which then connect to long distance routes.

Two roads have been identified by geophysical survey heading east-northeast away from the town (Butler *et al.* 2010, 7-8) and are interpreted to be part of RR570ext. Unfortunately, the roads cannot be traced beyond the survey area, as they are destroyed by iron workings or go under the modern A45.

It is likely that it underlies Northampton Road (Allen 2017, 3) which runs towards Higham Ferrers and is seen on the 1st Series OS map. Substantial sections of the Northampton Road also appear on Jefferys' 1779 map of Northamptonshire, showing it has some antiquity.

RR570ext must branch off Northampton Road and turn to the north before reaching Higham Ferrers as it is revealed by excavations at Higham Ferrers roadside settlement (Lawrence & Smith 2009). Here, the road has several surfaces, the earliest being ironstone paving 0.2m deep and composed of pieces up to 0.2m across and has been traced for c.150m, whilst the associated roadside ditches have been traced for over 200m, with a width of around 20-25m (Fig.20).

Beyond Higham Ferrers the route is lost again until it is revealed by a series of investigations in the Nene valley at Redlands Farm, Middle Sands and Stanwick (Crosby & Muldowney 2011; Parry 1995). Fig. 20c shows the locations where the road has been identified in a series of roadside settlements, overlain on the OS 1st Series map. The map also shows that Roman features had been identified in the area already, with *''Roman bricks*'' seen to the west of Stanwick and a 'Roman Station' at Mallows Cotton. The identified Roman road locations lie adjacent to and underneath an 'Ancient Way' shown on the OS 1st Series map, which is now covered by the A45.

The excavations near Redlands Farm and northeast to the Middle Sands Roman site (Parry 1995) in advance of the widening of the A45 have identified a series of sections of metalling and ditches located between SP 9361 7041 and SP 9682 7096. Dating is provided by sherds of pottery from 1st to early 2nd century AD on the metalling surface, whilst pottery from a ditch was dated between 1st to early 4th century AD. The excavations also identified the remains of a series of buildings whose common alignment suggests the presence of a contemporary road (e.g. Northants HER 1346). Slightly further northeast, investigation at the Stanwick Villa site also identified the road where a section was exposed during trenching around SP 9730 7162 (Crosby & Muldowney 2011, 70) although much of it is interpreted to underlie Cotton Lane (the Ancient Way on the OS 1st Series map).

Beyond Stanwick, the Ancient Way and RR570ext continue north to the deserted medieval villages of Marsh Cotton and then the neighbouring Mallows Cotton labelled ''*Roman Station*" on the OS 1st Series map. Substantial Roman features are recorded here underlying and surrounding the deserted medieval village including settlements (HER MNN4048), enclosures and trackways (MNN160392), field systems (MNN788) and even a possible villa (MNN20889). A large hollow-way (Cotton Lane) runs through the earthworks of the village. In places this is unmetalled, but a section excavated close to the A45 as part of the Raunds area project (Parry 2006) identified a 10m wide limestone surface that was subsequently replaced by a mixture of pebbles, limestone and ironstone. This has probably undergone much modification during the medieval period but could have Roman origins.

On the OS 1st Series Map (Fig. 20c) there are two roads that may be routes for the continuation of RR570ext from Mallows Cotton. One continues straight and the other turns towards the NE, parallel to the A45. Looking at the earlier Jefferys' map (Fig. 21a inset), only the route that is straight exists,

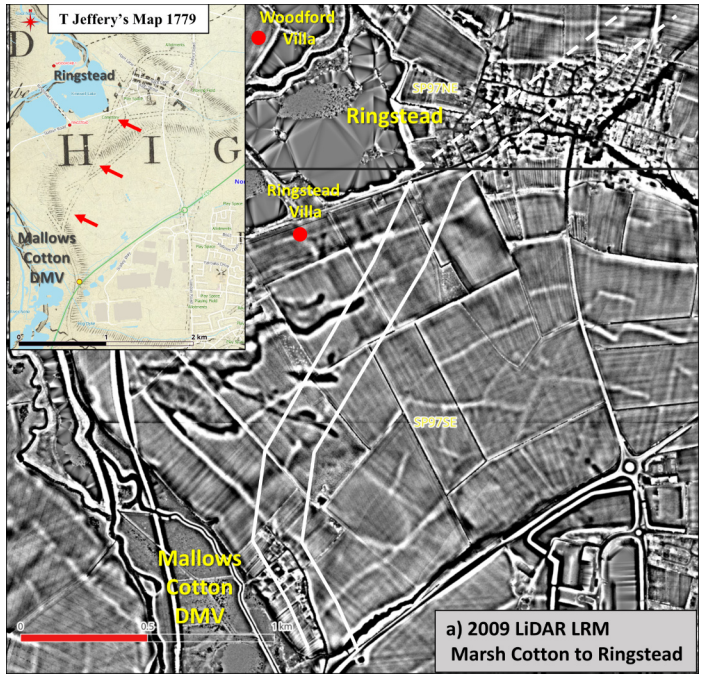
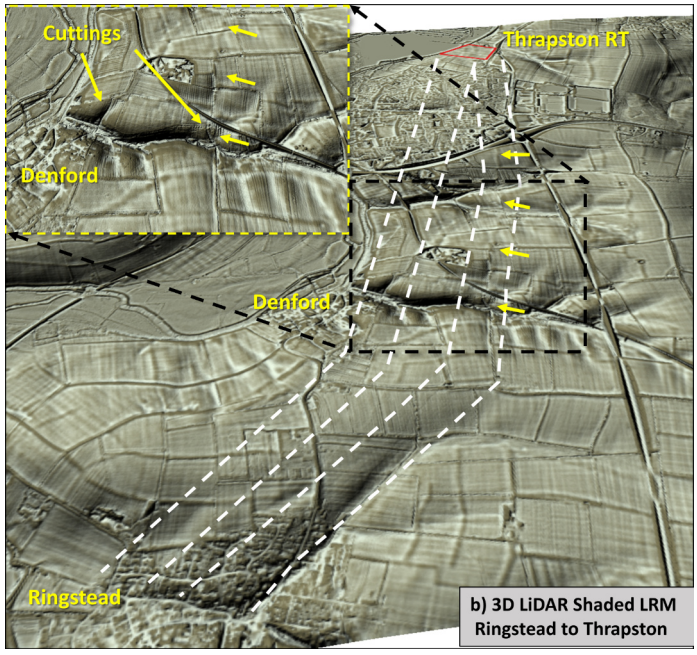


Fig. 21. RR570ext (a.) 2009 lidar LRM between Mallows Cotton and Ringstead with Jefferys' 1779 map inset and (b.) shaded lidar LRM between Ringstead and Thrapston with possible routes. Lidar data @ Environment Agency copyright and/or database right 2024. All rights reserved.



suggesting it is the more likely option. On the lidar LRM (Fig. 21a), the road can be seen turning in straight sections from Mallows Cotton and heading NE towards Ringstead Villa and Ringstead village.

The route between Ringstead and Denford is not clear with no evidence seen on the lidar or found in the HER records. The road between the villages on Jefferys' map is the same as the course of the modern Denford Road ,which may be a possibility, but it is a less efficient route as it climbs and descends a hill for no reason. A pair of possible routes to Thrapston are shown in Fig. 21b, which align with cuttings seen in a valley to the east of Denford. Beyond Denford, the route could underlie Denford Road and Midland Road, staying close to the River Nene and onto the Roman town. Roman activity has been recorded near Thrapston castle (HER MNN162501) but no road identified. If the cuttings seen in Fig. 21b are significant, then the Roman road would take a more easterly route. The most easterly course looks more promising, as beyond the cutting there is a linear feature seen on the lidar leading towards the Romano-British settlement identified on the SE side of Thrapston (HER MNN4371). It should be noted that the area between Denford and Thrapston has been subject to quarrying, minor railways etc. so the lidar response needs to be treated with caution.

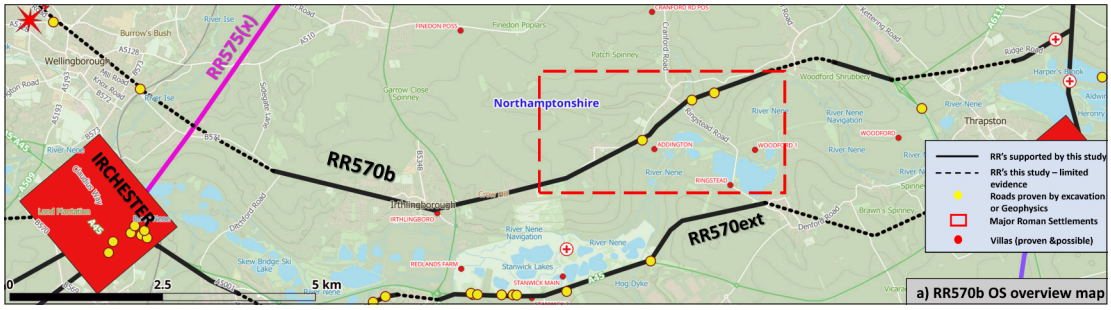
A further extension of RR570 to the southwest of Irchester, along the south side of the Nene valley has been identified by excavation and crop marks (Meadows 2009, 92). Fig. 19 shows the approximate course running from Irchester through the Wollaston and Grendon Roman sites. The lidar data does not identify the road between the sites of excavation, despite it being archaeologically identified for over 3km, probably due to quarrying, inundation and agricultural disturbance. Furthermore, Meadows suggests that the route had its origin in the early Iron Age as a pit alignment and the route is not straight, making it more difficult to determine. The only areas of metalling comprised thin gravel spreads which only occurred in the immediate vicinity of the associated farmsteads, seldom extending more than 100m from the sites. Beyond these areas, the road is only defined by roadside ditches (Meadows 2009, 92). This lack of metalling and *agger* means that road has proved very difficult to identify using lidar.

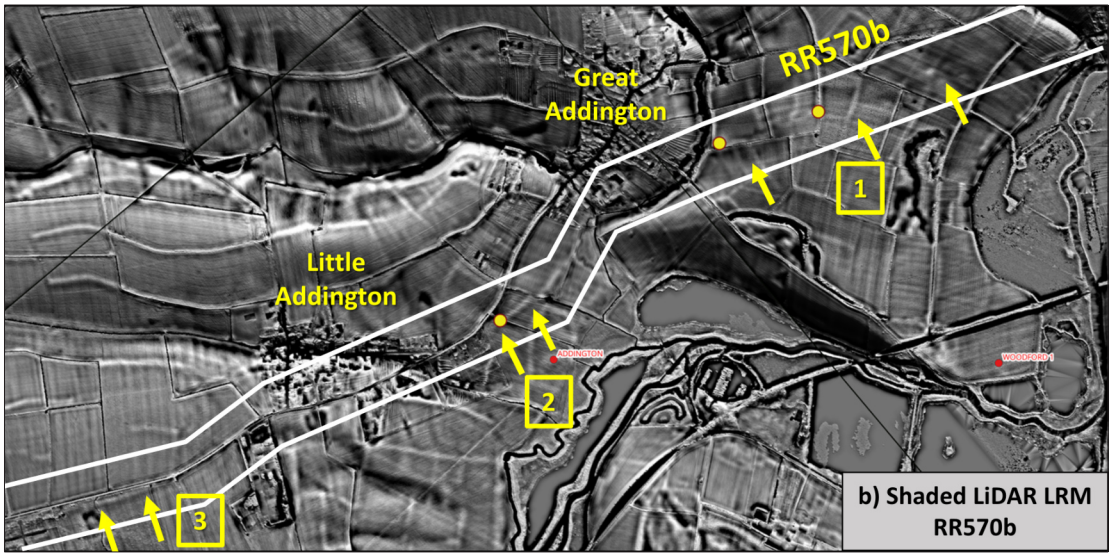
Meadows suggests the route may have been directed towards Towcester, but the curving nature and construction may mean it is more likely that it was used to service the villas and farmsteads along the south side of the Nene Valley rather than a long-distance route. Also, no evidence of the road is seen on the lidar between Grendon and Towcester.

RR570b: RR57a to Wellingborough, northwest of the Nene

A Roman road parallel to the Nene but on the north side has been postulated for some time e.g. (RCHME Northants Vol.1 1975, 116-123) where it is suggested that a road originated from RR57a near Lowick, passed through Lowick and Drayton Park, before changing course through Woodford, the Addingtons and then onto the current road to Irthlingborough. In RCHME Northants Vol.2 1979, 186-191, it is suggested the road then passes through Irthlingborough and crosses the Nene somewhere to the east of Ditchford Bridge before heading for Irchester. At the time, the road from Thrapston to Irchester to the south of the Nene was not supported (RCHME Northants Vol.1 1975, 116-7), so this was presented as the Thrapston to Irchester route.

The evidence now suggests a road north of the Nene existed together with one to the south, although in a different location to that proposed by the RCHME and is shown in Fig. 22. The key evidence comes from the central section of the road around 'the Addingtons' villages. A 1.4km long linear feature seen on lidar suggests a diffuse *agger* in the fields between Great Addington and Woodford. This partly





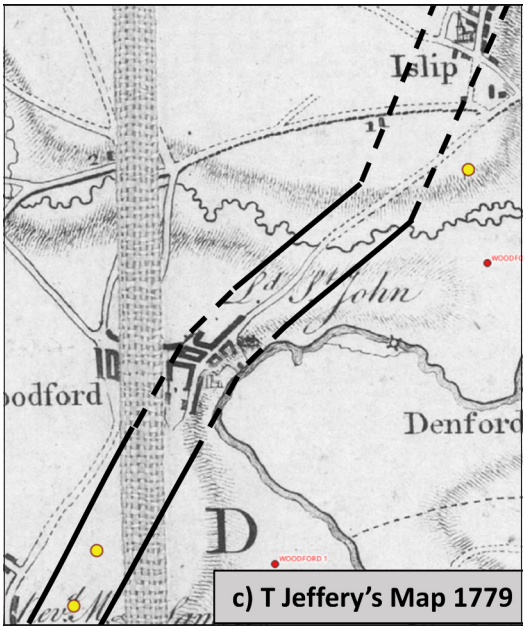


Fig. 22:

(a) RR570b route on OS map.

(b) Shaded lidar LRM around the Addingtons.

(c) Thomas Jefferys' Map of Northamptonshire 1779 around Woodford.

(d) Cropmarks north of Islip taken from RCHME Northants Vol.1, Figure 70. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.



coincides with a cropmark described as a 12m wide ridge which is 200m long, with side ditches from SP 9637 7556 to SP 9622 7520 (HER 1760/1/5) just outside Great Addington (Fig. 23b - area 1).

Further to the south, in the vicinity of Addington Roman Villa, a further section of *agger* has probably been identified by excavation (HER 1760/1/1 and RCHME 1975, 116-123) (*Fig. 22b* – area 2). This was first identified in 1964/5 as a low bank with a clear belt of limestone scatter and was excavated in 1967. The cambered structure of a road was found composed of tightly packed limestone cobbles with clay and some gravel resting on natural clay. The road was reported to be 25ft wide with the metalling up to 2.5ft thick but the age was not confirmed as Roman, as the oldest dateable pottery was medieval. The feature is visible on Google imagery as a linear spread of stone and is supported by the lidar data.

The identification as a Roman road was later brought into question, with suggestions it was a medieval headland and a series of trenches in an excavation 165m to the south (Souterrain 2020) did not identify the road. The interpretation that it is a headland is not supported by the study of Partida (2014), whose mapping did not identify one in the proposed location. Also, the trenches in the Souterrain excavation may have missed the road course, as they are not at the western most edge of the site where it appears that the Roman road turns slightly west and underneath the modern road.

Past Little Addington, the road is interpreted to underlie Irthlingborough Road all the way to Irthlingborough, which has a series of very straight alignments. There may be a small section where the Roman road is alongside the modern road just north of Crow Hill Recreation Ground. Here, a 300m linear feature, visible on lidar imagery is observed between SP 9585 7278 and SP 9573 7253 (Fig. 22b – area 3). The road then passes the Crow Hill Iron Age hillfort, which had continued occupation into the Roman period, and then into Irthlingborough where a possible villa has been identified near All Saints Church.

The Roman road then follows the straight course of Wellingborough Road to Stone Cross Farm, near the Ditchford road junction. The modern road then makes an angled turn to the west-northwest. If the assumed course is projected from Wellingborough Road before the turn at the Ditchford road junction, then there would be an intersection with RR575(x) (Kirk 2024, 339-324) around Irthlingborough Grange. There is a linear feature seen on the lidar from SP 9283 6922 to SP 9270 6908, but HER 3121/1/1 identifies this as a relatively modern trackway which is seen on the OS 1st Series map. Also, there is no clear evidence to support this route from the geophysical surveying associated with the Stanton Cross development (Arkley & Walford 2018). However, it may be possible that the surveying was unable to identify it, as the land to the east of Irthlingborough Grange is covered in green waste.

An alternative would be to follow the modern road where it makes the west-southwest turn, along Mill Rd/Wellingborough Road. Where Wellingborough Road makes a turn to the southwest, a field boundary and footpath continue straight past South Hill Farm. This would then be the location of the junction with RR575(x).

The Northants HER identifies a possible Roman road in this area (HER 7618/1) and suggest it may continue further to the west through Wellingborough, because of two possible sections of Roman road identified by excavation in the town. The first is north of Mill Road at SP 902 684, but this is said to be badly plough damaged and the second at Freeman's Endowed School SP 885 680 where an *agger* with side ditch full of gravel was found below made-up ground.

This possible alignment is supported when looking at the OS 1st series drawing for the area (OSD 252) which shows a trackway extending east from Wellingborough, along the line of Brickhill Road and

heading towards Mears Ashby. The alignment stops around SP 859 675 and no further continuation is seen in field boundaries or the lidar data. This maybe the route of the mooted Duston to Irchester Roman road but until further evidence is obtained it cannot be confirmed.

Heading back to the area from Woodford to RR57a, the route of RR570b to the north is not well defined. The RCHME interpret the road going towards Drayton Park and then onto a junction with Via Devana (RR57a) near Lowick. The number of changes of direction for no apparent reason and lack of lidar support bring this interpretation into question.

The preferred interpretation is that the road continues to loosely parallel the River Nene to an intersection with RR57a near the Roman Nene bridge crossing at Aldwincle (HER 1896/1/7). The road probably leaves Woodford using a road identified on Jefferys' map, but no longer in use, heading towards Islip (Fig. 22c). A faint lidar linear feature is observed following the road course from SP 976 776 to SP 980 778 near Alledge Brook, but its age is uncertain. The Roman road then likely turns more to the north and past Islip, as the road on Jefferys' map is heading for a Nene river crossing that probably wasn't present in Roman times.

To the north-northeast of Islip, a set of parallel cropmarks running 10-16m apart mark the location of road/trackway side ditches running NNE-SSEW for c. 380m. *Fig. 23d* which is taken from Fig. 70 of RCHME Northants Vol.4 1975 shows these pointing directly at a suspected Roman crossing of Harper's Brook at SP 9930 8040, which is evidenced by heavy limestone slabs (HER2302/0/1). Following this route would result in an intersection with RR57a around SP 9930 8060.

RR57a: Stanion to the River Nene section

The route of RR57a (often termed as *Via Devana*) in Northamptonshire is already well defined, apart from the area around Stanion and Brigstock (see Fig. 1) which will be discussed here.

The Roman road is seen approaching Stanion with an excellently preserved section in Hazel Wood, Corby and a further section in Oakley Purlieus Woods (Fig. 23a). The route is not clear on the lidar for the section from the A43 to Stanion Lodge, after which there is a faint linear feature on lidar heading towards Brigstock (Fig. 23a). This linear feature is supported by aerial photography (NMP photo SP9385_020) which shows a cropmark tracking across the fields following a ridge towards Brigstock. Fig. 23c shows the Roman road cropmark and dark patches associated with charcoal burning.

The route through Brigstock is not clear on the lidar, but there must be a change of direction somewhere in the village, as a linear feature on the lidar imagery is seen to the east of the A6116 at around SP 9521 8468 on a slightly different orientation, tracking southeast through Cat's Head Wood.

The Northants HER (HER 1896/1/21) reveals that the Roman road course may not only continue straight from Oakley Purlieus. A soilmark which is interpreted to be a Roman road running from SP 9048 8703 to SP 9065 8702 is observed. Also, as reported in HER1896/1/39 where the road metalling and ditches have been exposed, the road tracks slightly to the NE of the expected straight course. The cropmark location is shown between the two yellow dots in Fig. 23b. The orientation of these cropmarks is more east-west than the expected route and raises the possibility that there was an additional route to the Stanion Villa running to the north of Harper's Brook. The cropmark lies on the same orientation as a linear lidar feature running through Stanion village which turns into Brigstock Road as it approaches the villa, which may offer support.



Fig. 23 (a) RR57a Shaded lidar LRM Little Stanion to Brigstock. (b) HER query with alternative route. (c) NMP photo SP9385_020. (d) Shaded lidar LRM highlighting possible alternative route. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

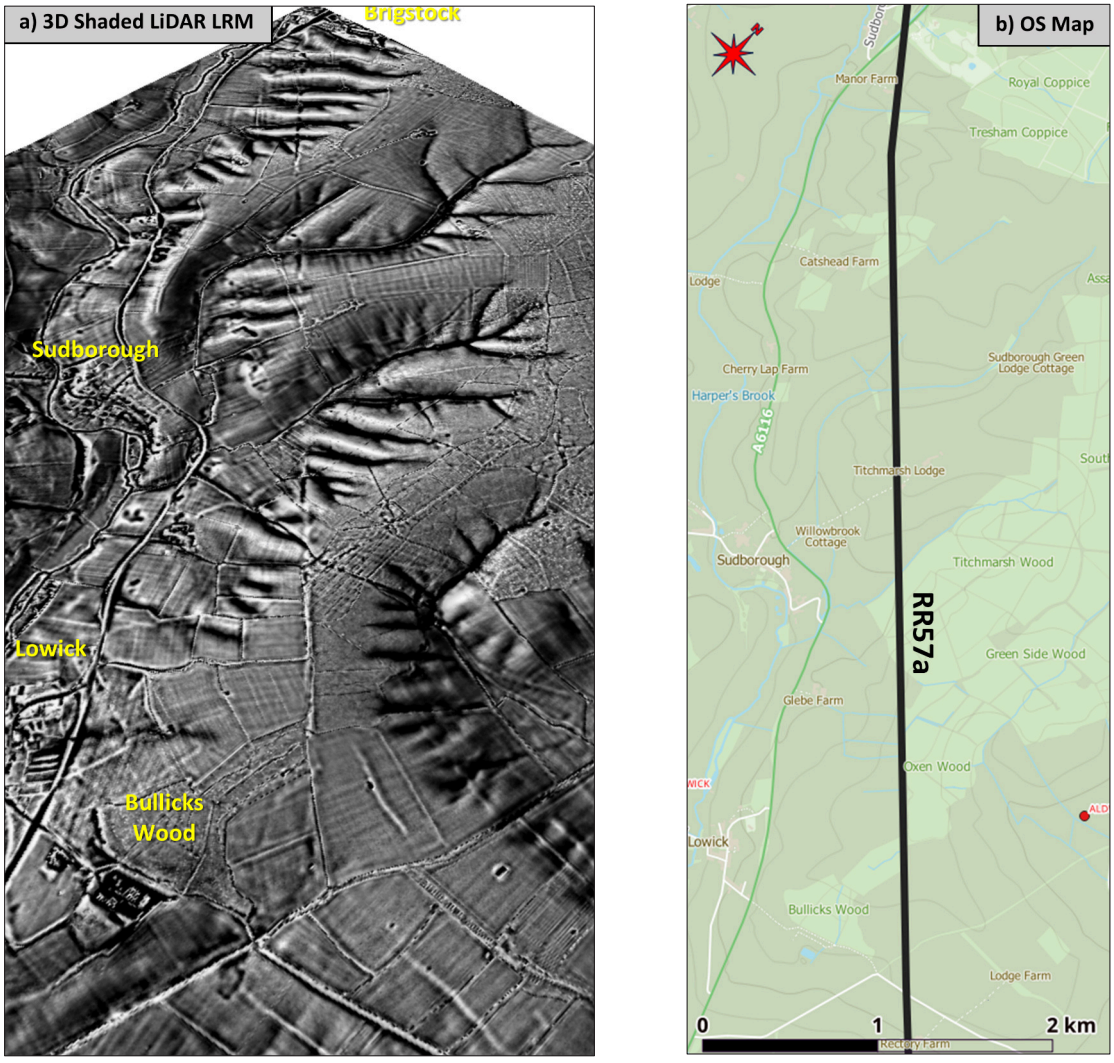


Fig. 24 (a) 3D shaded lidar LRM of RR57a between Bullicks Wood and Brigstock. (b) OS route overview Map. Lidar data *© Environment Agency copyright and/or database right 2024. All rights reserved.*

To the west of the villa, the course of the additional route maybe indicated by three linear sections seen on the lidar linear to the north of Harpers Brook, as indicated in Fig. 23d. These may be just headlands, but it would be useful to revisit the interpretation of the excavation of Stanion villa to determine if an east-west Roman road can be seen or inferred.

RR57a from the River Nene to Corby was considered uncertain by Margary (Margary 1973, 214) but the lidar data show one of the clearest sections of Roman road in Northamptonshire (Fig. 24a). The road can be seen as a line of *aggers* and cuttings over a distance of c. 5.5km, with a minor change of direction near Cat's Head Wood. The approach to the river Nene crossing is not well imaged by the lidar but the route is well defined by substantial archaeological investigations in the area, which had not been undertaken at the time Margary published.

Finally on RR57a, it should be noted that a possible Roman road heading southwards through Corby towards RR575(x) in Kettering could be interpreted from HER records but is not visible on lidar (Fig. 19). Two raised features at SP 8703 8639 and at SP 8690 8685 have been identified (M. Haken pers. com.) and may represent the route but these do not align well with archaeological evidence reported in the Northants HER and listed below. HER 3141/1/10 identifies an apparent *agger* near Oakley at SP

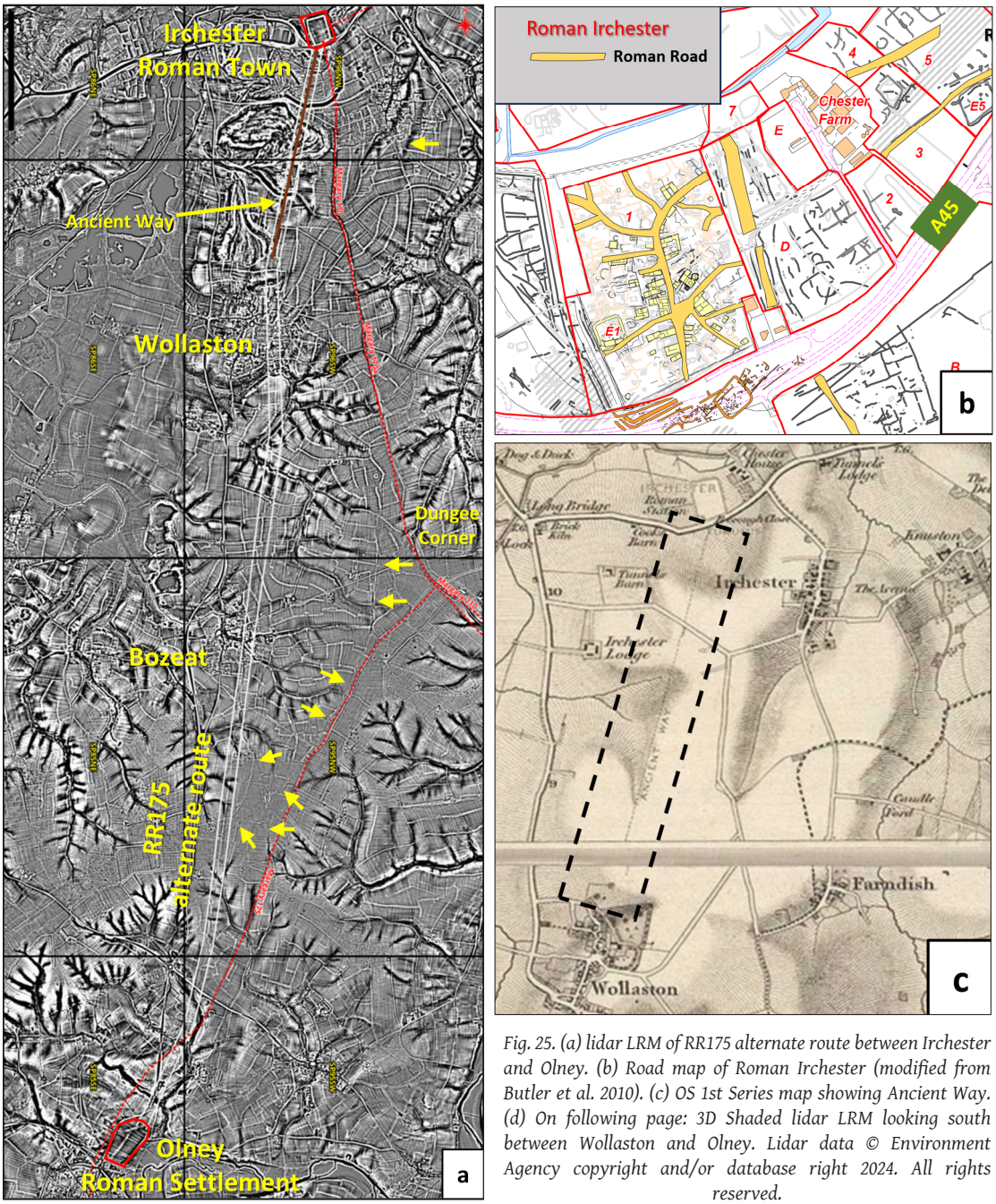


Fig. 25. (a) lidar LRM of RR175 alternate route between Irchester and Olney. (b) Road map of Roman Irchester (modified from Butler et al. 2010). (c) OS 1st Series map showing Ancient Way. (d) On following page: 3D Shaded lidar LRM looking south between Wollaston and Olney. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

8670 8660 but the age is not defined. Further north, HER 3141/1/11 notes a length of limestone slabs 4m wide and 150m long at SP 8640 8810 with much Roman pottery in the area. Unfortunately, the road cannot be identified in the fields between Corby and Kettering.

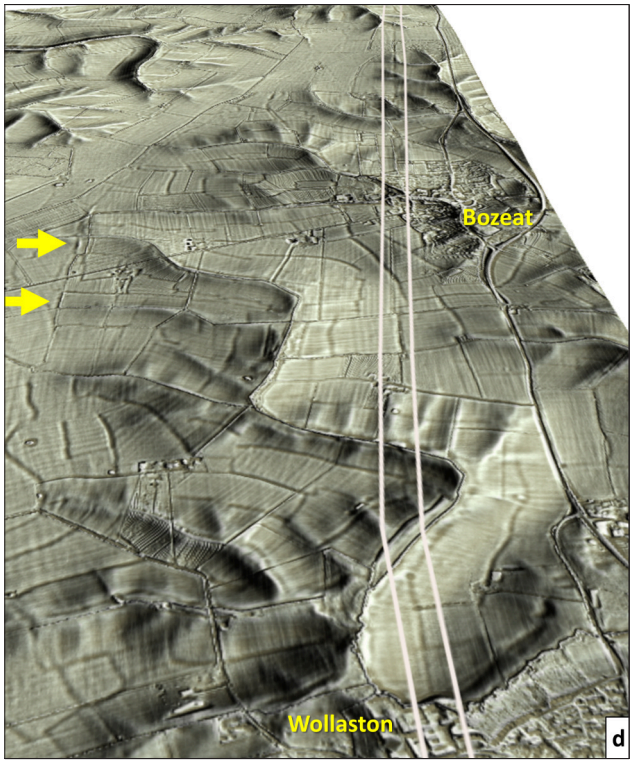
RR175 Irchester to Olney – an alternative route

The current interpretation for RR175 in Northamptonshire (Fig. 2) is for it to leave the Roman settlement at Olney and head northeast past Warrington and to then run along the Northants / Beds border to a junction with RR170 at Dungee Corner. This seems rather an indirect route between the two settlements and the route has not been proven by archaeological investigation. It is possible that this was a Roman road, as parts of it are straight and there is a raised bank, primarily on the Bedfordshire side of the border, but the recent discovery of a linear lidar feature suggesting a direct route between Olney and Irchester brings this into question.

The alternate route overview for RR175 is shown in Fig. 19 and the detailed analysis in Fig. 25.

As discussed earlier, the Roman road layout in the immediate surroundings of Irchester is likely to have changed when the town was enclosed in the late 2nd century AD. Fig. 25b shows the roads as identified in and around the town (Butler *et al.* 2010). The road identified to the east of the town appears to be the '*bypass*' road which joins up with RR170 and heads towards Dungee Corner.

Within the town, a road is seen approaching the south wall which is not seen on the outside. As this area has been heavily disturbed by modern road building and iron quarrying further to the south, this is not surprising. What is surprising is another 'Ancient Way' found on the 1st Series OS map, heading from the location of the intra-mural road towards Wollaston (Fig. 25c). This observation combined with a strong lidar linear south of Bozeat (Fig. 25d) suggests that there was a direct Roman road between Irchester and Olney. As indicated elsewhere in this volume, the label RR175aa(x) has been reserved for this route following the protocol laid out in Armstrong (2021, 282). In addition, the previous allocation of RR170 to the Margary/Viatores route along with RR170a, RR175 and RR210 are withdrawn being considered as currently disregarded until further evidence is presented.



The area immediately south of the Roman town has been quarried, so the lidar is inapplicable here. A short section of open fields before the village of Wollaston have an indistinct lidar response, however, south of Wollaston, the lidar response is much improved. A raised linear feature

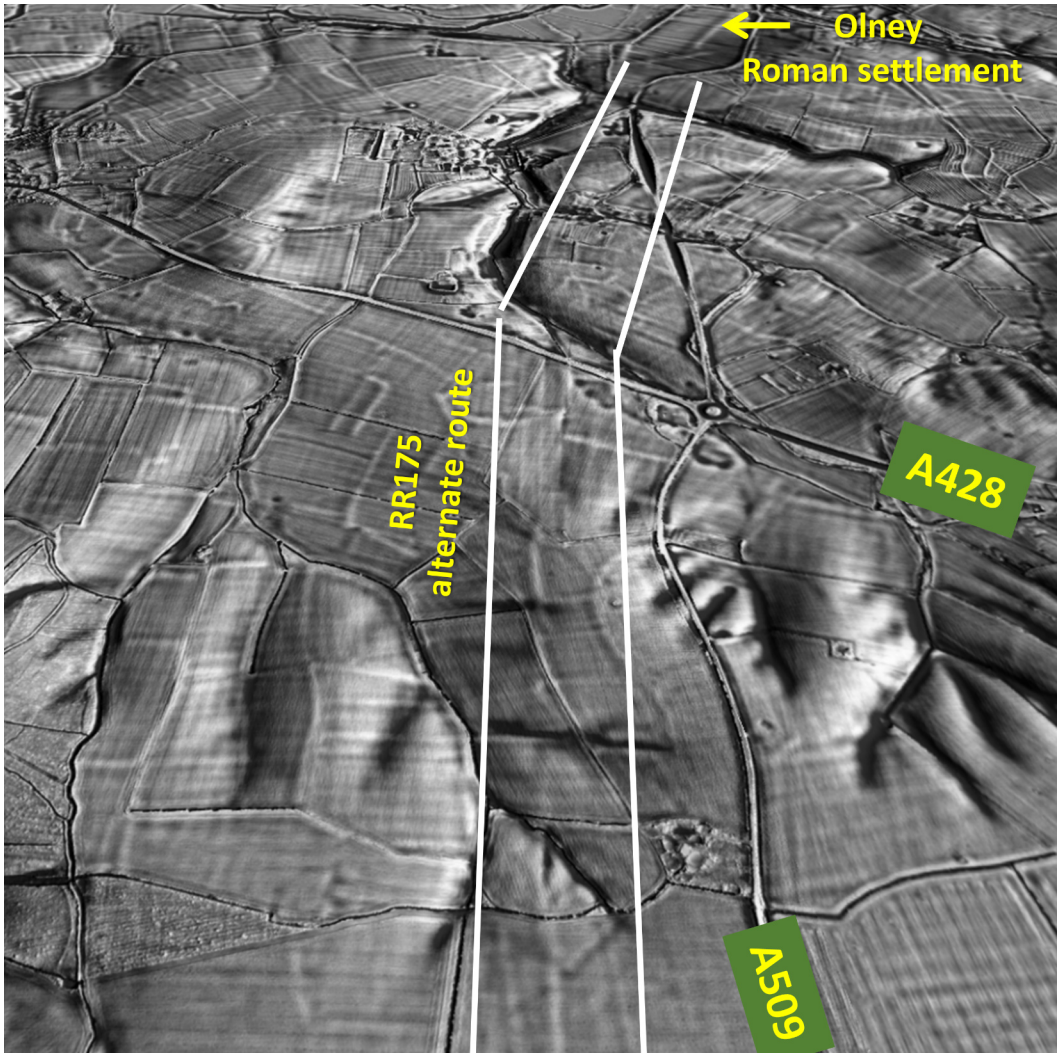


Fig. 26. 3D Shaded lidar LRM for RR175 approaching Olney Roman settlement. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

can be seen both north and south of Bozeat, which is especially strong in the area of Bozeat Grange. The Northants HER have recognised features in the same location and ascribed them to medieval or post medieval field boundaries (HER 1335/0/1) but their appearance and the fact there are cuttings as well as raised sections, gives more support to the conclusion it is a Roman road. Also, the best preserved *agger* is in an area of ancient woodland (Partida 2014), as might be expected if it were protected from agriculture.

The Roman road can be seen sub-parallel to the A509 approaching the Olney Roman settlement until it meets the A428 (Fig. 26). Here a slight change in direction is required to avoid a series of small

valleys and head straight for the Roman settlement. RR175 beyond Olney will not be discussed here but there is evidence it continues south towards *Magiovinium*.

Also, highlighted on Fig. 25a (yellow arrows) are a host of lineaments in this upland area between the valleys of the Nene and the Great Ouse. The age of these is uncertain and requires further investigation, but similar features nearby have been identified as Iron Age trackways. This raises the possibility that the Northants / Beds border feature may pre-date Roman times.

RR170 – Irchester to Dungee Corner & Kempston?

RR170 is interpreted to run from Irchester to Kempston, via Dungee Corner. The overall route is shown in Fig. 19 and 25a. The link between the Irchester 'bypass' (Fig. 25b) and the long-distance route is not obvious. For example, Margary 1973 has the route going along Wollaston Road from modern day Irchester to the south, but the northern part of this road isn't shown on Jefferys' 1779 map, indicating it is post-enclosure. However, there are no strong alternative candidates on the lidar data, so this is assumed to be the course for now.

Beyond SP 918 646, Jefferys' map shows a road coincident with the Roman road route all the way to Dungee Corner, indicating this is probably the correct course. A Roman interpretation might be supported by the fact that it is raised above the background landscape, even where it is now a green lane past Hinwick Road. The curve in the road on the approach to Dungee corner appears to be to avoid a stream valley and there is no lidar evidence that there are remnant *aggers* between the curves, meaning the Roman road must follow the modern roads precisely.

A section of possible *agger* from SP 9380 5936 to SP 9502 5841 is seen just over the Bedfordshire border beyond Dungee Woods where the modern road enters a stream valley and the road presumably continues through Harrold and onto Kempston as RR170a (Viatores 1964, 290).

Summary

As a result of this study, combined with previous work of Kirk (2024) and Ratledge (2024), the Roman road map of Northamptonshire has been updated to positively identify a total of c. 209 km of Roman roads with a further c. 64 km identified as possible.

In the south of the county, an alternative route for RR56a has been proposed and several of the Viatores routes questioned. Also, the route for RR162 from Bourton Grounds to Fleet Marston has been confirmed. A new route for RR172 has been identified from Haversham to Wootton and probably Duston, along with confirmation of the extension of RR570 from Thrapston to Irchester on the south side of the Nene. It appears that there is also a Roman road on the north side of the Nene which parallels this route. A more direct route for RR175 from Olney to Irchester has been identified, whilst a further extension of RR570 is reported on the south of the Nene between Irchester and Grendon but cannot be seen in lidar.

Several additional possible routes remain elusive, such as the suspected road from Duston to Towcester and that from Duston to Irchester, so the map will likely be updated in the future.

Abbreviations used in the text.

ADS: Archaeology Data Service

HER : Historic Environment Record

LRM : Local Relief Model

NMP: National Mapping Program

OS: Ordnance Survey

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Roman Roads and Rural Romano-Celtic Temples in Roman Britain - Perspectives and Case Studies

by Neil Godfrey
neil.godfrey@kellogg.ox.ac.uk

Abstract

This article examines the relationships between rural Romano-Celtic temples and Roman roads in Britain, positioning them within their broader landscape contexts. Through a review of the literature and an analysis of key themes - including accessibility, visibility, the nature of travel to temples, and the functional and symbolic dimensions of Roman roads - research questions and methodological approaches that integrate spatial and place-based perspectives are discussed. Case studies of the Romano-Celtic temples at Lamyatt Beacon and Titsey are used to demonstrate these approaches, highlighting the potential of landscape archaeology for understanding the interactions between sacred space and the Roman road network.

Introduction

Despite the growing body of evidence on Roman roads and religious sites in Roman Britain, the interrelationship between them remains relatively under explored. This article seeks to contribute to advancing this area of research by examining the connections between Roman roads and Romano-Celtic temples. These temples were in use in Britain from the mid-1st century to the early 5th century AD, with most excavated sites found south of a line from the Wash to the Severn Estuary (Smith 2018, 133). Whilst other religious structures that share an element of concentricity are reasonably categorised as Romano-Celtic temples, and whilst there are variations on this format, they are strictly defined as having an inner *cella* surrounded on at least three sides by a walkway, or ambulatory (Smith 2018, 132–133). Additionally, at many sites, a square or rectangular *temenos* ditch or wall enclosed the temple precinct (Lewis 1966, 131–132).

Rather than those situated within nucleated settlements or close to towns, this article focuses on two broad categories of temples. Firstly, those that are found very close to roads yet may be considered atypical nucleated roadside settlements in the sense that they appear to have been '*rural religious complexes*' (Smith 2018, 157), notably the large rural sanctuaries at Frilford, Oxfordshire (RR164) and Nettleton Shrub, Wiltshire (RR5c), together with the religious complex/roadside settlement at Springhead, Kent (RR1c), and the smaller roadside religious complex at Friars Wash, Hertfordshire (RR1e). Secondly, the rural temple sites found away from, but within a few kilometres of Roman roads,

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of which the numerous examples include Lancing Down, West Sussex (RR153), Woodeaton, Oxfordshire (R160b) and Uley, Gloucestershire (RR541). Other forms of sacred space, which are more numerous and geographically dispersed than Romano-Celtic temples, are beyond the scope of this article. As such, it serves as an initial exploration of the potential connections between roads and religious sites in Roman Britain, acknowledging the need for further and more expansive research. Following an exploration of the broader landscape context of Romano-Celtic temples and some key themes relating to roads and temples, case studies of the temples at Lamyatt Beacon in Somerset, and Titsey in Surrey are discussed. Lamyatt Beacon was selected as it is a good example of a rural temple site situated fairly close to the road network. Titsey is notable for being a temple located directly beside a road, yet lacking an associated nucleated settlement or a more extensive religious complex. However, it has been the subject of limited interpretation since its most recent excavation in 1935, and, as this article will suggest, the possibility that it was part of a broader religious complex remains.

Key Themes

Romano-Celtic Temples in the Landscape

Whilst a few studies (e.g. Bird 2004; Blagg 1986; Wilson 1973) have explored the landscape context of Romano-Celtic temples in Britain, and Ghey (2003) has done so for Gallo-Roman temples, research has predominantly remained site-focused, with discussions of the wider landscape setting typically confined to tangential observations. Nonetheless, these observations are sufficient to suggest that an association with the surrounding landscape is likely to be significant for the interpretation of temple sites (Ghey 2003, 24; Smith 2018, 168). They include continuity from pre-Roman ritual sites (Smith 2018, 135), and connections with other prehistoric landscape features, such as round barrows (Williams 1998, 72–73). Links between temples and the natural landscape have also been emphasised, such as relationships with trees, and a proximity to water (Bird 2004, 84-86). It has also been noted that Romano-Celtic temples are often found in elevated positions (e.g. Bird 2004, 84; Garland 2013, 189; Smith 2000, 312), with spot height analysis of rural sacred sites in southern and central England indicating a tendency for them to be located on higher ground than sacred space located within settlements (Smith 2018, 161). Elevated sites have been linked to several factors relating to visibility, including looking 'from' or 'towards' temples, including inter-visibility with rivers (Ghey 2005, 113), and other temples (Smith 2000, 150). The prominence of temples within the wider landscape appears to have been a deliberate and significant aspect of their placement (Bird 2004, 84; Woodward 1992, 24), with some situated to maintain visibility over the areas where people lived and worked (Derks 1998, 138). Furthermore, their visual impact was further enhanced through architectural features such as painted exteriors, distinctive red tile roofs (Blagg 1986, 19-21) and the addition of towers (Bird 2002, 44). It has also been suggested that high places were selected in Roman Gaul to express the superiority of the gods worshipped there (Derks 1998, 138), and that elevated positions for sacred sites in the ancient world may have reflected a desire to secure divine protection over the landscape (Jost 1994, 20).

Connections between Romano-Celtic temples, settlements and villas are also a common theme. Despite suggestions that rural temples were isolated (Rodwell 1980, 233), the Roman Settlement of Rural Britain (RSRB) project found that 88 per cent of excavated rural temples were situated within 5 km of a contemporary settlement, with 15 lying in the near vicinity of a villa (Smith 2018, 161). Furthermore, most Romano-Celtic temples and villas were constructed contemporaneously during

the mid to late Roman period, and often shared similar construction methods, suggesting that many temples were integral components of broader villa estates (Smith 2018, 161-167). Indeed, whilst worshippers' offerings may also have played a role in financing the building and maintenance of Romano-Celtic temples (Blagg 1986, 21), their construction and management must have been closely associated with the Romanised native elite (Mattingly 2006, 485), who had access to the resources and land required. Temples may also have played a role in creating and maintaining community identity (Smith 2018, 203). In some cases, they may have been constructed and maintained by the ruling group in an area (*pagus or civitas*) (Bird 2004, 80), as reflected in the fact that some were possibly situated close to *civitas* boundaries (Blagg 1986, 21). Furthermore, the nature of Roman religion suggests that most priests were likely to have been elected or appointed officials, or otherwise important members of the local community (Martin-Kilcher and Schatzmann 2009, 210-214, cited in Kiernan 2012, 94), and it seems likely that the largest rural sanctuaries were owned at the civic level (Smith 2018, 167). These relationships suggest that the construction and maintenance of temples were linked to concerns that extended beyond exclusively religious matters. Indeed, in contrast to the modern distinction between '*sacred*' and '*secular*' these two spheres are likely to have overlapped in the period (Ghey 2005, 112). This was the case in Rome where sanctuaries had always played multiple roles, before the boundaries between sacred and secular space became increasingly blurred in the Imperial period (Scott 2017, 3–9). Similarly, rural temples in Roman Britain may have served purposes beyond ritual, functioning as venues for markets, and other gatherings. For example, it has been suggested that the large number of coins discovered at the Wanborough temple in Wiltshire is indicative of '*public activity and business*' (O'Connell and Bird 1994, 33–4).

Observations regarding the relationship between Romano-Celtic temples and Roman roads highlight where temples are situated very close to roads, as well as broader potential connections between villas, temples, and roads (e.g. Bird 2004, 86). It has been proposed that the general proximity of temples to roads suggests that accessibility was a crucial factor in the construction and maintenance of rural temples (Smith 2000, 312) and essential to the prosperity of religious complexes (Smith 2018, 161). It is also suggested that roads were sometimes deliberately laid out to point directly at and bend round pre-existing sacred sites, as Bird (2004, 85-86) suggests occurred at Ewell in Surrey (RR15) and Springhead (RR1c) in Kent. In other cases, temples may have been sited to take advantage of road routes, with the objective of giving prominence to the sacred sites, bringing them to the attention of travellers (Bird 2002, 44). Furthermore, that the often-elevated locations of rural temples provided visibility from roads might indicate a deliberate intention to signpost temples for travellers, a theme connected to broader discussions concerning the nature of journeys with temples as their destinations (Kiernan 2012). Finally, it is important to acknowledge that numerous temple sites may have been associated with more than one of the previously mentioned landscape features. Moreover, that some locations may have held significance before temples were constructed, due to factors that are not always detectable archaeologically, such as ritually significant natural features or mythical stories associated with particular places.

Spatial and Place-Based Perspectives

Before exploring how certain related ideas might apply to Roman roads and Romano-Celtic temples, it is helpful to first provide a brief overview of how landscapes have been conceptualised in Archaeology. The '*spatial*' perspective (Lock and Pouncett 2017, 2) considers the landscape as the land itself: the humanly created - along with natural - features that exist '*objectively*' across space, and their natural context (Johnson 2006, 3). However, relying exclusively on a spatial approach has been

criticised for neglecting the personal experiences and meanings that people attach to landscapes (Feinman 2015, 685). Consequently, particularly in prehistoric archaeology, there has been a shift from focusing solely on physical features to incorporating social and cultural meanings. Consequently, landscapes viewed as '*place*' (Lock and Pouncett 2017, 2) are entities that are socially produced, acquiring meaning through human perception, experience, and cultural context (Ashmore and Knapp 1990, 1). Although there is one physical land available for study, landscapes are perceived differently depending on the observer's experience. As Häussler and Chiai (2020, 1–2) note, we '*see it with our eyes but interpret it with our mind.*' Thus, through ways of thinking and seeing, humans transform land into '*landscapes*' (Johnson 2006, 4). Furthermore, this process is reciprocal, as places are also seen as socially productive, actively influencing human experiences, perceptions and identities.

This shift towards understanding space as a fluid social construct has significantly impacted classical scholarship, encompassing small spaces to entire landscapes (Scott 2017, 11). Rather than viewing sacred spaces as physical locations that acquire their sacred status inherently (e.g. Eliade 1957), scholars have emphasised that they are created through '*the outcome of actions, intentions, and recollections*' and are '*the result of past and present interactions among humans, material implements, architecture, and landscape*' (Moser and Feldman 2014, 1). Furthermore, diverse theoretical perspectives are increasingly prevalent in the broader literature on trails, paths and roads (Snead *et al.* 2011, 13-17), with Talbert (2019, 23–35) highlighting the potential for approaches that might explore the wider roles of Roman roads '*in the cultures and mindsets of the Empire's peoples.*' However, whilst theoretical engagement in Roman archaeology has increased significantly in recent decades, with notable studies focusing on Romano-Celtic temples (e.g. Garland 2013; Smith 2000) and Roman roads (e.g. Matthews 1999; Witcher 1998), there remains considerable scope for further development. This limitation is particularly evident in the relationship between Romano-Celtic temples and roads, which remains relatively under-investigated and has yet to be thoroughly examined from a place-based perspective.

Functionality, Symbolism, and Changing Perceptions

Functional interpretations that emphasise utility are closely connected to a spatial perspective on landscapes, with Roman roads typically understood primarily in terms of their practical functions. This undoubtedly accurately reflects their original purpose, as '*artefacts built to assist people to journey efficiently from one place to another*' (Davies 2002, 11), initially in response to military needs and later to trade requirements (Margary 1973, 18). However, just as purely functional interpretations of villas as agricultural sites should be tempered by the evidence of culture, art, and religion found at many locations (King 2020, 155), interpreting roads solely in functional terms risks overlooking their cultural and symbolic dimensions. As Witcher (1998, 63-4) points out, in being built through spaces occupied by people and by modifying the physical landscape, roads also influenced how people understood the spaces in which they lived and moved. Therefore, in addition to being functional, physical structures enabling movement to a destination, Roman roads had a symbolic impact, embodying issues of ideology, power and identity, and were '*intimately involved with social constructions of the world*' (Witcher 1998, 60). Thus, they transcended physical infrastructure, to represent powerful symbols of '*civilization*' and tools for '*Romanization*' (Carlà-Uhink 2021), serving as a '*foundation, symbol and instrument of Roman rule*' (Kolb 2019, 3).

In concentrating on the immediate effects of road construction and associated infrastructure on the local population, previous studies that have considered Roman roads in Britain from a place-based

perspective have reflected these ideas. The emphasis has been on how roads demonstrated in a very visible way the dominance of the new regime (Matthews 1999, 413), and helped manipulate identity and modify power relationships (Witcher 1998, 68). For example, Matthews (1999, 412-413) refers to the symbolism of roads cutting across existing field patterns, of the *agger* being raised above the surrounding landscape and connecting places over long distances in a way that was in sharp contrast to the localised sense of place experienced by people living in the pre-conquest period. However, recognising that the meanings of landscapes continually change with the socio-cultural context of observers implies that perceptions of the significance of roads would have been reinterpreted from various standpoints (Witcher 1998, 66). Moreover, even after a road's original purpose had diminished, its physical presence in the landscape would have continued to influence the organisation and perception of space (Carlà-Uhink 2021, 73). Whilst initially it was as if the Roman road network in Britain was '*superimposed on its rural setting and had no relationship to it*' (Jackson 1984, 23 cited in Blagg 1986), over time it came to acquire such a relationship, with roads originally constructed for military conquest or trade later acquiring new significance beyond their original purposes.

Character of Journeys to Temples

One way that perceptions of roads evolved over time is through their emerging importance for individuals travelling to sacred sites. For example, although the Fosse Way lost much of its administrative significance early on, it facilitated a substantial flow of traffic to Bath, which was also likely to have contributed significantly to the establishment of the religious complex at Nettleton Shrub (Smith 2000, 206). Indeed, Romano-Celtic temples have been suggested as the destination for sacred journeys or '*pilgrimages*' more generally (Kiernan 2012, 83; King 2005, 363), including those associated with healing (Smith 2018, 147). However, ancient pilgrimage is difficult to define (Elsner and Rutherford 2007, 1-38), and particularly difficult to recognise archaeologically in Roman Britain. Whilst portable votives that might be associated with sacred travel are present at some sites, there is a lack of literary sources, depictions of pilgrims and relevant inscriptions as found elsewhere in the Greco-Roman world. Furthermore, it can be challenging to distinguish between religious and secular forms of travel (Grünewald 2017, 130). However, as discussed earlier there is evidence for a blurring of sacred and secular activity at temple sites in Britain, and as Kiernan (2012, 95) points out, most travel in antiquity was likely to have been multi-purpose. For these reasons, arguing that destinations served as the most tangible material evidence of ancient pilgrimage, Kiernan (2012, 80) defines pilgrimage as '*some kind of travel involving ritual destinations, even if the travel includes other non-religious purposes as well*'.

Therefore, notwithstanding the role of local trackways, the location of temple sites and their relationship to roads and settlements is key to understanding potential pilgrimage destinations. Indeed, under this definition any visitor to a temple isolated from nearby settlements would immediately fulfil the travel requirement of a pilgrimage. In addition to nearby roads, an indicator of travel to religious sites might be non-temple buildings that might be associated with guest accommodation, such as at the larger religious complexes as at Lydney Park and Uley (Woodward 1992, 47-49) in Gloucestershire, and possibly at Nettleton Shrub, Wiltshire (Blagg 1986, 21), as well as the smaller site at Pagans Hill, Somerset (Rahtz *et al.* 1989). However, where available, accommodation would likely be for significant guests only, with Derks (1998, 194) suggesting for Romano-Gallo temples that tents were likely to accommodate most visitors. However, as Smith (2018, 165) points out, in most British cases little investigation has taken place beyond the immediate area surrounding

the temple site, and therefore it is possible that some apparently isolated rural temples may have been part of larger complexes.

The emphasis on the likely multi-purpose nature of journeys to Romano-Celtic temples somewhat undermines traditional notions of pilgrimage, and so the term should be used with caution. Furthermore, when examining the types of travel associated with both larger religious complexes and smaller rural temples, the notion that pilgrimage must involve long-distance travel is also called into question. Kiernan (2012, 88) points out that rather than focusing on distance travelled, some anthropological models emphasise movement of communities outside their normal environments to draw out and emphasise their shared social identity. Therefore, in addition to facilitating potentially relatively long-distance travel, Roman roads may have played an important role in enabling access to rural temples that were far enough from settlements to provide a distinct ritual setting, yet close enough for large groups to reach in a relatively short time. Indeed, Bird (2004, 78) argues that given the presence of household shrines, rural temples were less likely to serve everyday purposes and were more likely associated with special visits, perhaps tied to the religious calendar. Additionally, Smith (2018, 203) has suggested that religious festivals may have attracted people living within 20 km of some rural religious sites.

Research Questions

The preceding discussion, together with insights from the broader archaeological literature on sacred space and landscapes, suggests the types of questions that might be asked of the relationship between roads and temples. In studies of other periods and regions, landscape analysis is often used to interpret the potential intentions and motivations of '*builders*' in choosing specific locations for constructing sacred spaces (Häussler and Chiai 2020, 2). However, in Roman Britain, despite the probable involvement of the native elite in temple construction and likely deliberate attempts to place temples within the landscape or to manage their settings, there has been little consideration of these settings and why particular places had temples at all (Bird 2004, 77-83). Furthermore, Smith (2018, 158) has questioned why so many temples were located in rural, non-settlement contexts, why certain sites were deemed worthy of devotion, and how these sites were connected within the wider landscape. As an important feature of the landscape in the period, Roman roads are key to addressing such questions. As Bird (2004, 85) suggests, the extent to which the siting of pre-existing temples – or ritual precursors of sacred sites - may have affected the subsequent courses of roads, may be examined. Additionally, the extent to which temples were located deliberately in relation to roads can be investigated, potentially offering insights into the behaviour and perceptions of Britons under Roman rule (Blagg 1986, 24). Finally, whilst more challenging, exploring the impact of the landscape setting of temples in relation to roads may provide perspectives on the potential experiences of travellers visiting these sites. Such questions are explored in the following case studies, which examine the relationships between Roman roads and the Romano-Celtic temples at Lamyatt Beacon and Titsey, within their broader landscape contexts.

Methodological Approaches

Just as their standards of construction varied (Margary 1973, 504), roads in the Roman Empire were not a uniform phenomenon, as their uses and implications were highly diverse, both spatially and socially, and they were experienced on a very parochial level (Witcher 1998, 60). Similarly, the

settings of Romano-Celtic temples vary from area to area, and this may indicate that there were locally significant customs involved, perhaps *civitas* related (Bird 2004, 77). Furthermore, the association between a temple and its surrounding landscape is often multi-dimensional. Therefore, an appropriate approach – which is adopted in the following case studies - is to explore the relationships between roads and temples within their broader landscape contexts, analysing them on a case-by-case basis. This involves establishing an understanding of specific temples (e.g. chronologies, finds) and reconstructing the contemporary landscape as fully as possible. This includes evidence for nearby Roman roads (e.g. precise routes, chronologies) and significant prehistoric features, villas, settlements, field systems, and other elements in the surrounding landscape.

While quantitative techniques such as aerial photography (AP), Light Detection and Ranging (lidar), and Geographic Information Systems (GIS) have been criticised for offering a '*detached*' spatial perspective, they are essential for identifying Roman roads and for situating and interpreting them alongside Romano-Celtic temples and other features in the landscape. Therefore, for the case studies, in addition to a literature review, Historic Environment Record data for a 3.5 km radius was obtained to inform an understanding of the landscape evidence up to and including the Romano-British period. For Lamyatt Beacon new research, including analysis of lidar and APs was undertaken in relation to RR465(x) / RRX037, as summarised in *Itinera IV* (Godfrey 2024) and in the Appendix to this paper. The route of RR14 is well established, and the analysis in this article is based on the route included in a current project mapping all known Roman Roads in Britain, which assigns a high degree of confidence to its accuracy (Mike Haken pers. comm., 10th October 2024). In terms of complementing these techniques with a place-based perspective, whilst it might be accepted in that perceptions of roads and the wider landscape changed over time, scepticism may arise regarding how these can be recovered (Fleming 1999, 119-125). Nonetheless, theoretically informed methodologies that allow landscapes to be examined at the '*lived scale*' (Lock and Pouncett 2017, 13) are increasingly employed in Archaeology, including in the study of sacred sites in their landscape contexts (Häussler and Chiai 2020, 1–3). For the case studies this involved incorporating some of the theoretical themes discussed earlier, supplemented by the relevant literature, together with field visits to ground truth the evidence, and to approach what Hadley (2023, 67) terms the '*mentality*' of roads, and the broader landscape.

GIS-based visibility analysis - a technique unavailable to some earlier researchers who suggested connections between the case study temples and roads - is a valuable tool for modelling visual

Figure	Site	NGR	Dimensions	Height	Surface offset
1.	Lamyatt Beacon Temple	ST 6693 3619	7.5m x 7.5m	8m	1.75m
2.	Ditcheat Villa	ST 6360 3407	35m x 15m	5m	1.75m
3.	Titsey Temple	TQ 4212 5496	6.17m x 6.48m	8m	1.75m
4.	Alternative Titsey Temple	TQ 4132 5604	6.17m x 6.48 m	8m	1.75m

Table 1: Key data for GIS visibility analysis

relationships in the landscape. Therefore, reverse viewsheds were generated for the case study temples and other significant locations. Reverse viewsheds identify all areas in the landscape from which a single location, such as a temple or villa could have been visible. A series of points representing the location and an estimated height of the corners of each building (specifically the *cella*, in the case of temples) were added to an ArcGIS Pro 3.02 project containing an Ordnance Survey Terrain 5 Digital Terrain model. A reverse viewshed analysis was conducted for each point using the Visibility tool, with a surface offset of 1.75 m to simulate a human observer at each position in the landscape (Table 1). The resulting viewsheds were then merged to create a comprehensive viewshed encompassing all points for a given building. In all the viewsheds presented in this article, the locations from which the relevant building could have been visible are coloured in orange.

Given the range of environmental variables and the limited available data, GIS visibility analysis is most effective at showing which areas would definitively not be visible due to the landscape topography. Notably the effect that vegetation has on visibility is a major challenge (Eckardt *et al.* 2009, 74) as there is not detailed environmental data to reconstruct the woodland in the case study areas, and even if there were, the precise location and impact of vegetation would remain uncertain. However, considering the elevated position of the temple locations and the likelihood of clear, vegetation-free roads, the viewsheds are likely to provide an accurate representation of potential visibility, especially from the roads. It is also possible that the presence of distinctive woodland may have played a role in marking the location of some temple sites. Whilst the trees may have obscured a direct view of the temple, their intentional placement could have acted as a proxy, guiding observers to the temple's location. In this case, the visibility analysis would still be broadly accurate, as locations from where the trees were visible would also likely correspond to locations where the temple could be seen, even if obscured by the woodland.

A further challenge is associated with the struggle of GIS to overcome its positivist foundations and to correspond to subjective human experiences (Gillings 2012, 601). Affordance theory has been proposed as a means of providing a theoretical basis to '*humanise*' GIS visibility analysis, by shifting the focus from a purely objective, spatial approach to one that considers how people in the past may have experienced and interpreted visibility within a landscape (Gillings 2009). In contrast to indirect theories of perception which posit that animals exclusively create and store meaning internally, the '*direct*' theory of affordance suggests that the environment in which an animal is embedded has inherent meanings encoded within it (Gibson 1979, 129). Furthermore, whilst perception may be '*direct*', the relational nature of affordances means that their manifestation and recognition is bound up with selective attention. Therefore, '*knowledge in the head*' - an individual's knowledge, memories, cultural constraints, situational contexts and experiences - (Gillings 2012, 605-607) accompanies '*information in the world*', in the recognition of affordances in the environment (Norman 1988, 54–80). Therefore, whilst GIS viewshed analysis typically quantifies what is visible from a given point based on terrain and other features, affordance theory introduces a more interpretive dimension by asking how visibility might have mattered to people inhabiting the landscape and therefore informs interpretations of the viewsheds in the case studies. Finally, with the caveat that they can be distorted by undiscovered sites or the differing size, wealth and power of villas (Eckardt *et al.* 2009, 79), Thiessen polygons can help generate a theoretical representation of villa estates, by focusing on separate sites, with straight lines drawn between neighbouring sites and a second series of lines drawn at the midpoint along each of the first series of lines at right angles. For this project, Thiessen polygons were generated using the Create Thiessen Polygons (Analysis) tool in ArcGIS Pro 3.02, which automatically constructed the polygons based on the villa site locations.

Lamyatt Beacon, Somerset

The scheduled (1003748) Romano-Celtic temple at Lamyatt Beacon was located 1.5 km east of the village of Lamyatt, Somerset, positioned at the summit of the now wooded, narrow ridge of Creech Hill (ST 6693 3619). Excavated between 1958-1960, and 1973, the temple measured 11 m square, with a central *cella* surrounded by an ambulatory. Two square annexes were symmetrically positioned on the east side, while a small sunken room on the south side, accessible only from the ambulatory, completed the layout (Leech *et al.* 1986, 262). The temple was constructed around AD 290 and remained in use until the early 5th century (Leech *et al.* 1986, 272). The finds assemblage is very similar to that at the scheduled (1017314) Romano-Celtic temple site at Cold Kitchen Hill, Wiltshire - which also included miniature axes, horseman brooches and antlers (Leech *et al.* 1986, 271) - located approximately 17 km to the east (ST 8342 3874), and in use between the early third and late fourth centuries AD.

The roads closest to Lamyatt Beacon were RR5b (Fosse Way) and RR465(x) / RRX037, with the latter road proposed to commence at a junction with RR5b at Pylle Hill, 5.5 km to the west of the temple (Woodhouse 1964). It has been suggested that RR465(x) / RRX037 terminated at the modern village of Lamyatt (Aston and Burrows 1982, 64). Furthermore, the excavators (Leech *et al.* 1986, 272) speculated that RR465(x) / RRX037 may have been intentionally constructed to provide direct access to the temple, suggesting that the road's construction around AD 300 reflected the temple's significance. Recent research (Godfrey 2024) suggests that there was likely to have been a road from Pylle Hill to Lamyatt. However, the road appears to have continued around the base of Creech Hill, passing through a valley before crossing the River Brue at Bruton, where a significant find of a lead ingot dating to AD 164-9 (RIB 2404.19) was discovered. Furthermore, whilst the remainder of the proposed route between Bruton and Semley requires further investigation, Woodhouse (1964) suggests that an 18th-century coach road '*of singular straightness*' to the west of Bruton, may indicate the course of the road, and research published in the Appendix to this paper demonstrates the continuation of RR465(x) / RRX037, between Pen Pits and Knapp Hill. Pen Pits was quarried from the Iron Age through the Roman period (Historic England 2024), suggesting a possible rationale for the construction of RR465(x) / RRX037. If, as seems likely, the full length of RR465(x) / RRX037 connected RR5b and RR46, it would probably post-date both roads but pre-date the temple's construction, by a significant margin.

Whilst it is unlikely that RR465(x) / RRX037 was constructed specifically to serve the temple, it is plausible that the temple location was chosen, at least in part, to take advantage of its proximity to this road and RR5b. In exploring this possibility, it is important to note that some other frequently observed associations with Romano-Celtic temples are not present at Lamyatt Beacon. It is notable that access to water does not appear to have been important in the decision to locate the temple on the hilltop. Furthermore, unlike at Cold Kitchen Hill, where the temple location appears to have been selected at least in part due to its historical and potentially ritual significance, dating to the Iron Age (Godfrey 2023, 23-26), there is very limited evidence for pre-Roman activity at Lamyatt Beacon prior to its construction (Leech *et al.* 1986, 308). The most significant prehistoric feature in the surrounding landscape is Fox Covert, an unexcavated partial contour Iron Age hillfort, located 650 m to the north-northwest, which is partially overlooked by the temple site. Whilst Woodward (1992, 22) has argued that hillforts were deliberately selected for temple construction, Bird (2004, 86) suggests that even where they were used, this was most likely connected to their elevated locations. However, Kamash (2016, 691) has emphasised a frequent failure to utilise hillforts, and it is the case that elsewhere in

Somerset - at Brean Down and Henley Wood - temples were located close to, but outside, a hillfort. There may have been a symbolic reason for this at Lamyatt Beacon, as the temple's elevated location, higher than the hillfort, may have been perceived as being closer to the gods while also offering greater prominence within the surrounding landscape. An alternative interpretation might be derived from Kamash's (2016 691) claim that Romano-Celtic temples may have been positioned to avoid the controversial Iron Age past, with features from this period left deliberately unused. Another possibility mentioned by Kamash (2016 691) is that not building directly over the Iron Age past may have been a form of protest that left a physical reminder of the ancestral memory and historic identity of native inhabitants. Therefore, it may also have been symbolically significant that this 'new' sacred location at Lamyatt Beacon overlooked the presumably empty hillfort, whilst also - as we will see later - benefiting from extensive visibility from the two roads, thereby aligning the temple with this powerful symbol of Roman authority and identity. However, in contrast to the relatively

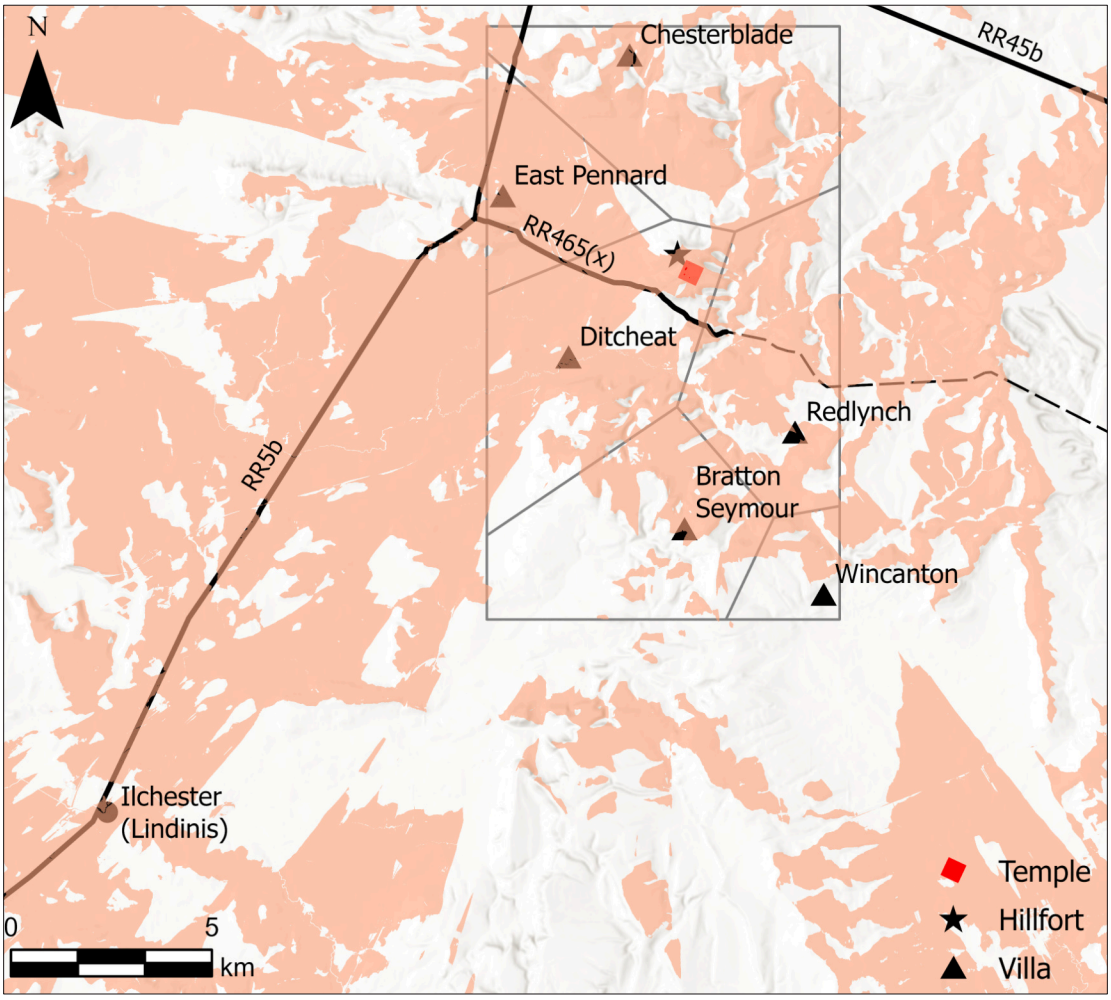


Fig. 1: Reverse viewshed of Lamyatt Beacon Romano-Celtic temple, with Thiessen Polygons (Author, 2024), Copyright for base layer: ArcGIS World Hillshade. Esri (2024)

early construction of the Titsey temple discussed later, Lamyatt Beacon was built much later in the Roman period, during the peak period of villa building and expansion in the wider region.

There is currently very limited evidence for contemporary field systems in the surrounding landscape, and of the non-villa sites, the most significant is at Evercreech (ST 6411 3630), where Broomhead (1988, 1–2) recorded a concentrated scatter of over 300 sherds of mid-2nd-4th centuries AD Romano British pottery, and which he suggests almost certainly represents an occupation site. Whilst the road is not mentioned in the report, this location is very close to where RR465(x) / RRX037 must have crossed the River Alham. More broadly, the construction and use of the Lamyatt Beacon temple coincided with a period of prosperity within the *civitas* of the Northern Durotriges, which was centred on Ilchester (Leech and Leach 1982, 78). Whilst the area to the north of Blackmoor Vale was more sparsely populated with villas than the area around Ilchester - where at least 50 villas of mainly 3rd and 4th century date were located (King 2023, 224) - there were six likely villas within 3.5-8.5 km of the temple site. Whilst only those at Bratton Seymour and Ditcheat have been excavated, Thiessen polygons provide a hypothetical estimate of the potential estate territories associated with the six villas (*Fig. 1*). Notably, whilst the East Pennard villa site is fairly close to RR5b and RR465(x) / RRX037, the hypothetical estate linked to the Ditcheat villa, located 3.5 km southwest of the temple, encompasses Lamyatt Beacon and a section of RR465(x) / RRX037 as it approaches the temple location. The limited dating evidence from Ditcheat suggests that the villa may have been contemporaneous with Lamyatt Beacon (Somerset HER 2023), and whilst the Thiessen polygon analysis should be treated with caution, the temple's position close to the boundary of four of the hypothetical villa estates might indicate that it was shared by them. This would be comparable to the temple at Wood End, Hertfordshire, which was located 3.5 km from two villas, and perhaps lying within the estate of one of them or on their common boundary and was likely to have been used by the local inhabitants of these estates (Smith 2018, 161). Furthermore, *Fig.1* demonstrates that Lamyatt Beacon was likely to have been visible from large parts of the hypothetical Ditcheat estate territory, the Ditcheat villa itself, and other nearby villa estates.

Therefore, whilst its location in relation to the nearby villas and the road network suggests that Lamyatt Beacon was not as '*isolated*' as Rodwell (1980, 233) has claimed, it does appear possible that it was, as he suggests, an '*estate temple*'. However, Leech *et al.* (1986, 272) argue that Lamyatt Beacon was a '*local cult centre*' and Smith (2001, 281) concurs in suggesting that it was a modest, yet prosperous religious centre, incorporating a Romanised cult. However, the estate temple and cult centre interpretations are not necessarily mutually exclusive. The focus of the cult was likely to have been Mars, conflated with a Cernunnos-type deity, which also appears to have been also venerated at Cold Kitchen Hill (Leech *et al.* 1986, 271–272). Furthermore, portable votive objects - which might be indicative of visitors travelling some distance - were found at the site, with some of the brooches being poor copies including one that could only have had symbolic value, which reinforces the idea that these portable brooches were made for visitors to a cult centre; intended either as votives or as souvenirs (Leech *et al.* 1986, 316-318). No other buildings were found at Lamyatt Beacon, and so unless further investigation reveals additional accommodation, if required this would have probably been via the use of tents. However, notwithstanding use of unknown local trackways, an analysis of likely travel times via RR5b and RR465(x) / RRX037 from Ilchester, other nearby population centres, as well as the junction with RR5b at Pylle Hill, suggests that the road network made Lamyatt Beacon highly accessible. For example, based on a presumed travel time of 4.3 km/hr by foot and 8 km/hr by horse, from Pylle Hill it would have taken approximately 1 hour, 15 minutes to reach the base of Creech Hill on foot, and 40 minutes by horse (Godfrey 2023, 59).

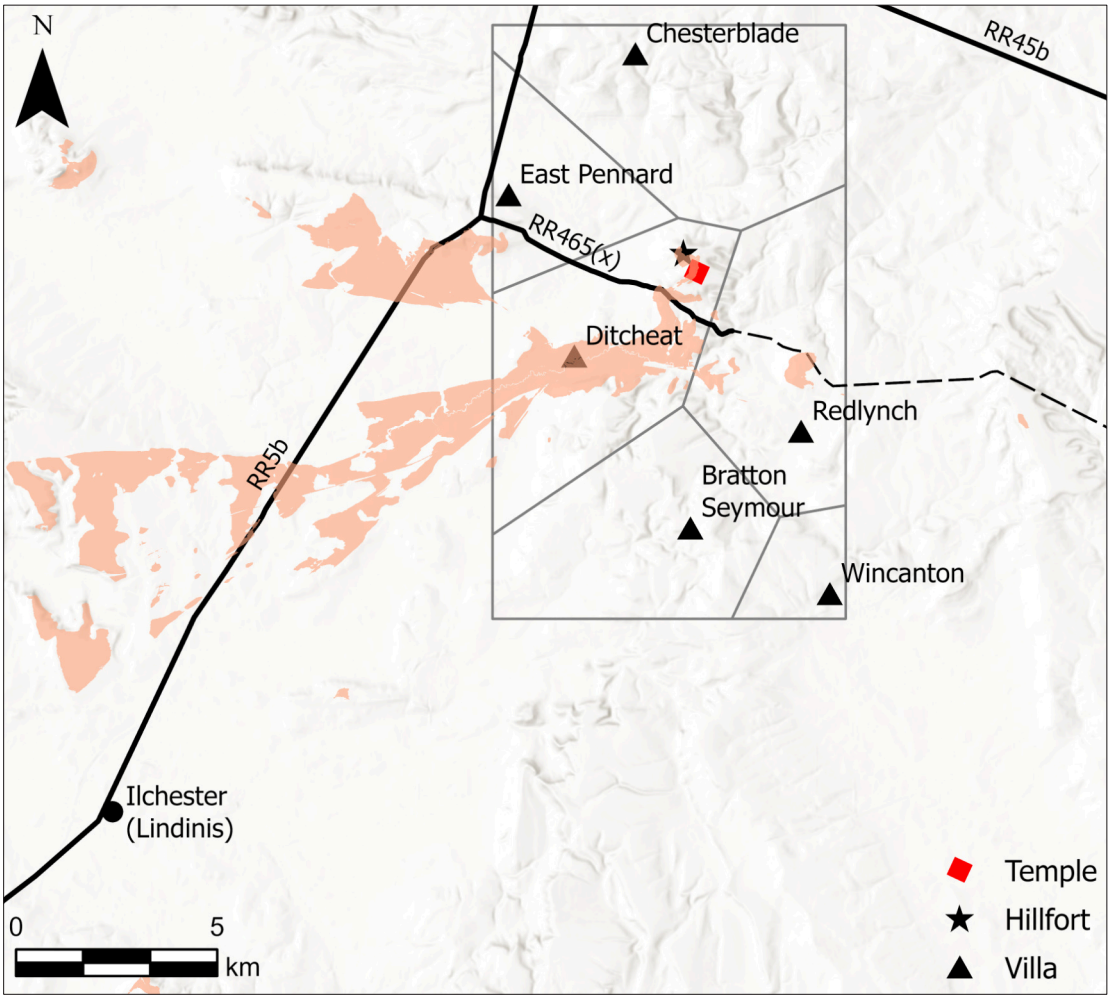


Fig. 2: Reverse viewshed of Ditcheat Roman villa with Thiessen Polygons (Author, 2024). Copyright for base layer: ArcGIS World Hillshade. Esri (2024)

If the selection of Lamyatt Beacon as a temple location was partly connected to an intention to capitalise on the pre-existing religious traffic on the Fosse Way, it may have been influenced by the success of the shrine constructed in AD 69 and subsequent temple sequences built around AD 230-250, close to the Fosse Way (RR5c) at Nettleton Shrub, which itself benefited from the significant volume of religious traffic travelling to the cult complex at Bath (Smith 2000, 312). However, the temple was set back from the road and within a steep valley meaning that it would have been scarcely visible from the road (Blagg 1986, 21). In contrast, whilst close to RR465(x) / RRX037, the steep climb to Lamyatt Beacon means that it was not a convenient roadside temple, yet it occupied a distinctive elevated position with extensive visual prominence. It is this prime visibility from the Fosse Way (RR5b) that Smith (2000, 280) suggests was likely to have contributed to the success of the Lamyatt Beacon cult. *Fig. 1* demonstrates that the temple was likely to have been visible from a significant stretch of RR5b. Furthermore, when this analysis is combined with the experience of walking sections

of the RR465(x) / RRX037 route from the junction with RR5b at Pylle Hill, it is evident that the temple is likely to have been a prominent feature along much of RR465(x) / RRX037 until reaching the present-day village of Lamyatt.

However, the motivations of the elite group that are likely to have been closely associated with the temple at Lamyatt Beacon, were not necessarily exclusively religious. Whilst the agricultural role of villas was significant, they also expressed status (Eckardt *et al.* 2009, 89). Much discussion has focused on villa architecture, mosaics, and furnishings (White 2023, 86). However, Romano-British barrows also served as displays of elite status. Whilst noting that the literature emphasises the role of barrows in elite display to transient populations via their proximity to Roman roads, a study of the Bartlow Hills in Cambridgeshire suggests that they were used to project power and wealth to a local audience (Eckardt *et al.* 2009, 76). Similarly, Romano-Celtic temples may also have served as a means of elite display to local and transient populations. Indeed, Smith (2000, 312) suggests that the visual dominance of temples such as Lamyatt Beacon over long distances, aligns well with the idea that they reflected the status of the competitive native elite. It is notable that, in contrast to the East Pennard villa, which was located near to RR5b and RR465(x) / RRX037, the Ditcheat villa was situated farther from both roads. Additionally, the Ditcheat villa was not as highly visible from either road or the surrounding landscape (*Fig. 2*). As a result, the temple may have served as a more effective means of expressing and projecting status for the group associated with this villa.

Whilst the desire to select an elevated spot to be closer to the gods may have been a factor, the visual prominence of Lamyatt Beacon from RR5b, RR465(x) / RRX037 and the surrounding landscape of villa estates, combined with the accessibility provided by the roads were likely significant factors in the selection of this location. In addition, to local visitors from nearby villa estates, these characteristics, together with the adoption of a well-established cult from Cold Kitchen Hill, would have helped attract visitors from further afield, including those travelling longer distances, such as to and from Bath. Furthermore, the siting of the temple may reflect the desire of an elite group, situated away from the densely populated villa area to the south-west, to exploit its advantages of visibility and accessibility in order to extend its influence to the region around Ilchester. The success of the Lamyatt Beacon temple's establishment is reflected in the construction of the Brean Down temple, built 40 years later and 45 km to the west. Similar in design and oriented directly toward Lamyatt Beacon, Brean Down also yielded antler finds, suggesting veneration of the same cult. Located within the same *civitas*, it is uncertain if the Lamyatt Beacon temple itself would have been visible across the Somerset Levels, but visibility analysis confirms previous suggestions (e.g. Leech *et al.* 1986, 271) that the hilltop itself was very likely visible, acting as a physical proxy for the temple that sat upon it (Godfrey 2023, 87).

Titsey, Surrey

The scheduled (1018506) Romano-Celtic temple at Titsey was situated on a clay rise which forms part of the Surrey Hills (TQ 4212 5496). Excavated in 1879 and 1935, the building had a *cella* measuring 6.17 x 6.48 m surrounded by an ambulatory, within a *temenos* of 30 x 31 m, surrounded by a substantial wall (Graham 1936, 88-89). The area within the *temenos* and around the temple itself was disturbed in the medieval period, and little meaningful assessment can be made of the quality or quantity of offerings (Bird 2004, 86). The temple was situated beside RR14, approximately 1 km south of where the road descends the North Downs escarpment. Margary (1973, 59) suggests that RR14 connected London

with the ironworking sites in the Weald or the corn-growing districts of the South Downs. However, Entwistle (2023, 90) suggests that establishing a boundary between imperial and client kingdom territories near the strategic Thames crossing may have been a concern, whilst Bird (2004, 85) proposes that the temple may have been situated near the boundary between the Atrebates and Cantiaci . The Pilgrims Way trackway - named for its later connection with Christianity - was likely in use during the Roman period (Margary 1973, 35). It ran east-west along the foot of the escarpment, crossing RR14 approximately 600 m to the north of the temple. Although Squerryes Park Camp hillfort is located 3.6 km to the southeast, there are few other recorded prehistoric monuments, Romano-British field systems, or settlements in the area. However, there is a rare combination of two winged-corridor villa buildings facing each other across a stream (TQ 4052 5462 and TQ 4058 5454) at Titsey Park (Davies 1997, 2-3), 1.6 km to the west of the temple site.

The *temenos* wall of the Titsey temple is aligned parallel to RR14, located within 4.57 m of where the road slightly shifts its alignment. There are other examples of temples situated at points where roads change alignment, such as Friars Wash, north of *Verulamium.* Although there is no significant evidence of pre-temple ritual activity at Friars Wash, two conjoined Romano-Celtic temples were constructed around the early 2nd century AD (Smith 2018, 161). Located approximately 400 m east of RR1e (Watling Street) – which was constructed in the immediate post-conquest period - the temple complex is positioned where the road alters direction. Smith (2018, 161) suggests that the elaborate design of the temple complex, and possibly its existence, can be attributed to the regular traffic along Watling Street.

The chronological relationship between the temple and road at Titsey is less straightforward. Whilst the pottery finds suggest that the temple was in use until some point in the 3rd century AD, the only indication of its construction date is provided by fragments of box-tile of the same pattern as fragments found in the temple debris. These were discovered in the road metalling, including '*right at the bottom*', which Graham (1936, 94-95) argues must have been incorporated during the road's original construction, not during a later repair. Margary's (1933, 39-42) discovery of pottery from RR14, further south at Barcombe Mills, suggests that the road was constructed no later than AD 150, and possibly closer to AD 100, or before. Based on this, Graham (1936, 95) argues that the road and temple were constructed simultaneously, with the box-tile incorporated into the road as builder's debris that was left around the site during construction. Box-tiles are typically associated with hypocaust floor heating and given the lack of evidence for such heating systems in Romano-Celtic temples, Bird (2004, 86) may be correct in suggesting the presence of a bathhouse closely associated with the temple. Nevertheless, no investigation has yet been undertaken beyond the *tememos* that might reveal additional buildings. Given the evidence, it does appear likely that the road and temple were constructed broadly simultaneously, as the box-tile recovered from the road suggests the possibility that the temple and potential associated buildings were already constructed or under-construction when the road was built. Furthermore, it would be an improbable coincidence if this long-distance road had passed by an already existing temple, requiring only a slight shift in alignment to accommodate its presence. Furthermore, it is possible that RR14 and RR150 were laid out through a coordinated surveying effort soon after the conquest, as, despite being 13 km apart, they run parallel to each other (Entwistle 2023, 83-39).

Graham (1936, 93) suggests that a slight change of alignment at the temple location was necessary for RR14 to maintain a reasonable gradient for ascending the escarpment to the north. However, he also notes that if this shift in direction had occurred slightly farther south, it would have routed the road

on higher ground, avoiding a marshy hollow associated with the stream to the north. This suggests that the specific location of the turn was chosen for a reason that outweighed the practical benefits of an alternative route. Whilst acknowledging that it may be accidental, he observes that the southern alignment of the road points directly at the east front of the *cella*, albeit at an oblique angle. With no other obvious landmarks to the north, he suggests that the road may have been aligned with something already present at the location of the *cella* - such as an earlier shrine, which would make it logical for the road to turn just before reaching that structure. However, whilst pottery from the end of the Iron Age and possibly the early years of the Roman period, which predates the temple, might suggest a settlement here, there is no evidence for an earlier sacred site (Dunning 1936, 97).

It seems more likely, particularly given the box tile evidence found at the bottom of the road, that there was some degree of coordination between the builders of RR14 and those of the temple and any associated buildings. This coordination may have influenced both the selection of this location for the temple and possibly the decision to alter the road's alignment at this specific location. Nonetheless, while the opportunity to locate the temple in a position requiring a slight change in alignment may have had symbolic significance, Bird (2004, 85) questions why this location, on a slight rise, was chosen rather than one a little further north on the top of the scarp slope of the Downs, which would have afforded more extensive visual prominence. A reverse viewshed modelling of a hypothetical temple location (*Fig. 3*) at the top of the escarpment supports Bird's (2004, 85) assertion that such a position may have provided greater visual prominence in the overall landscape than the actual temple site. However, as discussed below, this hypothetical location would have offered broadly comparable visibility to the actual temple site from RR14. Bird's (2004, 85) explanation is that the spring, located 100 m to the north and marking the source of the River Eden, may have been a significant ritual factor in the selection of the actual temple location. In addition to the known association between Romano-Celtic temples and springs, it can also be argued that there may have been a symbolic connection with the river's source. This seems to be the case at Springhead in Kent as well as at the likely Romano-British shrines at Hailey Wood Camp, Sapperton, and Wycomb in Gloucestershire (Smith 2018, 126).

Another reverse viewshed (*Fig. 4)* confirms suggestions that the actual temple is likely to have been visible from RR14 (Blagg 1986, 21). The temple may have been visible from the road as it descended the escarpment and headed south. After a brief stretch where the temple would have been obscured at points, due to a slight depression, it became potentially visible again as the road approached the temple. Additionally, it may have been visible from long sections of the southern approach, and, as Bird (2004, 85-86) suggests, the effect of the change in road alignment may have created the impression that the long straight stretch from the south was heading directly at the temple. The viewshed also suggests that the temple may have been visible from Pilgrims Way, particularly to the north-east of the temple. In this way, the temple would have served as a signpost for travellers, and as Blagg (1986, 21) suggests, offered '*a place where divine protection and sanctuary, and perhaps more worldly comforts, would be repaid by the worshippers offerings which financed the building and maintenance of the temple.*'

If the road and temple were constructed simultaneously, this suggests that the temple builders had sufficient influence to communicate and collaborate with the authorities before or during the construction of RR14. Therefore, Blagg's (1986, 24) description of the people who constructed the temple at Titsey as '*local farmers*', perhaps undervalues their status. Indeed, whilst the dating evidence is not definitive and the chronology for both sites remains limited, given the probable involvement

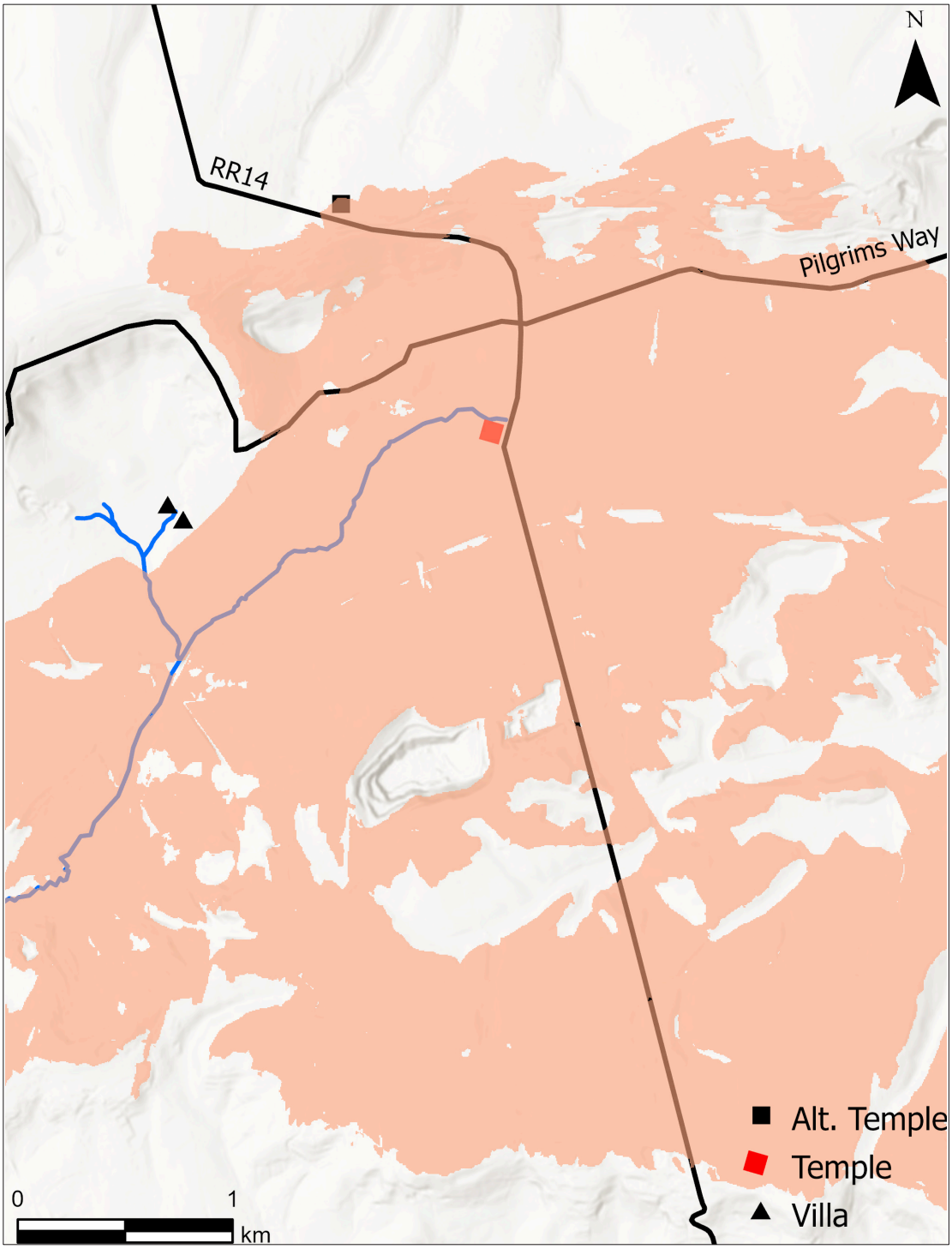


Fig 3: Reverse viewshed of hypothetical alternative Titsey temple site (Author, 2024). Copyright for base layer: ArcGIS World Hillshade. Esri (2024)

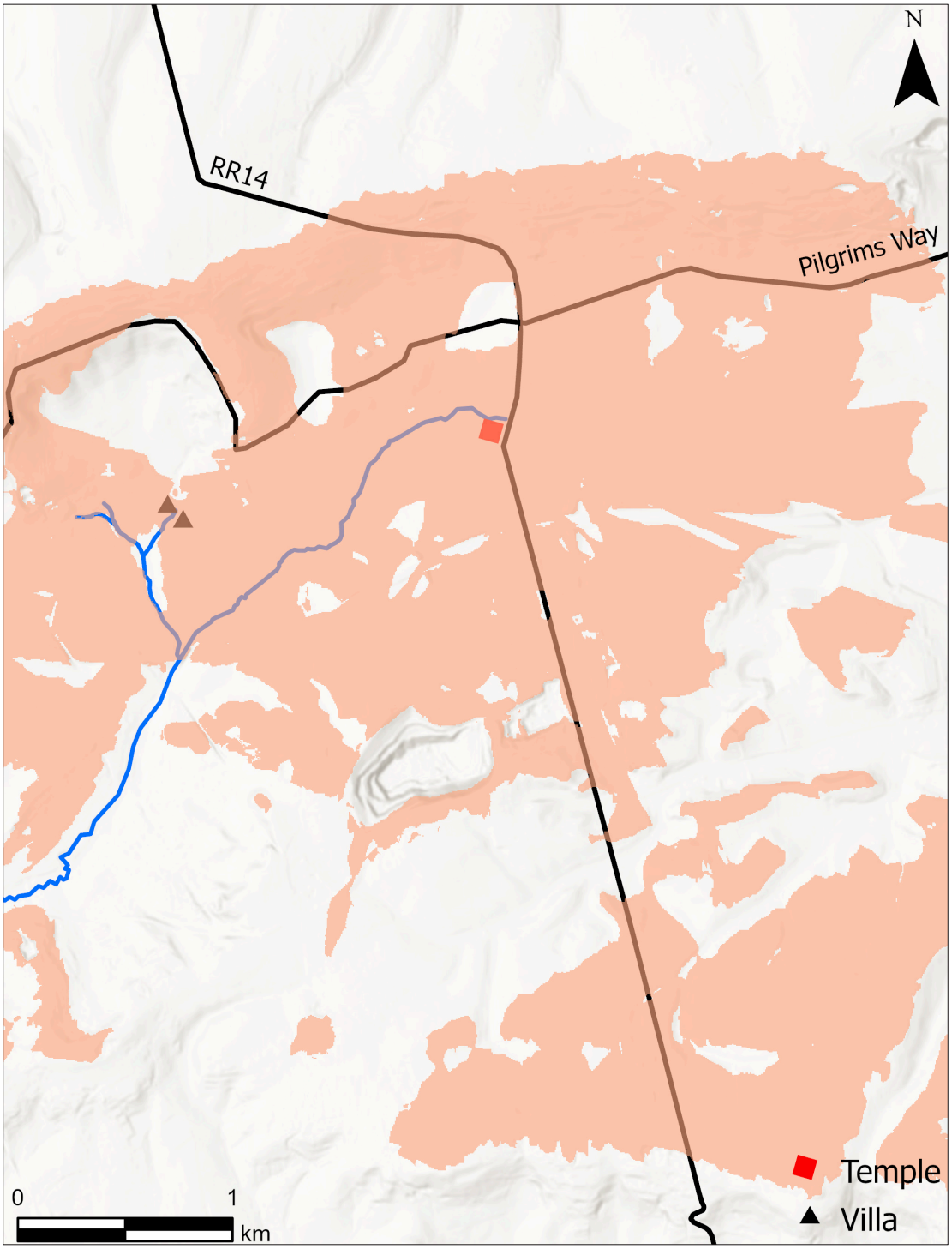


Fig. 4: Reverse viewshed of the Titsey Romano-Celtic temple (Author, 2024). Copyright for base layer: ArcGIS World Hillshade. Esri (2024)

of the native elite in constructing Romano-Celtic temples, it is noteworthy that the Titsey Park villa was built perhaps within a few decades after both RR14 and the temple, remaining in use until the 4th century AD. Furthermore, whilst a modern drain now cuts across the stream overlooked by the two winged-corridor villa buildings from the River Eden to the south, historic maps (Digimap 2024) show that, until relatively recently, this stream fed directly into the river. Therefore, the villa buildings and temple were connected by the watercourse, and this may have been symbolically significant. Further research may reveal more tangible connections between the villa and temple. Moreover, the temple may have provided an earlier opportunity for the local native elite to project their status through its patronage, with its placement deliberately chosen in a prominent, accessible location beside RR14. Although those who constructed the villa in the following decades may not have been the same individuals who patronised the temple, they may have belonged to the same enduring elite families. As Blagg (1986, 24) argues when discussing temples in Britain more generally, this may have reflected a deliberate response to the road as a new element in the landscape, where '*the political and the vernacular landscapes could meet*'. Thus, by positioning the temple at the roadside during the early Roman period, the builders signified their alignment with Roman authority.

In summary, coordination between the temple builders and the Roman authorities may have facilitated the construction of the temple near a slight adjustment in RR14's alignment - an alteration necessary for engineering reasons. This placement would have given prominence to the temple, whilst its location on a slight rise afforded it visibility to travellers approaching from either direction. Additionally, the spring, which is the source of the River Eden, may have enhanced the site's appeal, whilst a nearby boundary might have further contributed to its significance. Finally, the temple's location beside a road, but not part of a larger settlement, along with the box-tile evidence, suggests it may have been a key element of a roadside religious complex. However, further investigation beyond the *temenos* will be necessary to identify any additional associated buildings.

Conclusion

Research on Romano-Celtic temples has primarily focused on site-specific analysis, with limited discussion of their landscape settings, and often restricted to tangential observations. Similarly, whilst the relationships between Roman roads and Romano-Celtic temples have been acknowledged, they remain under explored. This article has argued that there is considerable potential for investigating these relationships. However, as demonstrated in the case studies, roads and temples cannot be meaningfully examined in isolation, and therefore a fully contextualised, landscape approach is recommended. Key questions to explore include why particular locations were chosen for temple construction, whether the location of specific temples influenced nearby road routes, and vice versa, together with broader questions around the roles of roads and temples in the landscape and society, as well as the potential impact of the landscape settings on people travelling to temples. Themes to consider may include the symbolism and meanings associated with landscapes, temples, and roads, alongside ideas related to the nature of travel to temples and the blurring of sacred and secular interests. Finally, whilst this article has concentrated on Roman roads and specific categories of Romano-Celtic temples, a broader study encompassing a wider array of temple settings and other sacred sites in Roman Britain could provide a more comprehensive understanding of the topic.

Acknowledgements

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Appendix: RR465(x)/RRX037, Pen Pits to Knapp Hill

Evidence for RRX037 from a junction with RR5b at Pylle Hill to Bruton, Somerset, was discussed in Itinera IV (Godfrey 2024, 361-364) and resulted in the new Margary number RR465(x) being reserved. This article assesses the annotated aerial photographs (APs) and maps from the Ordnance Survey Archaeological Division (OSAD 2018) archive together with new evidence, for a proposed section of RR465(x) /RRX037, from Wolverton, Wiltshire, to Knapp Hill, Dorset, which is assumed to terminate at a junction with RR46 near Semley, Wiltshire (*Fig. 1*). NB: All references in this article to the Ordnance Survey Archaeological Division (OSAD) relate to the OSAD'S RRX037 files – including notes, maps and AP's - digitised by the Roman Roads Research Association in 2018, and available to members on its website. The approach to referencing this is to reference the date of digitisation i.e., 2018, and the relevant page number in this archive file e.g. OSAD (2018, 1).

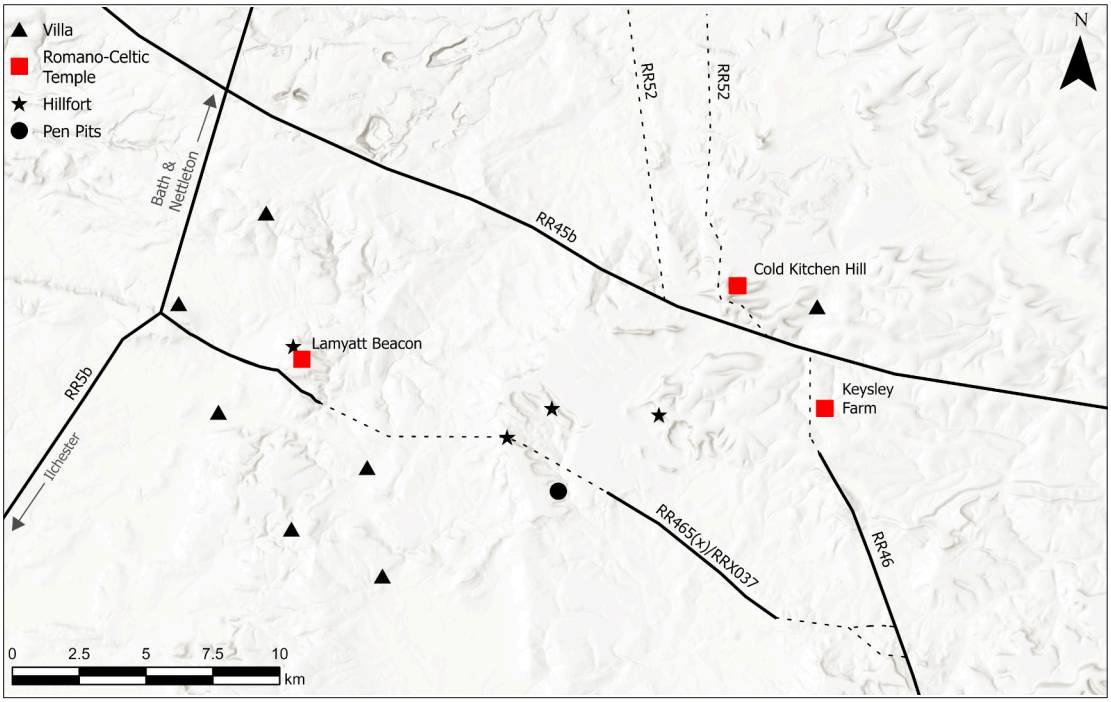


Fig 1. Overview of RR465(x) /RRX037 within the Roman road network (Author 2025). Copyright for base layer: ArcGIS World Hillshade. Esri (2025)

The first observation by the OSAD (2018, 11) for the road west of Pen Pits, relates to a '*faint trace*' and '*old field bank*' in AP's (OSAD 2018, 38, 39) of a field at ST 78568 31583, to the west of Zeals, now replaced by the A303. If RR465(x) /RRX037 continued its trajectory to the north-west for another 1.5 km from this point, it would pass Pen Pits. Greensand – used to make querns - was quarried here (Historic England 2024), and whilst the scheduled (1006139) site is located at ST 76732 31512, the quarry covered an extensive area. Crawford (1953, 100) argues that quarrying here took place because of the presence of a road, on the basis that '*querns are heavy, and there was no object in quarrying them elsewhere, when, by quarrying them beside the road, transport over rough, trackless country could be avoided'.* However, quarrying appears to have commenced in the Iron Age, continuing throughout the Roman period (Historic England, 2024), thus whilst the construction of a Roman road may have been influential in the further exploitation of this resource, it appears unlikely that quarrying commenced due to its presence.

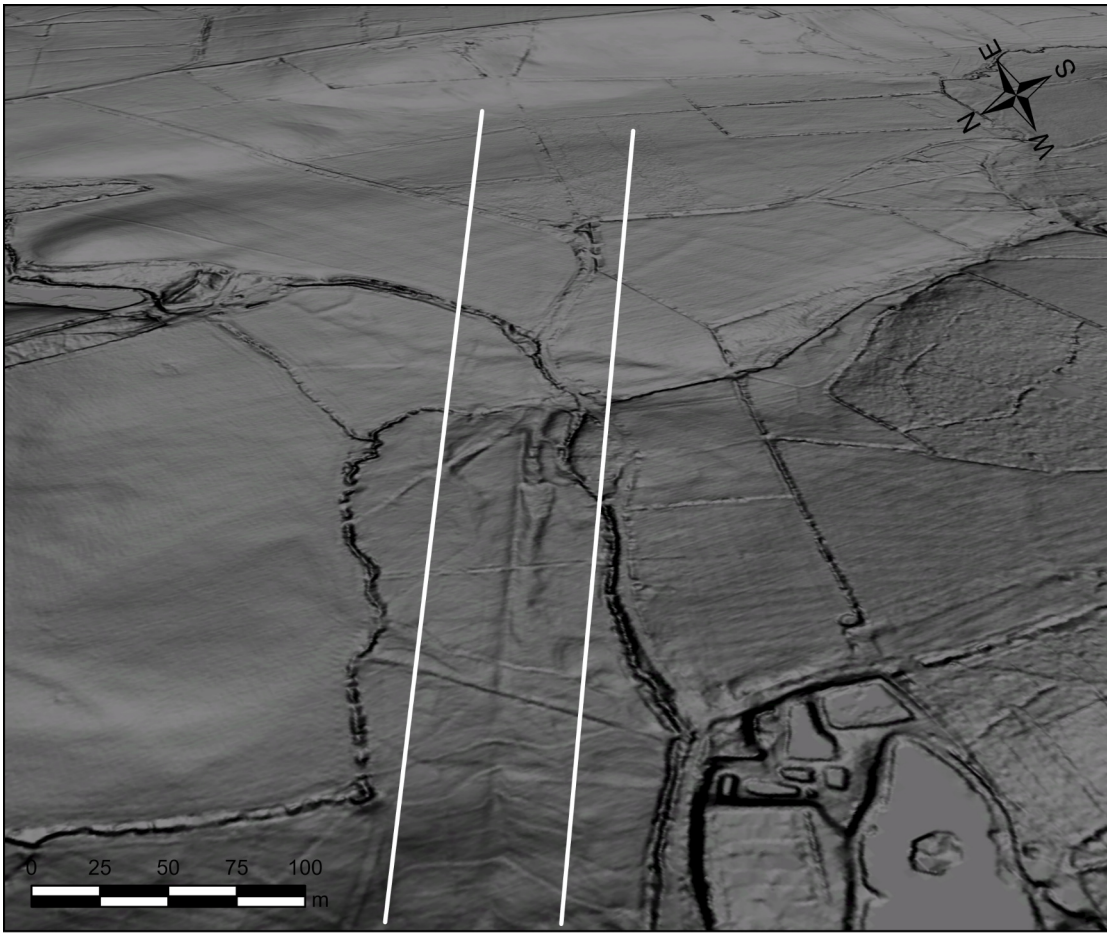


Fig. 2: 3D multi-directional hill shaded lidar image, orientated south-east from the field centred at ST 79211 31236. Lidar data © Environment Agency copyright and/or database right 2020. All rights reserved

Crawford (1953, 100) suggested that the road he refers to was *'in medieval times the boundary between the forests of Gillingham and Selwood and was called Hunting Path. Further west it is still called Hardway'*. He

goes on to suggest that it '*was one of the major routes of England*', passing by Stonehenge to the east. A note in the RRX037 OSAD archive (2018, 2) suggests that it is '*probable*' that Crawford (1953) was correct in arguing that RR465(x)/RRX037 '*was earlier aligned*' to pass through the natural '*gate of Wessex*', one of the main natural arteries leading westward off the chalk downs into the west country. However, the evidence presented below, suggests that if this road existed, it was very unlikely to be RR465(x)/RRX037. Furthermore, if the road line for RR465(x) /RRX037 in the study area considered in this article is extrapolated to the north-west from the first firm evidence in the field centred at ST 79211 31236, it is notable that the route would come close to the end (ST 74581 33540) of the 18th-century coach road '*of singular straightness*' (commencing at ST 70312 33337), that may indicate the route of RR465(x) /RRX037 to the west of Bruton (OSAD 2018, 1-2). Whilst further research is required on the proposed section of RR465(x) /RRX037 between Bruton and Pen Pits, both the coach road – lidar evidence shows it terminating 320 m from the western rampart – and the projected route that passes Pen Pits as it approaches from the east, intersect at Kenwalch's Castle. This is a scheduled (1008257) large univallate hillfort situated on the north end of a ridge in the hills of the Somerset/Wiltshire border (ST 74777 33536) (Historic England, 2025).

560 m to the south-east of the '*faint trace*' discussed above and on the same line is the first extant evidence for the road to the west of Pen Pits. The Wiltshire Historic Environment Record (2024), note '*probable medieval settlement earthworks*' in a field centred at ST 79211 31236, based on a RCHME Survey Map from 1994, which states: '*earthworks not surveyed*'. Lidar imagery (*Fig. 2*), when considered alongside the evidence that follows, suggests that this feature is the *agger* of RR465(x) /RRX037, extending 422 m in a south-easterly direction across the field, cut by several north-easterly oriented linear features. Historic mapping (Digimap 2025) – which does not record any feature in the location of the likely *agger* – confirms that at least two of these features are former field boundaries, which are also evident on lidar imagery and OSAD APs (2018 37-39). The OSAD (1983, 11) noted a ''*holloway*' in this field, and a *'parch mark on line*', whilst AP's (Google Earth (GE) 03/2016a; OSAD 2018, 37, 38, 39) reveal the likely *agger*, which was also visible during a recent drone survey (*Fig. 3*).

An AP (GE 03/2016a) shows a faint trace of the *agger* continuing on the other side of the field boundary to the south-east at ST 79536 31056. The road had to cross a watercourse immediately to the south-east of this feature, before AP's (OSAD APs 2018, 26, 37) show traces of the road at ST 79720 30929. Furthermore, lidar imagery *(Fig. 2*) reveals a faint feature continuing the *agger* line from the first field centred at ST 79211 31236 and crossing the subsequent 3 fields before eventually joining a short section of straight field boundary at ST 79913 30826. Lidar imagery also reveals that the road is likely to have cut across an unrecorded possible '*Celtic field system*' in this area.

The road line follows the field boundary for 370 m until ST 80247 30699, where it shifts alignment slightly to the south-east, and continues in a straight line of further field boundaries for 1200 m until ST 81272 29965. Lidar imagery and AP's (OSAD 2018, 28, 36, 37) show a short stretch of rough earthworks that may be related to the road, to the south of the hedge line at ST 80309 30622. Furthermore, this entire stretch of hedge line marks both the present unitary authority boundary and that between the parishes of Mere and Gillingham; it is also marked on historic maps (Digimap 2025) as the '*Union and R.D. (rural district) boundary*' and has formed part of the Wiltshire/Dorset boundary since at least 1831 (Dorset County Boundary Survey 2025). Furthermore, a public footpath also runs along the boundary for most of this section. The likelihood that this boundary is of a much earlier date is suggested by possible ridge and furrow either side of the hedge on OSAD APs (2018, 28) and lidar imagery between ST 80250 30696 and ST 80975 30181.



Fig. 3: Drone-captured AP orientated north-west towards Wolverton, across the field centred at ST 79211 31236 (Author, 23/12/24)

At ST 81272 29965, where the straight line of field boundaries ends, the road had to cross the Shreen Water River. The OSAD (2018, 11) refer to a crop mark here, and whilst it is not visible on any APs in the OSAD archive, a Google Earth AP (12/1945) possibly shows this aligned with the hedge line at ST 81293 29950. On the other side of the river, lidar imagery indicates higher ground, which might suggest that the road may have skirted the base of this, although this would require a slight shift in alignment from the crop mark discussed above. There has been much activity in this and adjacent fields, and historic maps (Digimap 2025) show that Longelm Farm previously occupied the location centred at ST 81469 29808 and may account for some features. Nonetheless, OSAD APs (2018, 30, 31, 36) show a possible faint trace of the line crossing the heading south-east across the first two fields, with Google Earth APs (12/2009, 03/2016b) also showing a feature on the line at ST 81463 29797.

From just above the modern road junction at ST 81665 29644 there is a straight field boundary accompanied by a public footpath, until Longmoor Farm. Whilst an OSAD (2018, 6) note suggests ''*hedge bank on line. No trace of agge*r', an OSAD AP (2018, 31) shows earthworks – possibly the *agger* – running above the field boundary, whilst lidar also reveals this feature running from ST 81809 29573 to ST 82027 29458, together with two possible extraction pits. Shortly before Longmoor Farm at ST 82063 29404, the OSAD (2018, 6) note a '*raised earthen strip 7m wide, 0.7 m high, enclosed within hedges*'. Lidar imagery suggests that this is in fact two linear features in parallel, at least one of which does not



Fig. 4: Multi-directional hill shaded lidar image of field at Longmoor Farm, centred at ST 82503 29115. Lidar data © Environment Agency copyright and/or database right 2020. All rights reserved

appear to be the road. An OSAD note (2018, 6) refers to AP's showing crop marks of the road heading south-east after Longmoor Farm, crossing the field centred at ST 82462 29133 until it meets the field boundary. This section can be seen as faint crop marks on several APs (OSAD 2018, 32, 33, 41), which correspond to a feature spanning the same location on lidar imagery, together with possible extraction pits (*Fig. 4*). Whilst there is a public footpath crossing this field, the current course runs slightly above the road route, and veers away to the east, before reaching the field boundary.

An OSAD AP (2018, 41) also appears to show the *agger* crossing the field boundary and into the field centred at ST 82556 28885, before crossing a stream and the modern road, into the field centred at ST 82792 28685. The road is also clear in a crop mark cutting across the top the latter field for 205 m as it approaches Lawn Farm on a Google Earth AP (12/2006) (*Fig. 5*). The entire section of road to this point from Longmoor Farm is also visible on lidar imagery corresponding to the APs (*Fig. 4*). The next evidence for the road appears as it crosses the field boundary at ST 83108 28536, just past the

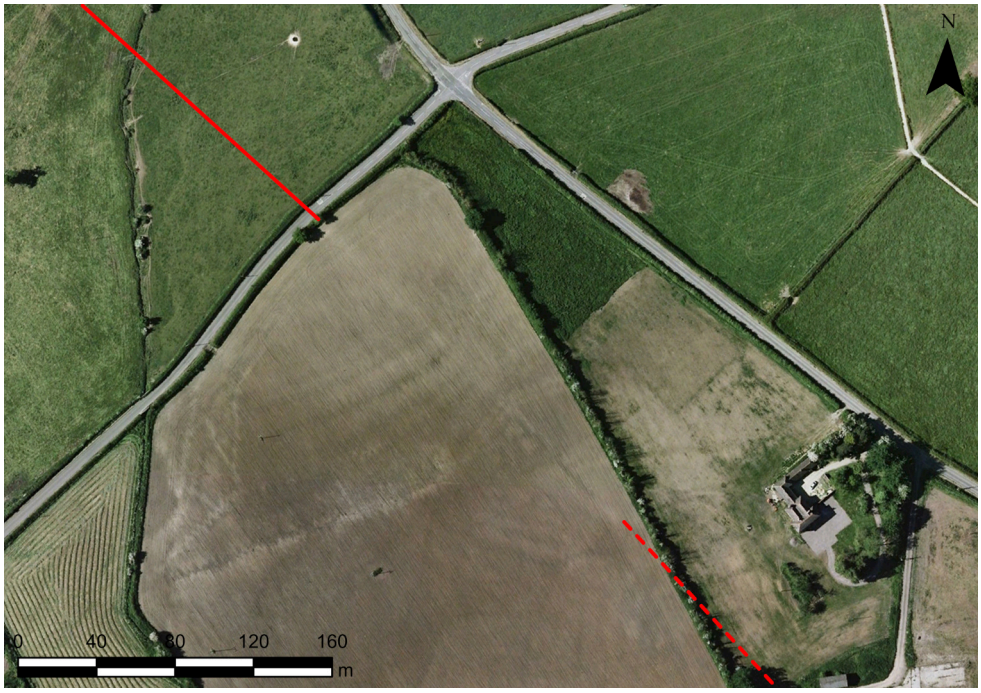


Fig. 5: Aerial Photograph of field at Lawn Farm, centred at ST 82804 28812 (Google Earth 12/2006)

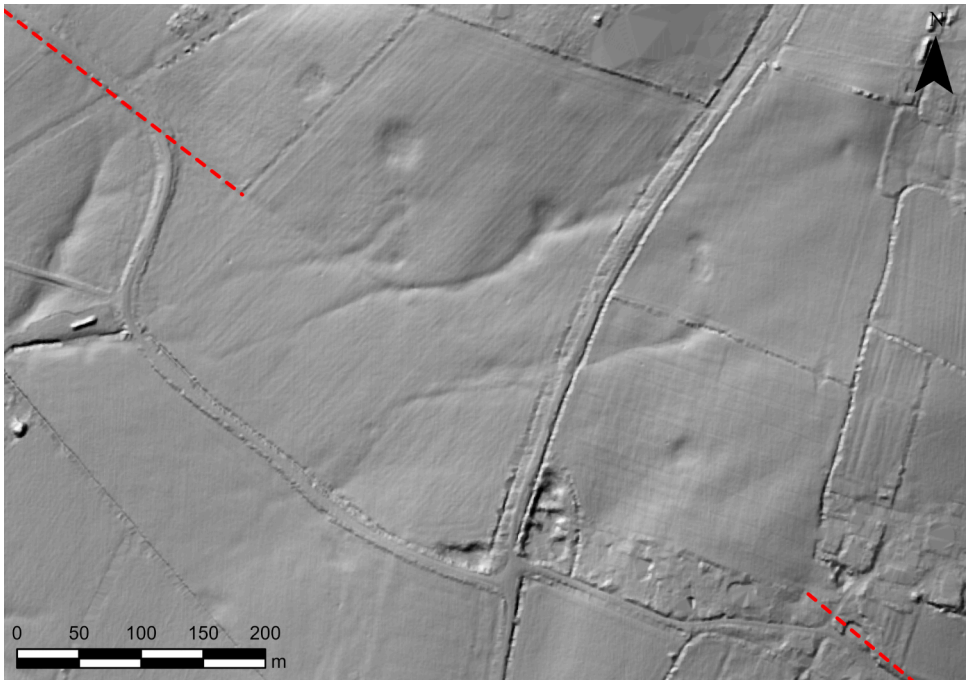


Fig. 6: Multi-directional hill shaded lidar image, centred at ST 84205 27705. Lidar data © Environment Agency copyright and/or database right 2020. All rights reserved

buildings of Lawn Farm, in the form of a trace on OSAD APs (2018, 41, 42, 43). Here lidar imagery suggests that line appears to skirt the southern slope of a small hill as it approaches the River Lodden. Once across the river, faint traces on OSAD APs (2018, 14, 15) suggest that the route joins the modern road at ST 83522 28138 just before it straightens for 570m.

At the end of this straight stretch of modern road, at the point where it turns south (ST 83995 27797), a short section of field boundary continues the modern road line for 55 m. Historic mapping does not show any previous field boundaries that might account for the feature, and therefore what appears to be the road is then visible on APs (OSAD 2018, 42, 43, GE 03/2017) and lidar (*Fig. 6*) as it skirts the base of a small hill, until the next field boundary at ST 84302 27616. 3D lidar imagery (*Fig. 7*) also appears to show the road crossing this field and across the boundary into the next field, centred at ST 84422 27576. Possible extraction pits are evident in the lidar imagery in both fields (*Fig. 6 & 7)*.

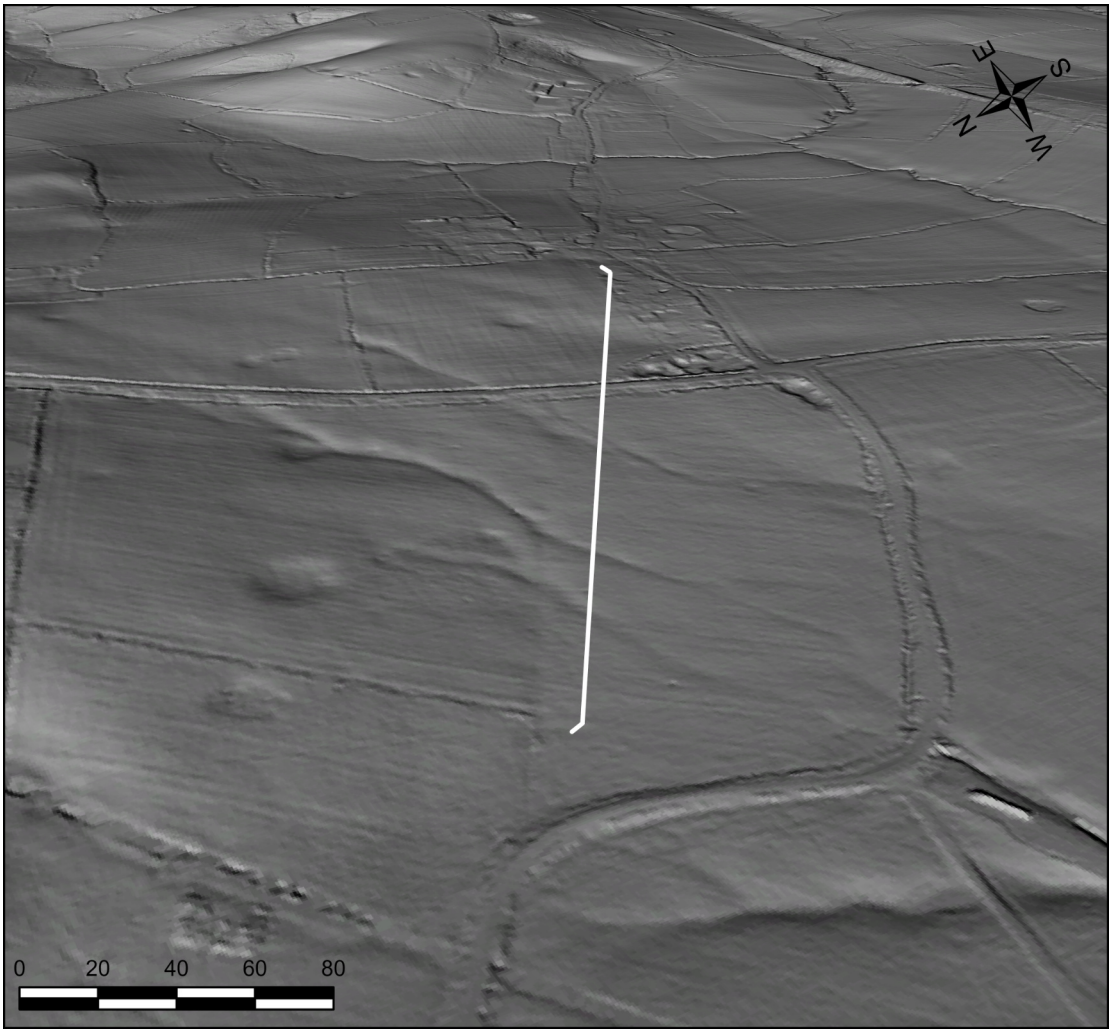


Fig. 7: 3D multi-directional hill shaded lidar image, orientated south-east from the field centred at ST 84205 27705. Lidar data © Environment Agency copyright and/or database right 2020. All rights reserved

The route then continues to join a fairly straight stretch of modern road for 500 m, until it reaches Culverhouse Farm (ST 85026 27137). From here the OSAD (2018, 6) tentatively suggest that the road skirted the southern slope of Knapp Hill before rejoining the modern road at Hugglers Hole (ST 86182 27031). It is notable that from here until ST 88141 26633, the line follows the modern road, before continuing straight onto a continuous line of field boundaries that date to at least the earliest OS

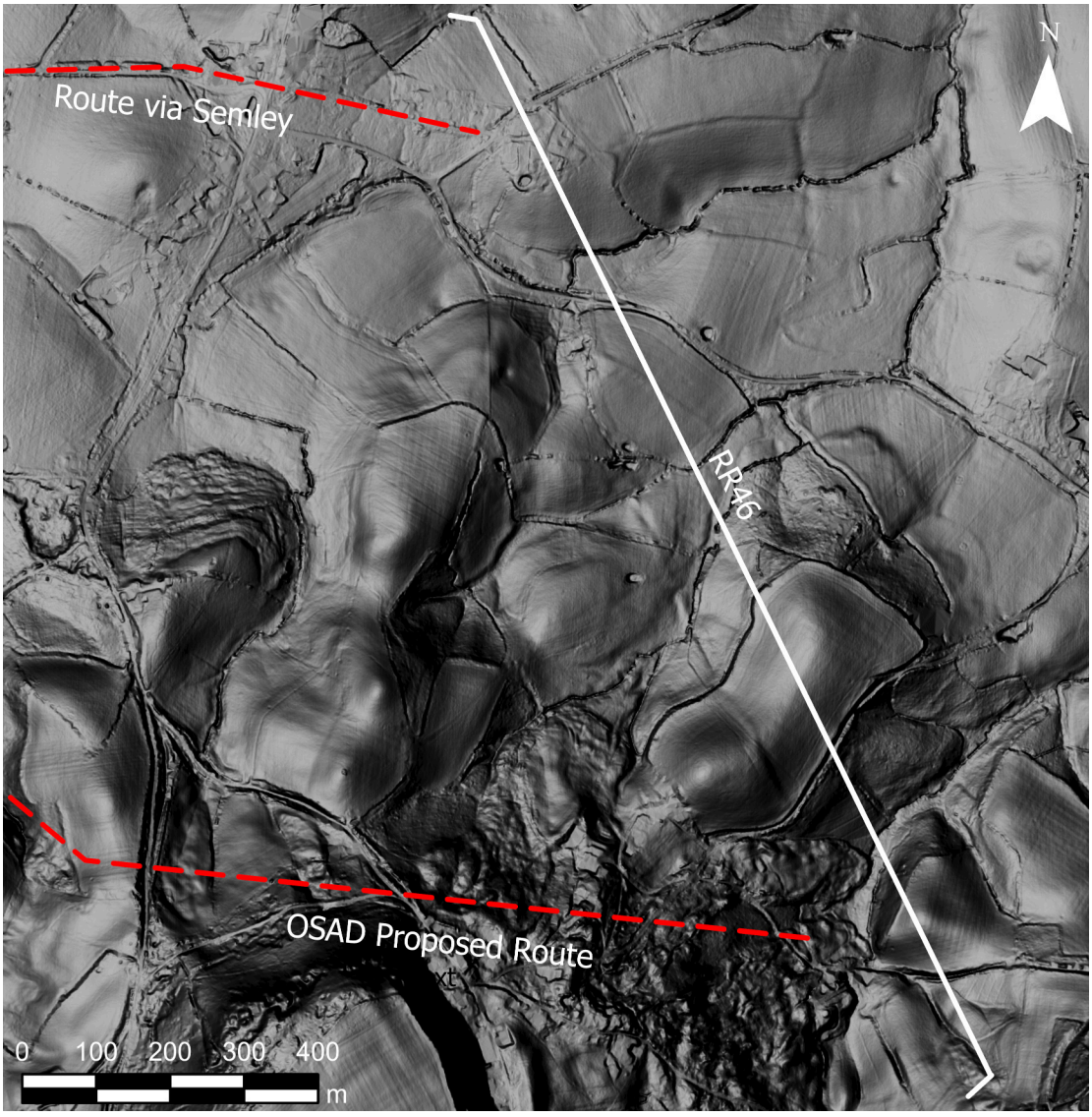


Fig. 8: Multi-directional hill shaded lidar image, centred at ST 89608 26232. Lidar data © Environment Agency copyright and/or database right 2020. All rights reserved

maps (Digimap 2025), eventually bearing south-east to where the line of field boundaries end and where this projected route would have crossed the River Sem (ST 88138 26627). From here, the OSAD

(2018, 7) suggest that it is '*feasible*' that the road headed south-east for 1 km, before taking a sharp turn to the east for 1.1 km until it joined RR46 at ST 89997 25850. RR46 is visible on lidar in this area for 960 m from ST 90147 25597 to ST 89748 26340 (*Fig. 8*). An alternative route to that proposed by the OSAD would continue in a fairly straight to line to RR46 by bearing very slightly north-east from the end of the straight line of field boundaries at ST 87694 26866 until the line joins a modern road at ST 88525 26956. Following a straight section of road through Semley, a public footpath (Ordnance Survey 2025) continues the line from ST 89212 26975 to eventually meet the route of RR46 at ST 89495 26919 (*Fig. 8*).

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The Principles of Roman Surveying as Displayed in Long-Distance Alignments

by Robert Entwistle
rob.i.entwistle@gmail.com

Abstract

This paper seeks to place Roman Long-distance Alignments in the context of both known Roman surveying methods and relevant modern practice. Although their existence has never been seriously challenged, Long-distance Alignments (laid out for presumably strategic reasons) can now only be identified indirectly through the roads and forts which used them to determine route and location. We briefly examine their nature, but chiefly consider how these remarkable works may have been laid out and why they took the form they did. Conclusions will relate to the strengths and weaknesses of Roman surveying methods.

Over twenty examples of Long-distance Alignments have been identified over the last two decades, but this paper mentions only a few to illustrate points being made. A fuller range can be found in Britannia Surveyed *(Entwistle 2019), and in* The Identification of Long-Distance Roman Alignments in Britain *(Poulter 2022).*

The Nature of Surveying

Topographical surveying, as understood today, seeks to determine and establish the boundaries, area and elevations of land and artificial features through the measurement of angles and distances. Accuracy depends upon methods used, the precision with which they are employed, and the levels of accuracy anticipated and required at the outset. In Roman times, no less than now, accuracy would depend on both the purpose of the task and the limits of the technology. Much in the essential nature of surveying retains common ground between past and present, although modern surveying reaches levels of sophistication undreamt of in the past. The Latin words for surveyor: *mensor* (relating to measurement) and *finitor* (the establishment of boundaries), indicate that fundamental aspects remain relevant to this day, although the intervening centuries have seen a revolution in methods, equipment and technology. However, as similar problems invite similar responses, we might expect that certain principles from the ancient world have remained relevant.

Modern surveying possesses technological tools inconceivable to the Romans, but the craft still falls fundamentally into topographical surveying and 'construction stakeout', a distinct branch which creates ground plans for construction work. We are familiar with Roman work that falls into that latter category, particularly the laying out of roads, camps and forts. Long-distance Alignments, by contrast, fall under topographical surveying and seem to represent a strategic phase in which the

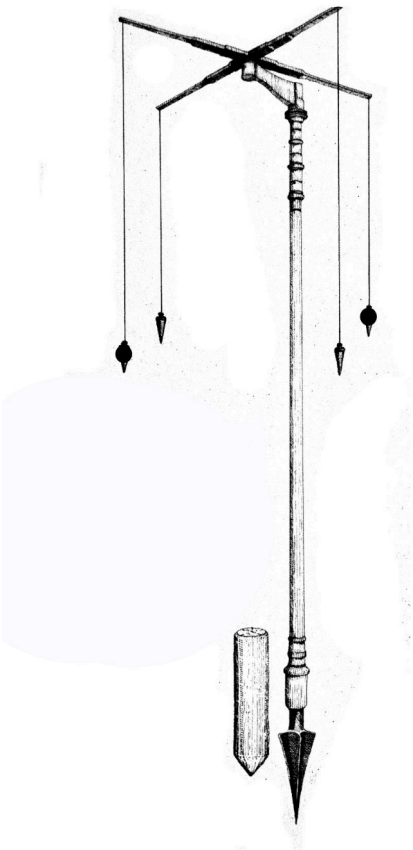
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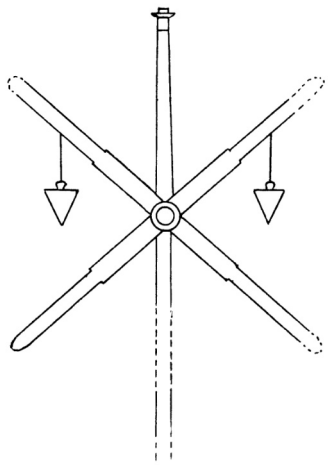
margins of empire were being explored and prepared for potential military operations, for infrastructure such as roads and forts, or for administrative division (Entwistle 2022, 55-57).

Roman Surveying Practice

Our knowledge of Roman surveying practice is largely governed by the chance survival and copying of texts. Although the Romans are remembered as great builders of roads forming strategic links across the empire, no surviving construction manual guides us towards understanding their methods. The ancient source most quoted on the matter is a poem by Statius celebrating the completion of the *Via Domitiana*. It would surely come as a surprise to Statius that his poem *Silvae* should become the principal source on the mechanics of road construction, a purpose that he is unlikely to have envisaged. Thus, faced with limited literary sources, we remain heavily dependent upon archaeology for interpreting the roads.

There is even less guidance in the ancient literature about the process of creating long-distance surveys, although information concerning related aspects of surveying methodology has survived. The *Corpus Agrimensorum*, a difficult and corrupt group of texts (treated and translated in Campbell, 2000), tells us much about the work of the *agrimensores*, professional land surveyors. They were responsible for, among other things, laying out boundaries and the formal grid pattern of agricultural land known as centuriation. The texts provide an indication of how accurate alignments should be





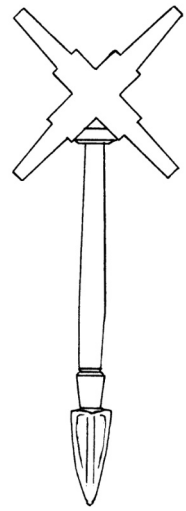


Fig. 1. Above. Drawings (courtesy Michael Lewis) showing the groma *as illustrated on tombstones from Ivrea and Pompeii*

Fig. 2. Left. Della Corte's widely-accepted reconstruction of the Pompeii groma *(after Della Corte 1922).*

formed for such purposes. We can still find sites where such grids are preserved recognisably (Bradford 1957, 145-216), notably in the Po Valley and in Tunisia. The area around Cesena (Italy) is a good example. In Orange (*Aurasio*, France) a fragmentary centuriation plan engraved upon marble has survived.

The *groma*, the main tool of the *agrimensores*, was a device comprising a vertical pole and a rotating horizontal cross piece. Cords ending in plum bobs fell from each of the four arms of the crosspiece, allowing surveyors to align pairs of cords for the sighting of alignments. The *agrimensores*, were proud of their craft – so much so that we have two preserved tombstones of practitioners from Ivrea and Pompeii showing carved representations of their signature tool, providing indication of their design (Fig. 1). Excavators in Pompeii found what are thought to be actual constituent parts of a *groma*, studied by Della Corte and resulting in his widely accepted reconstruction (Fig. 2). Despite all this, uncertainties remain about the details of the design (Lewis 2001, 129), but its overall capabilities are well understood.

Although the *groma* is best attested among civilian agrimensores, military surveyors also used it. The writer known as Pseudo-Hyginus mentions that in a military camp, the road crossing in front of the praesidium was known as the *groma* as the position of the gates was surveyed from this point (*De munitionibus castrorum*, 12.2). Much methodology would have been common to both civilian and military surveying, and the *groma* may reasonably be seen as the core surveying instrument of the legionary *mensores*. Their expertise is acknowledged by Hyginus, in the reign of Trajan, who writes of '*a volunteer ex-legionary* (evocatus*), who had sound military training and was most skilled in our profession*', who added more detail than usual to the bronze maps of land allocations in Pannonia *(De Condicionibus Agrorum*, quoted Dilke, 1971, 42).

Long-distance Alignments

Long-distance Alignments form a distinct branch of Roman surveying not recognisably discussed in the classical sources. More than twenty examples have now been identified in the north and south of Britain, some within connected networks. There is no attempt to list them in this paper: for that the reader is referred to Entwistle (2019), and Poulter (2022). Typically, they are long alignments, sometimes scores of kilometres long, whose existence is often deduced from long stretches of road demonstrably following a longer (but now invisible) surveyed line accurately connecting known Roman bases (see the Leicester-Cirencester example below). They are preserved visibly on the ground only where roads have been built upon them. Where a Long-distance Alignment turns or branches into a secondary line, the angle of turn is typically one of the four angles (other than right-angles) found in the familiar 3:4:5 and 8:15:17 triangles, both members of the 'Pythagorean Triple' family. These angles appear very regularly in connection with Long-distance Alignments (Entwistle 2019, 24-27) and are discussed further below.

The creation of Long-distance Alignments by Roman surveyors will presumably have followed an immediate need, most likely relating to strategic evaluation of territory and the recording of key features in preparation for military or administrative activity. We know Long-distance Alignments also to have been used in guiding road layout, and in the location of forts such as Ebchester and Piercebridge (Fig. 4) on Dere Street (Poulter 2009, 30). Road construction sometimes followed years or decades after the surveying of the line (Poulter 2009, 28), therefore lines must have been recorded on the ground and in Roman records to permit exploitation as need arose.

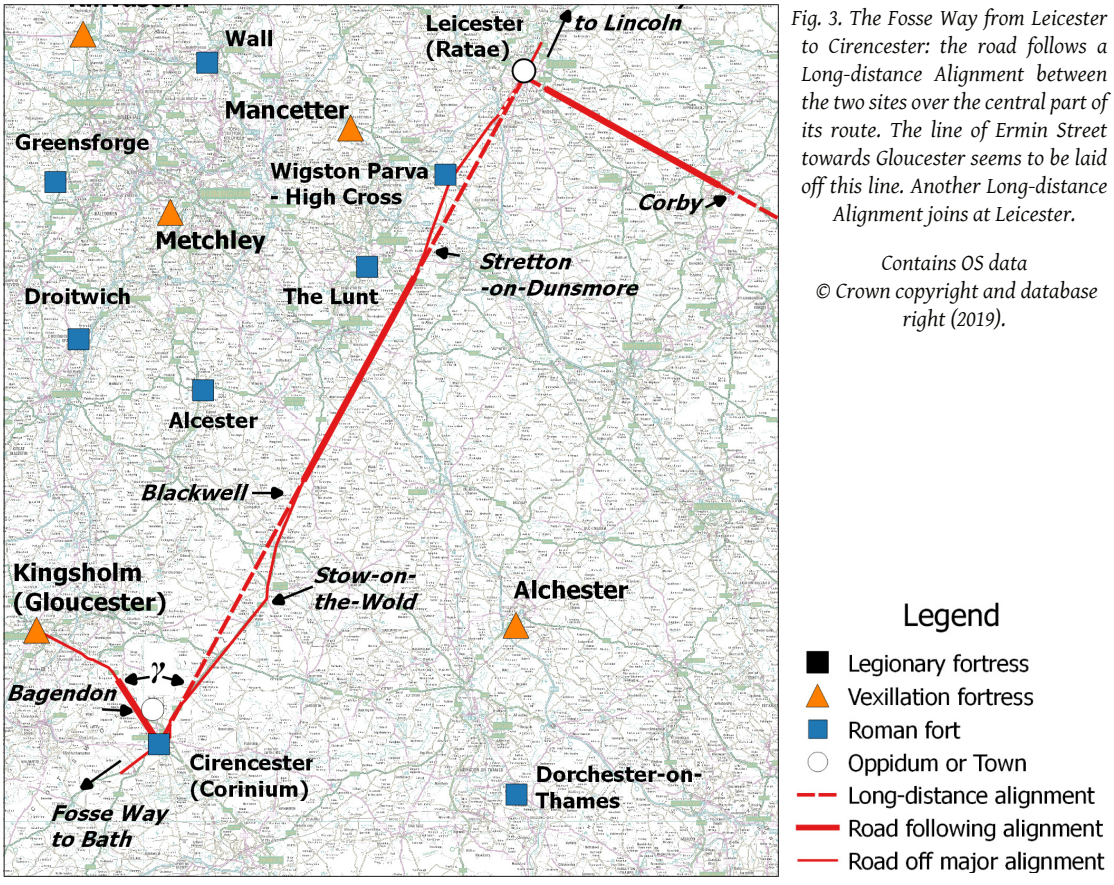


Fig. 3. The Fosse Way from Leicester to Cirencester: the road follows a Long-distance Alignment between the two sites over the central part of its route. The line of Ermin Street towards Gloucester seems to be laid off this line. Another Long-distance Alignment joins at Leicester.

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The existence of Long-distance Alignments has not been seriously challenged, but they remain a ghostly presence on the map. They are revealed by roads using their guidance, but road deviations often obscure the underlying planning. The Fosse Way between Leicester and Cirencester is a good example (Fig. 3). Its route is based upon a Long-distance Alignment which forms a direct line between the centres of the two locations: the central 34 km (21 miles) of this celebrated road is based upon that line. However, the Long-distance Alignment remained unsuspected as it was obscured by the road out of Leicester taking a diversion away from the line towards High Cross. A second diversion of the road towards Stowe-on-the-Wold, on the approach to Cirencester, was enough to hide the overall alignment, as at neither end does the road follow it.

A more complex example of a route underpinned by planning lines is Dere Street (Fig. 4), which likewise remained unsuspected until John Poulter made intensive study of the route. It came as a surprise to him to discover that the route was governed by a framework of alignments to which the road repeatedly returned (Poulter 2014, 8-10, 25-26).

Long-distance Alignments seem associated with an early phase of Roman activity in any given area. We see this in the focus of Long-distance Alignments on the Scotch Corner area, a location that was of greatest importance when the Brigantian state was allied to Rome, and when the nearby centre of Stanwick most likely formed the power base of Queen Cartimandua (Haselgrove 2016, 483; Entwistle

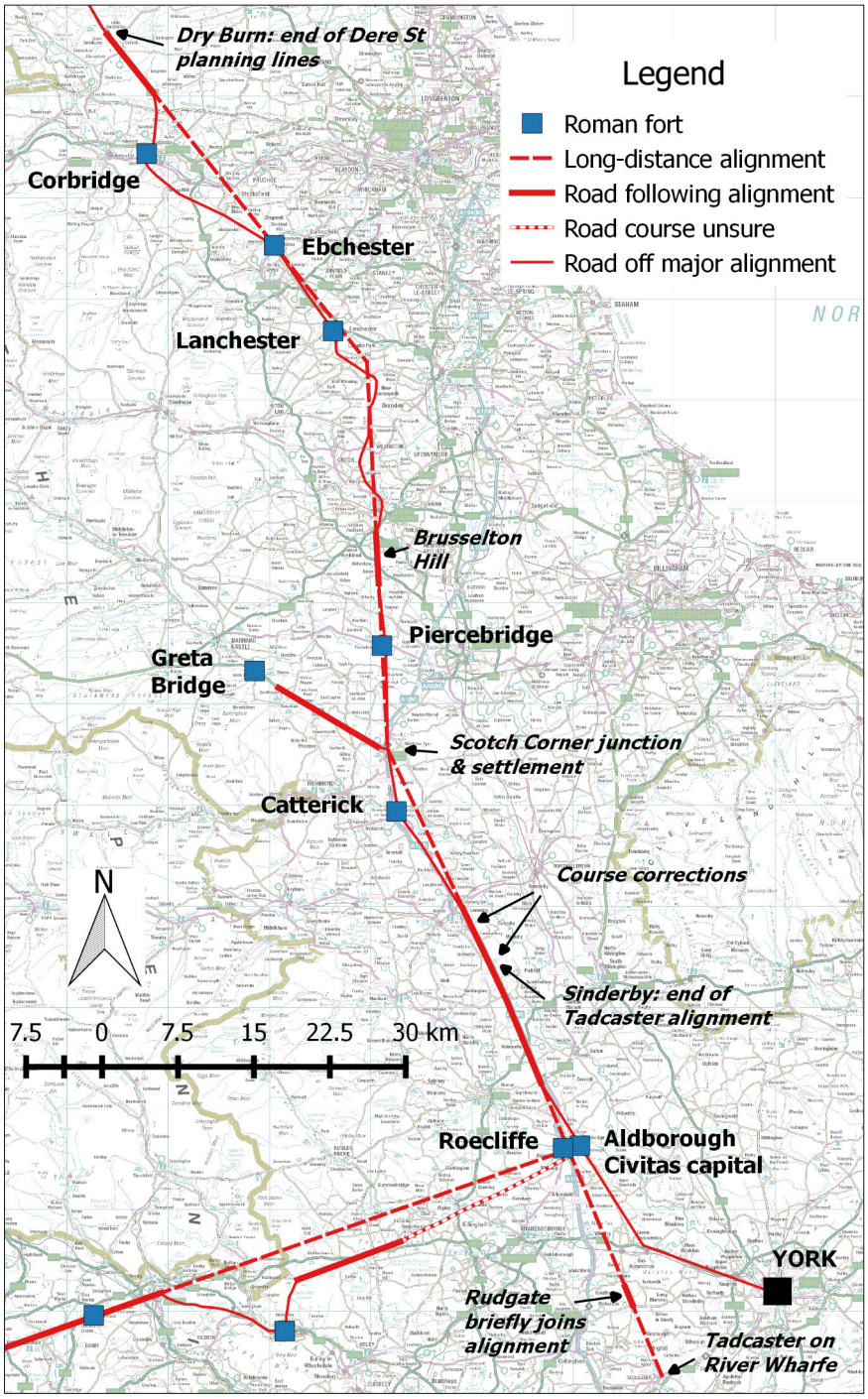


Fig. 4. Route of Dere Street, showing how its route is formed around a skeleton of Long-distance Alignments. Also shown, Long-distance Alignment marked by RR72a and RR720b west of Aldborough. Contains OS data Crown copyright and database right (2019).

2019, 86-88, 91-92). Similarly, Stane Street (Sussex) is best explained if we see the Alignment underlying it as laid out very early. It has perplexed many that Stane Street, emerging from London, was able to take a precisely direct line towards Chichester, 88 km (55 miles) distant over multiple horizons. The direct line between the two locations was clearly known before road construction started, as Margary acknowledged (Margary 1973, 64). Planning such a direct line between two distant existing locations would have been hugely difficult in Roman times, and unnecessary. Lewis analyses the issue authoritatively and concludes that establishing such a direct line would in theory have been achievable (Lewis 2001, 238-242), but only at the cost of enormous time and labour. If all that labour were intended merely to prepare a road route, then it would have been a remarkably pointless task: the road uses the direct line for less than one third of its length, and in any case would have been served just as well by an approximate line. By contrast, a Long-distance Alignment from the Thames crossing, at the earliest stage of conquest, could readily have been laid out towards the old 'Southern Kingdom', and used to define the location of the military base that ultimately evolved into Chichester. Ebchester, in the north, seems (as we have seen) to have had its location established on a Long-distance Alignment in just this way (Fig. 4). In the case of Chichester, an existing long-distance planning line would have eased the task of later road surveyors, who inevitably found themselves heading in the right direction just by using it (Entwistle 2019, 41-44).

Constraints upon Roman Surveyors

Long-distance Alignments commissioned from the *mensores* would have been a serious challenge to their skills but would have built on long-standing methods. Practice is best understood in comparison with modern surveying techniques, interpreted within the technical, conceptual and mathematical context of the age. Even before laser distance measurement and GPS became the norm, modern surveyors have assumed access to the graduated magnetic compass and optical instruments such as the sextant and theodolite. It goes without saying that the Romans had none of these. Lodestone (naturally magnetised rock) had long been known for its ability to attract iron, with knowledge of it credited to Thales of Miletus in the 6th century BC but regarded as little more than a curiosity. In Europe there is no reference to the magnetised compass needle until the end of the 12th century AD, first described by the English theologian Alexander Neckham in *De Naturis Rerum* around 1190, then by Peregrinus in 1269 in his *Epistola de Magnete* (Keithley 1999, 2-3). A form of solar compass is described by both Vitruvius and Hyginus Gromaticus, but it was large and required bright sunlight and many hours (from morning to afternoon) to find West-East, and therefore the cardinal points (*De Architectura*, 1.6, 6; *De limitibus constituendis*). A portable circular sundial could have been used in the same way to limited levels of accuracy (Campbell 2000, 494). An additional source of inaccuracy for any form of solar compass is that the high point of the midday sun deviates slightly over the course of the year (Isler 2001,165); certainly, as a means of walking on a bearing it was entirely impractical.

The telescope is even later, being invented in the early 17th century. By 1608 a few individual examples of low power telescopes were appearing, but it was Galileo who realised the potential of the device, greatly increasing its power, and bringing it to public attention through his treatise *Siderius Nuncius* in 1610 (Koestler,1968, 368). The first theodolite (without lenses) was invented by the English mathematician Digges in the 16th century, being a simple compass mounted on a tripod with a sighting device. Telescopes were not integrated into them until the 18th century (Hewitt 2010, 22). The first truly precise instrument was the 'Great Theodolite' built by Jesse Ramsden for William Roy: three years in the making and used for the London/Paris triangulation of 1787 (Hewitt 2010, 80). All

this might lead us to assume that the principal divide between ancient and modern surveying lies in a revolution in observational accuracy, brought about by the development of instruments that could exploit optics and the magnetic compass, particularly from the late 17th century onwards.

However, there was another, possibly more fundamental distinction. Roman surveying instruments lacked any scale, graduation in degrees, or provision for the measurement of angles. Indeed, the *groma*, celebrated as it may be, is so limited in its function that it could do no more than create or extend alignments forwards, backwards, or at right-angles. Although the viewing cords can be rotated horizontally, there is no scale for measuring this. Working within this limitation was a distinct preference for Roman surveyors as the superior Greek *dioptra* was available, but unused in the western empire as far as is known. That more sophisticated instrument was more compact and allowed both horizontal and vertical movement ¬– although even this, for terrestrial surveying, was not scaled in degrees (Lewis 2001, 100). That practice was reserved for astronomy: for scientific rather than everyday usage. The idea of dividing a circle into 360 degrees was ancient even in the Roman era, extending back to Babylonian times, yet there is no trace of that system being used in everyday Roman life. Measuring angles was not part of what Greek and Roman terrestrial surveyors conceived surveying to be about, and nothing suggests that they saw that lack as an inconvenience: had they desired it, the technology was available. In the modern world the measurement and determination of the angles and sides of geometrical figures are indissolubly linked, taught from primary school onwards, and constituting a fundamental part of surveying. In the Greek and Roman approach to geometry, however, the determination of angles was ignored entirely. Understanding that mindset is crucial to our appreciation of Roman surveying, avoiding facile comparison with modern practice.

A Rectilinear Approach to Surveying

It could be argued that Roman surveying practice was, at its core, about subjecting the environment to the service of the state by controlling and organising it through regimented systems of straight lines. Regulation of this sort could be used for town grids, centuriation (that is grid forms of agricultural holdings and access tracks), administrative boundaries, military camps, and roads. There were key advantages in such use of straight lines: structures became easy to plan, measure, and record. It also introduced predictability, allowing troops to move rapidly and efficiently to their quarters in temporary camps during a campaign, a point emphasised by Polybius (6, 41). For camps and forts, alignments provided the external outline, the positions of the gates, and the footprint of internal structures such as roads, barracks and granaries. Buildings were marked out in strips, each allocated a function, 'so that the whole system of surveying (*totius metationis*) does not fall into disorder' (*De Munitionibus*, 40). Used with skill, the *groma* was entirely appropriate for such work, providing users with the means to set out lines, extend existing ones, and turn at right-angles.

This surveying approach was so deeply ingrained that it became adopted for roads, the sinews of empire, even though their requirements were inevitably different. Roads could not be endlessly ruler-straight as routes must negotiate hills, valleys, bays, rivers and marshes; nevertheless surveyors brought the same skills to their planning. Lucilius makes casual reference to the use of the *groma* on the roads in his Satires (2nd century BC), turning the word (*groma* or *gruma*) into the unusual verb *degrumare: 'Viamque degrumavisti ut castris mensor facit olim'*: "you have 'gromered' the road as a surveyor does a camp" (Lucilius, Book 3, 96-7). The Roman habit of setting out roads in a series of straight alignments with little use of curves is so distinctive (and celebrated) a feature that it forms a

major diagnostic means of attributing roads to the period. The habit of forming routes from a series of connected alignments was simply the go-to professional solution for surveyors schooled in the Roman tradition. In a different era, a related mindset – aesthetic rather than technical – would impose structure upon nature through the disciplined avenues and formal gardens of Versailles, rather than the sweeps and romantic lakes of Capability Brown.

Triangles and Circles

Despite this preference for straight lines and rectilinear grids, the best trained surveyors would have been thoroughly familiar with, and able to use, wider aspects of classical geometry – which was the most developed form of mathematics in the Graeco-Roman world. The concept of 'similar triangles' was exploited militarily for such matters as finding the height of a city wall (Vegetius, *Epitome IV*, 30) or the width of a river when direct measurement in the presence of an enemy would be highly dangerous. In this latter case, surveyors would sight a virtual right-angled triangle over the water, then draw out a similar one safely on shore where distances could be measured without difficulty (Fig. 5).

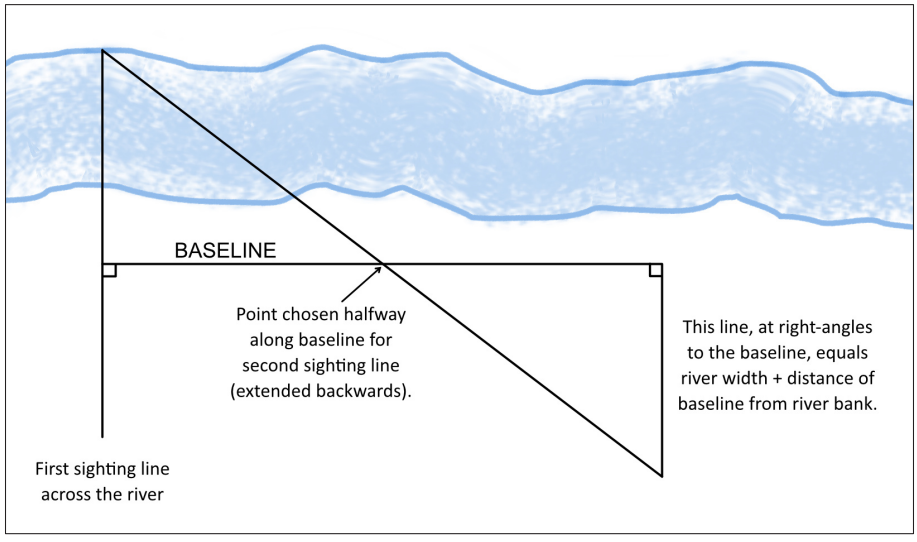


Fig. 5. Nipsus' method for measuring the width of a river using similar triangles.

This expertise with triangles, however, did not extend to the measurement or calculation of their angles (as discussed above), only the length and relationships of the sides and the calculation of area, and the ability to copy size and shape from one triangle to another through an understanding of 'similar triangles'. Even right-angles, fundamental to Roman surveying, were not considered as '90 degrees' but as the quarter of a circle. Pythagoras in the sixth century BC, who built an entire philosophy around geometry, produced his famous theorem regarding the length of the hypotenuse with no reference to angles, remarkable though that is to our conception of things.

The grounding of Roman surveyors in Greek geometry can also be seen in their ability to manipulate and exploit arcs of circles. This knowledge was exploited to establish the trademark 'playing card' rounded corners of camps and forts, each laid out as a quarter of a circle (*De Munitionibus*, 54). In construction, the iconic Roman arch, used in every large structure from triumphal arches to aqueducts and the Colosseum, was based upon the semi-circle – a concept further developed into the barrel vault (much used in baths). Most elaborately the concept became thoroughly three dimensional as the dome, seen to remarkable effect in the circular Pantheon in Rome, a major prestige project which still impresses today, and whose dome is (internally) a hemisphere. This extraordinary engineering project possessed sophisticated mathematical proportions, all based upon the circle (Fletcher 2019, 329-345).

Deducing Practice

Understanding the parameters within which the *mensores* operated allows us better to appreciate the methods available, and unavailable, to them in areas where practice is poorly documented – such as Long-distance Alignments. Their skills and understanding provided areas of strength, and areas of constraint.

It has sometimes been suggested, for example, that triangles being a fundamental aspect of Greek mathematics, the principle of triangulation could potentially have been used by Roman surveyors for survey work and mapmaking. Certainly, Heron of Alexandra had advocated the use of triangles for calculating land area (*Metrica*), and Moreno Gallo has demonstrated the sophistication with which this could be done (Moreno Gallo 2006, 39). However, triangulation as a means of topographical surveying, as against calculation of land area, was unknown in classical times. It is a superficially attractive idea to suppose that the *mensores* might have been early adopters of the methods developed in Europe from the 16th century, and which underpinned the mapping of Great Britain from the 18th to 20th centuries, but that process was not accessible to them.

The methodology of triangulation requires quite different skills and approaches from those of the Greek geometers. Whereas Heron divided plots of land into triangles and worked out their areas, triangulation as understood today does far more, accurately transferring an entire landscape to map form. It depends on laying out an expanding range of varied but juxtaposed triangles, growing away from a single baseline. That precisely measured baseline, through trigonometry, is used to calculate all other distances for the entire extent of the survey. For this to be possible, every triangle must have its angles precisely measured as it is laid out, requiring a theodolite or similar optical instrument capable of measuring in fractions of a degree. The process is expanded and continued until a designated territory is mapped.

Such a form of surveying was quite beyond Roman surveyors, skilled as they were: it depends on the repeated accurate measurement of observed angles, and consequent calculations. The *groma*, as we have seen, could not begin to do this observational work, having no capacity to measure angles. Triangulation was a process alien to the way Roman surveyors went about their craft, and they were not equipped for it.

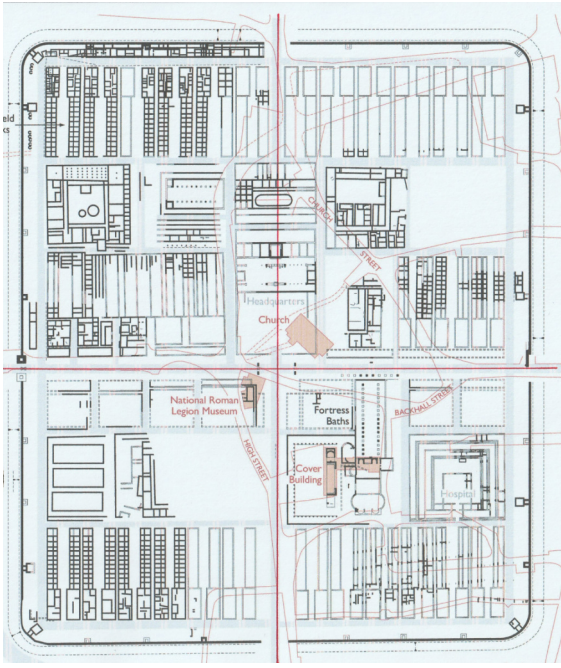
Long-distance Alignments and the Principles of Surveying

In investigating how Long-distance Alignments were surveyed, modern methods provide some indication of what is possible. The remarkably steady way in which Long-distance Alignments hold accurately to their course, and the precision with which turns are made, suggests that they result from practised methods, rigorously carried out. Authoritative guidance on comparative modern methods is drawn principally from *Surveying* (Punmia et al. 2005) and T*he Principles of Surveying* (Herubin 1974).

1: Precision and accuracy

In modern practice, precision is considered vital at every stage of observation, measurement and recording. Although absolute accuracy is unattainable, it should always be sufficient for the specified task, taking account of time and resources. Factors such as surveying methods, estimations, instrumental tolerances, and prevailing weather conditions all impact upon results. The same factors would have affected professional Roman surveyors; the instruments of that era had coarser tolerances, but precise handling could bring surprisingly good results. The principal operational weakness of the *groma*, other than lack of optics and graduated scale, was the thickness of the sighting cords (the nearer appearing broader than the further) and their tendency to swing in the wind. An experienced user could attempt to compensate for these failings, while attempting to ensure that mistakes or carelessness did not lead to further error.

Modern surveying emphasises the importance of rigour in observational practice: exact positioning and levelling of instruments, precision in observations, and repetition in case of doubt (Herubin 1974,



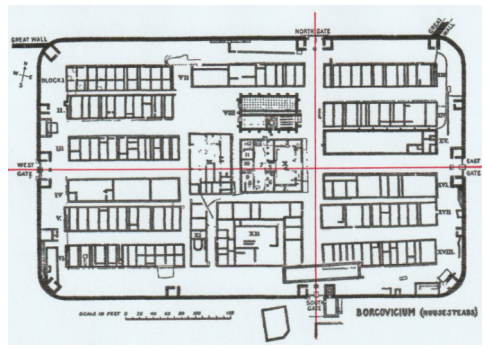


Fig. 6. Above. Housesteads Fort: squarely laid out, with the partial exception of blocks XVII and XVIII (Encyclopaedia Britannica, 1911). Most Wall forts show sound standards of layout.

Fig. 7. Left. The fortress of Caerleon (South Wales): competently and squarely laid out. (© Hawlfraint y Goron / © Crown copyright (2024) Cymru Wales.) .

Note: Figs 6 to 9 are not to the same scale.

24-25). Within the technological limitations of the period, the best Roman surveyors would have concurred: Hyginus Gromaticus was disdainful of poor practice that used the *groma* insufficiently and left mistakes unrectified (*De Limitibus Constituendis* 154.18 – 155.7); Nipsus specified the precise setting up of the instrument, centring it over existing boundary markers and levelling it by use of a plumbline (*Limitis Repositio 7-18*).

Nevertheless, not all Roman practice appears quite so professional and conscientious. It is not rare for archaeologists to find examples of corners in Roman buildings, *insula* blocks in towns, and other planned structures, that are less than fully square – and military architecture is no exception, as Collingwood and Richmond noted: 'Normally a *castellum* is rectangular or approximately so, though its intended right angles are sometimes inaccurate' (Collingwood and Richmond, 1971, 26). Some military construction is, however, exemplary: legionary fortresses generally display competence in their design, exuding an impression of efficient purpose. Their footprint is well laid out: good parallel sides, well aligned internal roads, and buildings which are properly square.

Such well executed plans lead us to suspect the hand of trained and experienced surveyors, reflecting the assertion of Taruttienus Paternus that *mensores* were classed as *immunes* ¬– specialist military personnel freed up from duties affecting other soldiers (*Digest of Justinian* 50, 6, 6).

Some auxiliary forts, no less than fortresses, similarly display professional standards of layout. These include most examples from Hadrian's Wall, such as Housesteads (Fig. 6). It may be no accident, however, that Wall forts, like the Wall itself, are believed to have been built by detachments from the legions.

Forts, however, are more variable than fortresses in the competence of their design. Some, such as Gelligaer (Fig. 8) show less competence in their layout even though all the usual structures are present. It may well be relevant that some of these are strongly suspected of being built by the same auxiliaries who manned them. Auxiliaries must often have had to construct their forts without access

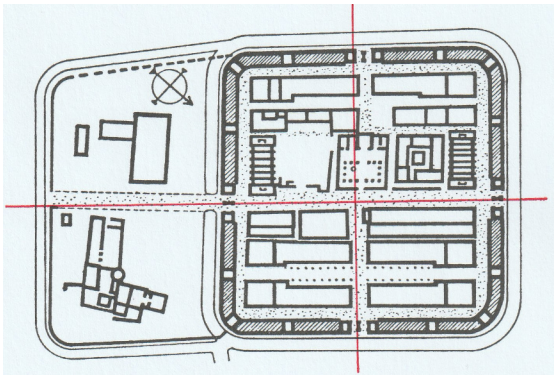


Fig. 8. Above. Gelligaer fort (after Nash-Williams). No doubt sound construction, but less expert in terms of layout.

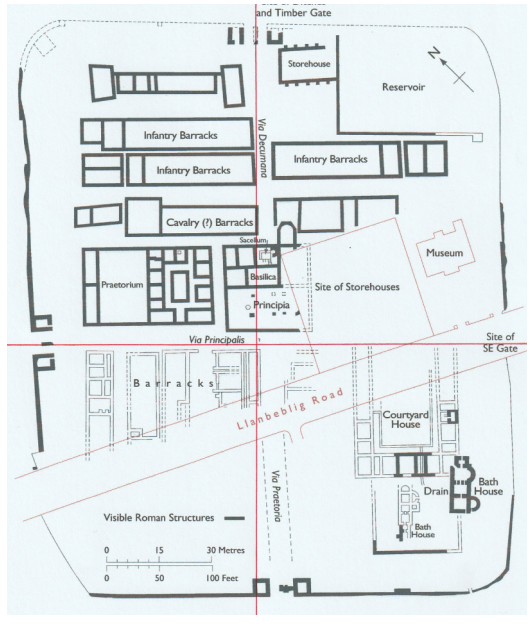


Fig 9. Right. Segontium fort. North Wales. Overlooking the Menai Straits, this fort, like Gelligaer, is less expert in terms of layout. (© Hawlfraint y Goron / © Crown copyright (2024) Cymru Wales.)

to legionary expertise: structures can be found where soldiers practised their fort-building skills – often small, but with particular emphasis on corners and gates. In Wales at least 18 such structures exist on Llandrindod Common close to Castell Collen auxiliary fort, and others are found near Tomen-y-Mur fort. For troops working without legionary supervision, ensuring that a structure was militarily sound, practical and secure would understandably have been a higher priority than overmuch concern for square corners and parallel sides. Where precision and accuracy of layout is evident, this should be considered potentially indicative of a trained *mensor's* input and possibly of legionary construction.

Roads, no less than forts, in general display practicality and solidity of construction, but variation in associated surveying standards. This is particularly evident where roads are preceded in their course by Long-distance Alignments.

Thus Dere Street (Fig. 4), in its different phases, demonstrates some of the best, and the worst, of surveying standards. Poulter demonstrates how the road's route was refined from a small number of Long-distance Alignments to a more complex practical cross-country route, the first and last phases sometimes separated by decades. In terms of surveying the first planning phase was far more expert than the construction phase, implying the involvement of separate teams: 'In contrast to this accuracy in long-distance surveying, the shorter distance planning of Dere street... shows evidence of mistakes'. Poulter identifies such a mistake at Bedale Beck, where connecting alignments are laid out poorly and fail to make an accurate junction with each other. 'This inaccuracy may reflect lesser skills amongst those surveyors who planned the road compared with those who set out the long-distance alignments' (Poulter 2009, 24). We may suspect that the initial Long-distance Alignments, presumably set out for strategic reasons, were surveyed by legionary *mensores*, whereas the final stage of construction used whatever surveyors were attached to the construction team, who may have been civilians (Moreno 2024, 61-62).

A similar impression emerges from study of RR150 in its crossing of the Weald, south of London (Entwistle 2019, 36, 38-39). The road moves between two different Long-distance Alignments, leaving Stane Street (on the Chichester alignment) in the region of Kennington Common (Margary 1973, 62) to navigate its way independently through modern Croydon and Godstone. Near Lingfield it attempts to swing on to the second Long-distance Alignment (Fig. 10) which crosses the Weald from the North Downs to Hassocks (where there is a Roman cemetery). By following this Alignment the road ends up running parallel to RR14 – obvious from the OS map of Roman Britain – which is following another linked Long-distance Alignment across the Weald (Entwistle 2023, 89). The road builders clearly intended to follow the line through to Hassocks and made a sharp turn toward it at 'Green Wood' (Fig. 10), where Margary notes a 'distinct change of direction to the south-west' (Margary 1973, 63). At Green Wood, however, they had already overshot the Alignment by some 0.7km, as perhaps they realised as they cut back quite sharply. They regained the line just west of Felbridge, but again, overshot slightly, suggesting that it was not clearly marked, except perhaps at high points. Two slight course adjustments brought them exactly to the Long-distance Alignment at Selsfield Common, the highest point of the Long-distance Alignment crossing the Weald, where we can expect there to have been a prominent marker. Beyond this point they follow its line approximately all the way to Hassocks, but consistently strayed a little eastward except where they crossed the valley now occupied by Ardingly Reservoir (not marked on the 1947 base map, Fig. 10). A late correction is finally made in approaching Hassocks (and the 'Greensands Way', RR140), where Margary again notes a turn (Margary 1973, 64).

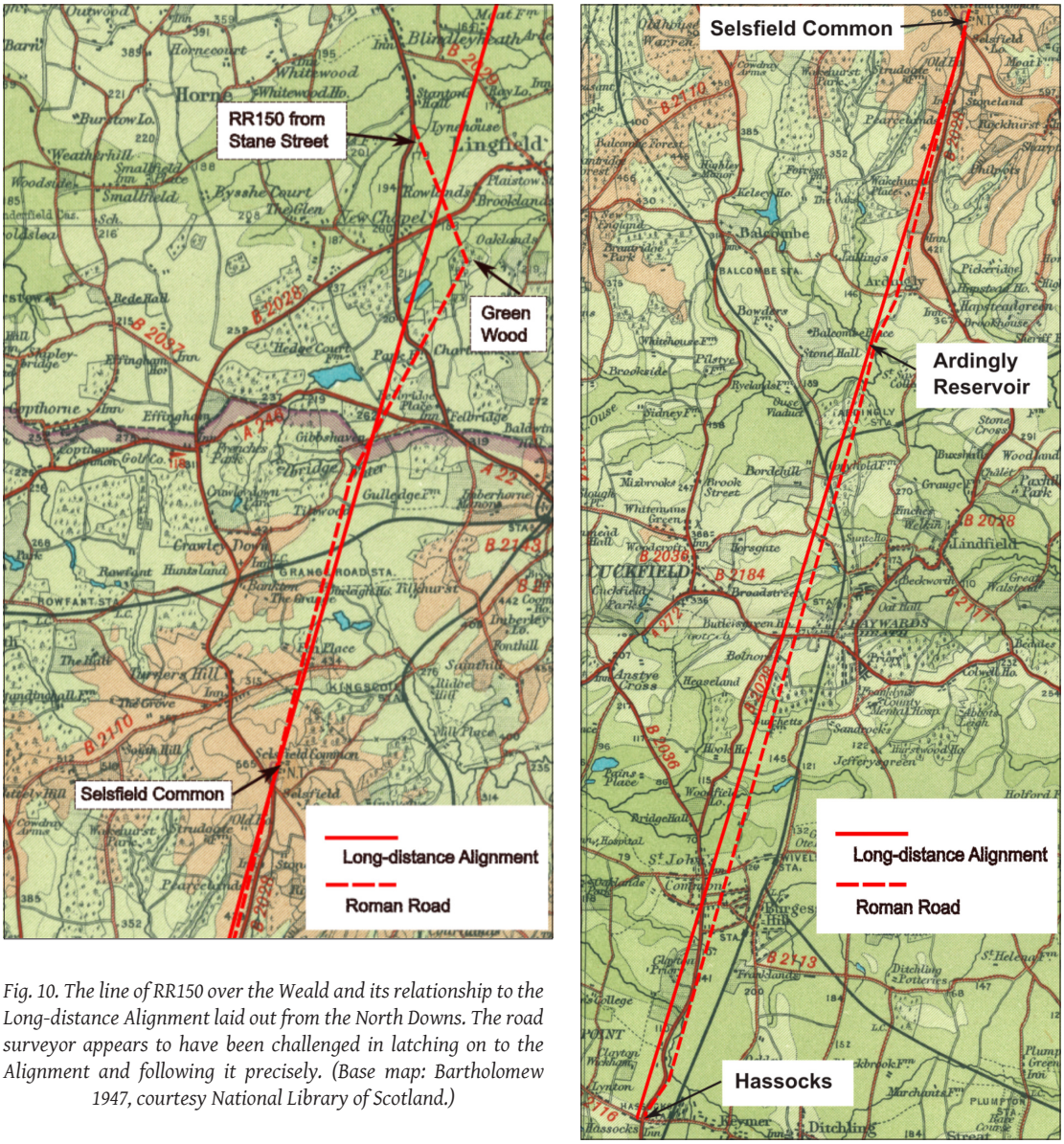


Fig. 10. The line of RR150 over the Weald and its relationship to the Long-distance Alignment laid out from the North Downs. The road surveyor appears to have been challenged in latching on to the Alignment and following it precisely. (Base map: Bartholomew 1947, courtesy National Library of Scotland.)

It is hard to believe that the surveyor responsible for setting out this road line was operating any significant distance ahead of the workforce, or surely directional errors would have been ironed out to reduce wastage of time and materials. His construction brief seems to have required him to plot the route in reference to existing Long-distance Alignments, which ought to have been straightforward, but no doubt proved a challenge through the hilly, wooded terrain, with limited numbers of markers. The result was solid and functional, fulfilling its design brief, but showing lesser surveying skills than those displayed by the original military team.

For both forts and roads, we can identify variable standards, gaining the impression that precision in surveying matters depended on both the task and the team: different tasks employed differently

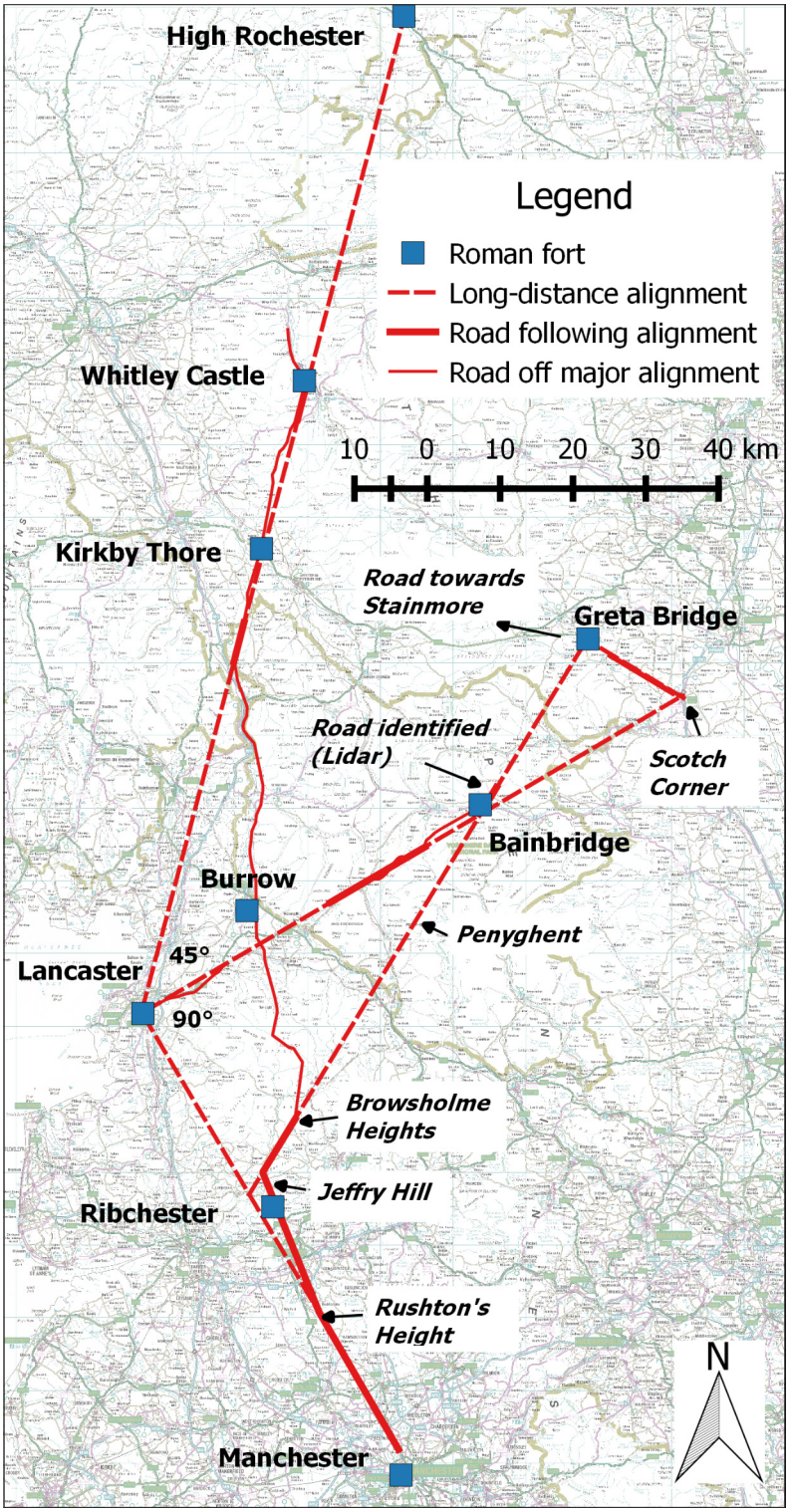


Fig.11. RR7c, travelling northward, swings sharply on to a Long-distance Alignment (LDA) at Jeffry Hill and follows it as far as Browsholme Heights. RR732 (marked 'Road Identified') follows the same LDA at a later point. The LDA is part of a group based upon Lancaster and Scotch Corner. See also Fig. 14

trained personnel, some being highly skilled, some less so. Long-distance Alignments show Roman practice at its most precise, powerfully indicative of professional legionary involvement. The methods they chose to employ remain to be examined.

2: Surveying a straight line

The most evident feature of Long-distance Alignments is the precise maintenance of a given alignment, possibly over scores of kilometres. We find this, for example, in the alignment laid out between Jeffry Hill (where the Western Main Roman Road, RR 7c, climbs to the hills above Ribchester) and the site of Greta Bridge fort (just east of the Pennines), two points separated by Penyghent, the Pennines, and 85 km (53 miles) (Entwistle 2019, 20-23). It would be difficult, perhaps, to find a more challenging line to survey, yet two different roads closely follow it, one well west and one well east of Penyghent, witnessing to the precision of the line (Fig. 11) The Main Roman Road swings dramatically on to this line on the top of Jeffry Hill (see also Fig. 14) in a turn of a little over 53 degrees, then off it again 8 km further on at Browsholme Heights. The second road to follow the line has only recently been discovered, far to the east of the first. Now labelled RR732, it climbs the fell above Askrigg, perhaps leading from Bainbridge to Bowes (Entwistle 2019, 22-23).

This sort of precision over long distances can be seen elsewhere. Stane Street (RR15), discussed above, is a celebrated example, in its alignment running southwest from London Bridge, over hills and ridges, directly to Chichester. The road itself follows the original Alignment only as far as Ewell (preserved as the modern road in many places), but the line, projected onwards, reaches to Chichester. The ability of Roman surveyors to maintain a straight alignment over score of kilometres is not a matter of dispute.

However, as has been demonstrated, in laying out precise alignments, the *mensores* were playing to their strengths. Rectilinear surveying – accurate prolongation of a surveyed line – was their fundamental skill. *De Arte Mensoria*, attributed to Frontinus, describes how the job was normally done: first checking the verticality of the *groma* by plumbline, then taking a backsight on earlier markers across a pair of cords. 'We first use the *ferramentum* [*groma*] and regulate all procedures by plumb-line... then sight the markers and take a back sight on them'. He continued to show that once the cords were aligned and set, they were used as a foresight to position new markers ahead. In due course the instrument moved forward to these, and the process was repeated (*De Arte Mensoria* 16.6 – 17.9, translated Lewis 2001, 325).

The process of *chain surveying* is the nearest modern equivalent to the Roman process, carried out using linear measurements only (i.e. no theodolite or compass). The handbook *Land Surveying* describes this process as 'The earliest form of surveying', nowadays used only for small surveys (Wilson 1977, 33).

An alignment projected forwards is, in modern surveying parlance, a *traverse*. Punmia's description of its creation through the process of *chain surveying* is very reminiscent of Frontinus. At a chosen spot, Point *A*, the surveyor ensures that his instrument is set vertically and horizontally to avoid introduction of error, then sights forward with it to establish Point *B*, and moves forward to that point. From here he takes a backsight to *A*, to ensure continued accuracy of the line, and clamps his instrument to avoid it being nudged out of true when he changes direction. He then shifts the viewer 180 degrees and takes a foresight to establish *C*, the next point on the *traverse*. In due course the surveyor moves to *C*, takes a backsight to *B* and continues onward as necessary (Punmia et al. 2005, 153).

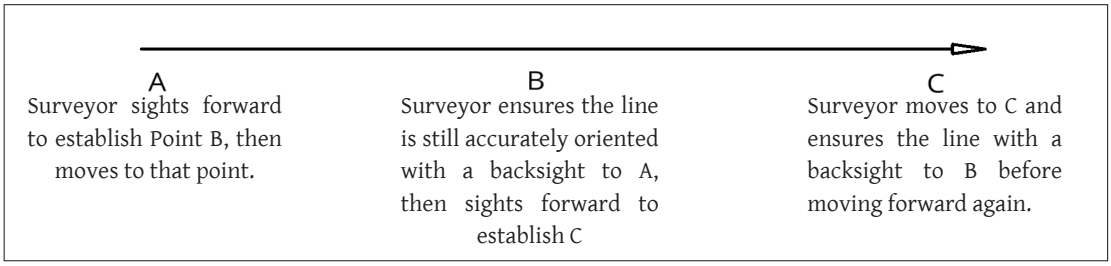


Fig. 12. Sighting a traverse.

The backsight, mentioned by Frontinus, deserves particular emphasis; in Herubin's view, taking a long, accurate backsight and ensuring that the sighting starts from a sound basis, is even more important than the foresight in limiting error (Herubin 1974, 116). In essence the whole sighting process is much the same as in Roman times: a *mensor* would feel at home taking part in it.

Surveying through means of a *traverse*, is regarded as a rapid and effective way of localising and recording points of interest (whether natural or man-made) relatively close to the line. The location of each such point is identified in relation to the line of the *traverse*, for example by laying out an *offset* towards it, and duly recording it as part of the survey (Punmia et al. 2005, 165). We might expect that the Romans would similarly wish to record points of strategic importance as they progressed. Field notes are a closely controlled part of surveying today (Punmia et al. 2005, 23) and the *mensores* would surely be aware that a survey's value would be much reduced without observations made on the spot.

Chain Surveying is not usually used over long distances, but the *mensores* would need to have found ways of making this sort of process work efficiently over tens or scores of kilometres of difficult ground, without optical aids and ideally avoiding hundreds of short observational hops.

Working from whole to part

One means of preventing the accumulation of small errors in surveying is considered fundamental today. Punmia states that a 'ruling principle of surveying... is to work from whole to part. It is very essential to establish first a system of control points and to fix them with higher precision. Minor control points can then be established by less precise methods' (Punmia et al. 2005, 3). Herubin similarly points out that the longer the distance over which a sighting is taken the less opportunity there will be for error, and 'this applies until extreme range reduces visibility because of limitations...of the person's eyes' (Herubin 1974, 116).

We have good evidence that Roman surveyors acted on these principles in their works, even though there is nothing concerning it in the literary record.

What was seen (at the time) as 'the longest straight alignment of the ancient world' (Lewis 2001, 242) is the line of the outermost Upper German-Raetian limes which stretches almost ruler-straight for 81.3 km between Haghof in the south and Honehaus in the north, with only a single (1.6 km) deviation to avoid a steep valley (Fig. 13). This was laid out, presumably by legionary *mensores* c AD 160, and was formed of a palisade, ditch and bank with irregularly spaced stone watch towers. A precise modern survey of the southern 29 km shows that the mean deviation of the ditch from a truly straight line was plus or minus 1.9 m, with an almost equal directness maintained further north. Lewis argues that

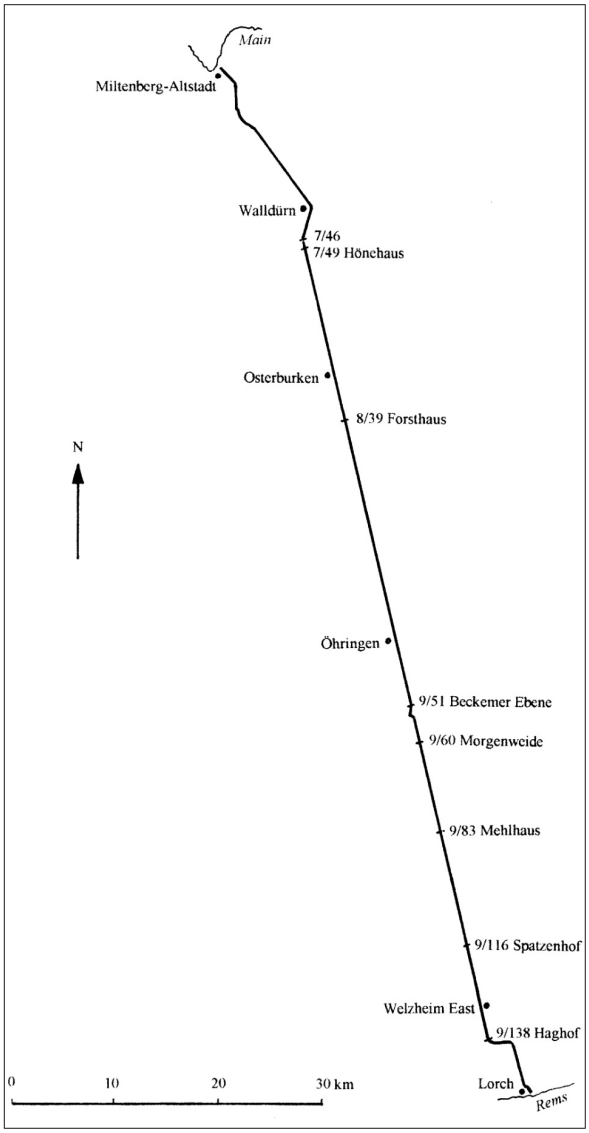


Fig.13. The Outermost Upper German-Raetian limes*. The line was laid out almost ruler-straight from Haghof to Honehaus, demonstrating the practice of forming long observational leaps, later divided by interpolation. (Diagram courtesy Michael Lewis.)*

the whole system was surveyed by sighted alignments, using the longest observational hops possible. He considers that six were likely between Haghof and Honehaus, the longest being between Forsthaus and Honehaus (around 17 km.). Once those sighted leaps had secured the accuracy of the whole line, intermediate markers for the construction teams were backfilled by 'interpolation', with noticeably less accuracy. Thus, it seems that once the critical overall accuracy of the survey had been secured with long sightings between key points, smaller intermediate divisions were regarded as less critical. The whole was more than the sum of its parts.

We are reminded of the way in which individual stretches of road alignment often follow a Long-distance Alignment somewhat approximately, as in the Weald (Fig. 10). During road construction, attention to an exact line was of little consequence providing that it could continue to be used as a guide. Road surveyors had different priorities from the *mensores* who laid out the Long-distance Alignments.

We can recognise the same strategy in other works of Roman surveying. The great marble map of Rome, the *Forma Urbis Romae*, reflects the city as it was in the early 3rd century. Only fragments remain, but it must have once been over 18m long. Analysis suggests that the major parts of the city were carefully set out to scale, but representations of buildings and other details were fitted in less accurately once the overall picture was established. Accuracy of the whole was of greater consequence than accuracy of the parts (Lewis 2001, 100).

We can find a final probable example of this practice in the alignment (already referred to) leading to Jeffry Hill, near Ribchester on the Western Main Roman Road (Fig. 14). Close to Whittlestone Head, the road heading north from Manchester turns off its existing alignment to head directly for Jeffry Hill, 20 km (13 miles) away. First it must climb to the Top of Ramsgreave, 11 km (7 miles) away, then dip down into the Ribble Valley and across the river past Ribchester, before climbing to Jeffry Hill.

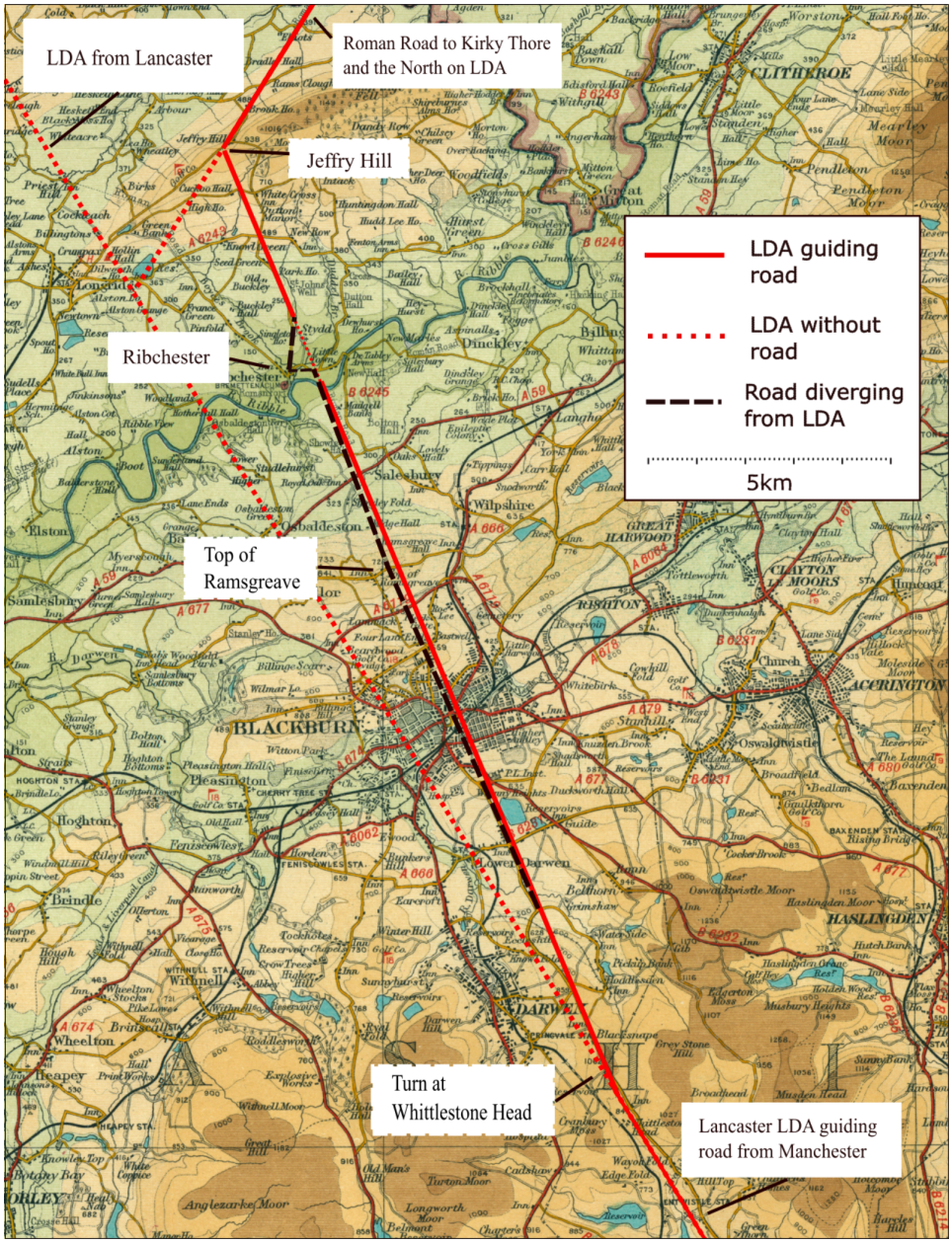


Fig 14: The alignment between Whittlestone Head and Jeffry Hill is more precise than the two subsidiary alignments from Whittlestone Head to Top of Ramsgreave, and Top of Ramsgreave to Jeffry Hill, which diverge 120 metres off-line. (Base map: Bartholomew 1947, courtesy National Library of Scotland.)

The Long-distance Alignment between Rushton's Height and Jeffry Hill extends nearly 21 km (13 miles) but would appear to have been set out in a single leap. At the Top of Ramsgreave, the intermediate high ground, we find that the road has shifted some 120 metres off-line, necessitating a

minor correction towards Jeffry Hill. This may well be a case of a single long alignment being subdivided less accurately for the purposes of road construction. The *mensores* had, with great precision, taken the largest leap available to them, leaving the Lancaster-Manchester line at a pre-formed angle (Entwistle 2019, 27). Once overall accuracy had been assured, precision over Top of Ramsgreave was not a key priority for road surveyors.

One major issue before the age of optics would be Herubin's warning that the benefits of long observational leaps for greater accuracy only work up to the point where 'extreme range reduces visibility'. We can assume that Roman surveyors would have been highly aware of this issue, although we can do little more than speculate on the means adopted to mitigate the problem. John Poulter (and others) have suggested the use of lights at night (Poulter 2014, 22), and this does indeed vastly increase the range over which a point can be viewed. However, without the means to establish a bearing in degrees, seeing the point is of little advantage, and a *groma* cannot be used in the dark. A likely alternative solution was to go for size and skyline location in setting a point intended to be visible from afar. We can make informed judgements about where some such points would have been positioned, but until we find post holes or other structural evidence, the matter must be left open. Roman engineers, we may be sure, would not have been deterred by such challenges.

Line-of-sight or Bearing

In the modern world, if an alignment is created there is a choice between laying it out by line-of-sight, or by compass bearing. Over a long distance, perhaps surprisingly, the two are not the same. Because of the curvature of the world, a compass bearing does not represent the shortest line between two points that are very far apart, but curves gently away from that line (finally spiralling to the poles) (Boas 1962, 205). On a Mercator-style map (which squashes the round earth on to a flat plane), by contrast, it is the compass bearing which is straight, and the line-of-sight (or 'geodesic' line) which should show a gentle curve.

As the magnetic compass was not available until many centuries after the Roman era, this paper has maintained that Long-distance Alignments would have been laid out by line-of-sight rather than by bearing. That, however, has been a subject of debate between the author and John Poulter, who has recently argued the opposite (Poulter 2024, 265) – one of the few points on which they have disagreed. Poulter argues that as Long-distance Alignments are not noticeably curved on maps, they must have been laid out by compass bearings rather than by 'line-of-sight', and that the Romans must have found a way of utilising lines of constant bearing, even though the magnetic compass was still to be invented.

There can be no argument with the principle of a geodesic line forming a gentle curve on a Mercator-style map, but Google Earth, which this author uses to trace longer alignments, already makes allowance for geodesic paths, leaving those observations unchanged. The extent to which a 'geodesic' line shows curvature over long distances on a Mercator-style map can be measured but varies between cases, depending upon latitude, distance, and direction. For a line running due north-south a geodesic line and a bearing are identical. The example used by Poulter is the line of the northern end of the Devil's Causeway (near Tweedmouth), extended to Scotch Corner. Just the first 16 km are indicated by the road and form the only part of any longer alignment that is guaranteed. The argument that it reached to (and was laid out from) Scotch Corner – 130 km directly ahead on the map – is persuasive but unproven, as it is not known to connect with any other Long-distance Alignments or pass through Roman sites.

Because a geodesic (line-of-sight) path following such a long course should be curved, it will follow different compass bearings at its northern and southern ends. Those can be calculated once start and end points are known, but in this case the difference turns out to be minimal: 171° 48' 36" and 172° 04' 25" respectively. With something like a mere quarter of a degree separating them, the curvature over 130 km is barely perceptible. The geodesic line (line-of-sight) turns out to agree well with the 16 km course of the Devil's Causeway near Tweedmouth, and the author sees no need to pursue other alternatives.

The curvature is nevertheless sufficient for a best-fit geodesic line based upon the northern section of the Devil's Causeway to by-pass Scotch Corner some 600 m to the west (having traversed the Stanwick complex). That might imply that the case for a Long-distance Alignment between Scotch Corner and Tweedmouth should be reviewed.

Roman error checking

An issue that we have not explored is the issue of Roman surveyors error-checking their own work. However carefully they went about matters there is always the possibility of error in a sighting, which if not corrected would become steadily more serious as the *traverse* began to diverge from the intended line. Hyginus Gromaticus was aware that errors made at key points in a survey could propagate larger errors, and that cross checks were important. Thus he commented (in discussing centuriation): 'The DM and KM must be plotted by very good surveyors, who must also fix the end of each *quintarius* (i.e. every 5th intersection), to prevent error which if accumulated will be difficult to correct. If there is a defect in the *groma* or the sighting, a wrong observation immediately appears on one *quintarius* and admits of fairly easy correction' (quoted Dilke 1971, 58).

Modern surveyors build in checks to try and prevent unplanned error in the first place, and to reveal it should it occur, so that it may be corrected. This is most easily done for a *closed traverse* (which links back to the beginning), where it is obvious if the *traverse* does not close upon its starting point, and where internal checks on the geometry of the loop are possible. It is much more difficult in an *open traverse* – and the checks suggested by Punmia require the measurement of angles (Punmia et al. 2005, 167).

The remarkable accuracy sustained by Long-distance Alignments over score of kilometres implies either that the Roman surveyors had such robust systems in place that mistakes were not made, or they had developed a means for correcting errors as they occurred. One possibility stands out, reflected in modern usage, although it would have greatly increased the surveying workload.

In 1967 the United States Coast and Geodetic Survey had the task of creating a precise straight line, some 35,600 feet long, for a high-speed sled track at an Air Force base in New Mexico. The basic work was carried out by triangulation, but as an accuracy check two parallel *offset* lines were also surveyed. For reasons relevant only to the site in New Mexico, the distances chosen were 80 and 100 feet from the main line. As the three lines were independently laid out, the accuracy of each could be readily confirmed by measuring distance from the other two at different points (Jones and McKay 1969, 398-401).

Johnston similarly suggested in 1979 that the Romans might have surveyed parallel lines as a means of roads by-passing obstacles (Johnston 1979, 69), and it is a strategy that would have paid off in terms of error-checking. Any errors in the establishment of a line would become clear if independently surveyed lines approached or separated. Whether this was really a strategy adopted cannot now be

proved: we might expect that 'steering' alignments would not be retained once their purpose was served. Nevertheless, we find roads following Long-distance Alignments sometimes moving to a closely parallel course for a stretch, and this represents one (but not the only) possible explanation for the phenomenon. Thus, the Western Main Roman Road (RR7b) north of Manchester is seemingly on-line as the A56 through Prestwich, and also at the Lowercroft reservoirs between Ainsworth and Walshaw (SD 7717 1096); yet a little further north through Affetside (SD 7558 1351) the line (represented by the modern road, named 'Watling Street') runs some 53 metres west of the Alignment for around 2.5 km. Roman roads, as we have seen, sometimes follow Long-distance Alignments a little haphazardly, but a closely parallel course seems to be something else. We also find examples of roads moving to a more distant parallel course, but these are likely to require other explanations. One such example, for which we have only tentative theories to date, is seen in Fig. 4, where the Long-distance Alignment approaching Aldborough from the west carrying roads RR72a and RR720b (possibly now to be considered as a single road) jumps over 3 km southward to follow a parallel course over Blubberhouses Moor.

3: Turns in alignments

A *traverse*, in modern surveying, has a beginning and an end; either it returns to its starting point after a series of turns (a *closed traverse*) or it ends at another point (an *open traverse*). Most Roman Long-distance Alignments that we observe form *open traverses*, with turns or branches (such as we have seen on Jeffry Hill) present in most. We can expect surveyors to have kept a careful record of where turns occurred.

An initially unexpected, but fundamental, finding regarding Long-distance Alignments relates to these turns. The same four angles are found to be used repeatedly in turns and branches: the angles present in two 'Pythagorean Triple' triangles, the 3:4:5 and the 8:15:17 (Fig. 15). Both triangles are not only right-angled but share the property (common to all 'Pythagorean Triples') of having their three sides measurable in whole units (i.e. no fractions or decimals). Although four angles may seem a very limited range for surveyors, they constitute 16 directions of travel in total when used right or left of an alignment going forwards, and right or left going backwards (Fig.16).

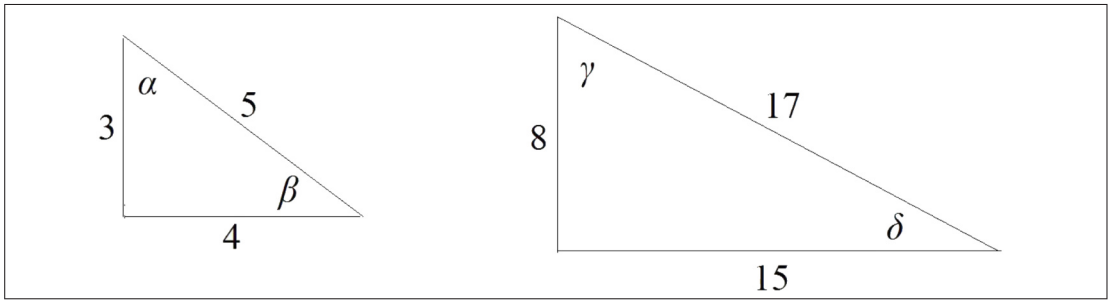


Fig. 15. The 2 triangles used in laying-off angles for Long-distance Alignments. All sides are measured in whole units.

Use of these triangles is not so strange as it might first appear. Pythagorean Triples were known as early as Babylonian times, but so far as this author is aware, only these two are mentioned in any context by Roman writers: the 3:4:5 by Vitruvius (*de Architectura X*, vi, 4), and the 8:15:17 by Marcus

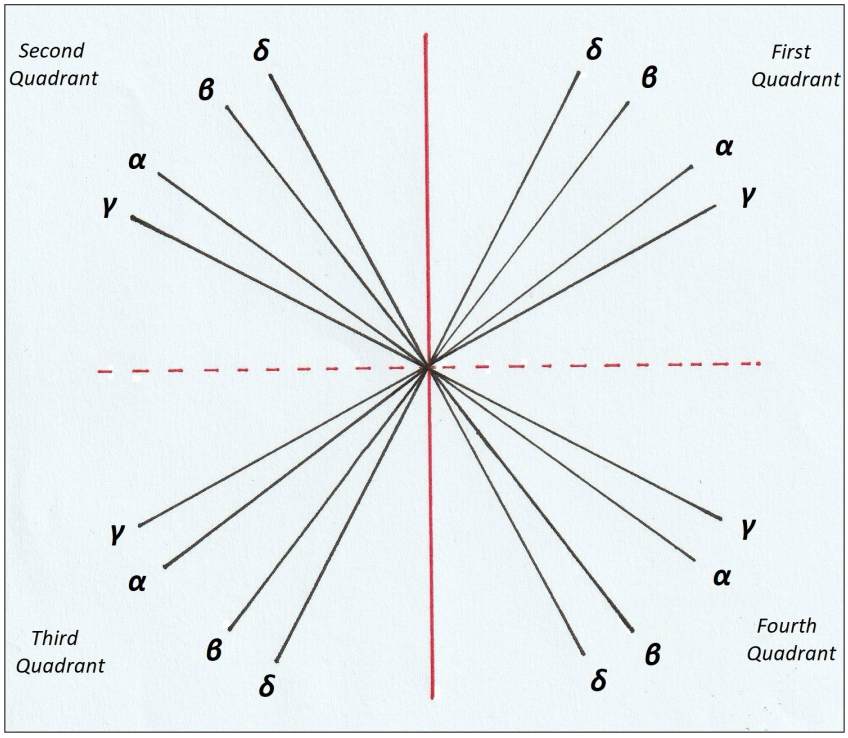


Fig .16. The pre-set angles used in laying off turns. Four angles, forming 16 directions.

Junius Nipsus (an *agrimensor*) in the *Corpus Agrimensorum*. He uses it in setting a mathematical problem (*Podismus*, quoted Dilke 1971, 55-56), where the whole units forming its sides ease calculation. He also uses the 15:20:25 'Triple' triangle in a similar way, but that is merely the 3:4:5 writ large (multiplied by 5).

These 3:4:5 and 8:15:17 triangles possess specific advantages which made them familiar and useful to surveyors. They are easy to measure out because their sides are composed of whole numbers; but they have the additional advantage (alone among the simpler 'Triples') that their 'vertical' sides can be drawn out as exactly one cubit while the other sides remain measurable in whole palms and digits – the standard Roman measurements of length (for more detail see Entwistle, 2019, 101-106). A reasonably skilled artisan could have produced precisely made portable rods, based on a cubit, that would form these triangles predictably and accurately.

All this, however, leaves aside the question of why standardised, pre-formed angles of turn should be found at all as an aspect of Long-distance Alignments. We must now turn to that.

Measurement of turns in degrees, the usual modern method, was not available to Roman surveyors. However, even in modern times, there is a system of surveying that manages without angles measured in degrees.

This is the *chain traverse* which is reliant upon linear measurement alone. Angles of turn, when required, are formed as chain angles, or tie angles, measured out by chain and tape (Punmia et al.

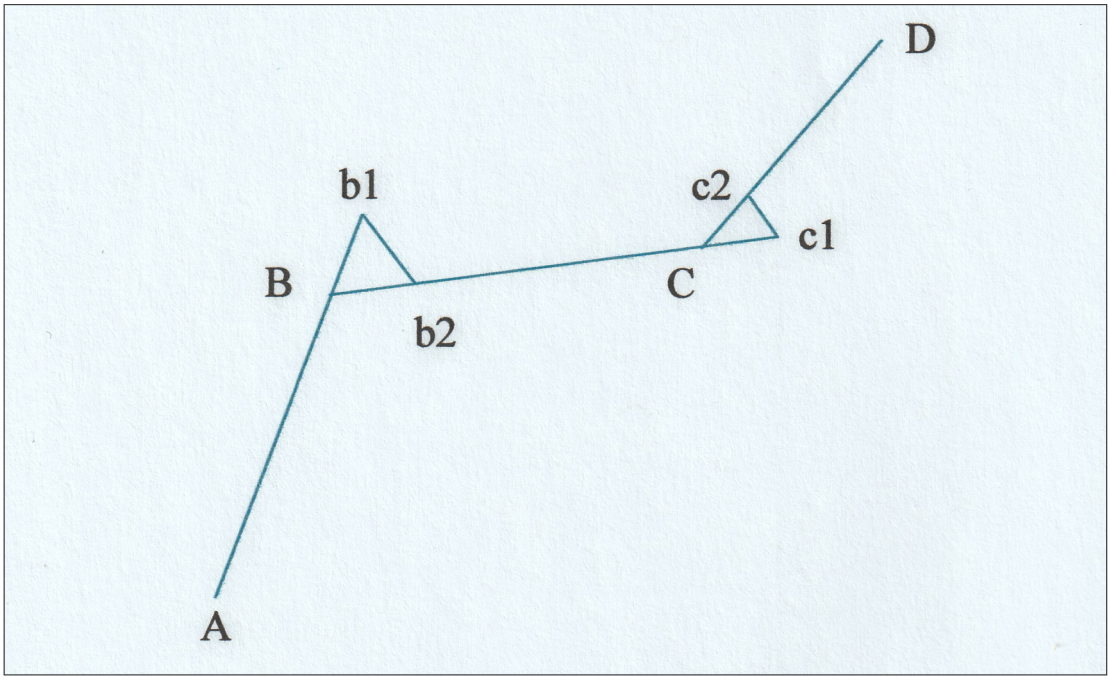


Fig. 17. The chain traverse (ABCD) has turns formed from linear measurements, as at B-b1, B-b2, and b1-b2.

2005,161). Three measurements of length form each angle, effectively creating a triangle with sides of known length at each point of turn, one side in line with the original direction of travel (backsight), a second in line with the new direction (foresight), and a measured tie line connecting the two (Fig. 17). This method was just as available to the Roman world as to the modern, but in the modern world it is regarded as 'unsuitable for accurate work' (Punmia et al. 2005,162), no doubt due to the potential for error in pegging out measured turns on uneven terrain in difficult conditions. Roman surveyors seem to have controlled this by using pre-formed, accurately measured triangles, which could be levelled and sighted (Entwistle 2019, 24-27).

In a modern *traverse*, a change of direction (whether of the main line, or to form a new subsidiary line) should take place at a *station*: a measured point along the *traverse* marked in a semi-permanent way, as by knocking a post into the ground (Punmia et al. 2005, 85). It is emphasised that for the deflection to be precise, an exact backsight must be taken on the existing line before a foresight is taken on the new line. This, we have seen, was the practice recorded by Frontinus before any new alignment.

Herubin, in discussing the modern *traverse*, advises on two ways in which an angle can be turned from the main line, whether to modify that line's direction or to lay out a subsidiary one. Either a convenient point is sighted and the angle measured directly towards it, or the angle is *laid off*. In the second case 'the angle is known ahead of time and the point is established at that angle from a given line' (Herubin 1974,112). The first option was not available in the Roman world as there was no means of measuring an observed angle; it was however entirely possible to *lay off* a pre-established angle from a given point on the line, as certain angles could be created by linear measurements. Indeed, this would bring about precisely the results that we repeatedly observe on Long-distance Alignments.

Roman angles, as we have seen, were not based upon degrees, but upon linear measurement. This could be done by measuring along the x-y axes of a right-angle, as described by Lewis (2001, 228). Peterson gives examples of something very similar with roads crossing a centuriation grid diagonally by counting off squares each way, cutting through the corners of the grid like a straight line through a graph (Peterson 1993, 98). The two right-angled triangles we have discussed (3:4:5 and 8:15:17) provided two angles each, formed in this familiar way, enabling Roman surveyors to plot, lay out, and record their turns (Fig. 16).

For Long-distance Alignments to have been set out with the precision we see, the *mensores* were clearly proceeding in a highly organised way. We can expect backsights to have been regularly taken on previous markers before foresights were taken to prolong existing lines or *lay off* new ones. A triangle could have been measured out afresh on the ground for each angle *laid off*, as in modern *chain surveying*, with the appropriate side serving for the foresight. This method would enable large triangles to have been laid out, increasing accuracy; however, it would also introduce the possibility of measurement error and require truly horizontal ground. This author favours the hypothesis that surveyors familiar with the *groma* and accustomed to sighting across plumblines at a convenient height, using a levelled instrument, might well have operated in similar fashion for *laying off* pre-set angles. A triangular frame made up of standardised rods with corner plumb lines, capable of rotating on a *groma* staff, would have permitted angles to be sighted in much the same way as a continued straight line.

Managing distance errors

Modern surveyors accept that error is inevitable and strive to manage it within limits appropriate to the task in hand, taking account of methods used, time and resources (angle 1974, 22). It is reasonable to ask whether the *mensores* had any similar conception of acceptable margins of error in their work, and how far they were aware of fundamental limits to accuracy that were implicit in their methods.

For Long-distance Alignments created by the methods discussed in this paper, the aspect most subject to intrinsic error (rather than human mistake) would have been measurement of distance. Alignments could be sighted, and angles *laid off* for turns, with some precision – but measurement of distance travelled over the length of a survey was more problematic.

Surveyors habitually used ten-foot rods for small-scale surveying tasks such as laying out camps: there is no record of them using anything longer such as cords or chains (Lewis 2001, 21). Clearly such rods could not be used to measure miles travelled along a *traverse*. On roads the best option would have been the hodometer, if available: this was a cart whose wheels drove cogs, enabling a stone to be dropped after each mile to mark the distance. We are given specifications of the machine by both Hero and by Vitruvius, with Vitruvius describing it as 'handed down by our predecessors' (*De Architectura, X*, 9). For roads it would have provided a reasonably exact means of measurement, but over rough ground it could not function, and the only alternative was pacing.

The Roman mile, 'mille passus', was a 'thousand paces', or 5000 Roman feet. The pace has remained a rough and ready way of measuring distance into modern times, and the professional 'bematists' or 'step measurers' who accompanied Alexander's Asian campaigns are credited with remarkable accuracy. Today it is considered that with practice, pacing can give an accuracy of 1 foot/metre in 100 (Herubin 1974, 39; Punmia et al. 2005, 38), although compensation is required for obstacles and slopes.

Pacing provides a valid way of judging distance but would have been considered quite inappropriate for tasks requiring high precision, such as centuriation. Roman surveyors will have understood that linear measurements in Long-distance Alignments, especially over hilly terrain, was the least accurate part of their work. Herubin views modern surveyors as having a duty to manage such issues: 'To control error so that the total error is not excessive, sources of error must be understood and methods and equipment must be chosen that will reduce the total errors to allowable limits' (Herubin 1974, 24). The remarkable precision by which the *mensores* maintained the line of their Long-distance Alignments, and the accuracy with which they *laid off* prepared angles, suggests that they were determined to maintain accuracy over aspects fully under their control. Knowing that there could be no absolute precision over distance travelled, this may reflect a concern to keep error in major surveys within understood limits.

Conclusion

We have associated Long-distance Alignments with an early phase of Roman activity when strategic needs were key and engineered roads not yet completed; and argued that to maintain accuracy they were laid out by line of sight using the largest leaps possible (and not by bearing). We have proposed that there was more in common between professional surveyors in ancient and modern times than is sometimes allowed, with certain strategies and approaches remaining relevant across the centuries. Not least important was preparation: Roman surveyors understood that precision in the positioning and setting up of their instruments was as important as precise observation. We have seen also, however, that standards varied between different classes of surveyors, and in certain building tasks the services of surveyors are unlikely to have been used at all. Where the work of legionary *mensores* can be strongly suspected, the degree of competence is usually high.

We have suggested that the greatest single distinction between ancient and modern surveying was the lack of any attempt in Roman times to measure angles in degrees, which immediately excludes Roman surveying from much recent practice, including modern conceptions of Triangulation. Consequently, the most relevant aspect of modern surveying to Roman practice, as we see it in Long-distance Alignments, is the minor branch known as *chain traversing*, using *chain angles*, which depend upon linear measurement only. Nevertheless, this form of surveying seems to have allowed ground to be covered rapidly, taking account of features of strategic interest. Corners were turned, and subsidiary lines laid out, utilising prepared angles in a way that is still recognised today. The resulting alignments, laid out in the field, had the advantage of being readily and accurately preserved through diagrams and records.

All surveying that operates over long distances has a high potential for error. It is hard to believe that Roman surveyors could have managed without systems of checks to ensure that Long-distance Alignments remained sufficiently accurate and reliable to be useful, hypothesising that this might have been done through projection of independently surveyed parallel lines. Roman surveyors would have been highly aware that their greatest source of approximation in producing reliable data lay in distance measurement, although there would have been a sound understanding of distance as marching time. By contrast the *mensores* kept a tight rein on those aspects of Long-distance Alignments which could be closely controlled: precision of alignment over great distances, and the accuracy of turns. These aspects still impress today.

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The Roman Imperial Road in Dacia: Lederata / Dierna - Porolissum. A General Overview

by Florin-Gheorghe Fodorean
Of Babeș-Bolyai University Cluj-Napoca
fororean_f@yahoo.com

Abstract

This paper examines the most significant road of Roman Dacia, the 'highway' of the province. This road also served as a frontier in the western part of the North-Danubian territories, conquered by Trajan in 106 A.D. We discuss several important categories of sources related to this road: 1. The Peutinger map; 2. Trajan's Column and the main road; 3. The milestones discovered along the route of the Imperial road; 3.1. The milestone from Aiton; 3.2. The milestone from Mera; 4. The topography and archaeology of the Imperial road (4.1. From Lederata to Tibiscum; 4.2. From Dierna to Tibiscum; 4.3. From Tibiscum to Ulpia Traiana Sarmizegetusa; 4.4. From Ulpia Traiana Sarmizegetusa to Porolissum). Discussion of the road includes information about its route, its preserved sections, the main settlements along the way, and the principal forts. The description of the road is, in many instances, based on personal field investigations and photographs.

Introduction

An efficient strategy often adopted by the Romans in conquering new territories was to build roads for the advancing army, and temporary camps along the line of march for the bivouacking of troops. Due to the vast expanse of the Roman Empire, these roads - along with bridges and milestones - became prominent features of the landscape in all regions under Roman control. As a result, scientific interest in topics related to the Roman road network, including the *limes*, has generated a substantial body of literature, beginning in the 19th century and continuing to the present day.

The Peutinger map and the Imperial road of Roman *Dacia*

The Peutinger Map has generated a significant body of literature (illustrative examples include: Miller 1916; Weber 1976; Bosio 1983; Brodersen 2001, 7-21; Salway 2001, 22-66; Allen 2003, 403-415; Brodersen 2003, 289-297; Gautier Dalché 2003, 43-52; Prontera 2003; Gautier Dalché 2004, 71-84; Talbert 2004, 113-141; Albu 2005, 136-148; Salway 2005, 119-135; Talbert 2005, 627-634; Pazarli, Livieratos and Boutoura 2007, 245-260; Talbert 2007, 353-366; Talbert 2007a, 221-230; Albu 2008, 111-

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119; Talbert, Elliott 2008, 199-218; Pazarli 2009, 101-116; Fodorean 2011, 9-19; Rathmann 2013, 203-222; Albu 2014; Rathmann 2016; Diederich 2021, 372-397).

In recent years the author has discussed essential aspects of how *Dacian* Roman roads were depicted on the Peutinger map (Fodorean 2002-2003, 51-58; Fodorean 2013, 37-38; Fodorean 2016, 83-84). In fact, three roads are represented north of the Danube: 1. the *Lederata - Tibiscum* road; 2. the road *Dierna - Tibiscum - Sarmizegetusa - Apulum - Napoca - Porolissum*; 3. the road *Drobeta - Romula - Apulum*. The road sectors *Lederata - Tibiscum* and *Dierna - Tibiscum* actually form part of the same main road

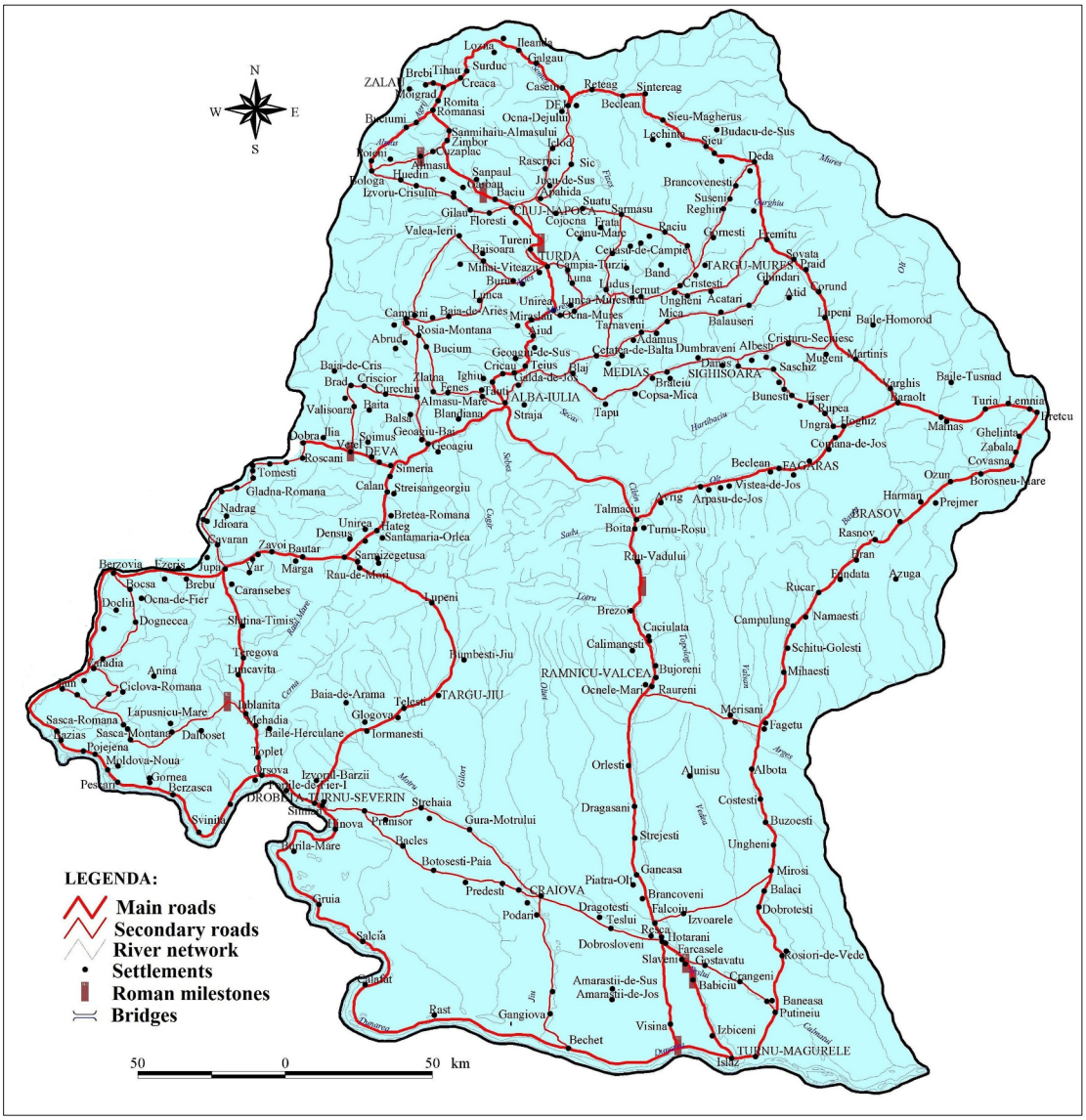


Fig. 1. The main roads of Roman Dacia, with location of the milestones (author F. Fodorean).

which traversed the entire province from south to north, from the Danube River towards the northernmost fort in *Dacia*, *Porolissum* (*Fig. 1*).

The first road is represented in segment VI 2 of the Peutinger Map which depicts eight toponyms and seven distance figures, totalling 73 Roman miles: *Lederata* - XII (Roman miles); *Apus flumen* - XII; *Arcidava* - XII; *Centum Putea* - XII; *Berzobis* - XII; *Aizis* - III; *Caput Bubali* - X; *Tivisco* (represented by a vignette).

The second road begins at *Dierna*, located on the Danube River, and ends at *Porolissum*. The document records twenty-four settlements and a total distance of 270 Roman miles. These are: *Tierva* - XI (Roman miles); *Ad Mediam* - XIIII; *Pretorio* - IX; *Ad Pannonios* - IX; *Gaganis* - XI; *Masclianis* - XIIII; *Tivisco* - XIIII; *Agnavie* - VIII; *Ponte Augusti* - XV; *Sarmategte* - XIIII; *Ad Aquas* - XIII; *Petris* - VIIII; *Germizera* - VIIII; *Blandiana* - VIII; *Apula* - XII; *Brucla* - XII; *Salinis* - XII; *Potavissa* - XIIII; *Napoca* - XVI; *Optatiana* - X; *Largiana* - XVII; *Cersie* - IIII; *Porolisso*.

Along this road, five settlements are depicted with vignettes: 1. *Tibiscum* (Jupa, Caraș-Severin County); 2. *Sarmategte* (sic!) (today Sarmizegetusa, Hunedoara County); 3. *Apulum* (today Alba Iulia, Alba County); 4. *Napoca* (today Cluj-Napoca, Cluj County); 5. *Porolissum* (today Moigrad, Sălaj County).

Regarding the significance of these vignettes in the Peutinger Map, the most comprehensive study to date remains the work of Annalina and Mario Levi (Levi and Levi, 1967). They categorised the 555 vignettes into several distinct groups: a) 429 vignettes of the so-called 'double-tower' vignettes; b) edifices of the 'temple' type; c) edifices of the 'aquae' type; d) edifices featuring parallel elements; e) vignettes encircled by wall structures; f) the three major vignettes representing Rome, Constantinople, and Antioch; g) vignettes depicting ports, lighthouses, and other distinct representations. Italian historians have concluded that the 'double-tower' vignettes, along with those depicting temples and baths, were associated with the needs of travel: "It is precisely through the analysis of the most common types – the 'two towers,' 'temples,' and 'baths' – examined in relation to other figurative representations, particularly depictions of rural structures, that it has been possible to identify them as edifices located along Roman roads which were designed to meet the needs of travellers for provisions and rest" (Levi and Levi, p. 170).

The presence of these vignettes on the Peutinger Map in *Dacia* has sparked various debates. One such debate (Petolescu 2000, 19-21) associates cities depicted with vignettes in *Dacia* with their status. For example, *Porolissum*, at some point designated as *municipium Septimium*, is considered the most significant site along the northern frontier of *Dacia*. *Napoca*, which was granted *municipium* status during Hadrian's reign and later elevated to a *colonia*, also features prominently. *Apulum*, which housed the *legio XIII Gemina* in a 24-hectare fort, and *Sarmizegetusa Ulpia Traiana*, the capital of Roman *Dacia*, are other examples. Lastly, *Tibiscum*, noted as the most important crossroads in the Banat region, is also represented.

Another perspective on these aspects (Benea 1999, 138-154) focuses on the late Roman period, specifically the 4th and 5th centuries A.D. The author of this study suggests that the Peutinger Map reflects *Dacia* in this period, arguing that the region was not entirely abandoned after Aurelian's withdrawal in 271 A.D. Instead, he asserts that the Romans maintained a degree of military and juridical control over the trans-Danubian territories. Consequently, Benea believes that the five settlements depicted with vignettes in *Dacia* indicate that the Imperial road system in *Dacia* remained

in use, primarily for economic reasons: to provide access to the salt resources in *Potaissa*, the iron resources in Banat, and the gold mines in the Apuseni Mountains. Furthermore, the author claims that these cities also served as Christian centres, which explains their representation with vignettes. However, we have previously argued that such a scenario is untenable. Apart from certain areas in present-day Oltenia and Muntenia, which were under Roman control during Constantine's reign, the regions of Banat and Transylvania – through which the former main Imperial road passed – were of no interest to the Romans in the 4th and 5th centuries A.D.

In simple terms, these vignettes represent stopping points along the road.

Another important aspect regarding the Peutinger Map in *Dacia* concerns the distances between settlements. In numerous instances the distance of 12 miles appears, as well as values close to this number. In a study published in 1997, Al. Diaconescu argued that the distance of 12 Roman miles, frequently indicated on the Peutinger Map along the roads in *Dacia*, corresponds to a typical day's march, or *iustum iter* (Diaconescu 1997, 13-52). This value is also commonly found along the roads depicted in Moesia and Pannonia (Fodorean 2016, 146, table 15). Therefore, we conclude that the Peutinger Map was compiled, among other sources, using various military itineraries or 'maps' created by the Roman army during and after the conquest of new territories. These source 'maps' (*formae provinciae*) would have been based upon observations of the terrain by the Roman army. Consequently, as previously argued (Fodorean 2016, 161), the sources for the Peutinger Map were diverse, including settlement lists with the distances between them, road descriptions, *formulae provinciarum*, and military itineraries, both written and illustrated.

Trajan's Column and the main road

There are 11 scenes on Trajan's Column – namely, XV, XIX, XXIII, LVI, LX, LXV, LXIX, XCII, CXVII, CXXVII, and CXXIX – that depict soldiers engaged in the construction of roads or small bridges. Analysing these scenes is crucial not only for the objectives of our current study but also for expanding our understanding of building activities carried out by the Roman army north of the Danube during and immediately following the conquest of *Dacia* in 106 A.D. (Fodorean 2004, 410-423). It is important to note that the scenes on Trajan's Column have been interpreted in various ways over time: some scholars have rightly recognised the Column as a propagandistic monument, while others have exaggerated the historical value of the monument. Certain attempts to correlate specific scenes on the Column with particular *Dacian* landscapes, rivers, or settlements have been unsuccessful.

Scene XV (according to Cichorius, 1896-1900) depicts a Roman fort and a road, illustrated as a zigzag line, connected by a bridge, and accompanied by a group of auxiliary soldiers (referenced as scenes XIII / XIV-XVI in Coarelli, 1999). Clearly, the scene provides a schematic representation of a fortified road; however, it is not possible to determine the exact location of this road in the actual terrain.

Scenes XIX and XX depict legionary soldiers engaged in the construction of a bridge, forts, and roads (Coarelli 1999, pl. 17, scenes XV-XVIII-XX).

In scene XXIII, several legionary soldiers are shown cutting down trees in a forest. This would have been to clear the terrain, making space for the construction of a future road (Coarelli 1999, 64, pl. 20, scenes XVII / XXII-XXIII).

Scene L from Trajan's Column depicts a zigzag road and marching legionary soldiers (Koeppel 1980, 301-306; Stephenson 2013, 79-93, especially 79, particularly emphasises the role and involvement of the Roman army in construction activities, noting: 'Scholars of the reliefs have long noted the striking fact that more scenes of engineering, building and land works appear on this victory monument than actual battle scenes').

Such representations (including those in scenes XV and XCII) would seem to suggest an itinerary representing a Roman army route, linking one fort to another. The style of these depictions is consistent with that found on the Peutinger Map, where roads are portrayed as segments or lines.

Ten legionary soldiers who open a road into a forest are represented in scene LVI (Coarelli 1999, 101, pl. 57, scenes XXXIX-XL / LV-LVI, 102, pl. 58, scenes XL / LVI-LVII). In scene LVIII, a road and a wooden bridge are illustrated (Coarelli 1999, 103, pl. 59, scene XLI / LVII-LVIII, 104, pl. 60, scene XLI / LVIII-LIX; Fodorean 2004, 415-416).

In the back of the scene LII, a group of legionary soldiers is shown building a road through a forested, mountainous area (Coarelli 1999, 98, pl. 54, scenes XXXVII-XXXVIII / LII-LIII; Fodorean 2004, 416). Also, in the scene LXIX, eight legionary soldiers open a road through a forest in a mountainous region (Coarelli 1999, 121, pl. 77, scenes XLIX / LXVIII - LXIX).

Scene XCII depicts several soldiers constructing a road in a mountainous, hilly landscape, illustrated by a zigzag line with seven segments. In the background, a fort is visible (Coarelli 1999, 152, pl. 108, scenes LXVI-LXVII / XCI-XCII; 153, pl. 109, scenes LXVII / XCII; Fodorean 2004, 417).

In scenes CXXIV-CXXVI, several legionary soldiers are shown clearing the forest and constructing a stone wall (Coarelli 1999, 197, pl. 153, scenes XCIII-XCIV / CXXIV-CXXV).

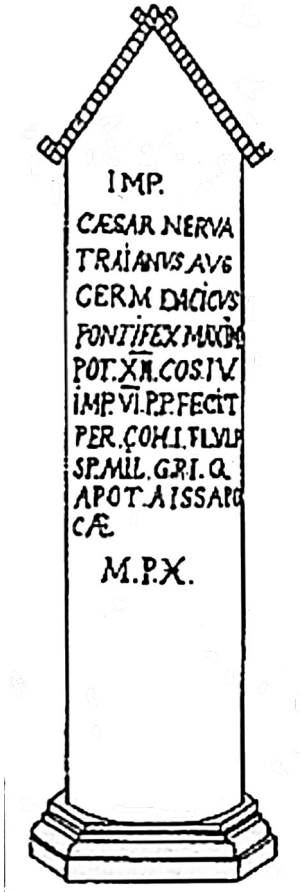
Soldiers engaged in the construction of a road along a river are depicted in scene CXXXI (Coarelli 1999, 200, pl. 156, scenes XCVI / CXXVIII-CXXX, 201, pl. 157, scenes XCVI-XCVII / CXXIX-CXXXI).

To sum up, these scenes, which include a certain level of repetition and are chronologically linked to the first military campaign against the *Dacians* (101-102 A.D.), convey a planned message: that legionary soldiers possessed the skills, logistics, and expertise required to fell trees, traverse mountains, and construct roads and bridges. The message is clear, demonstrating the superiority of the Roman army in overcoming all obstacles, including challenging terrain. Through *labor et disciplina*, these soldiers could effectively surmount any natural or human impediment. Of particular importance to our discussion is the idea that the first roads north of the Danube were constructed during the first and second military campaigns, with road building continuing even after the conquest. These roads were initially constructed in the Banat region and are possibly the same routes depicted on the Peutinger Map, specifically along the routes *Lederata* to *Tibiscum*, and *Dierna* to *Tibiscum*. In the commentaries of his book *De Bello Dacico*, Emperor Trajan recorded: *Inde Berzobim, deinde Aizi processimus* ('From there we advanced to Berzobis, and then to Aizis'). It indicates that Trajan took the western route, the *Lederata* to *Tibiscum* road, to advance into enemy territory during the first military campaign. The so-called eastern road was also constructed in the Banat region, following the valleys of the Cerna and Timiș Rivers. This road connected the settlements of *Dierna* (present-day Orșova, Mehedinți County) with *Tibiscum* (present-day Jupa, Caraș-Severin County).

To conclude, for the reasons outlined above, attempts to pinpoint the exact locations of scenes depicting roads, bridges, and soldiers engaged in construction activities in the terrain are very challenging. It is essential to understand that the repetition of such scenes served a straightforward yet highly effective purpose: to convey the message of the Roman army's superiority, as well as the discipline and labour capabilities of Roman soldiers.

The milestones discovered along the route of the Imperial road

Only nine milestones have survived from the area that once belonged to the former province of *Dacia*. These milestones were discovered in the following locations: in Aiton (Cluj County, dated 108 A.D.) (Winkler 1982, 587-589; Fodorean 2016, 89-90), Mera (Cluj County, dated 169-176 A.D.) (Fodorean 2006, 68-71; Piso 2011, 321-323), Almaşu Mare (Sălaj County, dated 236 A.D.) (Fodorean 2006, 71-73; Piso 2011, 323-324), Veţel (Hunedoara County, the ancient Micia, dated in 251-253 A.D.) (Fodorean 2006, 74-75; Piso 2011, 324-326), Lăpuşnicel (Caraş-Severin County, dated in 251-253 A.D.) (Fodorean 2006, 75-79; Piso 2011, 326-328), Băbiciu de Sus (Olt County, dated to Septimius Severus' reign, possible 205 A.D.) (Fodorean 2006, 80), Gostavăţu (Olt County, also dated to Septimius Severus' reign) (Fodorean 2006, 80), Racoviţa-Copăceni (ancient Praetorium, dated 236 A.D.) (Fodorean 2006, 80-81), and Sucidava (Celei, dated 326-333 A.D.) (Fodorean 2006, 81-82; Piso 2011, 328-329).



Of these nine milestones, two are particularly relevant to our discussion: the milestone from Aiton and the one from Mera.

The milestone from Aiton

Aiton is a small village located precisely 10 miles (14,785 km) north of Turda (Roman *Potaissa*). In 1758, a milestone was discovered within the village's territory, though the exact location of this discovery remains unknown. It has been suggested that it was found in the southern part of the village. The milestone itself has since been lost, with the only remaining evidence being a 19th-century drawing (*Figs. 2 & 3*) (Fodorean 2006, 64-68; Fodorean 2013, 34; Fodorean 2016, 89-90; Fodorean 2019, 224-228, Fodorean 2024, 204-205, and catalogue, 210, no. 12). The text (CIL III 1627) reads:

Imp(erator)
Caesar Nerva Traianus Aug(ustus)
Germ(anicus) Dacicus
pontif(ex) maxim(us)
(tribunicia) pot(estate) XII co(n)s(ul) V (sic)
imp(erator) VI p(ater) p(atriae) fecit
per coh(ortem) I Fl(avia) Vlp(ia)
Hisp(anorum) mil(liaria) c(ivium) R(omanorum) eq(uitata)
a Potaissa Napocae
m(illia) p(assuum) X

Fig. 2. Drawing of the milestone from Aiton (source: Winkler 1982, 81).

Emperor
Caesar Nerva Trajan Augustus,
Germanicus Dacicus.
High Priest (Pontifex Maximus),
in the twelfth year of his tribunician power,
holding the consulship for the fifth time,
acclaimed as imperator for the sixth time,
Father of the Fatherland (Pater Patriae),
constructed this
through the 1st Flavian Ulpian Cohort
of Spaniards, a unit of one thousand soldiers and cavalry, Roman citizens,
from Potaissa to Napoca,
over a distance of ten Roman miles.

Based on Trajan's titles, it is evident that the milestone was erected in 108 A.D. on this road, known as the Imperial road or the 'the highway' of *Dacia*. The importance of this epigraphic monument for the history of *Dacia* cannot be overstated, as it provides us with several key pieces of information: 1. The main road of *Dacia* was constructed during and after the conquest of the province in 106 A.D. If the road extended to this area by 108 A.D., it is reasonable to infer, without excessive optimism, that the entire route, which connected the Danube River to the northernmost settlement in *Dacia*,



Fig. 3. Copy of the milestone discovered in Aiton in 1758 (located in the courtyard of the local school in Aiton, Cluj County).

Porolissum, was likely completed around 110 A.D.; 2. The contribution of Balbus (the chief land surveyor brought into *Dacia* by Trajan to organise and supervise the construction of military installations – roads and forts) was crucial in the first year following the conquest of *Dacia*, when logistical decisions were essential for organising the new province, to plan the new roads, to chose the place of the future forts and the future cities; 3. According to the inscription, this specific road segment was constructed by an auxiliary unit, *cohors I Flavia Ulpia Hispanorum milliaria civium Romanorum*, which is notable because building activities were typically carried out by the legions.

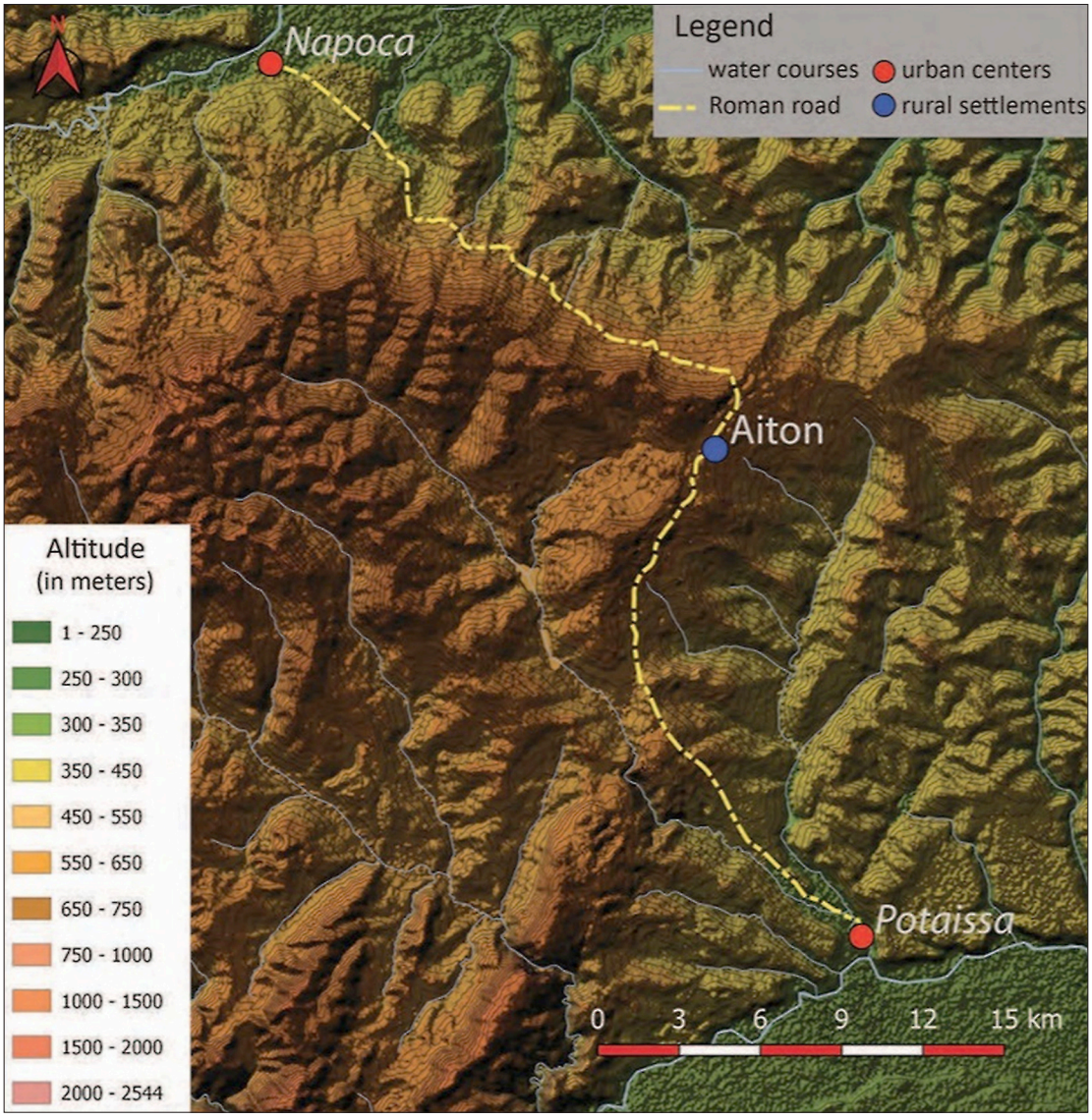


Fig. 4. The route of the Imperial road from Potaissa to Napoca, showing the location of Aiton (source: Dîscă 2020, 260, fig. 1).

Aiton is very rich in archaeological discoveries (Fodorean 2015, 217-232; Dîscă 2020, 259-275). Concentrations of archaeological materials, including ceramic fragments, bricks, tiles, aqueduct pipes, foundation walls, and even coins, were found in two distinct areas of the present-day village: one in the southeastern part and another in the northern part, very close to the route of the Imperial road *(Fig. 4, Fig. 5)*. Based on this evidence, we propose that the archaeological remains uncovered near the Roman road during the excavations of 1913 and 1979-1982 likely represent parts of a former *mansio*, constructed in the vicinity of the Roman road.

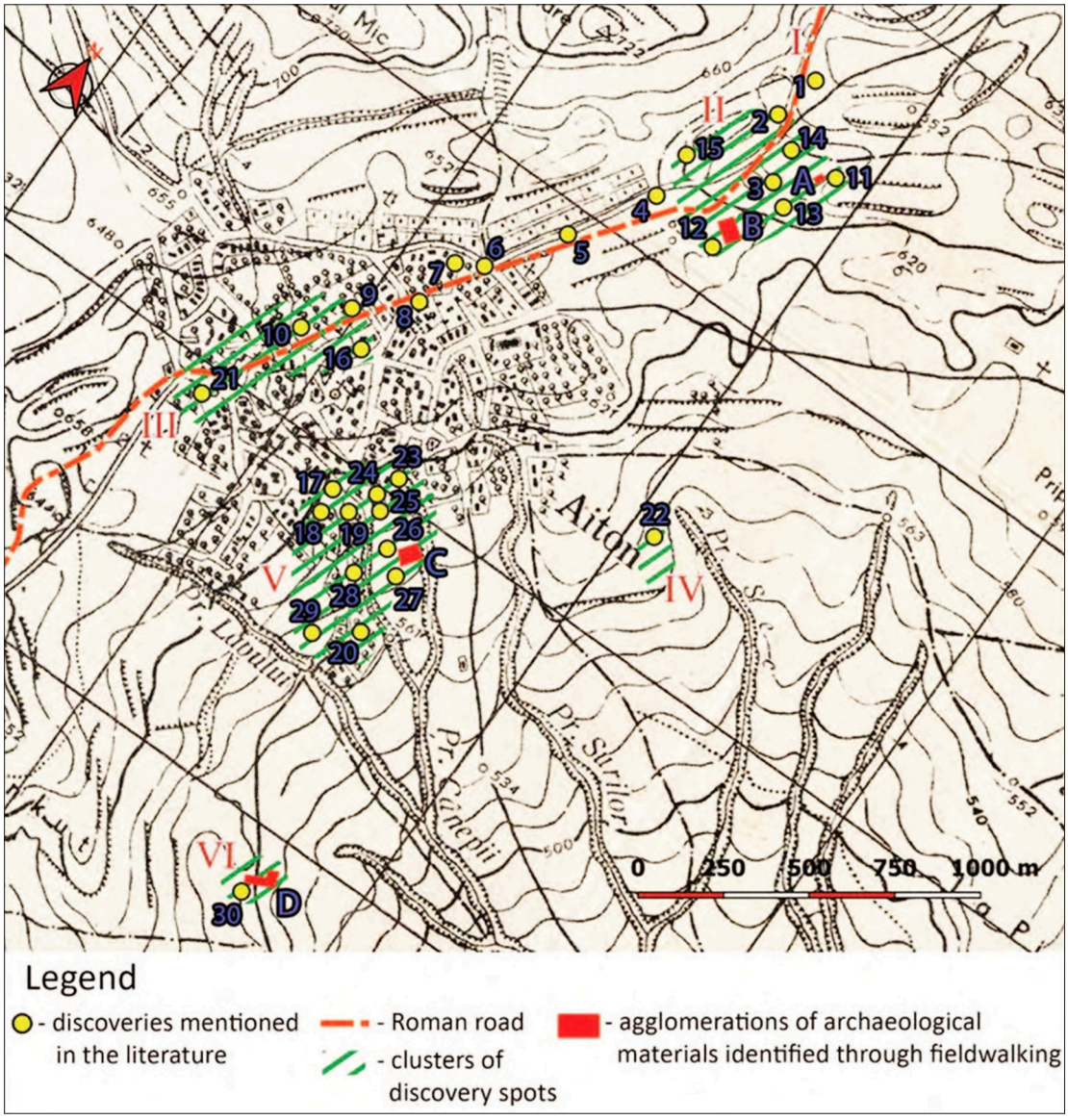


Fig. 5. Archaeological discoveries in Aiton (source: Dîscă 2020, 266, fig. 4).

The milestone from Mera

In 1932 a milestone was discovered in the southern part of the village Mera, close to Napoca, along the route of the former Imperial road. It is currently housed at the National Museum of Transylvanian History. It was first published by C. Daicoviciu (Daicoviciu 1928-1932, 48-53) and has since been reanalysed in various studies (Daicoviciu 1970, 224-230; Fodorean 2002, 64-66; Fodorean 2006, 68-71; Piso 2011, 312-314; Fodorean 2013, 34; Fodorean 2016, 91). It is a cylindrical stone column with a quadrangular base, measuring a total height of 2.25 m (the column itself, excluding the base, is 1.75 m high) and has a diameter of approximately 43 cm (*Fig. 6*). Half of the column has been destroyed.

Based on Daicoviciu's reading, we propose the following interpretation:

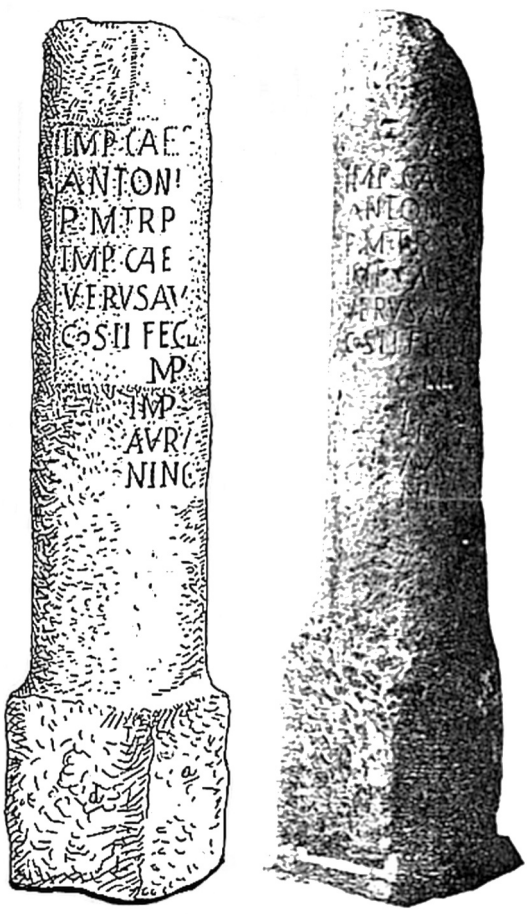


Fig. 6. The milestone from Mera (Cluj County) (source: Daicoviciu 1928-1932, 49).

Imp(erator) Caes(ar) [M(arcus) Aurelius]
Antoni[nus Aug(ustus) Armen(iacus)]
p(ontifex) m(aximus) tr(ibunicia) p(otestate) XIX
imp(erator) III co(n)s(ul) III et]
Imp(erator) Cae[s(ar) L(ucius) Aurelius]
Verus Au[g(ustus) Armen(iacus) tr(ibunicia)
pot(estate) V imp(erator) III]
co(n)S(ul) II fece[runt a Napoca]
mp [X]
Imp(eratore) [Caes(are) M(arco)
Aur(elio) A[nto]
nino [Aug(usto)]

Emperor Caesar Marcus Aurelius Antoninus Augustus Armeniacus, Pontifex Maximus, holding tribunician power for the 19th time, hailed as imperator for the 3rd time, consul for the 3rd time, and
Emperor Caesar Lucius Aurelius Verus Augustus Armeniacus, holding tribunician power for the 5th time, hailed as imperator for the 3rd time, consul for the 2nd time,
built (this) from Napoca at mile X,
under the reign of Emperor Caesar Marcus Aurelius Antoninus Augustus.

The text of the milestone suggests that the road was probably repaired in 164-166 A.D. during the reign of Marcus Aurelius and again between 169-176 A.D. (Piso 2011, 313). I. Piso was right to assume that the road was prepared in 164-166 A.D. in the context of a possible invasion, and then repaired in 169-176 A.D., in the context of the Marcomanic wars.

The key takeaway from the text of this milestone is the strategic importance of this road for the military operations of the province throughout its existence, from 106 to 271 A.D.

The topography and archaeology of the Imperial road

From Lederata to Tibiscum

From *Lederata* to *Tibiscum*, the Peutinger Map records a total distance of 73 miles, eight settlements, and seven distance markers. We assume that the distance from Aizis to Caput Bubali (only III miles on the Peutinger Map) is a copyist's error. If we put XIII miles instead of III, this would align with the current distance between Fârliug and Cornuțel. Consequently, the total distance from *Lederata* to *Tibiscum* would be 83 miles (122.7 kilometers).

The stations recorded on the Peutinger Map are, in some cases, difficult to locate. *Lederata* (present-day Ram, Serbia) is positioned on the right bank of the Danube in Serbia. *Apus flumen* is believed to correspond to the river Caraș or Orešac (Serbia). The following stations could be identified (some only hypothetically) as follows: *Arcidava* (Vărădia or Vršac); *Centum Putea* (Surducu Mare?); *Berzobis* (Berzovia); *Aizis* (Fârliug); *Caput Bubali* (Cornuțel); and *Tivisco* (Jupa). The total distance of 73 miles (approximately 108 km) is accurate if the proposed locations are correct.

Some sectors or crossroads have been archaeologically identified in the field: close to the fort of Vărădia, from Doclin to Biniș and Bocșa Română, near the fort of Surducu Mare, and in the areas of the villages of Ramna, Brebu, and near Jupa (Răuț, Bozu, Petrovsky 1977, 135-159; Bozu 2008, 81-105).

From Dierna to Tibiscum

From Dierna to *Tibiscum*, the Peutinger Map records a total distance of 68 miles, with 6 distance markers and 7 settlements. Again, some stations recorded in the Peutinger map are difficult to locate. *Dierna* corresponds to present-day Orșova (Mehedinți County). *Ad Mediam* has yet to be identified. *Praetorium* is located at Mehadia (Caraș-Severin County), where a Roman fort was built. Another Roman fort was established at *Ad Pannonios* (Teregova?). The locations of *Gaganis* and *Masclianis* remain unknown. The current distance from Orșova to Jupa (97 kilometers) roughly matches the distance indicated on the Peutinger Map from *Dierna* to *Tibiscum*, which is 68 miles (100.5 km).

This road has been identified at only a few points. A recent study examined the Roman forts in the southwestern part of *Dacia*, providing accurate and comprehensive data through geophysical surveys, aerial photography, digital terrain models, and geomagnetic prospection regarding the forts situated along the two Roman roads in Banat (Țentea, Matei-Popescu, Timoc 2023, 763-804).

From Tibiscum to Ulpia Traiana Sarmizegetusa

From *Tibiscum* to *Ulpipa Traiana* the Peutinger map records a total distance of 37 miles: Tivisco-XIIII; Agnavie-VIII; Ponte Augusti-XV; Sarmategte. Recently, its route has been identified at several points in the terrain: east of Obreja, west of Glimboca and west of Oțelul Roșu (Dîscă, Leonti 2023, 49-70) (Fig. 7, Fig. 8, Fig. 9). However, the most significant information regarding the route of the Roman road is provided by the maps produced in the Habsburg Empire, starting in the 18th century. The maps from the First Military Survey depict this road with a thick red line, labelled as “Landstrasse aus Banath

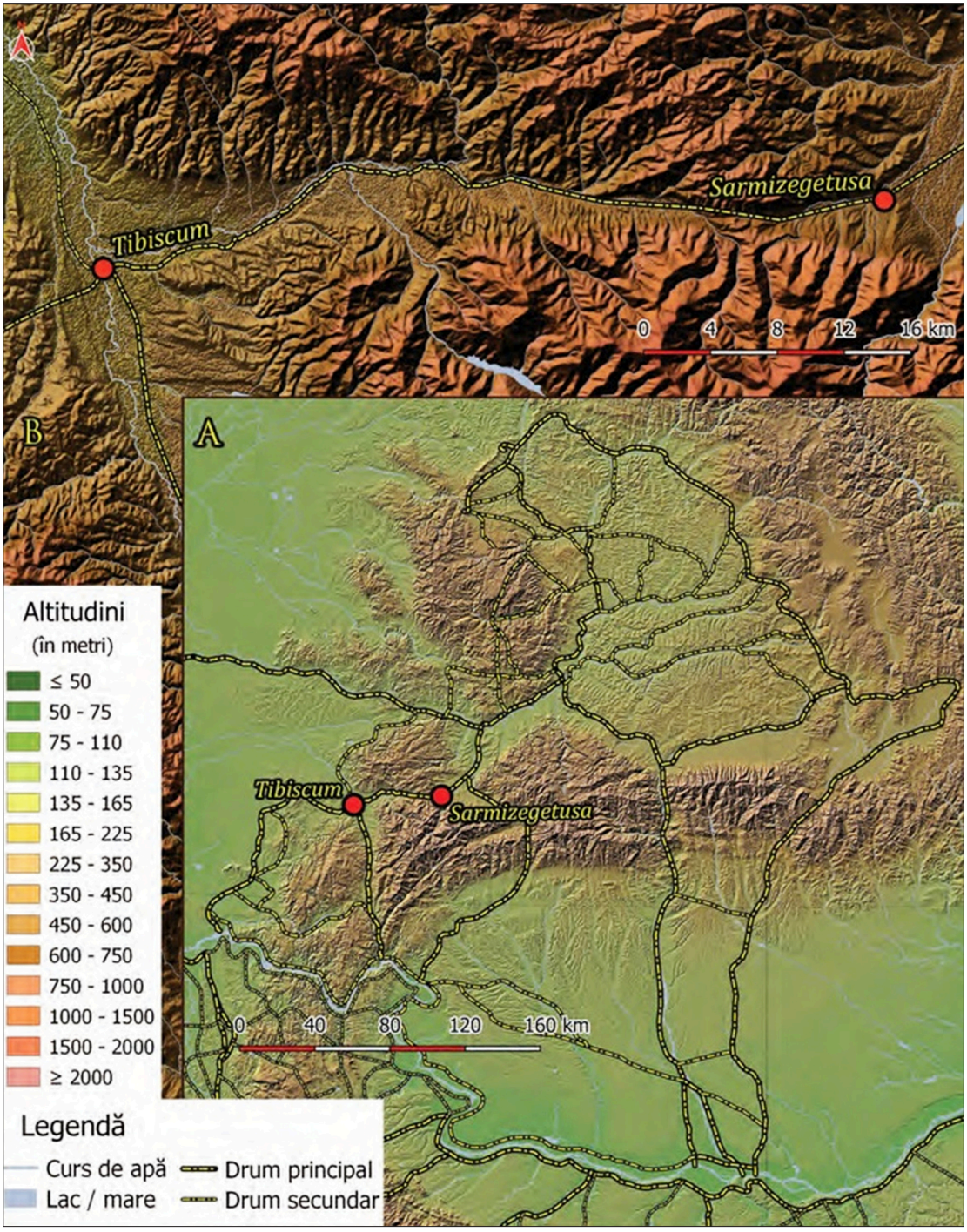


Fig. 7. Digital elevation model showing the main roads of Dacia and the route of the Roman road from Tibiscum to Ulpia Traiana Sarmizegetusa (source: Dîscă, Leonti 2023, 51, fig. 1).

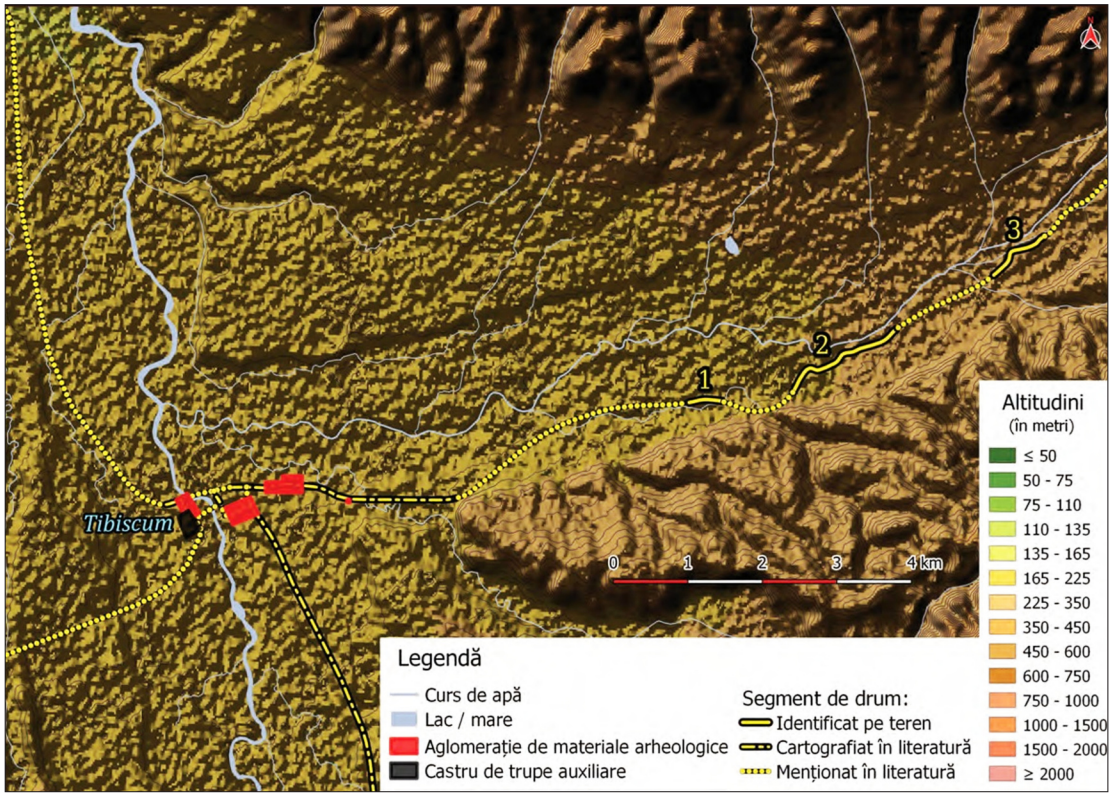


Fig. 8. Digital elevation model depicting road segments identified on the ground in the area of Tibiscum – Ulpia Traiana (source: Dîscă, Leonti 2023, 65, pl. V).

nach Szaszváros", close to the former Roman city. The former Roman city Ulpia Traiana is indicated by the expressions "Römisches Laager der 7: und 13. Legion Ano 103" and "Stäte von Ulpia Trajana alwo die Röm. Colonie gewohnet" (First Military Survey, Siebenbürgen, Ancrum Maps). The Imperial road is depicted with the same red line from Unciuc to Subcetate, spanning approximately 10 kilometres, with two toponyms: "Trajaneer Weg" and "Trajaner Weg" .

On the maps from the Second Military Survey (Europe in the XIX. century ,Arcanum Maps), the same Imperial road, named "Trajans Weg", is marked with a red line from Várhely ("Gradiștie") (Sarmizegetusa, Hunedoara County) to Nagy-Osztro (Ostrov, Hunedoara County). Continuing in the same direction, from Unciuc to Săcel and Bărăștii Hațegului, the road, referred to as "Römische Strasse", is depicted as a straight line .

The same Imperial road from Várhely ("Grădiște") to Nagy-Osztro (Ostrov), drawn as a line and labelled with the toponym "Trajans Weg", is depicted on the maps from the Third Military Survey (1:25000). The term "Römisches Lager" is used to denote the former city, while "R. Amphitheater" indicates the ruins of the amphitheatre . The same road is represented on these maps as a straight line from Baresd (Bărăștii Hațegului, Hunedoara County) to Subcetate. Below this road sector, it is written



Fig. 9. Traces of the Roman road west of the village of Glimboca (source: Dîscă, Leonti 2023, 54, fig. 3).

in capital letters, "Traian" (Habsburg Empire (1869-1887) - Third Military Survey (1:25000) | Arcanum Maps).

The maps from the Third Military Survey (scale 1:75000, 1869-1887) depict this road in the sector from Várhely ("Gradiștie") to Ostrovu Mare (Ostrov) with the usual toponym, "Trajans Weg" (Habsburg Empire (1869-1887) - Third Military Survey (1:75000) | Arcanum Maps).

In the Várhely ("Grădiște") - Nagy Osztro (Ostrov) sector, using the same toponym, "Trajans Weg", the so-called "planuri directoare" indicate the same Imperial Roman road, represented on these maps as a straight line from Baresd (Bărăștii Hațegului, Hunedoara County) to Subcetate. The toponym "Traian" is used to indicate the road.

We conducted terrain investigations several years ago to identify, measure, and map the remains of the former Imperial road over a distance of approximately 16 kilometres (Fodorean 2007, 365-384) in the sector from *Ulpia Traiana* to Sântămăria Orlea. In the area of the northern side of the former Roman city and further on, from Sarmizegetusa to Ostrov, the road remains visible in the field (personal research conducted in 2006, 2007, 2014, 2016, and 2017). The traces of the Roman road are well preserved, as it was constructed as an *agger*. In other words, its structure is elevated compared to the surrounding terrain (Figs. 10, 11, 12).





Fig. 10, above & fig. 11, below. Vestiges of the Imperial Roman road leaving Ulpia Traiana Sarmizegetusa (photos F. Fodorean).



Fig. 12. Vestiges of the Imperial Roman road leaving Ulpia Traiana Sarmizegetusa (photos F. Fodorean).

From Ulpia Traiana Sarmizegetusa to Porolissum

The settlements located along the Imperial road from *Ulpia Traiana* to *Porolissum* are *Ad Aquas* (Călan, Hunedoara County), *Petris* (Uroiu?, Hunedoara County), *Germisara* (Germizera in the Peutinger map, today Geoagiu-Băi, Hunedoara County), *Blandiana* (today Blandiana, Alba County), *Apulum* (Alba Iulia, Alba County), *Brucla* (Aiud?, Alba County), *Salinae* (Războieni-Cetate, Alba County), *Potaissa* (Turda, Cluj County), *Napoca* (Cluj-Napoca, Cluj County), *Optatiana* (Sutor?, Sălaj County), *Largiana* (Românași, Sălaj County), *Certiae* (Romita?, Sălaj County), *Porolissum* (Moigrad, Sălaj County) (*Fig. 13, Fig. 14*). The most significant areas where the Imperial road has been investigated in the terrain are the ones from Războieni-Cetate to Turda, from Turda to Cluj-Napoca, in the area of Nădășelu and Sutor (Cociș, Lăzărescu, Socaciu 2022, 83-130), and at the entrance to the Roman city of *Porolissum*. In the sector from Războieni-Cetate to Turda, at the beginning of the 20th century, Téglás István, a school inspector who lived in Turda, and also an enthusiastic amateur archaeologist, draw a sketch of the road, using the toponym 'Trajanus ut' ('Trajan's road') (*Fig. 15*). Close to the village of Ceanu Mic, the road was identified in the terrain in 2005 (*Fig. 16, Fig. 17*). The road is also visible near the village of Aiton, primarily in ploughed areas, where its infrastructure is gradually being destroyed (*Fig. 18*). The best-preserved section of this road is located at the entrance to the city of *Porolissum*.

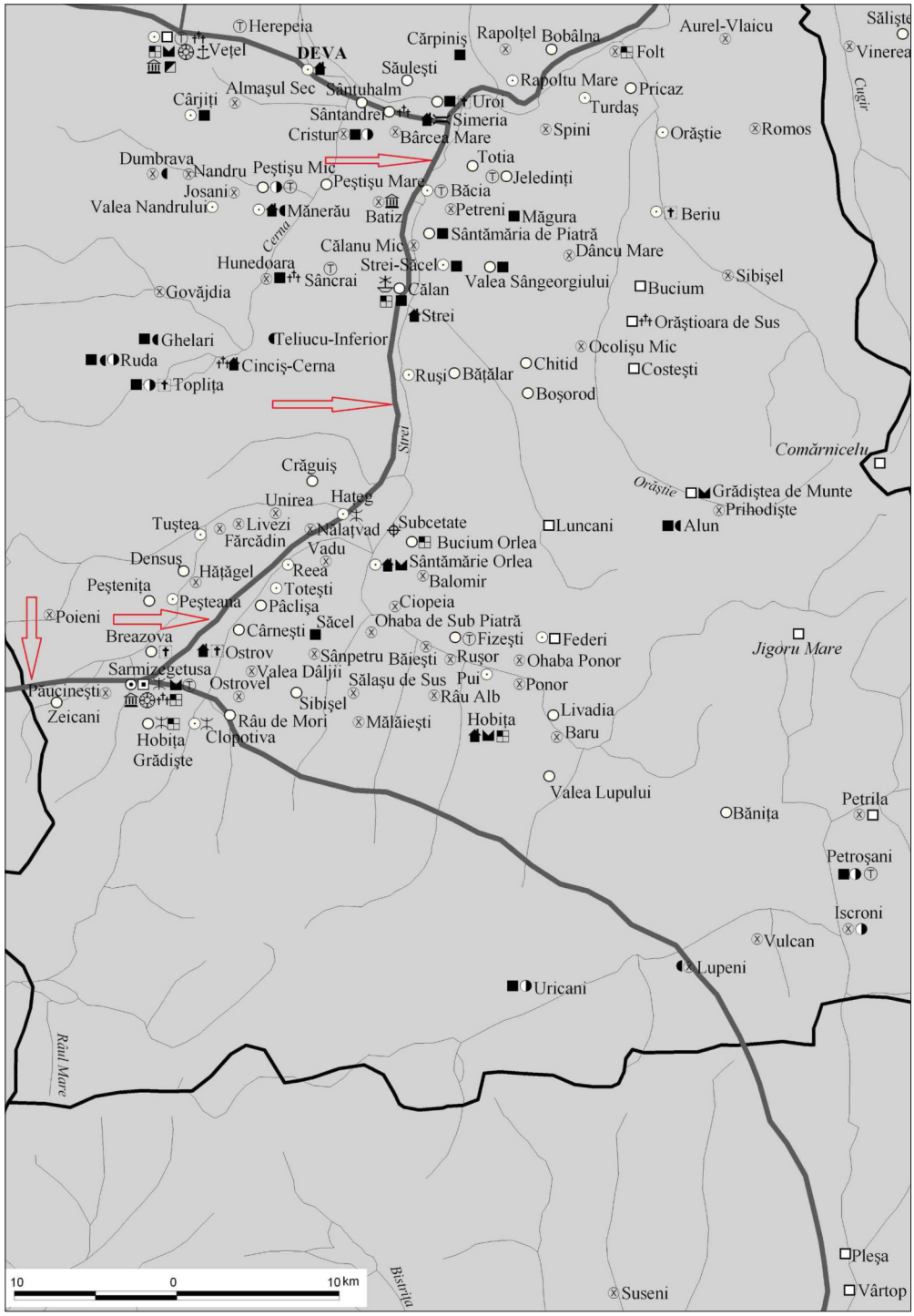


Fig. 13. The route of the Imperial road from Sarmizegetusa to Uroiu (source: Bărbulescu 2005, 121).

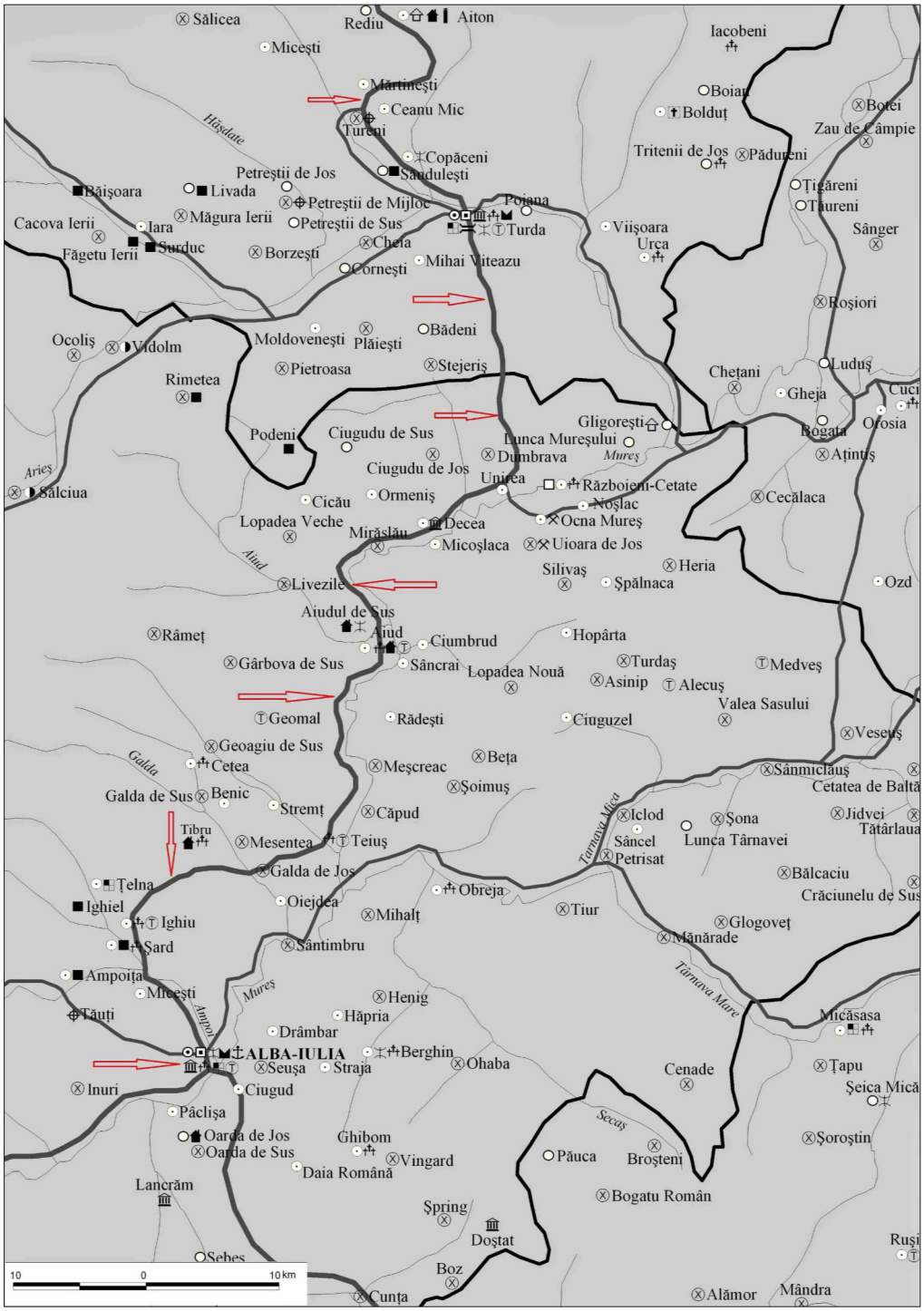


Fig. 14. The route of the Imperial road from Alba Iulia to Turda (source: Bărbulescu 2005, 114).

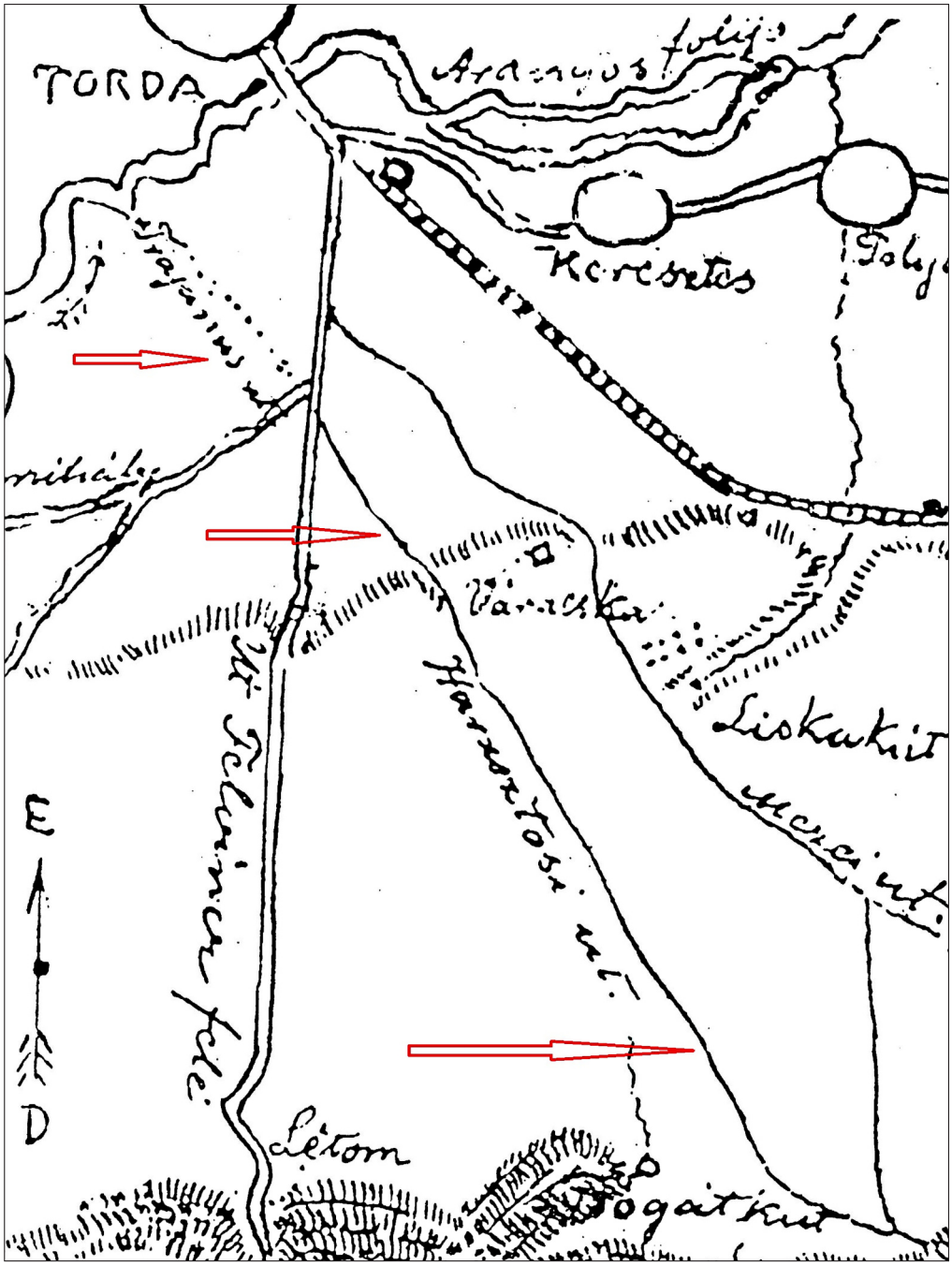


Fig. 15. A sketch depicting the line of the Imperial road in the Războieni - Cetate – Turda area, drawn by Téglás István (source: Téglás 1913, 58).



Fig. 16 above, 17 below. Excavated sections of roadbed in the vicinity of Ceanu Mic village (photos F. Fodorean).





Fig. 18. The line of the Imperial Roman road close to the village of Aiton (photo F. Fodorean).

Conclusions

The Imperial road of Roman *Dacia* functioned as the 'highway' of the province, serving several important roles. To summarise, its significance is connected to the following aspects: 1. For a period of time, it served as a frontier road in the western part of *Dacia*; 2. All the legionary fortresses in *Dacia* were constructed along it: *Berzobis*, *Apulum*, and *Potaissa*; 3. All the major cities of the province were located along this road: *Dierna*, *Tibiscum*, *Ulpia Traiana Sarmizegetusa*, *Apulum I*, *Apulum II*, *Potaissa*, *Napoca* and *Porolissum*. These settlements were strategically positioned along the road. A remarkable example is the location of *Ulpia Traiana:* 72 Roman miles from *Berzobis* (legionary fortress from 106 to 117 A.D.) and 72 miles from *Apulum* (legionary fortress, the garrison of *legio XIII Gemina* from 106 to 271 A.D.).

In our analysis of the organisational pattern of Roman *Dacia* immediately following its conquest (Fodorean 2019, 17-29), we concluded that for organisational purposes the Romans precisely established several strategic points along the main Imperial road, implemented during the military campaigns and immediately after the conquest of *Dacia*. We identified two categories of sites along this road:

A. The so-called primary sites, which are the most significant from a strategic standpoint, positioned approximately 72 to 80 Roman miles apart. In our view, these sites are: 1. Berzovia, the fortress of *legio IIII Flavia Felix*, garrisoned from 106 to 117 A.D.; 2. *Ulpia Traiana Sarmizegetusa*, where a legionary fortress was constructed in the first phase, from 102 to 106 A.D.; 3. *Apulum*, the fortress of *legio XIII Gemina*, garrisoned here from 106 to 271 A.D.; 4. *Napoca*, *municipium* during Hadrian's reign; 5. *Porolissum*, where several troops were garrisoned in a large auxiliary fort positioned on the Pomet Hill.

B. The so-called intermediate or secondary sites are situated between the primary sites, at distances of approximately 36 to 40 miles. These would be: a. Vărădia (*Arcidava*?), where two auxiliary forts were archaeologically identified; b. Jupa (*Tibiscum*), a significant crossroads, where a fort was constructed, and where the two segments of the Imperial road intersect; c. Cigmău (close to Germisara, Hunedoara County), where an auxiliary fort was built; d. Războieni-Cetate, where an auxiliary fort and its associated civilian settlements were established (Cociș, Lăzărescu, Socaciu 2022, 83-130).

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Roman Roads in Moesia Inferior: the History of Research and the Road Network

by Adriana Panaite
panaite_adriana92@yahoo.com

Abstract

Research into Roman roads within today's Romania is a relatively new topic in the specialised literature. Although interest started developing in the late nineteenth century, it is only relatively recently that we have works available dealing with this topic. Even so, there have been several stages of research into the Roman roads of the region, as presented in the first part of the article. The second part of the paper focuses on the roads of Moesia Inferior, the Roman province that in antiquity occupied territory now within Romania and Bulgaria. The stages are presented by which the area evolved from the first contacts between the Romans and the Lower Danube populations, to its transformation into a Roman province. The focus is on the establishment of the road network in the area, which is one of the key elements of the functioning of the province.

Introduction

Roman roads are one of the most important engineering achievements of the ancient world. The network of roads that developed with the expansion of Rome facilitated the rapid movement of soldiers, information and goods. In order to enable each new settlement to function, a system of arteries was created to (re)connect in some way all those far from Rome. The construction of roads was one of the factors that led to the creation of a new type of economy, extremely dynamic and linking territories located at considerable distances, first in Italy and then gradually throughout the empire (Laurence 1999, 78-80, 145). Their emergence and development were driven by the need to secure resources to supply the army, which was far greater in numbers than the population of many of Italy's cities. Thus, the possibility arose of creating an infrastructure to supply first the army, but also the imperial capital that was growing in size, population and needs. Every newly conquered region had to be linked to Rome. The road network thus facilitated political domination over great distances.

The Roman road network brought about a '*compression*' of space, creating the *'Roman landscape*'. Road construction, together with the founding of towns and the division of the land by centuriation (a process little investigated, but with some remaining traces, e.g. at *Ulmetum* [Krebs 1998, 97-125]), both (re)shaped and unified that space. Each city is, after all, 'a little Rome'. This created the conditions for the implementation of Roman law and state control in every settlement in the empire. Not only space but also time was compressed. With the help of the milestones, one could determine one's exact

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position and location in relation to Rome (e.g. *Frontinus*, *De Aquis 5; Plinius* the Younger, *Epistulae* 2,17). Knowing speed of movement and location through the milestones made it possible to plan a journey, and the time required for either that, or more importantly, a military campaign (*Vegetius, Epitoma rei militaris 3,6; Historia Augusta, Severus Alexander 45*).

During the reign of Augustus and later Trajan, there was a real building boom. From the golden milestone (*miliarium aureum*), which was set up in 20BC in the Roman Forum, 19 roads led to each of the provinces of the empire. By the time of Trajan, the total length of Roman roads was over 100,000 km. The 2nd century marks the completion of the road system. During the same century, most roads were paved. By the Severan period, road construction was already much reduced, with repairs or various other maintenance activities on the roads themselves or other facilities being most commonly documented: milestones re-erected, resting places repaired, etc.

Building a road was primarily a political act. Each new conquered area was transformed into a Roman province, linked to the empire by at least one major artery. Beyond its immediate practical significance, a road symbolised Rome's permanent presence in the area. If the written sources refer to the reign of Augustus as *Tota Italia,* the expression *Italia restituta* is used for that of Trajan. During the time of these two emperors, road construction reached its peak in terms of kilometres of road built, and in terms of regions/provinces linked. Their direct involvement in road construction and maintenance attaches the image of the prince as patron and benefactor to the geographically and politically unified space. The road and the emperor unified spaces and created Roman 'consciousness'. The emperor could be present in the provinces either in person, perhaps marching to a new campaign, inspecting the army, or on a pleasure trip, or symbolically, through building or milestone inscriptions, or through other means of imperial propaganda, e.g. Roman coins such as the one struck by Augustus with the legend: *Quod viae mun(iendum) sunt* [for having the roads rebuilt]. Architectural monuments also require mention: thus, following construction of the *Via Flaminia*, the senate celebrated Augustus with an honorary arch at the end of the road (Laurence 1999, 41-42).

History of Research on Roman Roads in Romania

Within the territory of today's Romania, two Roman provinces functioned in antiquity: *Dacia* and *Moesia Inferior*. These entered the Roman sphere of influence at different dates and remained part of the empire for different periods of time. The province of *Dacia*, occupying only part of the territory of Decebal's kingdom, was organised by Trajan at the end of a war of conquest, conducted in two stages: AD 101-102 and AD 105-106. The province of *Moesia Inferior* covered Dobruja, the territory between the Danube and the Black Sea, as well as territories south of the Danube, today's Bulgaria, in the northern half of the country, as far as the Balkan Mountains.

As the Romans advanced towards the Danube, the area south of the river became part of several administrative structures: the *ripa Thraciae* or *Moesia*. In AD 86, *Moesia* was divided into two provinces, *Moesia Superior* and *Moesia Inferior*, with the boundary between them being the river *Ciabrus* (Tchybritza) and the Haemus Mountains marking the southern limit of the latter. During the reign of Hadrian, *Almus* (Lom, Bulgaria) and *regio Montanensium* (around Montana, Bulgaria) became part of the province of *Moesia Inferior*. Later, towards late 2nd century AD, *Nicopolis ad Istrum* (Nikiup, Bulgaria) and *Marcianopolis* (Devnija, Bulgaria) were also included as part of the province, while *Messambria* (Nessebar, Bulgaria) became part of Thrace. *Dacia* was one of the last provinces added to the empire

and one of the first to be abandoned, belonging to the empire until the reign of Aurelian (270 to 275 AD); by contrast *Moesia Inferior* underwent a process of political and administrative reorganisation after the invasions of the Carpi and Goths in the mid-3rd century, and then went through a series of reforms initiated by Diocletian and completed by Constantine the Great, so that by the end of the 3rd and beginning of the 4th centuries, we can speak of three provinces: *Dacia Ripensis, Moesia Secunda and Scythia Minor*, the latter being located mainly within the territory of Dobruja.

Until relatively recently, Roman roads in the territory of today's Romania and Bulgaria did not represent a major research focus. We can trace several stages in the evolution of investigations into this most important subject, greatly studied and developed in some other provinces of the empire. The interest of researchers began to manifest itself at the end of the 17th and the beginning of the 18th centuries. As might be expected, this was not then of a scientific nature, being represented mainly by travel guides for lovers of antiquities. Real scientific research began in the late 19th century. Of the works published at that time, the most important were those by K. Jireček and the Škorpil brothers (Jireček 1877; Shkorpil 1905; Jireček 1974) dedicated to the towns and roads of Bulgaria.

By far, the most important personality of this early period is Pamfil Polonic. Born in 1858, he graduated from several military schools, with topography as his specialisation. Because of his skills, in 1892, he was appointed as a draughtsman at the National Museum of Antiquities from Bucharest. For Romanian archaeology, Pamfil Polonic remains the first to introduce topographical methods for locating archaeological sites. One of his many interests was the investigation of the Roman roads. His notebooks, preserved mainly in the Library of the Romanian Academy (Manuscripts Section), contain many notes, drawings and details, in precise written form, based upon accurate field observation and measurements (Măgureanu 2013, 77–90; Măgureanu 2014, 115–126).

He is the author of the first archaeological maps of *Dacia* and Dobruja. His work '*On the walls (Trojans), roads and Roman fortresses in all the countries inhabited by the Romanians*', was never published, despite being awarded by the Romanian Academy with the Adamachi prize in 1917. It is worth mentioning that this work had the following motto: *The Emperor's Valley*, a direct reference to Emperor Trajan. Almost two decades later, convinced that his work would never be printed, he tried to offer it to the public in the form of a summary. However, that formula did not work either: he succeeded only in publishing two brief articles (Polonic 1935a, 21-26; Polonic 1935b, 18-26).

Analysing Polonic's manuscripts relating to Roman roads, we notice that the author treats the roads in *Dacia* and Dobruja differently. The description of the Roman roads in *Dacia* is extremely meticulous, including elements of relief, climate, distances, etc., whereas for Dobruja, Polonic starts from information already known at his time from ancient sources, principally the *Tabula Peutingeriana.* In the case of Dobruja, he no longer makes topographic observations, nor describes and maps sections of road discovered, as he did for *Dacia*. His field trips were aimed at verifying information, especially distances indicated in the ancient itinerary. He concluded that for each road segment there is a disagreement of about 5 km between actual distance in the field and distance indicated in the *Tabula Peutingeriana.* (Panaite 2011; Suceveanu, Barnea 1993, 159–179).

One of the earliest articles dealing with Roman roads in Bulgaria, apart from works already mentioned above, was published in 1937 by Yanko Todorov, in the series *Quaderni dell'Impero, Le grandi strade del Mondo Romano* under the title *Le grandi strade romane* in Bulgaria. On the basis of information known at

the time, he drew up a picture of the roads in the provinces of Thrace and *Moesia Inferior* (referring only to Bulgaria). Unlike his Romanian contemporaries, he also dated the roads. According to him, the roads to Thrace were already functional in the middle of the 1st century AD, in Nero's time. On the basis of inscriptions, milestones, and data on the deployment of Roman legions in the area, Todorov stated that the road along the Danube lay on the right bank and its construction was undertaken by soldiers of the IV Scythian and V Macedonian legions; later, important works in the Iron Gates area were made by Trajan, who also extended the road to the Danube delta. In 1938, in the above-mentioned series (*Quaderni dell'Impero, Le grandi strade del Mondo Romano*), Emil Panaitescu published a summary study, *Le grandi strade romane* in Romania, without, however, making any reference to roads in Dobruja. Two years earlier the same author had already published, with comments, a map of these roads and another map showing the links between the Danube provinces and the other parts of the empire (Panaitescu 1936).

The following period, until the Second World War, is the time when some Roman road routes were gradually discovered, especially in south-western *Dacia*, but also in Dobruja; it is also the time when the first, generalised, papers or chapters on Roman roads appeared, especially in relation to *Dacia* (Fodorean 2003). For Dobruja one of Pârvan's publications is most important (Pârvan 1912, 576-585), presenting a coherent picture of the Roman roads in the region. In his opinion, the roads that cross Dobruja from North to South are the important ones, the so-called imperial roads, while the secondary roads, semitae, oriented East-West, are those that connect the Danube with the Black Sea coast. As for the road through the interior of Dobruja, Pârvan corrects its route as it appeared in the Corpus Inscriptionum Latinarum (CIL) by drawing it further west.

The next period runs from the end of World War II to the 1970s. Within the territory of *Dacia*, Roman roads began to be systematically researched, with a decisive contribution by D. Tudor, who utilised much of the field research undertaken by P. Polonic (Tudor 1968a, 49-60; Tudor 1968b). For Dobruja, by contrast, there are only works dealing with the general history of the region during Roman time. In the second volume of the *History of Dobruja*, published in 1968 (Vulpe, Barnea 1968), and which deals with the territory in the Roman period, a chronological picture of the construction and stages of use of the road network is realized for the first time. Even though the subject is not given its own chapter, the data are presented for each emperor separately, and we have a clearer picture of the Roman roads, based upon an increasing number of archaeological discoveries and systematic research.

From the 1980s to the present day, road research in *Dacia* has undergone remarkable development. In this period a series of articles have been published resulting from systematic research into routes, infrastructure, superstructure and the main technical characteristics of Roman roads (Fodorean 2003).

In 2006, the first monograph dedicated to Roman roads in *Dacia* was published by F. Fodorean (Fodorean 2006). The work covers the range of aspects to be considered when analysing Roman communication routes. Florin Fodorean's book therefore deals with ancient, medieval and modern sources, road routes, transportation, constructional and legal elements, aspects of daily life etc., while proposing also a methodology for researching the communication routes of the North Danubian province.

A few years later, the same author took a further step in his research, proposing an attempt to reconstruct the Roman landscape in *Dacia*, using a combination of historical 19th Century

cartography, digital data and GIS: The Topography and the Landscape of Roman *Dacia* (Fodorean 2013).

For the same period, a series of monographs were published dealing with various topics in the history of Dobruja in the Roman period, but which include only general reference to Roman roads in the area: the Roman army (Aricescu 1977; Sarnowski 1988), fortifications (Zahariade 1988; Biernacka-Lubańska 1982), Danube *limes* (Zahariade, Gudea 1997; Gudea 2005), ports and the Danubian fleet (Zahariade, Bounegru 1996), economic life (Suceveanu 1977; Dyczek 2001) rural life (Suceveanu 1998; Bărbulescu 2001; Bâltâc 2011), etc.

We should especially mention the works of A. Suceveanu and A. Aricescu. Suceveanu places more emphasis on the idea of water travel (for local and other needs, on the smaller rivers of Dobruja), as well as on the need for a capillary network of local roads running along the water courses of the region. A second aspect that he emphasises, based upon the analysis of inscriptions, is the existence of *beneficiari* stations in the towns and fortifications of Dobruja, part of the infrastructure that was responsible for the good functioning and security of the roads.

Relying on the comparative study of cartographic and archaeological sources, the second author makes suggestions regarding the location of several ancient toponyms. Another of his hypotheses, in our view supported by solid arguments, is that from *Noviodunum* (Isaccea, Romania) to *Salsovia* (Mahmudia, Romania) the route represented in the *Tabula Peutingeriana* could be travelled by water.

The last synthesis on the history of Roman Dobruja appeared in 1991 (Suceveanu, Barnea 1991) and represents the first time that we see a chapter dedicated to the subject of roads. Benefiting from an increasing number of discoveries, and the published results of systematic archaeological research and field research, this chapter gives us an overview of the system of communication routes in Dobruja. In addition to the important roads already known (along the Danube and along the coastline) we now have a clearer route for the so-called '*central road*', which crossed Dobruja from South to North, through the centre of the territory; this road has been reconstructed on the basis of archaeological information and written sources, as it was not marked on any cartographic source preserved from antiquity to the present day.

Articles and monographs published in recent years now give us an overview of the Roman road network in the province of *Moesia Inferior* (Torbatov 2000; Madžarov 2004; Madžarov 2009; Panaite 2016). Despite the fact that few traces of the Roman roads have been discovered to date, their routes can be reconstructed, especially on the basis of milestone inscriptions (Panaite 2012a), itineraries and cartographical sources (Panaite 2012b; Fodorean 2014), analyses of the aerial and satellite images (Ștefan 1971; Ștefan 1973; Ștefan 1974a; Ștefan 1974b; Ștefan 1975; Ștefan 1976; Ștefan 1977a; Ștefan 1977b; Ștefan 1977c; Ștefan 1983; Ștefan 1984; Ștefan 1986; Crăciun 2008), comparing their data with information gathered from the field (Gugl, Panaite 2016; Madžarov 2004; Panaite, Miu (Bem) 2016), as well as from patterns of human settlement and necropolis (Oltean 2013; Oltean, Hanson 2007; Oltean, Hanson 2013), identified through survey research (Bărbulescu 2001; Bâltâc 2011; Tomas 2016). We still have to rely on old descriptions of the roads, from the end of the 19th-beginning of the 20th centuries, already mentioned above, which might prove to be inaccurate, as a recent analysis, undertaken for a segment of the *limes* road between the rivers Osăm and Vit, has shown (Torbatov 2021).

Adriana Panaite

The Pre-Roman Roads and the Creation of the Province Moesia Inferior

The future terrain occupied by *Moesia Inferior* was very diverse, consisting of a high Danube slope and the river's floodplain representing a flat corridor of swamps, marshes, rushes, and lagoons, ranges of gentle hills crossed by a series of rivers flowing from the south and wide plains as far as the Danube Delta and the Balkan Mountains, a real puzzle of ecosystems characterized by a variety of resources and forms of habitat. These topographical elements naturally divided the territory into smaller areas, inhabited by different groups of people: Getae, Greeks from the Black Sea colonies, Scythians (Irimia 2000–2001, 299–315), and Sarmatians (Bârcă 2006, 3–28; Bârcă 2013, 99–125; Oţa 2013, 317–320) and Bastarnae (Babeş 1994, 164–166). Although different, both in terms of physical features of the terrain, and of the populations who lived there, those micro-regions were transformed into a cohesive whole (a province), with the Roman army playing a decisive role. (Duch 2017, 371–397). It took the Romans almost two centuries to accomplish this, requiring a huge military effort as the local population showed fierce resistance (Batty 2007, 347–350).

When considering the populations of this area, the *Getae* are the largest group that the Romans met in the Lower Danube (Bâltâc 2011, 28–35). Information about them appears in written sources, to which is added archaeological information (Irimia 1980; Irimia 1981; Irimia 1983; Irimia 2007; Irimia 2010). Even so, reliable archaeological evidence is surprisingly limited.

Earlier scholars believed that large areas at the Lower Danube may have become almost unpopulated because of the frequent clashes in the area between the Romans and local populations. Ancient sources provide information about two major operations to resettle large populations during the first century AD in the Lower Danube area, which was apparently uninhabited. These two well-known resettlement operations were performed by *Aelius Catus* (Strabo 7.3.10) and *Silvanus Aelianus* (CIL XIV, 3608; Conole, Milns 1983: 183–200). This is increasingly refuted, but relatively few sites have produced evidence for continuous occupation even so. They are made harder to identify securely by the difficulties involved in dating later Latène period finds, but there are still a number of sites where unbroken settlement is highly likely.

Historical and archaeological sources (Irimia 1980, 115; Irimia 1983, 75) give data of a significant demographic development within the inhabited area, but the pattern of occupation and settlement of the territory is still unclear. The existence of significant variation within the types of *Getae* settlement is generally accepted and there are some studies dedicated to producing typologies of *Getae* settlement (Irimia 2007, 137–141).

The existence of local *Getae* should be extended also to the Roman Imperial period, as their presence is demonstrated not only by archaeological and epigraphic sources dating from the 2nd and 3rd centuries AD, but also by toponyms, especially those ending in -dava, that belong to the broader family of *Geto-Dacian* toponyms (Suceveanu, Barnea 1991, 34–39; Suceveanu, Rădulescu 2001, 291–306).

What characterises the politics of the Romans is the diversity of their actions which, taking into account pre-existing realities, combine diplomacy—through the organisation of intermediate administrative territorial units such as *ripa* and *praefectura, strategiae* - with military actions. *Limes* and *ripa (Danuvii)* are mentioned by Tacitus (Tacitus, Agricola 41, 2), while during Domitian a *praefectus classis Moesicae et ripae Danuvii* is attested, which proves that the area east of *Novae* and the Jantra River

was mostly patrolled by the Roman fleet (Tomas 2016, 25–29). This area represents also the tax district of the *ripa Thraciae* (ISM I 67, 68; Tomas 2016: 104–108), starting from *Dimum* (Belene, Bulgaria), although it is uncertain if *Dimum* itself belonged to p*ublicum portorii ripae Thraciae* or to *publicum portorii Illyrici*. This tax district demonstrates the beginning of the Roman customs organisation of the Lower Danube: part of a wider process of administrative organisation in the Roman province.

An intermediate stage in the organisation and extension of control over this territory is represented by the presence of *strategiae* (administrative districts). There are traces of the Thracian *strategiae* in the area of the future *Moesia Inferior*, and especially in *Scythia Minor*. Members of the aristocracy became *strategoi* under the Roman rule, which demonstrates that up to Trajanic–Hadrianic times the administration of the Lower Danube territory depended upon the former aristocracy. Moreover, it seems that the system was not instantly abolished when this area was assigned to the province of *Moesia* after AD 46 (Matei-Popescu 2018). Rome maintained the Thracian *strategiae* for a long time because the loyal Thracian elites voluntarily adopted elements of Roman culture, frequently functioning as cultural intermediaries. On the other hand, the *strategiae* represented the future *territoria* of newly-founded Roman settlements.

This is the context in which access roads or earlier roads were to be transformed by the Romans into real highways, with new ones being constructed as the province became organised. The most important route connecting Thrace with the regions north of the Danube ran along the Hebrus and Strymon rivers, across the Trojan Pass, along the Osam and Vit rivers up to Oescus, and then along the river Olt. There was another route across the Rusalijski Pass and along the valley of Rositsa, likely continuing further along the Osam and Yantra rivers. Through the Šipka Pass there was a further route going north on the valley of Yantra and its tributaries (Hristov 2002: 72–73, 78–79, 84–90).

The Oescus - Philippopolis road, an old Thracian communication route, was one of the first to be taken over by the Romans in the Lower Danubian lands after the liquidation in AD 46 of the Thracian kingdom. It provided a direct link through the present-day Trojan Pass between the legionary camp of *Oescus* (Gigen, Bulgaria), located on the Danubian *limes* in the province of *Moesia*, and the capital of the newly established province of Thrace – *Philippopolis* (Plovdiv, Bulgaria), where it connected with the so-called Diagonal Road from *Singidunum* (Belgrade, Sebia) to Byzantium. According to the explicit testimony of the inscription from Michiltsi of AD 61 (CIL III, 6123=CIL III, 14207), by this time the road was already fully operational, forming part of the network of *viae militares* in that part of the Empire (Madžarov 2009, 202-214).

Another important observation considers the burial mounds and their concentration on a diagonal line extending from the area of *Durostorum* (Silistra, Bulgaria), on the Danube, to the Black Sea coast, and then down to *Callatis* (Mangalia, Romania) and further to the south. This data also confirms the existence of an inland route of travel starting from the Greek colonies, whose alignment could previously only be presumed based on Greek pottery discovered in adjacent settlements (Irimia 2007, 168; Oltean 2013a, 202–219). The discovery of Greek artefacts – primarily amphorae – in interior settlements proves the connections (and thereby routes), predominately commercial, between *Getae* and Greeks from the colonies. In the settlements at Izvoarele, Satu Nou and Adâncata, there may even have been *emporia* or Greek enclaves in pre-Roman times (Irimia 2007, 169–174). Let us not forget that along this route, in the Roman period, there was a well-established Greek community at Urluia (Barnea 1969, 595–609), in the territory later administered by the city of *Tropaeum Traiani* (Adamclisi, Romania).

A similar situation is also well-documented for *Axiopolis* (Cernavoda, Romania), which, before the Romans, was involved in the transit trade with cereals from the eastern part of the Wallachian Plain (Bărăgan) along the Carasu valley to *Tomis* (Constanta, Romania) (Suceveanu 1977, 105; Suceveanu 1998, 45), probably at that time still partly navigable. This is also the shortest link across Dobruja, from the Black Sea coast to the Danube. Three lines of fortifications lie between *Axiopolis* and *Tomis*, one of which is a stone wall with military fortifications along its line. The strategic importance of this route of communication (Panaite 2017, 41-48) is demonstrated by the fact that after the transformation of the area into a Roman province it is very well guarded by a strategic system of fortifications comparable to that of the *limes*, and this is (maybe) the reason why it was interpreted as a frontier (Hanson, Oltean 2012, 297-319).

It was noticed that the roads that the Romans developed or built in the wake of their military campaigns in the Lower Danube area or in the first stages of organising the province of *Moesia* could not have crossed tribal territories for fear of potential attacks, but must have rather followed boundaries between the tribes. This avoided conflicts, while assuring relative safety of travel and monitoring population movement (Dyczek 2010, 153; Dyczek 2023, 140).

The finalisation of the organisation of the Danubian frontier takes place during Trajan's time and receives its final shape only at the beginning of Hadrian's reign, when the area beyond the Danube in Wallachia, a military buffer for *Moesia Inferior* which was seized by the Romans during Trajan's war in *Dacia*, was given up, and with the establishment of the southern border of the province *Moesia Inferior*. All military units were afterwards garrisoned south of the Danube, in *Moesia Inferior*, or along the Olt River, in the newly created province of *Dacia Inferior* (Petolescu, Matei-Popescu 2008; Țentea, Matei-Popescu 2015).

Water-Based Communication

Topography and waterways are the major factors in determining the path of the access network throughout the area. The river Danube was the main water route, but it is to be assumed that there was interconnectivity between land and water routes. Some communication routes were built along the main rivers, such as the Isker, Vit, Osam and Yantra. A recent study demonstrates the importance of the river Danube for the area, but also of the links between the fortifications on the Danube line, located at the mouths of the rivers (Oltean, Lungescu 2024). In general, we still know too little about possible navigable waterways in antiquity. Still, the late Roman literary sources for the movement of goods of that time (*Themistios, X, 133 and Priscus, 123*) and the archaeological evidence complements and illustrates that transport route. Thus, those goods were either transhipped on the river from sea-going vessels or unloaded in the western ports of the Black Sea, from where they were then transported by road.

Only recently has the problem of the connection between land roads and ports been studied. The detailed investigations for the fortification at *Noviodunum* demonstrate not only the existence of two ports, located to the east and west of the fortification, but also a direct connection between the directions of the land roads, which come from the interior of the province to the fortification and the direct access to the two harbour installations (Bivolaru et alii 2022).

Rivers also represent a significant topographical element in the organisation and delimitation of space. One of the most important inscriptions discovered in Histria is the so-called *chorotesia* (ISM I,

67, 68), through which the Roman authorities delimited the territory of the city that depended from an administrative and legal point of view on the former Greek colony. Two rivers, which already at the time of issuing the document, have Latin names – *Pisculus* and *Turgiculus* - are listed among the delimitation elements.

Another argument is provided by the Pliny the Younger's correspondence with Trajan (Pliny the Younger, Letters, X, 61-62). Here we learn how Pliny, seeking Trajan's opinion on the digging of a canal between the lake near *Nicomedia* and *Pontus Euxinus*, much needed for the transportation of goods, is first of all advised to verify the relationship between the levels of the lake and of the sea. To accomplish this task, he was to ask *Calpurnius Macer*, the governor of the province, to detach from the army of Lower *Moesia* a specialist in such measurements (*librator*), "*because the provinces in those parts have no lack of such craftsmen*".

Main Roads in Moesia Inferior

The system of Roman roads in *Moesia Inferior* developed in stages, by incorporating and expanding existing connections, but also by establishing new routes, especially as part of the process of provincialisation after the conquest of a new territory (Panaite 2016; Panaite 2023), with the Roman army playing a decisive role (Duch 2015; Duch 2017; Matei-Popescu 2010). The establishment of the road network was crucial to both the internal development of the province and the security of the frontier.

The province of *Moesia Inferior* was crossed by important, long-distance, North-South and East-West routes. Because of its position, it was an important link between the Danube provinces, Orient and

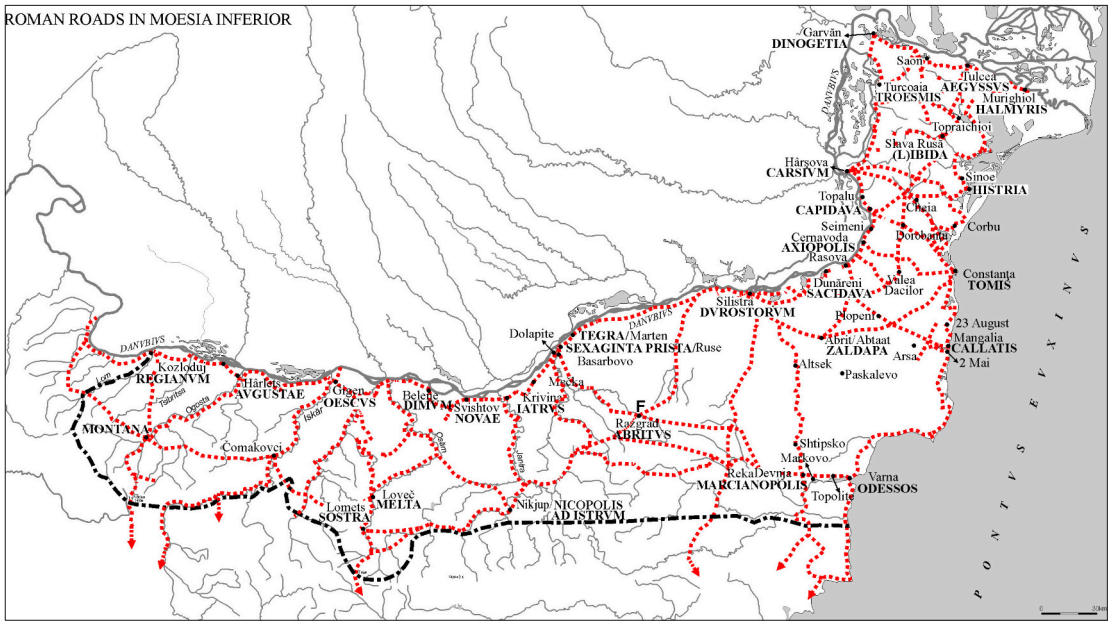


Fig. 1. Roman roads in Moesia Inferior

Upper Italy and there was a particular military need to allow the passage of large bodies of troops (*Fig. 1*).

The road along the Danube (*limes* road), the most important in the province, followed a route of particular strategic importance and fulfilled primarily a military role. It started at *Singidunum* (Belgrade) and was built entirely on the right bank of the river. Along it, at determined distances of Roman miles, were fortifications, stations, watchtowers and signal towers. Apart from the large fortifications (*Oescus, Novae, Durostorum, Troesmis, Noviodunum,* etc.), we know of only a few signal towers, for example Oryahovo (district of Oryahovo, Bulgaria) and Batin (district of Ruse, Bulgaria), in the vicinity of *Novae* (Five towers along the Danubian escarpment, Tomas 2016, 95), as well as for the *Halmyris* area (Zahariade 2011, 311-322; Suceveanu et alii 2003, 87-88). In the Danube Delta it connected with another road of strategic importance: the one that followed the coast southwards as far as Constantinople.

The issue about the roadbed and composition of the Danubian Roman road has not been entirely clarified even now. No example of the roadside stations, as first built, has been studied archaeologically. Archaeological studies which have been carried out reveal different stages from the development of the settlements and fortresses by the road, described in the *Tabula Peutingeriana* and *Itinerarium Antonini* as roadside stations. Madžarov (2009) and Fodorean (2014) paid greater attention to the comparative analysis of distances given by the cartographic sources between the separate roadside stations compared with the actual distances of the places in which they were located. Taking this into account as well as his personal field surveys, Madžarov (2009, 133-183) gives a more precise location to certain stations and settlements, situated along the Danubian road. At much the same time, field surveys conducted by German, Bulgarian, and Polish archaeologists (Mitova-Džonova 1979, 32, 36; Conrad, Stančev 2002, 676; Dyczek 2008, 259-260), allowed the course of the road near Nikopol, Belene, and Iatrus to be determined.

For the study of Roman roads, milestones are our main source of information, enabling a reconstruction of their course and direction and, presumably, of their chronology. Placed, by definition, every mile (approx. 1480 m) along the major Roman roads, the milestones (Kolb 2004, 135-155; Kolb 2011, 14-28) constitute political statements, whether concerning the movement of emperors, or economic and military programmes.

Originally practical aids for travel that provided useful information about distances, they gradually became instruments of communication and political propaganda, or means of asserting loyalty to an emperor, serving as symbols of Roman power.

Most of the milestones discovered in the Lower Danube area belong to the road along the Danube (the so-called *limes* road), but there are also inscriptions associated with the other main roads (Black Sea coast road, central Dobruja road, northern Balkan road) or secondary roads (connecting the Danube with the Black Sea or *Moesia Inferior/Scythia* with neighbouring provinces). It was noted that most of them come from the territory of the (future) province of *Scythia* (Panaite 2011, Panaite 2012a).

To date, about 109 milestones from the territory of *Moesia Inferior* have been discovered. There are 78 inscriptions dated within the Early Roman Empire (*Fig. 2*) and 46 for the Late Roman period (*Fig. 3*). The texts are written in Latin, apart from four inscriptions in Greek discovered near *Odessos* (Varna). The earliest milestone is dated to the reign of Trajan and was discovered at Sacidava, and the latest is from

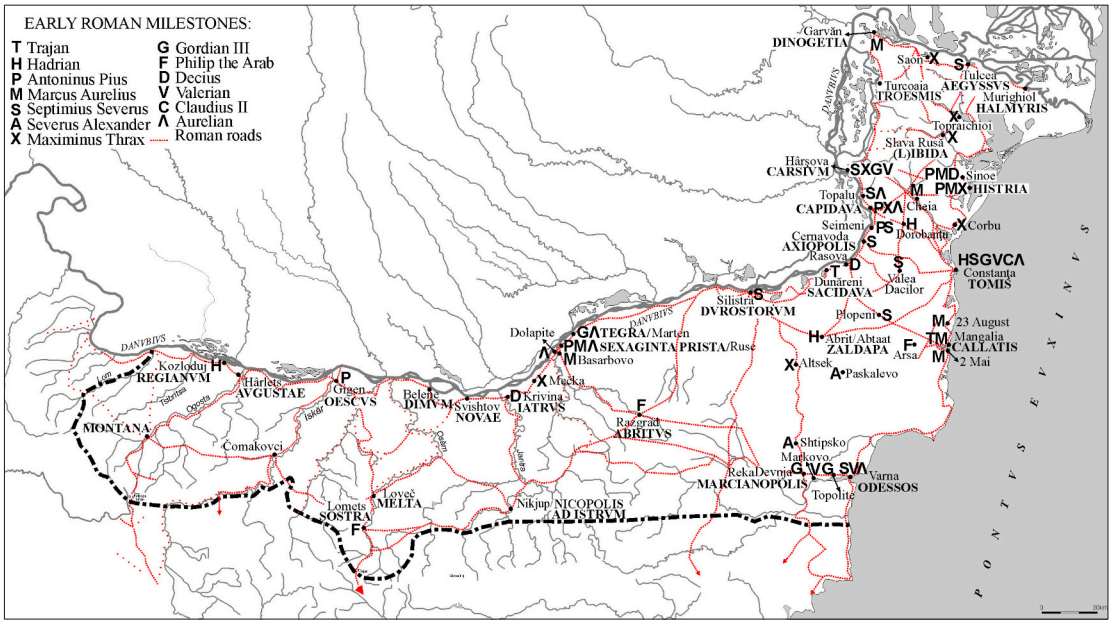


Fig. 2. Early Roman milestones in Moesia Inferior

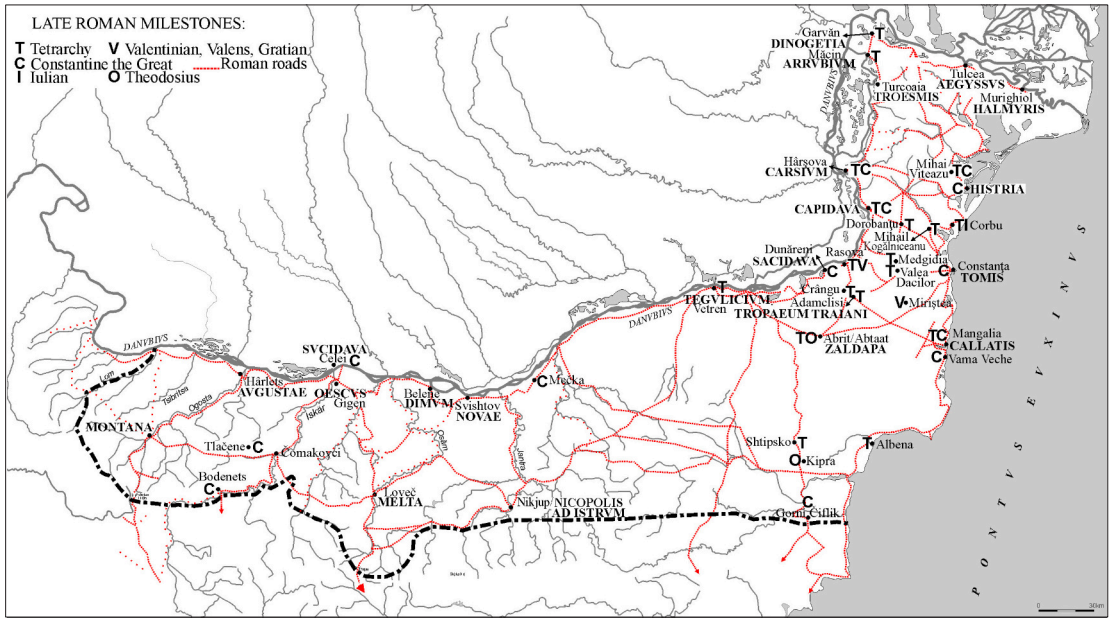


Fig. 3. Late Roman milestones at the Lower Danube

the time of Theodosius and Arcadius (AD 383–395) and was found in Kipra. Sixteen of the milestones are overwritten (palimpsests): eight of these were found on the road along the Danube, four belong to the road along the Black Sea coast, and three on the north-south central road through Dobrogea, while the origin of one is unknown. Two of these milestones were reused during the Early Roman Empire, seven had been rewritten during the Late Roman Empire, and another seven were dated to, or immediately after, the Tetrarchy (the time of Diocletian or Constantine) and reused later, during the 4th century AD. Only eight milestones were found in situ or very close to the place where they had been located in antiquity (Panaite 2011; Panaite 2012a, 131–143; Panaite 2015, 593–600; Panaite, Alexandrescu 2009, 429–455).

It is still an unanswered question as to why a large number of milestones have been discovered in *Moesia Inferior*, concentrated mainly in the territory of Dobruja, in contrast to *Dacia*, for example, where only nine milestones are known. Construction of the Danube *limes* road began in the time of Augustus. Later, the emperors Tiberius, Claudius and Domitian carried out important construction and repair works along its route in the area of the Iron Gates. Its development was completed by Trajan, during the *Dacian* Wars and the period immediately following. This road was also the centrepiece of the *limes*, by which we mean the whole system of border organisation: the access road, fortifications, with land troops backed up by units of the Danube fleet.

The road along the Black Sea coast links long-established urban centres, its role being decisive when analysed in terms of trade links. However, although the economic aspect of the road is essential, its strategic dimension should not be overlooked, as the coastal road was one of the main access routes to the area from south to north. Initially, the road remained undeveloped (as a '*country road*') with traffic carried mainly by sea. The Romans took the pre-existing route and turned it into a road in the true sense of the word. Traces of this road within the province of *Moesia Inferior* have not yet been found. They have been identified further south, in Thrace, in the area of Burgas Bay (Madžarov 2009, 184-202).

The two great roads of the province, that of the Danube *limes* and that of the Black Sea coast can be easily reconstructed according to the *Itinerarium Antonini* and *Tabula Peutingeriana*, with distances between localities usually verifiable, their routes mostly identified on the ground. Although the documents are often seen as having no practical purpose, they prove to be extremely accurate for the Lower Danube area, contributing significantly to the reconstruction of Roman road routes (Fodorean 2014). When the information from the *Notitia Dignitatum* (Pars Orientis) is added in, one can complete the picture of the two roads, identifying a whole series of *stationes* and the military units accommodated in each fortification (Ivanov 1999; Țentea et alii 2019).

The Dobruja central road was the artery that crossed the region from south to north, from *Marcianopolis* to *Noviodunum* and *Aegyssus*. It is not represented in any ancient itinerary, but its route can be established on the basis of archaeological information and written sources: *Marcianopolis - Zaldapa - Tropaeum Traiani - Medgidia - Ulmetum - Ibida* and from there to *Aegyssus* and *Noviodunum*.

Most of the milestones discovered on this route date from AD 293-305; from an earlier period, milestones are reported from Hadrian (at Dorobanțu and Zaldapa) and from Severus (at Cheia, Valea Dacilor and Ibida). On the basis of their analysis, we can assume the following: the construction of the road began, from south to north, under Hadrian; some sections were repaired in Severan times; and a large effort to rebuild the road took place early in the Late Roman period.

The route of the North Balkan Road, running parallel to the *limes* road, is as follows: M*ontana - Melta - Nicopolis ad Istrum - Marcianopolis - Odessos*. The segment between *Melta* and *Marcianopolis* is represented in the *Tabula Peutingeriana.* The only intermediate station between the two is *Nicopolis ad Istrum.* The segment *Marcianopolis - Odessos* appears only in the *Itinerarium Antonini*. The construction of segments of this road will have begun in Trajan's time, with the foundation of the cities of *Nicopolis ad Istrum* and *Marcianopolis*, but its completion and the creation of links to other centres in the middle part of the province were carried out under Hadrian.

The chronology of road repair and restoration clearly mirrors – with some minor discrepancies – the construction and use of fortifications in *Moesia Inferior/Scythia Minor.* Cities peaked in development under Marcus Aurelius and Septimius Severus in the late 2nd and early 3rd centuries AD (Suceveanu, Barnea 1991, 33-34), and roads followed the same pattern (Panaite 2012a, p. 131-143; Panaite 2015). The same phenomenon can be observed in Late Antiquity, specifically during the reigns of Diocletian and Constantine and later, during the reigns of Anastasius and Justinian (Suceveanu, Barnea 1991, 205-208).

This system of major routes demonstrates travel across the province and, more broadly, across the empire, but within it a dense system of local roads developed, contributing to the development of the local economy and trade.

In order to map secondary and local roads for each administrative territory we must use a combination of sources, including settlements (*vici* or *pagi*), *villae rusticae*, beneficiary stations, *mansiones*, etc., to which is added archaeological and epigraphic information. For the territory of Romania, in addition to existing publications (Bărbulescu 2001; Bâltâc 2011), we may use the cIMeC open-source database – National Archaeological Repertory: a live document to which new sites are regularly added, and existing sites amended in line with on-going research. The database can be searched according to county, period and type of site among other criteria. However, there is considerable variability in the quality and quantity of information uploaded. Particular care needs to be taken in distinguishing between the Roman and Later Roman periods because 3rd-6th century sites are regularly classified as being of either period. Differentiating between military sites and their adjacent civilian settlements may also prove difficult. As far as road segments are concerned, they are few; and the major problem, in our view, is that most are recorded as roads even though they have not been identified on the ground, but only as linear anomalies present in aerial and satellite photographs.

Another aspect that needs to be taken into account is the contemporary archaeological landscape which was greatly altered as a consequence of intense agriculture, and the massive land improvement works carried out during the Communist period: the irrigation system on *Insula Mare a Brăile*i (Alexandrescu, Olariu 2017, 134–136) and the construction of the Danube-Black Sea navigation canal. The Danube Delta also changed its shape over this period (Vespremeanu-Stroe et alii 2017), and some precise studies reveal transformations of the landscape in *Histria* (Preoteasa et alii 2012; Vespremeanu-Stroe et alii 2013), *Halmyris* (Giaime et alii 2019) or *Enisala* (Preoteasa et alii 2019). The coastline of the Black Sea has also undergone major changes and is now about 2 km further west than in ancient times, as seen at *Tomis or Callatis* (Scarlat 1973; Scarlat 1975).

The three longitudinal roads crossing Dobruja from North to South were intersected by a multitude of local roads, *semitae*, which linked the Greek coastal towns to the military camps and cities on the Danube: e.g. *Durostorum-Callatis, Axiopolis-Tomis, Capidava-Tomis, Capidava-Histria, Carsium-Histria* etc.

Attempts to reconstruct local road routes have been few, but detailed studies have been proposed for the territories of *Noviodunum* (Lockyear, Sly, Popescu 2005), *Halmyris* (Zahariade, Karavas 2015), *Tropaeum Traiani* (Panaite 2006; Panaite, Miu (Bem) 2016) *(Fig. 4*), *Histria* (Panaite 2010, Panaite 2014) (*Fig. 5*), *Troesmis* (Gugl, Panaite 2016, 448-58; Alexandrescu et alii 2023) *(Fig.* 6), and for the southern part of Dobruja, mainly using aerial photos (Oltean 2013; Oltean, Hanson 2007; Oltean, Hanson 2013).

Factors taken into account when reconstructing the network of local roads for specific centres are based upon need: water and food supply, requirements for raw materials (primarily stone and clay), defence and the ability to respond quickly in case of attack, communication etc.

To demonstrate the speed with which connections between different regions of the province were ensured, we refer to the connection road between *Tropaeum Traiani* and *Callatis*. A milestone from the time of Trajan was discovered in *Callatis*, the second in the whole province to be dated to his reign (Avram, Ionescu 2022, 67–70). Dated to the year 114, it is of limestone, very likely extracted from the Deleni quarry. Most importantly, it is made of the same type of stone used for the construction of triumphal monument at Adamclisi, erected by Trajan and inaugurated in AD109.

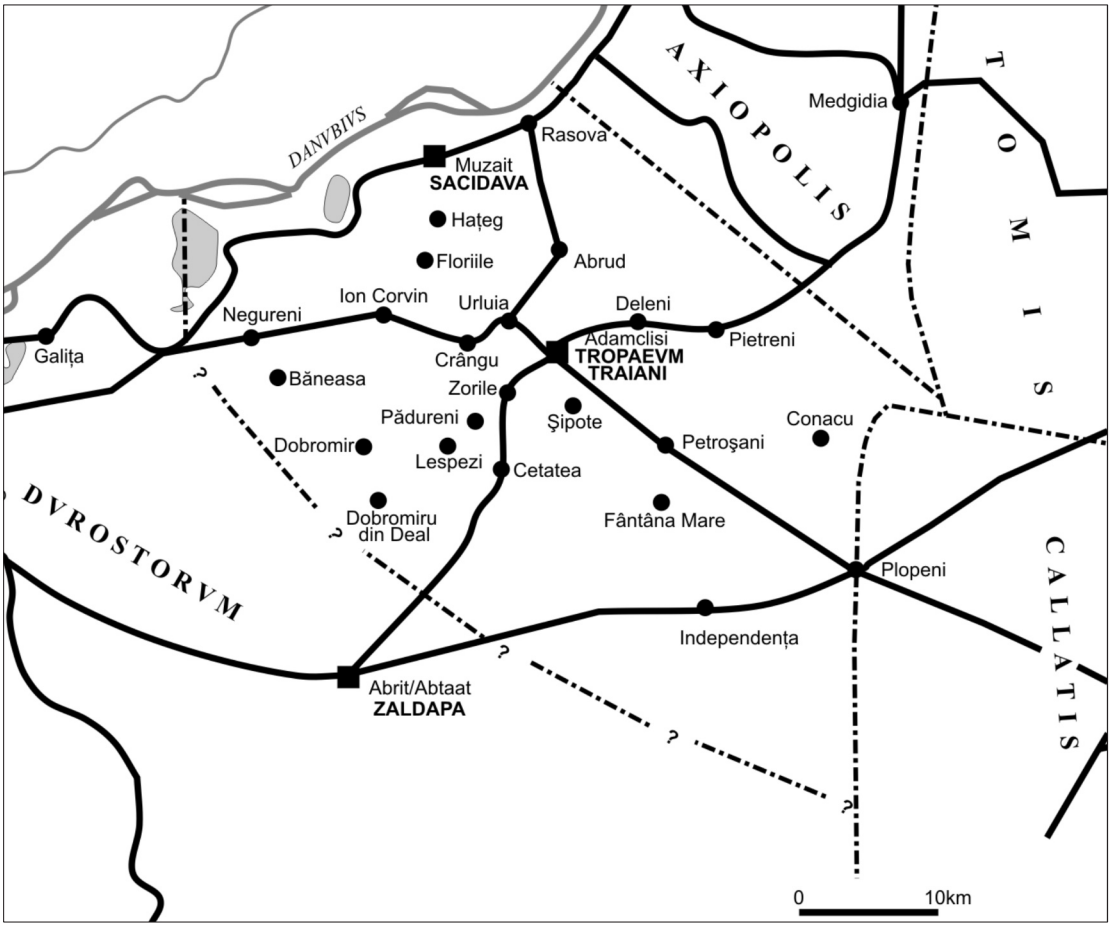


Fig. 4. Roman roads in the territory of Tropaeum Traiani



Fig. 5. Roman roads in the territory of Histria

The Romans imposed a new system of land ownership, agriculture and farming, which decisively influenced the organisation and distribution of rural settlements. (Bâltâc 2011; Bărbulescu 2001). Each settlement administered a territory whose limits were visibly marked on land. Roads seem to have been the most important form of boundary, not only because they assured communication, but also because they provided the necessary infrastructure for easily moving troops, arms and supplies into territories which needed to be defended. Roads were also extraterritorial, hence open to everyone, thus avoiding border conflicts.

Two inscriptions from *Moesia Inferior* contain the expression *via publica.* The first, written in Greek (ISM I, 378) is a complaint made to the emperor by the inhabitants of *Chora Dagei* (a settlement located

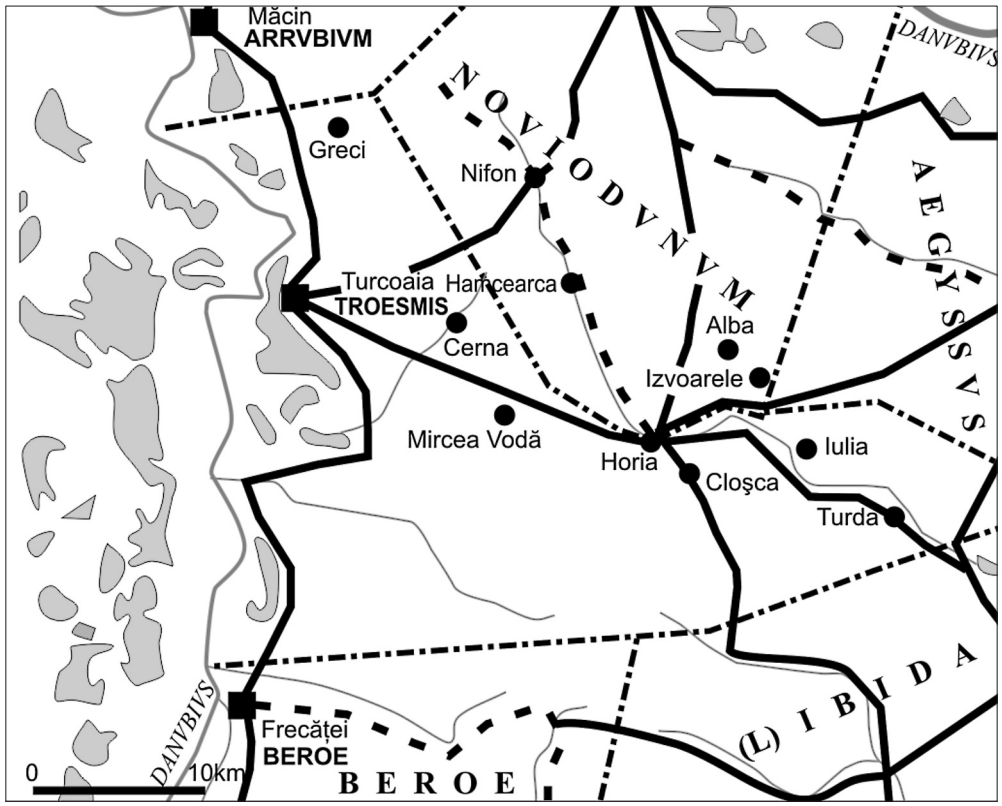


Fig. 6. Roman roads in the territory of Troesmis

near the '*public road*') asking for their road maintenance obligations (l*eitourghiai, angareia = munera)* to be reduced. The same inscription mentions a second settlement, *Laikos Pyrgos*, through which the '*public road*' also passed, and whose inhabitants, having the same difficulties with carrying out the public tasks, complained about them to the governor.

The second inscription, written in Latin (ISM V, 60) comes from *Ulmetum* (Pantelimonu de Sus), and most likely records a decision concerning land boundaries. A *via publica* is mentioned among other elements of reference. For Bulgaria there is a similar database, currently unavailable to foreign researchers. However, it was possible to look at some specific areas, that between the legionary garrison at *Novae* (Svishtov, Bulgaria) and the town of *Nicopolis ad Istrum*, where two landscape surveys have been carried out (Tomas 2016, 92-96; Poulter 1995).

Those investigations were undertaken utilising improved methods for the identification of new sites and the clarification of site location, extent and structure. Many of these ensue from a greater application of remote sensing techniques, both geophysics and aerial imagery, facilitated by international collaboration. The vast majority focused on better understanding the archaeology of the *limes*, directed towards clarifying the full extent and complexity of civilian settlement associated with military bases (*Noviodunum, Troesmis, Novae*, etc.). By contrast, little effort has been made in the hinterland of the province.

Roads and the Roman Army

The Roman army was clearly an important factor in *Moesia Inferior*. The military function of a road is perhaps the most important. Roads appears in connection with military conflicts, are built by the military, and mainly serve to facilitate the movements of troops and military supplies.

The road along the Danube, which was slowly transformed into the road that defined the *limes*, is the result of construction of military forts and their connecting roads, a process that was carried out from west to east following the stages of the expansion of the province. Additional secondary roads were constructed along the main rivers flowing into the Danube. Each tributary's mouth was invariably guarded by a legionary or auxiliary garrison. *Oescus* and *Novae* are placed in locations with ideal harbour positions and favourable to controlling the river itself.

Military sites are associated with the emergence of settlements such as the *canabae* and *vici*, which played an important role in the urbanisation of the province. Many army veterans were settled in the province as landowners (legionary veterans) or as the inhabitants of towns; some of them became active in local municipal administration. *Vici* and *canabae* provided important centres for many activities and services directed at both the army and the civilians, including industry, trade, transport and religious activities. These sites had a huge impact on local economies and social life, and in this way, they contributed to the rapid transformation of the territory.

But the army did not influence only the roads; it was also the main factor shaping the economy and local production. Like many other provinces in the Roman Empire, the resources of *Moesia Inferior* appear to have been largely based on agriculture, although ancient authors are divided on the fertility of the soil in this region (Zahariade 2006, 13), along with considerable pasturage for sheep, cattle and horses. Local food provision systems provided by the numerous farms created by successful settlement operations played a major role in the expansion of the garrisons. The numerous military troops quartered in the province, and the civilian settlements accompanying them, required supplies of food and building materials (Duch 2015, 235–260). As a consequence, one can notice the appearance of numerous rural settlements and villas and new agricultural practices (Bâltâc 2011; Bărbulescu 2001).

The Roman settlement pattern in the study area shows itself to be largely pragmatic. The great majority of settlements are located within areas of arable potential. Agriculture seems to be the main occupation, although the data at our disposal are more assumed than demonstrated. Villas and small towns represent the key-element of the settlement pattern. The location of rural settlement is influenced mostly by the major towns, which have their own extensive extra-mural/sub-urban activity, but outside these centres dense occupation has also been traced.

Over the past few decades, there has been a significant amount of research by international teams using fieldwalking, geophysical and aerial drone surveys, and rare excavations, directed towards clarifying the full extent and complexity of civilian settlement associated with military bases at forts such as *Noviodunum* and *Halmyris* (e.g. Lockyear, Sly, Popescu 2005; Zahariade and Karavas 2015), *Troesmis* (Alexandrescu et. al. 2016), *Novae* (Derda et alii 2008; Ciołek, Dyzcek 2011; Tomas 2016), and *Capidava* (Opriș, Rațiu 2017) with additional landscape survey work undertaken by Oltean and Hanson (2013).

An extremely thorough and focused analysis carried out a few years ago aimed to quantify the extent of the logistical burden represented by Roman garrisons, in terms of land and transport requirements (Matthews 2018). The focus was on arable land, both to feed the soldiers but also to provide feed-barley for transport animals. Based upon just a few regions of *Moesia Inferior* which are better understood as a result of combined investigations specific to landscape archaeology research, this paper proposes a theoretical model for estimating the supply requirements of the army, both in terms of agricultural production, and the number of soldiers or burden animals that had to be maintained. The author's conclusion is that the Roman army fed itself from the resources of *Moesia Inferior.* We hope that future extensive field research will confirm this theory.

Another aspect connected with the army is linked with its dynamic involvement inside the territory of the province. The study of temporary military camps within their geographic and historical contexts represents a novel focus for investigation. These sites are frequently identified only through close analysis of satellite or ariel photography and rarely offer more than the slightest remains on the ground. For this reason, marching camps have been underrepresented in our picture of how the Roman military operated, a deficiency which was recently addressed (Matei-Popescu, Tentea 2023). Roman temporary camps have been identified in Carcaliu, Istria, Ovidiu and Căscioarele, allowing us to gain a better picture of Roman army deployment in this frontier area. From a previously rather static view of the army, accommodated within fortresses and forts from the reign of Trajan onwards, it is now possible to see an army on the move, deployed at times to other parts of the province. An attempt to connect these fortifications to known historical movements of Roman troops within the region have been proposed.

A special category of soldiers clearly associated with roads is represented by the *beneficiarii consulares*. A distribution map of the findspots of inscriptions mentioning these officials helps us not only to trace the route of the roads, but also to understand better their role in ensuring safe transport, and perhaps to secure borders. Their importance is further indicated by evidence of their role in assuring a steady income to the state treasury (*aerarium*) either directly by levying customs or indirectly by securing roads, convoys and passengers. The 48 inscriptions from the territory of the province (Schallmayer et al. 1990, 469–506, 758–759; Ivanov 1993, 26–30) come from both main and secondary roads. A high concentration has been recorded in the Montana area, but also in other settlements along the road parallel with the *limes* (Glava Panega in Asklepion). In terms of dating, they fall generally between the second and third centuries, mostly from the second half of the second and the first half of the third century.

Conclusions

The building of a coherent and functional road system helped bring the area of *Moesia Inferior* under the direct control and administration of the Roman authorities (Panaite 2016; Panaite 2023). Despite the importance of the road network, we still lack a complete picture of its development and functioning. Although recent publications on ancient road-related topics in South-East Europe have multiplied and diversified, we still lack a systematic study of the territory by large-scale intensive fieldwalking surveys, which can collect material and identify unknown sites or roads segments. As a consequence, it remains difficult to explain what effect the Roman conquest and the subsequent period of Roman occupation had on the development of the landscape. Clearly, large numbers of new features were introduced, new types of settlement were constructed, and new activities were carried

out. We still lack investigations relating to the characteristics of rural territory in the province, land distribution and organisation, connections between road networks – especially the local roads – and the division of arable territory between the various rural communities, known most often only on the basis of epigraphic sources.

Crucially, the Roman army influenced the development of the rural landscape through the construction and maintenance of communication system, even more than it did through the creation of markets or the imposition of administrative structures. The network of Roman roads developed in provinces like *Moesia Inferior* influenced the location of settlements and supported the whole provincial mechanism. In conclusion, the study of road networks needs to be linked to new survey projects, in order to better assess the impact of the establishment of roads upon the lives of provincial populations.

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A Review of Roman Roads within and from the 'Small Town' at Sandy

by Mike Luke & Ruth Watkins
m.luke@albion-arch.com

Abstract

Recent research has changed our understanding of the origins, layout and status of the Roman 'small town' *at Sandy, Bedfordshire (Luke 2024). In addition, the identification of a new Roman road from Sandy to Great Staughton (Ratledge 2024a, 314) and the classification of this settlement as a 'small town' (Historic England 2024), has a significant bearing on our understanding of both Roman Sandy and its road network. This article describes both the Roman roads within Roman Sandy and those that connect to the next significant settlements. In reviewing the evidence, it also presents an alternative interpretation for the development of the road network in this area. Prior to this recent work, Roman Sandy had always been viewed as being located on the apex of the main road between Baldock and Godmanchester (RR22). However, the evidence presented here challenges the assumption that the Godmanchester Road was always the primary thoroughfare, and instead suggests that the Great Staughton Road could have been the first main road through Roman Sandy.*

Introduction

After the Location and Background sections, this article describes the evidence for the roads within the '*small town*' at Sandy, and the roads which connect to other settlements. The evidence often comprises side ditches, identified as cropmarks and geophysical anomalies, but also includes occasional evidence in the form of surface/makeup deposits and quarry pits.

A review of recent and past evidence for Roman Sandy was undertaken in 2020/1, partly due to the 'spare' time provided by the Covid lockdowns. The publication of the preliminary results was the first to establish that the town had defences (Luke 2021). These, along with the layout and extent of the town, were described in more detail in Luke (2024). The publication of the latter has provided the impetus for this article.

In this article, Roman roads are referred to by their RR reference number issued by Margary (1973) or more recently by the Roman Roads Research Association. All roads within the town of Roman Sandy are referred to by a locally designated R number; this is to enable cross-referencing to these roads in the 2024 publication.

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Location

Modern Sandy is a town in the northern part of Central Bedfordshire Authority. The county town of Bedford lies c.12km to the west of Sandy and Biggleswade lies c.5km to the south (Fig. 1). The modern town is bordered by the A1 (Great North Road) to the west and the London–Edinburgh railway line to the east.

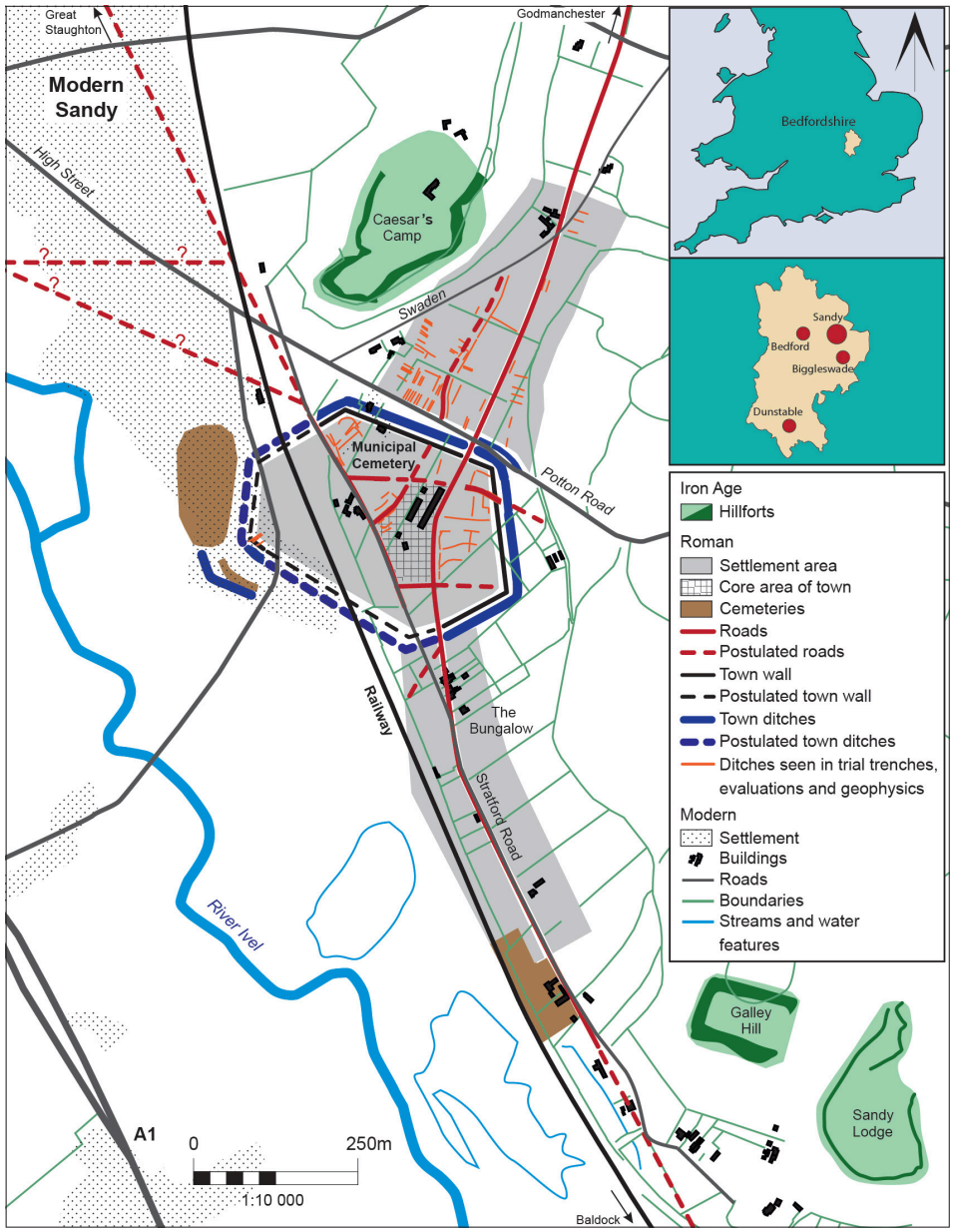


Fig.1. Roman Sandy overlaid onto modern map (after Luke 2024, fig.8)

Topographically, Sandy is located between the floodplain of the River Ivel and the Greensand Ridge to the east, which rises to c.60m OD. The solid geology of the area is mapped as the Woburn Sands Formation from the Lower Cretaceous, Lower Greensand Group. These are overlain by superficial outcrops of clay, silt, sand and gravel head deposits, with alluvial sands and gravels adjacent to the River Ivel.

The Roman town is located on the south-east side of the modern town approximately centred on the Municipal Cemetery (Fig. 1). A number of archaeological investigations within, and in the vicinity of, the Municipal Cemetery, have demonstrated that in places, this part of the Roman town is buried by 1.2m of colluvium. While this layer has protected Roman (and earlier) remains, it has hindered archaeological investigation, especially those restricted to the narrow foundations or service trenches of modern developments. This explains, in part at least, why it has taken so long to establish the extent of the Iron Age settlement and Roman town and identify the existence of the Roman defences.

Background

Iron Age hillforts and settlement

Three hillforts are known within 1km of the Roman town (*Fig. 1*). They have not been investigated in detail and so it is not known if they were still in use at the time of the Roman Conquest. However, their existence probably does illustrate the importance of the Sandy area in the Iron Age. This is reinforced by the number of late Iron Age coins found in the Sandy area, and it has even been suggested that Sandy may have been the site of a tribal mint (BCAS 1997, 2).

There is good evidence for late Iron Age settlement in four different locations within the area of the Roman town, as attested by features and finds from this period (Luke 2024, 9–10, fig. 4). While these remains could represent four individual farmsteads, it is also possible that they were part of the same settlement, in which case it might have extended over 10ha. There is also evidence for cremation cemeteries associated with at least two of these areas.

The presence of three hillforts in the vicinity, the quantity of late Iron Age coins and evidence for the extent of Iron Age settlement, all suggest that the Sandy area was an important location in the Iron Age. The Roman town of Sandy, therefore, developed in an already populated area, and it may well have incorporated some of the existing boundaries and trackways.

The Roman town

The area to the east of the Sandy known as 'Chesterfield', now in vicinity of the modern Municipal Cemetery (Fig. 1), has been a well-known source of Roman finds since the 17th century (Watkin 1882, 268–74).

The first coherent article on Roman Sandy was published by D.E. Johnston in 1974, where it was described as a '*settlement*'. [As an aside, David Johnston later went on to have a career in archaeology including in 1979, publishing a book on Roman roads in Britain]. Since Johnston 1974, the evidence for the Roman town has been described by various authors, e.g. Simco 1984 (114–5); Dawson (1995); BCAS (1996, 1997); Albion Archaeology (2003). Roman Sandy was also included in Rodwell and

Rowley's *Small Towns of Roman Britain* (1975) , but not in Burnham and Wacher's *The 'Small Towns' of Roman Britain* (1990).

Fieldwork for over twenty years has increased our understanding of the origins, defences, layout and extent of the Roman town at Sandy (Luke 2024). The evidence derives from a large number of

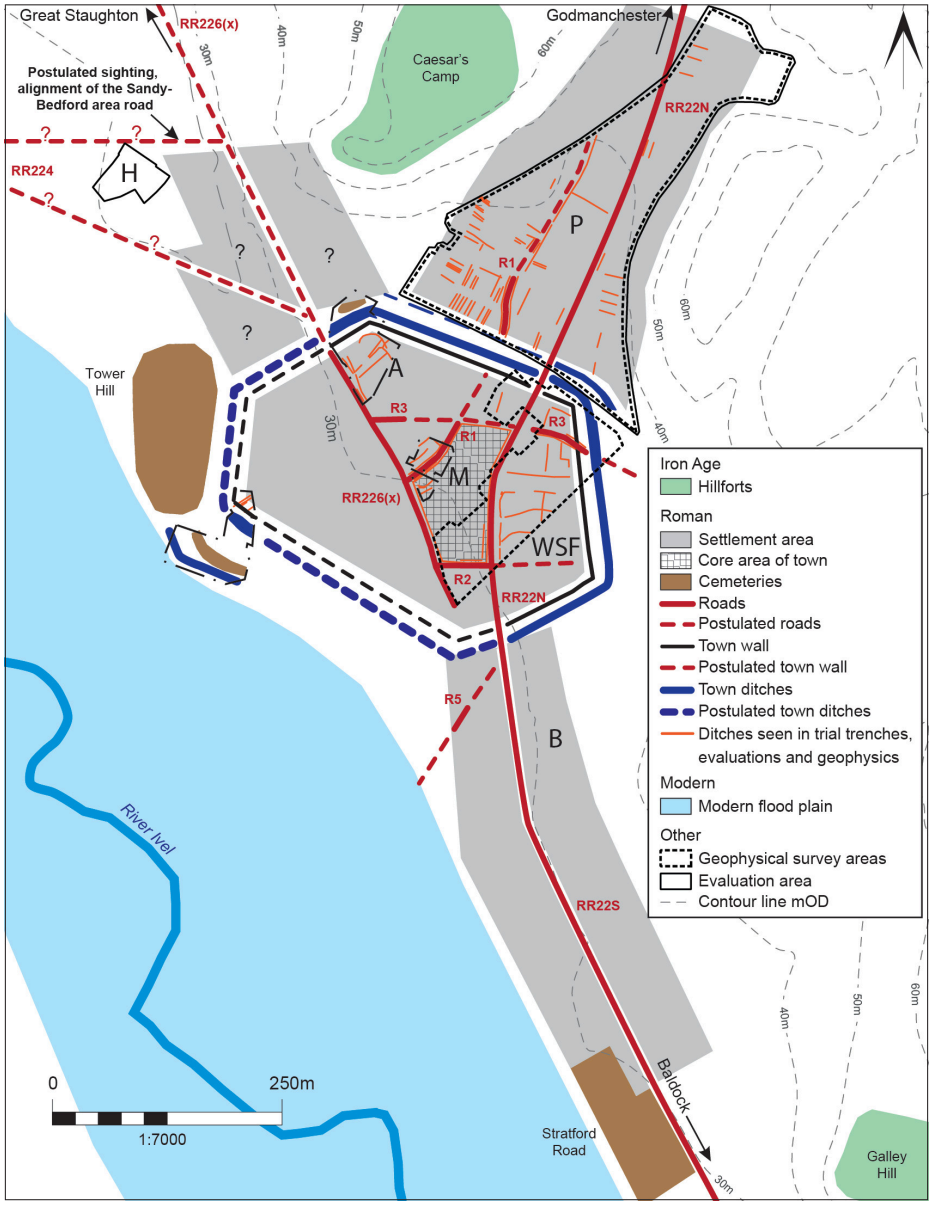


Fig. 2. Overall layout of Roman Sandy (after Luke 2024, fig.7).

Note: A=AOC excavation, B= Bungalow trench, H= High Street evaluation, M= Municipal Cemetery, P= Potton Road evaluation, WSF= Woodside Farm geophysical survey

investigations of a variety of scales and types, undertaken by different organisations/individuals. This 2004 publication showed the value in taking time to review disparate records and carefully consider what links can be made between them. A description of the key investigations can be found in Luke (2024, 3–7), so is not repeated here.

The Roman town is now known to have been 30–35ha in extent (Luke 2024, 34). The area available for settlement may have been restricted to the east and north by the steep slopes of the Greensand Ridge, and to the west by the floodplain of the River Ivel (*Fig. 2*). Present evidence suggests that settlement was concentrated along the roads to Godmanchester and Baldock, RR22 to the north and south. The extent of the town to the north-west – beneath present-day Sandy – is uncertain as only limited archaeological investigation has taken place there.

Within the town, a polygonal area of c.11ha was enclosed by defences comparable to those at Godmanchester (Luke 2024, 33–4, table 1, fig. 12). These comprised a large ditch, 11.5–15m wide and 2.5m deep, and a parallel wall, 3m wide. There is some evidence for an additional, c.5m-wide ditch at the north-east and south-west corners of the defences. No firm evidence for gateways into the walled area of the town is currently available, although they must have existed in some form. The little evidence that exists is discussed by Luke (2024, 17–18). The limited hand excavation and lack of dating evidence mean that it is not yet possible to securely date the defences, although there is sufficient information to suggest, that they were not a primary feature of the town (as was often the case).

Within the enclosed and unenclosed parts of the town, there was a network of roads, some of the minor roads which appear to have been truncated when the defences were built (Luke 2024, 19–24). The layout and nature of these roads are discussed in this article.

The majority of the evidence for buildings comes from within the town's defences, principally from the Municipal Cemetery excavations (Luke 2024, 26–8). With the exception of one possible roundhouse, all the buildings were rectangular (Dawson 1995, 173). These were all timber buildings with thatched or shingled roofs, but some made use of blocks of local sandstone to create low walls, on which timber frames were constructed.

To date, the only evidence for a masonry building was found during the digging of a cess pit on land adjacent to the Municipal Cemetery (within the Woodside Farm area, but outside the extent of the geophysical survey) (Luke 2024, 27–8). Salvage investigations revealed seven courses of '*large, dressed, rectangular blocks of ironstone*', bonded by lime mortar (BCAS 1994, 8). Tiles (roof, floor, and box flue) and fragments of *opus signinum* were also recovered. The substantial nature of the stonework led to the suggestion that it might have been a building associated with a *mansio* (BCAS 1994, 13).

The masonry building was located within the defences and in-between the roads to Godmanchester and Great Staughton. It was also probably within the land plot defined by roads R1, R2 and R3 (*Fig. 2*). Given its central location and the presence of a masonry building, it is possible that this plot was the '*official*' core of the town (Luke 2024, 34–6).

Outside of the defences and on the periphery of the town, there were at least two large cemeteries: Tower Hill/Tesco and Stratford Road (*Fig. 2*). Numerous other burials have been found; some may have been isolated, while others were part of small cemeteries, some of which lay within the town's defences (Luke 2024, 28–31).

Roman road research in Bedfordshire

The existence of about 40 Roman roads was proposed in the 1960s by a group of Roman archaeologists operating in the south-east Midlands, known as The Viatores (1964). A dozen of these Roman roads, totalling c.150km in length, were located within Bedfordshire (Simco 1984, 78), which is of note as Bedfordshire is one of the smallest counties in England. Margary, who was an advisor to The Viatores, listed their roads in later editions of his Roman Roads in Britain, but he did not repeat the descriptions (Margary 1973, 175–7, map 7a).

The evidence proposed by The Viatores for Roman roads usually comprised straight lengths of modern road or tracks, hedgerows, parish boundaries, as well as visible earthworks and occasionally sub-surface remains. This evidence was examined by Angela Simco in her survey of Roman Bedfordshire (1984, 78 and fig. 68), and she dismissed all but a few of the proposed Roman roads, because many of the modern roads and hedgerows were created only at the time of Enclosure. However, Simco was only verifying or dismissing the evidence presented for the Roman roads by The Viatores and was not necessarily saying that all the proposed roads in Bedfordshire did not exist.

The most recent significant discovery regarding roads in the Sandy area is the identification of a Roman road from Sandy to Great Staughton (Ratledge 2024a, 314).

Roads Within the Roman Town

Evidence for Roman roads in this area has been found intermittently over the last 50 years, but recent research has provided a better understanding of the layout and nature of roads within the town *(Fig. 2)*. Having reviewed all the available evidence, a new layout for the roads within the town has been proposed (Luke 2024, 21–24, fig. 7). In summary, it is possible that some of the roads may have existed in the late Iron Age, and the evidence suggests that during Roman times, although the roads appear to have been planned in a systematic way, they did not form a rectangular grid-like pattern. There is also evidence that some of the Roman roads were truncated when the town defences were built. However, the picture is still incomplete, and for the western part of the Roman town, this is likely to remain so, as any evidence is likely to have been destroyed when the railway (including sidings, station, car park and ballast quarries) and residential buildings were built.

The evidence for roads within the town is described here, partly to provide an idea of how these were constructed, and so they can be compared to the major roads which link to other settlements.

The only road within the town that has been the subject of open area excavation was R1, when a 50m length was exposed within the Municipal Cemetery 1989–1991 excavations (M on fig. 2) (Luke 2024, 22). Hand investigation indicated that this road had been repeatedly resurfaced with compacted gravel and was bounded by side ditches, whose recuts narrowed the width of the latest road surface to c.3.5m (Dawson 1995, 173; fig. 15.3). Within the town, most of this road (for c.400m) was 50m west of, and broadly parallel to, the Sandy to Godmanchester road. Approximately 150m to the north-east, the probable continuation of this road outside of the defences, was identified by two parallel geophysical anomalies, c.7m apart, which were traced for at least 100m within the Potton Road evaluation (P on fig. 2, fig. *4*), although for this length, no gravel surface was present (Albion Archaeology 2019, fig. 3) (Figs 2 and 4). One interesting aspect of this road is that the current evidence

suggests that it was *'cut across'* when the northern defences were constructed and therefore pre-dates them.

Geophysical survey undertaken at Woodside Farm (WSF on *Fig. 2*) in 1996, produced good evidence for an E–W road R2 (Luke 2024, 23) associated with the Sandy to Godmanchester road. A linear high resistance anomaly c.4m wide, suggestive of a stone surface (GSB 1996, 4), was visible for c.50m to the west of the Sandy to Godmanchester road. A geophysical ditch-type anomaly was present along part of the north side of R2, and this turned to form the west side of the Sandy to Godmanchester road. There is no evidence that road R2 extended eastwards, however, as this area was beyond the limit of the geophysical survey, but the road's continuation is a possibility. An interesting feature of this road is that it appears to provide a link between the Great Staughton road and the Godmanchester road.

The geophysical survey at Woodside Farm also produced evidence for another road R3, although this was not interpreted as such at the time (Luke 2024, 23). The evidence comprised two parallel ditch-like anomalies c.7m apart (GSB 1996, fig 4). These appear to have been truncated when the eastern defences were constructed. Within the area of geophysical survey, R3 was only located to the east of, and roughly perpendicular, to the Sandy to Godmanchester road. If the alignment of this road is extended to the west of the Sandy to Godmanchester road, it then coincides with '*an E–W gravel track*' identified during grave-digging in the 1960s (Johnston 1974, 39, fig. 3 label 3).

Just outside of the southern defences, was another possible road R5. This is indicated by the presence of a linear faint cropmark on an oblique aerial photograph (SF2503/25 held by the HER), suggestive of a stone surface (Luke 2024, 24). The cropmark was c.7m wide and visible for c.30m to the south-west of the present-day Stratford Road. R5 runs NE-SW and may possibly have been aligned between the south-east gate, across the River Ivel, to the Roman settlement on the opposite bank (Dawson and Maul 1996).

The Viatores suggested another road in this area which might have been associated with the Tower Hill cemetery (*Fig. 2*). This was based on '*by probing*' and observations within two narrow pipe trenches, resulting in section drawings which appear to show 'gravel metalling' (The Viatores 1964, 499). However, the location of these trenches is problematic. In the text, they are described as being near the train station (The Viatores 1964, 271), whereas on the published plans, they are shown as being adjacent to Stratford Road (The Viatores 1964, 516) and therefore, would form part of one of the connecting roads (see below). Therefore, at present, there is insufficient evidence to support the existence of this Tower Hill cemetery road and hence it is not shown on the figures here. However, if it did exist, it is interesting that its possible course would head to the north-west gate of the town, mirroring the arrangement of road R5 to the south. The evidence for a possible Tower Hill cemetery road is discussed in more detail elsewhere (Luke 2024, 24).

Roads From the Roman Town

Traditionally, it has been thought that Sandy was located at a change in the alignment of the road from Baldock to Godmanchester (RR22) (Fig. 3). However, the recent discovery based on lidar evidence of a Roman road from Sandy to Great Staughton, Cambridgeshire (Ratledge 2024a/b, 314), issued Margary number RR226(x) in 2024 (Armstrong and Holmes 2024, 387), and a better understanding of the layout of the Roman town (Luke 2024, 34, fig. 12), has cast some doubt on this long-held view. This will be explored further in the Discussion .

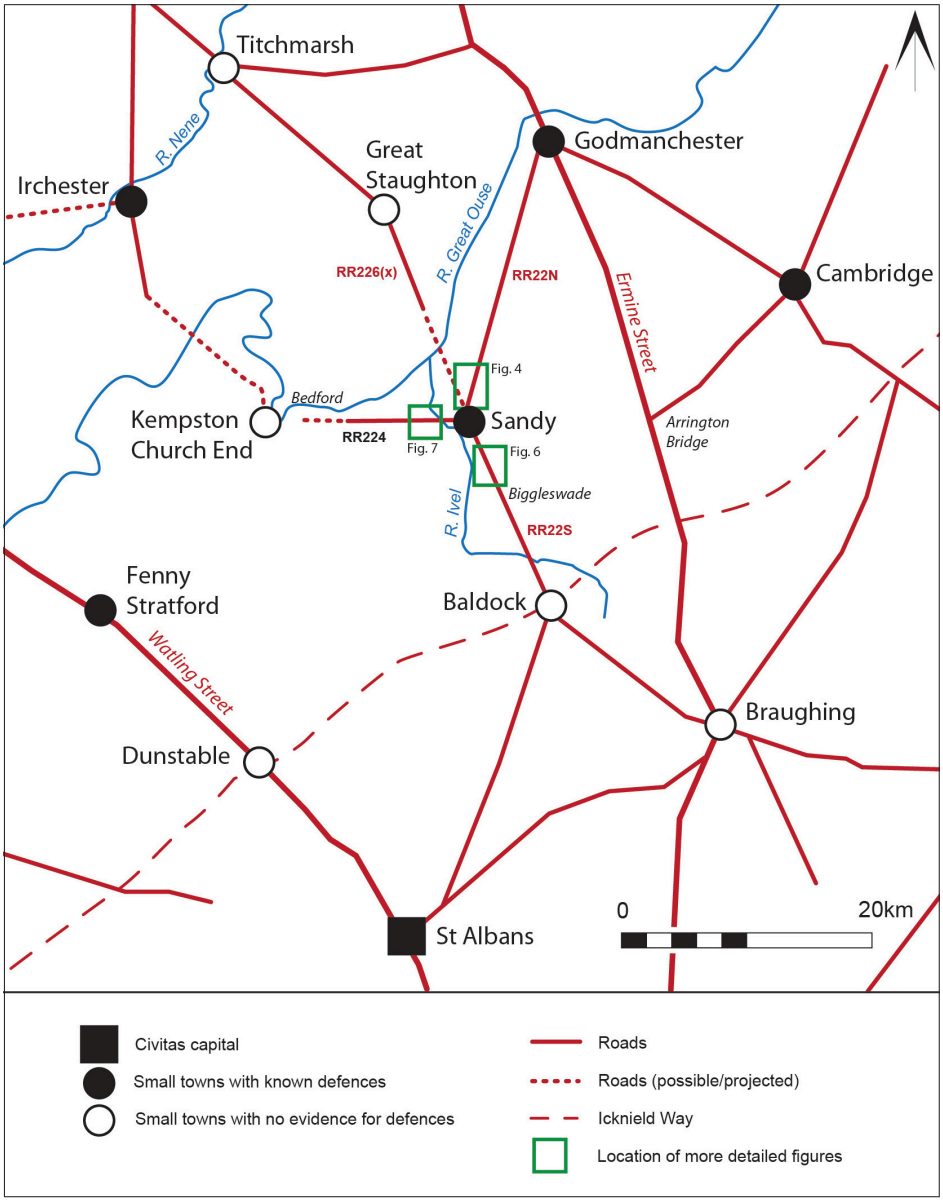


Fig. 3: Map showing the road network around Sandy with the location of detailed figures indicated

The Viatores proposed a road linking Sandy to Cambridge (via Arrington Bridge on Ermine Street), which they considered to be the same road as that to the Bedford area (RR224), and they also proposed one to the Irchester (RR225) (The Viatores 1964 map on 356–7; Johnston 1974, 39–40, fig. 1; Dawson 1995, fig. 15.2). Of these, all except the Sandy to Bedford area road have been dismissed by Simco due to lack of supporting evidence (1984, 78 and fig. 68). Although there is some lidar evidence interpreted by David Ratledge to support the existence of the road to Arrington Bridge (Ratledge

2024b), no firm evidence has been found to date. Therefore, this road, and the claimed road to Irchester RR225, are not discussed in this article.

In the descriptions below, the roads are named based on the next significant settlement from Sandy. This means that the two alignments of the Godmanchester to Baldock road are described separately, as RR22 north (R22N) and RR22 south (R22S). Where possible, the evidence nearest Sandy is described first, followed by any evidence further away. The text starts with a comment on the alignment of the road, then describes the evidence. I have not repeated any evidence previously published by The Viatores and Margary, except in a small number of cases.

Sandy to Godmanchester (RR22N)

Alignment

Despite the road having to ascend onto the Greensand Ridge outside of Sandy, its course took a single alignment from Sandy to Godmanchester, Cambridgeshire (Fig. 3). However, at Godmanchester, the road had to turn to enter the town via the west gate. It has been suggested that this is because the road was originally aligned on a crossing of the River Great Ouse, which predated the existence of the town defences at Godmanchester.

Evidence

Within the defended part of Roman Sandy, and just outside the town to the north, the road has been identified based on non-intrusive evidence and evaluation trenches. Based on the combined evidence, the road within the defences appeared to deviate from its alignment with Godmanchester and gradually curved southwards to become the road to Baldock (RR22S) going south-east (Fig. 2).

On a 1984 oblique aerial photograph (SF2503/25 held by the HER), a faint linear cropmark is visible near the south-east gate, suggesting a stone road surface. The cropmark is c.7m wide and clearly visible for c.50m within the defences, continuing less clearly to within c.10m of the present-day Stratford Road (believed to overlie the Sandy-Baldock road in this area). No side ditches are visible. The intersection of the south-eastern town wall and the road is marked by a broader cropmark which may be associated with the south-east gateway. If correct, this would suggest that the road passed through the defences at a slight angle, rather than perpendicularly, as one might expect.

Road-like linear anomalies that coincided with the cropmarks just described, were found just to the north by geophysical survey at Woodside Farm in 1996. At the time these were interpreted as a street within the Roman town rather than the road to Godmanchester; which was believed, incorrectly, to have been located c.100m to the east (GSB 1996, fig 4). In places, the road appeared to be defined by side ditches as indicated by parallel linear geophysical anomalies, c.9m apart (*Fig. 2*). The north-east gateway should lie within the Woodside Farm geophysical survey area; however, nothing was identified with any degree of confidence, possibly because this area was on the edge of the survey area. However, the Sandy-Godmanchester road must have passed through the northern defences and it is interesting that the gateway was not in a central location.

The course of the road to the north-east of the defences was identified within an evaluation undertaken on land adjacent to the Potton Road in 2018/9 (Albion Archaeology 2019) (Fig. 4). The road was traced for 350m as a linear geophysical anomaly, 12–22m wide (Magnitude Surveys 2018) and it was targeted by Trenches 6, 9 and 15 (Albion Archaeology 2019, 16–17). Hand investigation was challenging (even

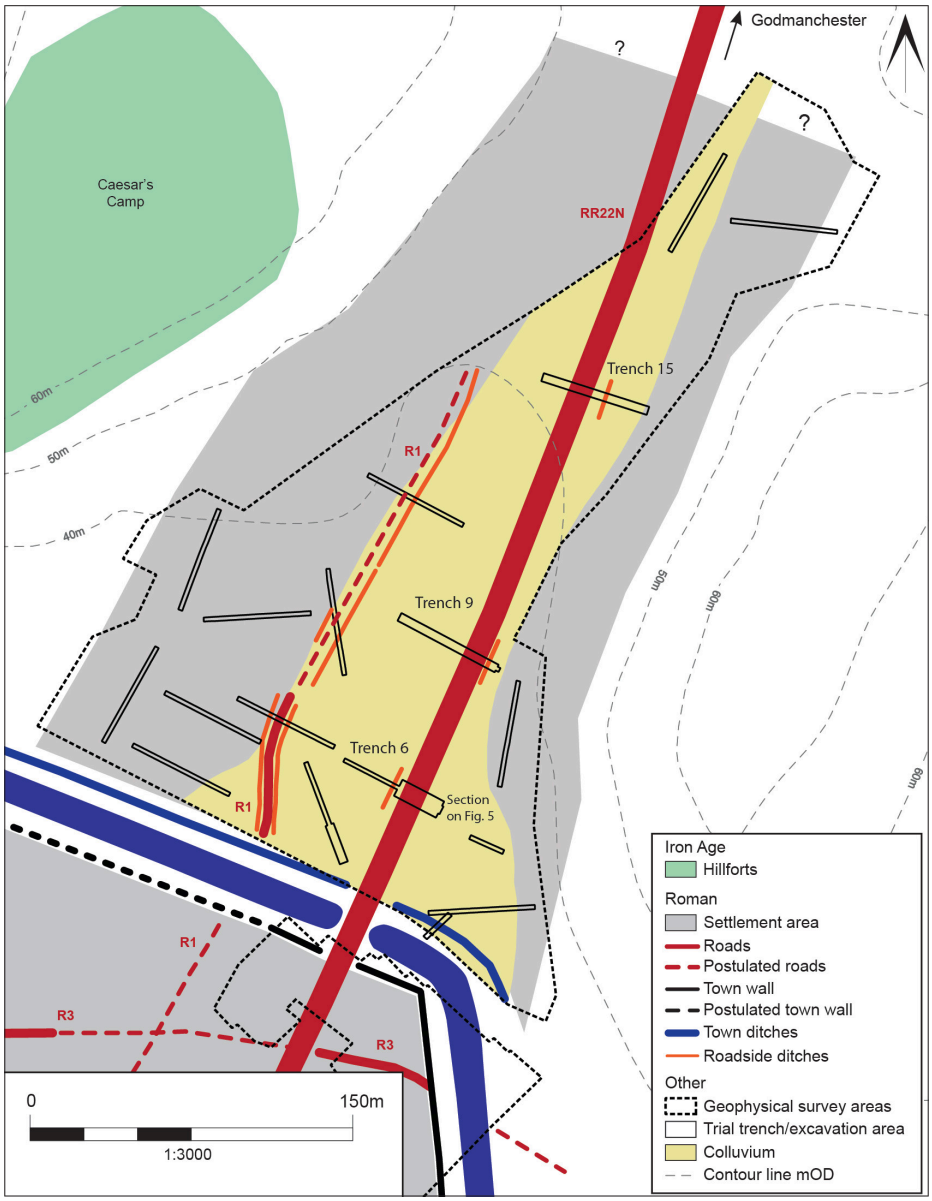


Fig. 4: Plan showing evidence for the Sandy- Godmanchester road (RR22N) - Potton Road evaluation (after Albion 2019, fig. 16)

with the sides of the trenches being stepped) due to a thickness of up to 1.5m of overburden. The overburden consisted of up to 0.7m of topsoil/ subsoil and up to 0.8m of colluvium (Albion Archaeology 2019, 14, table 1). The evidence for the road looked clear as a geophysical anomaly, but identification was initially difficult because of the depth at which it occurred, and because only its makeup layers survived. As expected, the investigation within the trenches indicated that the width of geophysical

anomaly was far greater than the actual width of the road, which was found to be at least 4.15m and 5.8m wide (Trenches 15 and 9 respectively), and up to 12.25m wide (Trench 6).

The nature of the road construction was best observed within Trench 6 where a section through it was hand-excavated (Albion Archaeology 2019, fig. 9, section 1) (*Fig. 5*). Here the road measured at least 12.25m wide; the full width was not excavated to prevent damage to the adjacent Roman building remains, which directly abutted its NW side. The lowest makeup layers comprised mixed silts and sands (used to level the ground), followed by sand deposits (which were cambered to provide drainage), then thin dark silty makeup layers and finally remnants of the road surface which mainly comprised areas of compacted gravel, clay and silt. In total, the road deposits were over 1.2m thick. Understanding the remains of the road within Trench 15 was complicated. There was evidence of a road surface which had been heavily truncated by later features. The surviving surface measured at least 4.15m wide, comprising a yellow-grey sandy silt makeup layer and a road surface of compact sandy gravel. The road appeared to be truncated by a holloway to the NW, although this may have been associated with later use of the road.

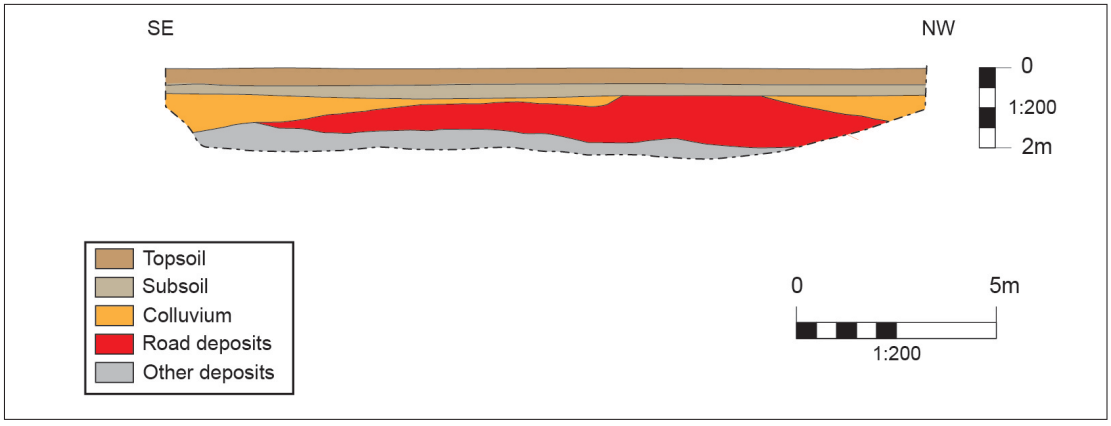


Fig. 5 Section through the Sandy-Godmanchester road (RR22N) - Potton Road evaluation (after Albion 2019, fig. 9, section 1)

The road was found to be bounded by ditches on at least one side in all three trenches and these had been recut on multiple occasions. Evidence for buildings and other activity was present adjacent to the road and may have masked the full extent of the original road.

Clear evidence for the road in this part of Sandy had not previously been recorded. For example, in 1955 when pipe trenches adjacent to Potton Road were observed (The Viatores 1964, 235; Johnston 1974, 39), no evidence for the road was noted. This may be because the course of the road appears to be near the base of a dry valley in which a considerable thickness of colluvium has formed, making the road difficult to excavate and identify.

To the north-east of Sandy, the road coincides with a field boundary known as Hasell Hedge for c.1km, and it is in this area that The Viatores state that the *'road was observed in 1950 to consist of 5in of red sand, packed tightly on a clay foundation*' (1964, 238). However, they do not record a precise location or say where this information came from. More recently, David Ratledge (2024c) used lidar to trace the course of the road between Sandy and Godmanchester.

Sandy to Baldock (RR22S)

Alignment

Current evidence suggests that the course of this road took a single alignment from Sandy to Baldock, Hertfordshire (Fig. 3).

Evidence

All of the evidence described here comes from the section of road between Sandy and Biggleswade (c.5km south of Sandy).

A recent suggestion is that in the southern part of Roman Sandy, the Sandy-Baldock road underlies at least part of the present-day Stratford Road (Luke 2024, 21) (Fig. 1). This supports Margary's initial thoughts in the first edition of Roman Roads in Britain (1955, 177). The evidence for this is that Stratford Road, through what would have been the southernmost part of the Roman town, coincides with the alignment of the Roman road identified to the north of Biggleswade (see below) and, although Margary did not know at the time, a large Roman cemetery was located adjacent to Stratford Road c.500m south of the defences (Luke 2024, 29, fig. 7) (Fig. 2). In addition, within the defended area of the town, there is firmer evidence for the existence of a Roman road underlying part of Stratford Road, see p166. However, it should be noted that, the Sandy-Baldock Roman road deviated from the current Stratford Road near The Bungalow, and in terms of this article became the road to Godmanchester (described above).

An alternative route for the Sandy-Baldock road has been proposed, c.50m east of the present-day Stratford Road. This was based on the discovery in 1954, of a road-like surface in a single trench dug at The Bungalow (Johnston 1955; The Viatores 1964, 237; Johnston 1974, 37 and 39) (B on Fig. 2). The feature was described by The Viatores as being *'17ft wide and 14in thick, formed of rammed gravel, apparently in several periods of construction. Under this was what looked like a foundation-layer of larger stones extending several feet to the east of the road*'. The feature appeared to have been constructed over a ditch and was possibly associated with a hearth (The Viatores 1964, 237, 515). No evidence for the continuation of this feature was found on its projected alignment c.25m to the north during investigations at 7 Stratford Road (Heritage Network 2009). It is therefore possible that the remains observed at The Bungalow could represent either a side street, yard or the floor of a building located within southern part of the town.

Approximately 3km south of Roman Sandy, on the northern outskirts of Biggleswade, two parallel linear cropmarks indicate the course of the Sandy-Baldock road (RR22S). These are visible for c.170m on a Google Earth aerial photograph, dated June 2009. This area has been evaluated by Oxford Archaeology (2020), who identified two parallel linear geophysical anomalies, c.17m apart, that could be traced intermittently for 370m (Magnitude Surveys 2019, 11, fig. 7) (Fig. 6). These were investigated within twelve evaluation trenches. Ditches corresponding to the road were not always present, but when identified, they varied in width from 1.1m to 5m, suggesting that at some point they may have been utilised as quarries (Oxford Archaeology 2020, 60). In addition, linear arrangements of pits were identified by geophysical survey and trenches (Fig. 6). These may represent quarry pits for the road, but as they have been examined only within evaluation trenches, it is not certain that they are Roman in date. The only possible evidence for a road surface was a deposit of compacted flint cobbles within the recut western roadside ditch in Trench 2 (Oxford Archaeology 2020, 34, 60; plates 13, 14; fig. 6 section 173). This was 2m in extent and 0.05m thick (Oxford Archaeology 2020, table 3).

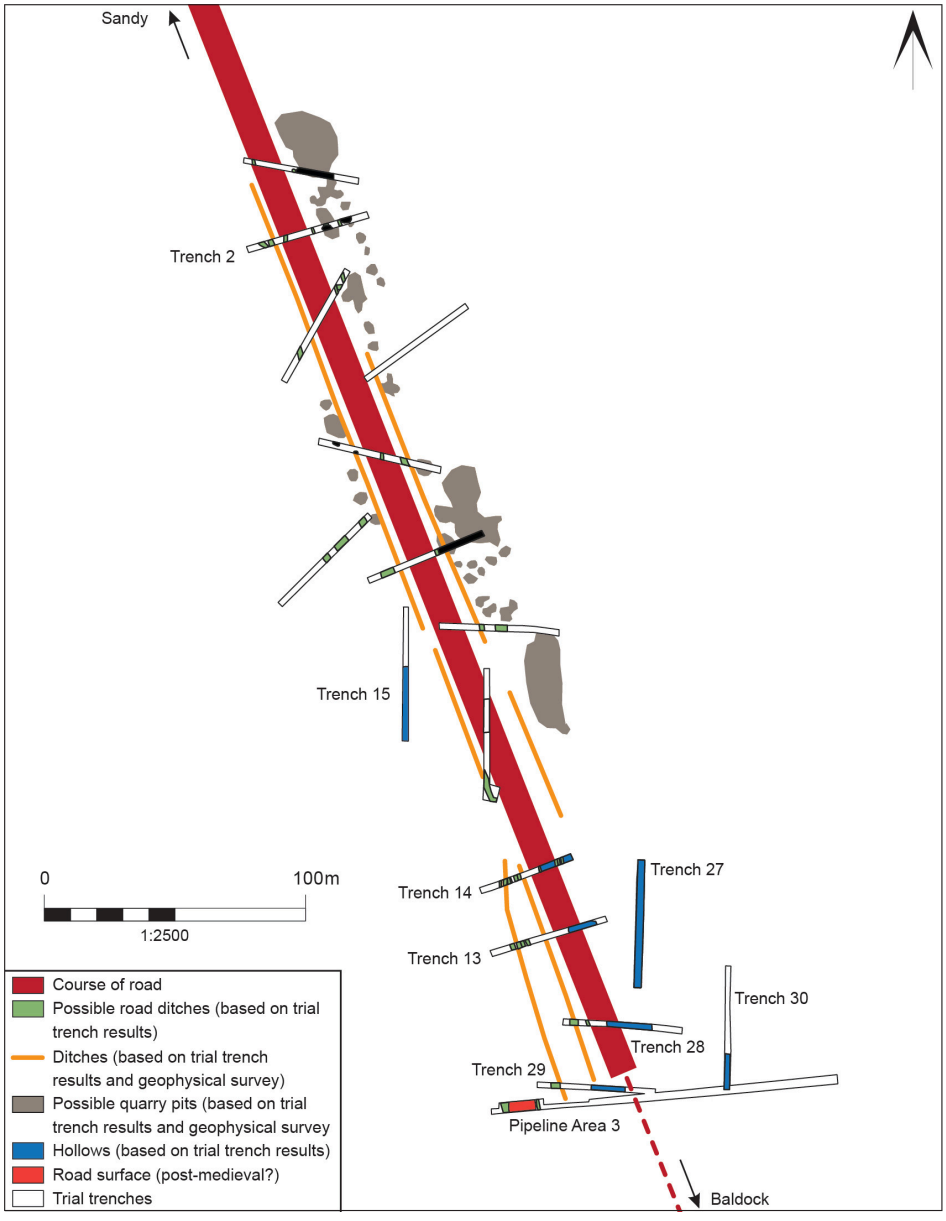


Fig. 6: Plan showing evidence for the Sandy-Baldock road (RR22N) to the north of Biggleswade (after Oxford Archaeology East 2015, fig. 3 and Oxford Archaeology 2020, figs 4, 5a, 5c and 5g)

During an earlier evaluation and excavation undertaken in advance of a pipeline (Oxford Archaeology East 2015, 12, fig. 3), a metalled surface and its associated ditches were identified in this vicinity. These remains were initially interpreted as post-medieval in date, because both ditches flanking the surface contained post-medieval pottery (Oxford Archaeology East 2015, 15). However, since then, it has been suggested that these are remnants of the Roman road which remained in the landscape as a boundary until the post-medieval period (Oxford Archaeology 2020, 4, 60; Forster 2021, 327–8). While

this is possible, based on the location of these remains (as shown on Oxford Archaeology East 2015, 12, fig. 3), it would suggest that either this represents an additional Roman road, or that the course of the Sandy-Baldock road had shifted c.50m west of the road alignment identified in the 2020 evaluation (Fig. 6). Currently, there is insufficient evidence to link the 2015 evidence to the Sandy-Baldock road. It is, however, interesting that metalling has survived. This may be because the area investigated was located on the edge of arable fields so may not have been subjected to intensive ploughing.

The presence of hollows up to 0.3m deep in Trenches 13, 14, 28 and 29 on the proposed course of the Roman road may suggest that they were created by the passage of people along the routeway (Oxford Archaeology 2020, 25). However, the presence of hollows in Trenches 15, 27 and 30, that are not part of the road, casts some doubt on this interpretation.

To the south of Biggleswade, the Roman road between Sandy and Baldock is believed to underlie the A1, but as far as the author knows it has never been observed.

Sandy to Great Staughton (RR226(x))

Alignment

This road was identified on the basis of lidar evidence by David Ratledge (2024d, 314). The limited current evidence suggests that despite the road having to cross the River Ivel and its floodplain, the course of this road took a single alignment to Great Staughton, Cambridgeshire. It is worth noting that from Great Staughton, the road changed direction to take a single alignment to the Roman town at Titchmarsh, Northamptonshire (just east of present day Thrapston), where it crossed the River Nene (Fig. 3).

Evidence

Other than lidar, all the evidence for this road derives from investigation within Roman Sandy. As suggested above, it is possible that the present-day Stratford Road overlies this Roman road (Fig. 2). AOC excavations, which straddled the north-west defences and were adjacent to Stratford Road (Capon 2023, 12) (A on Fig. 2), support this suggestion, as gravel and sand layers are interpreted as being part of a road with side ditches. Additional, but indirect evidence that this Roman road may underlie Stratford Road, is the way in which Roman ditches within the allotment excavations (A on Fig.2) turn to respect it, and that some ditches are parallel to Stratford Road. This area was located very close to the north-west gateway.

The presence of a Roman road underlying the Stratford Road in this area is also supported by early observations made by David Johnston in 1955, within two narrow pipe trenches (Viatores 1964, 271 and 516). The section drawings, recorded as DEJ 4 and 5, appear to show a cambered '*gravel metalling*' (Viatores 1964, 499), which looks reasonably convincing as a possible road. However, there is a problem with the location of these observations as they are titled as being located at the railway station (The Viatores 1964, 271), but the associated location plan shows them both east of, and adjacent to, Stratford Road (The Viatores 1964, 516).

More recently, an area of undated gravel was observed in the side of a foundation trench during a watching brief, adjacent to the south side of the present-day Stratford Road (Albion Archaeology 2020, 9), c.80m south-east of the AOC excavation. Of course, if this was the only evidence then the

recorded remains could be associated with a perhaps wider, potentially post-medieval version of the modern Stratford Road.

Nearby within the Municipal Cemetery 1989-91 excavation (M on Fig. 2), Roman ditches appear to be turning possibly to respect a road to the south underlying Stratford Road (Luke 2024, fig. 5). In addition, the location of some Roman buildings adjacent to Stratford Road within the Municipal Cemetery excavations (Dawson 1995, fig. 15.3) suggests the possibility of a contemporary road just outside the excavation area (Luke 2024, fig. 9). Finally, the existence of the road RR226(x) is also supported by the way in which road R1 within the Municipal Cemetery excavations (adjacent to the modern Stratford Road), turned slightly as if to meet a perpendicular road.

The Roman road underlying Stratford Road was interpreted as an internal one within the Roman town (Luke 2021, 23) until David Ratledge identified a road heading towards Great Staughton (Ratledge 2024a, 314). Although he has identified its probable course based on lidar (Ratledge 2024d), to date, no archaeological fieldwork has been undertaken along this road outside of Roman Sandy.

Sandy to Kempston Church End/Bedford area (RR224 west)

Alignment

Current evidence suggests that for the majority of its course, this road took a single alignment from Sandy to the Bedford area (*Fig. 3*). It has been suggested that its survey was sighted onto/from the hilltop known as Caesar's Camp just north of the Roman Sandy (Luke 2021, fig. 7), but it will have needed to deviate from this alignment to enter the Roman town.

Destination

Although its destination is often described as the '*Bedford area*' (Simco 1984, 65), there are no Roman '*small towns*' as such in the Bedford area. Therefore, unlike the other roads the destination is worthy of a short discussion.

The most significant known Roman settlements in the Bedford area that this road (RR224) may have been associated with are: the possible estate centre at Newnham (Ingham, Oetgen and Slowikowski 2016); the potential high-status villa at Manton Lane (Luke, Cocking and Sayer 2017); the possible high status farmstead SL54 within the southern part of the Biddenham Loop (Luke 2016, 337); and the c.17ha settlement at Kempston Church End (Luke 2016, 208–41). The latter seems the most likely destination.

The Kempston Church End settlement contained a well-built Roman road which may have headed to the walled small town at Irchester. This is the main reason that Kempston Church End is described as a '*roadside settlement*'. If Kempston Church End was at the intersection of the roads from both Irchester and Sandy, then the latter would have required a change in alignment to go round the meander in the River Great Ouse known locally as the Biddenham Loop.

Evidence

The cropmark evidence is key to understanding the course of this road, so is described first. The original identification of a possible road was made by St Joseph based the presence of two sets of parallel linear cropmarks on the same alignment south of Willington and north-east of Cardington

(The Viatores 1964, 268-9; Johnston 1979, aerial photograph opposite page 34; Simco 1984, image 63). The Viatores extended the alignment based on the cropmarks using, in part, existing roads and hedges along the same line; they also believed that the road continued beyond Sandy to Wimpole, Cambridgeshire (1964, 268–9, 484–5). Parallel cropmarks have now been identified in four locations between Sandy and Bedford, all are visible on Google Earth, and the cropmarks are 9–12m apart. No evidence for the road has yet been found within the southern part of modern Bedford.

The easternmost cropmarks indicating the presence of a road, are located 2km west of Roman Sandy; this is the only part of the road which has been subject to archaeological investigation (Fig. 7). The route of the Mox Hill to Sandy water main crossed the alignment of the Roman road in two locations c.600m apart. Therefore, these areas were examined by a two-stage evaluation: stage 1, Trench 29 (Northamptonshire Archaeology 2007a, 4) and stage 2, Trench 1 (Northamptonshire Archaeology 2007b). Subsequently, the locations where the water main crossed the Roman road, were examined in the pipe easement in advance of the construction of this pipeline: Area 3 (in area of Trench 29) and Area 4 (in the area of Trench 1) (Northamptonshire Archaeology 2007c, 4–5) (Fig. 7). The results for the two trenches are described in two separate evaluation reports and the results of the easement investigations within a third report. Unfortunately, the results do not entirely agree with each other, for example: in the western area, one roadside ditch was found in evaluation Trench 29 (Northamptonshire Archaeology 2007a, 4, fig. 3), but two roadside ditches, c.13m apart, were found in the easement investigation (Northamptonshire Archaeology 2007c, 4–5, fig. 4) (Fig. 8); in the eastern area one roadside ditch was found in Trench 1 (Northamptonshire Archaeology 2007b, 4, fig. 3), but

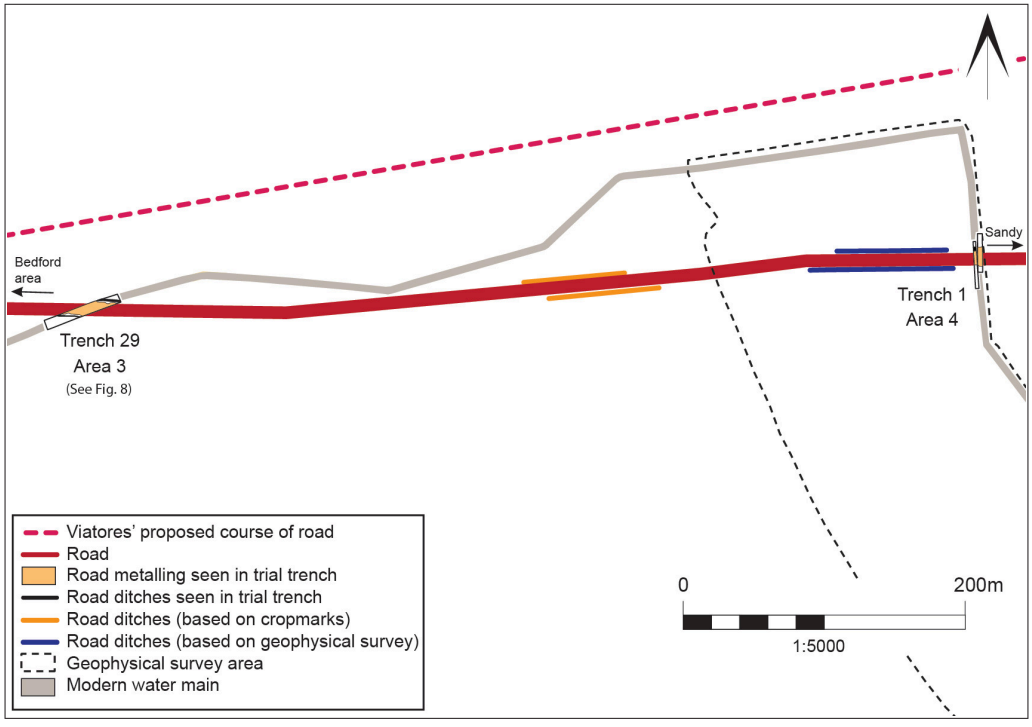


Fig. 7: Plan showing evidence for the Sandy-Bedford road (RR224), west of the River Ivel (after Northamptonshire Archaeology 2007a, fig. 2; 2007b fig. 2; 2007c, fig. 2, and Sumo 2022, fig. 7)

in the easement investigation this was believed to be modern and no roadside ditches were present (Northamptonshire Archaeology 2007c, 4–5, fig. 5).

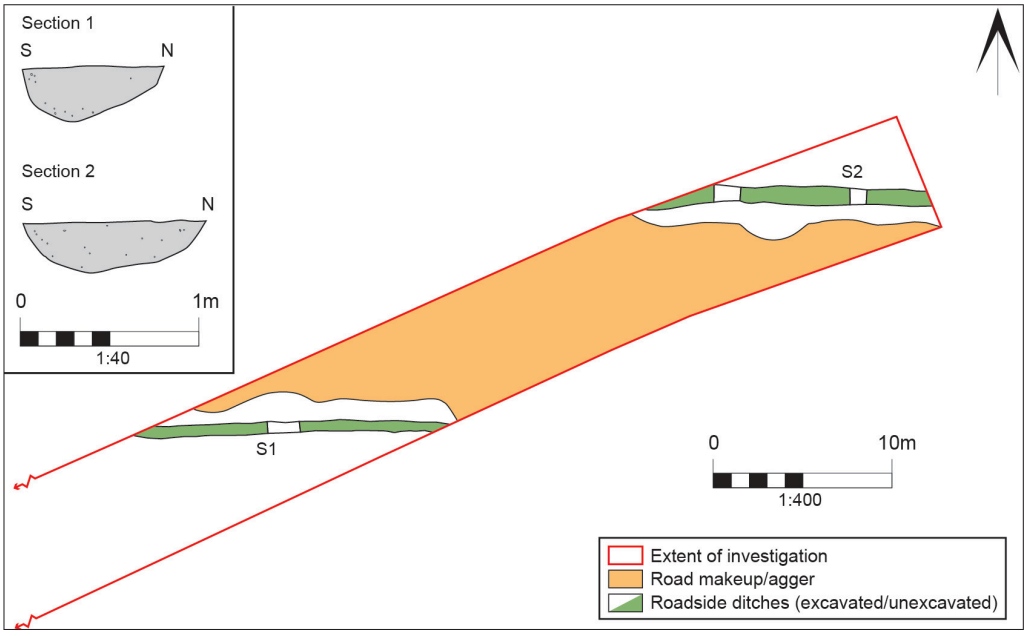


Fig. 8: Detailed plan of the Sandy-Bedford road (RR224) within Area 3 of the water main investigation (after Northamptonshire Archaeology 2007c, fig. 4)

Both the western and eastern areas produced evidence for possible road deposits. The western area contained what is described as '*a sand and gravel bank*' (Northamptonshire Archaeology 2007c, 4, fig 4; plate 2) (*Fig. 8*). This was 8-10m wide, and survived to a maximum height of c.0.35m above the surface of the surrounding natural substrate, and was found lying immediately below the topsoil, with no subsoil present. The report also states that, 'There were traces of a gravel layer, with occasional small cobbles, running down the centre of the bank. Where it survived, the gravelly layer was c.0.06m thick' (Northamptonshire Archaeology 2007c, 4, plate 3). A sand and gravel bank was also identified in Area 4, but at c.12–14m it was slightly wider than that in Area 3 (Northamptonshire Archaeology 2007c, 4–5, fig 5). It had been heavily disturbed by later activity and there were no surviving traces of the gravel layer seen in Area 3.

At a later date, and part of a separate tree planting proposal, a geophysical survey was undertaken immediately to the west of evaluation Trench 1/Area 4 (Fig. 7). This located two parallel linear geophysical anomalies, 11.5m apart, that were believed to represent the Roman road (Sumo 2022, 5). Their presence is curious, given that no roadside ditches were identified in Area 4 (see above), and the two geophysical anomalies are closer together than the recorded width of the road bank in Area 4 (see above). Also, the alignment of the geophysical anomalies is very slightly different to that of the cropmarks to the west (Fig. 7). It is possible that, if this is evidence for the road, this minor change in alignment was required as the crossing point of the River Ivel was located only c.400m to the east.

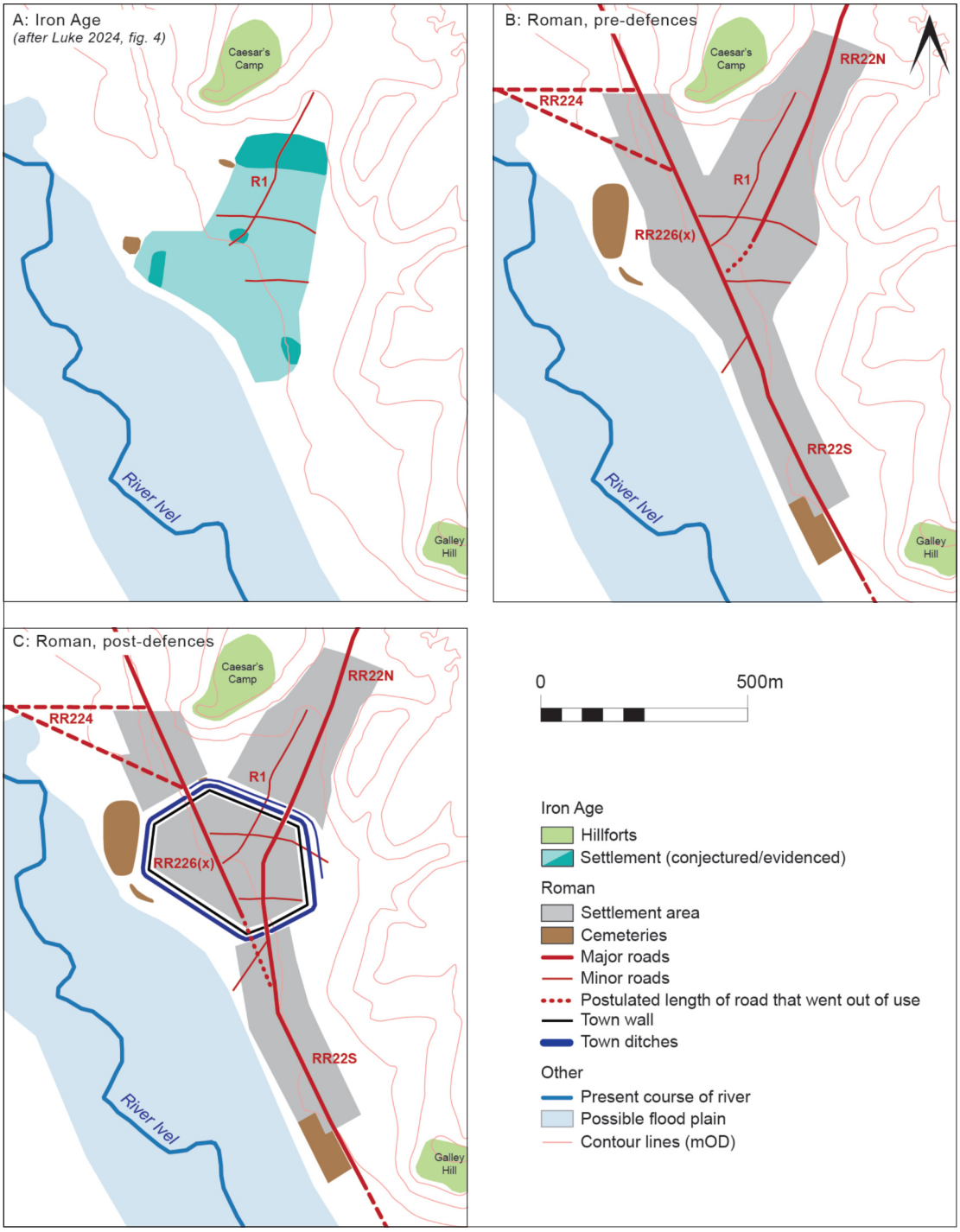


Fig. 9 Possible layout of Sandy in the Iron Age (A), Roman: pre-defences (B) and Roman: post-defences (C)

The evidence for the course of the road in this area corresponds with the alignment of the cropmarks identified near Cardington and Willington, and therefore the route proposed by The Viatores can now be rejected (Fig. 7). Their route took a more northerly course and may have been largely based on their belief that the road would need to cross the River Ivel near the Girtford Bridge (1964, 270, 485). Based on the more recent evidence, the crossing point of the river would be c.140m to the south of the route proposed by The Viatores.

There is no firm evidence for the course of the road between the River Ivel and Roman Sandy, partly because most of this route is under the modern town. The only possible evidence recorded for a Roman road within the modern town was what is described as a '*hard gravel layer*' observed by workmen during the construction of the Fire Station (The Viatores 1964, 249). This is located c.400m west of the town defences and c.60m north of the projected alignment of the cropmarks to the west of the River Ivel. An evaluation at 58-66 High Street was located adjacent to, but mainly on the south of, the projected alignment (H on Fig. 2), but this produced no evidence for the road nor for any evidence for Roman settlement (Archaeological Solutions 2010). It is likely that the E-W course of this road changed to a NW-SE alignment to the west of this area to enter the Roman town via its north-west gate (Luke 2024, 21, fig.7) (Fig. 2).

Discussion

This article has presented the evidence for roads within Roman Sandy, and those connecting to the next significant settlements. These roads will be discussed here under the categories of,'minor and major roads within the town of Roman Sandy and major roads leading away from Roman Sandy, before a new interpretation of the layout and development of Roman Sandy and its roads is described.

Pre-Roman routeways

It has often been speculated that some Roman roads may have had their origins in prehistory e.g. Bishop (2021, 1–10), and it seems likely that late Iron Age trackways existed in the late Iron Age landscape within and around Sandy; hence the inclusion of some on Fig. 9A although there is no firm dating evidence. However, further fieldwork will be required to determine their origins.

Roads within Roman Sandy

There is now a much better understanding of the layout and nature of roads within the Roman town, including both the minor town roads and the major roads which then link with other settlements. However, the evidence has largely been derived from disparate records of work or observations by a variety of people and organisations over the last fifty years, and so our understanding is imperfect.

Minor Roads within Roman Sandy

A number of minor roads have been identified and although the layout of roads within the town did not form a rectangular grid-like pattern, there is still a suggestion that there was some degree of planning (Fig. 9B). The evidence also shows that some roads were truncated when the later defences were built (Fig. 9C). Our understanding of the layout is still incomplete, and for the western part of the Roman town is likely to remain so, as much of this area was destroyed by modern development (Fig. 1).

It has been noted that some of the minor roads comprised compacted gravel; this is confirmed for R3 by observations made during modern grave-digging (Johnston 1974, 39), and by the excavated evidence for R1 within the Municipal Cemetery (Dawson 1995, 173). There is no evidence from trenches within the Potton Road evaluation that the northern length of R1 had a road surface, but this area has been subject to intense modern ploughing. Geophysical anomalies (for R2) and cropmarks (for R5) also show that some roads had stone surfaces. Based on the available evidence, the roads surfaces were 3.5–7m wide.

Based on excavated and geophysical anomalies, most of the roads within the town appear to have been bounded by side ditches, 4–7m apart. The ditches associated with R1, within the Municipal Cemetery excavation, had been recut on several occasions, reducing the width of the road surface (Dawson 1995, 173). It seems likely that the ditches were dug as part of the original road design. Therefore, one explanation for why they are not always visible on geophysical surveys, is that over time the ditches were overlain by masking deposits as roadside activities encroached.

Major Roads within Roman Sandy

The available evidence for major roads within the town i.e. those that then continue outside of the town, towards the next significant settlement, is limited to the Godmanchester road (RR22N) and to a lesser extent, to the road to Great Staughton (RR226(x)).

The course of RR22N within the town is based on cropmarks and geophysical anomalies, but the best evidence for its construction comes from the Potton Road evaluation trenches (Albion Archaeology 2019), which lie just outside the defences to the north. Within these trenches, the road comprised makeup layers 4.15–12.25m wide and 1.2m thick, with remnants of a compacted gravel, clay and silt road surface. It is likely that the makeup layers represent a succession of road rebuilds rather than a single phase of construction. The road was bounded by side ditches which had been recut on multiple occasions. Within, and just south of the defences, cropmark and geophysical anomalies indicate that the road surface may have been c.7m wide and defined by ditches c.9m part. Due to the location of this road within a dry valley its construction may not be representative of all major roads within Roman Sandy.

The road to Great Staughton (RR226(x)) is believed to largely underlie the present-day Stratford Road and has therefore never been fully exposed. Its probable north-east side was investigated within AOC excavations where gravel and presumed side ditches were identified (Capon 2023, 12). Gravel has also been found adjacent to the present-day Stratford Road within narrow pipe trenches observed by Johnston (The Viatores 1964, 499), and within a narrow footings trench for a new building (Albion 2020, 9). All these trenches produced no dating evidence and therefore, it is also possible that the gravel might be associated with a perhaps wider, post-medieval version of the modern Stratford Road.

Major Roads leading away from Roman Sandy

It is clear that each of the four major roads described above took a course based upon a single alignment from Sandy to the next 'significant' Roman settlement: Godmanchester, Baldock, Kempston Church End and Great Staughton (Figs. 10 and 11). It should be noted however, that not all of these settlements could be classified as 'small towns', but they were the next 'major' settlement along the roads from Sandy. The single course of the roads suggests a degree of planning and

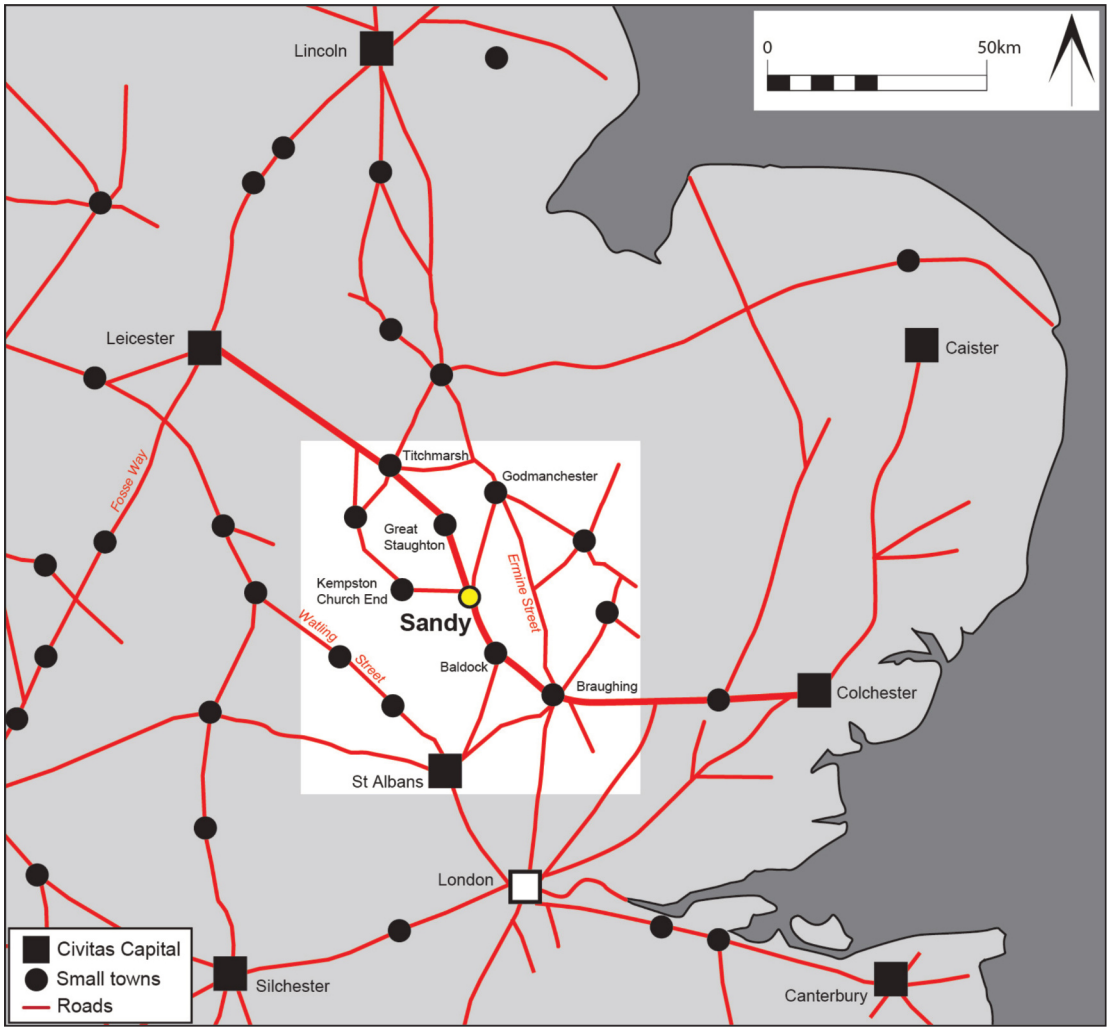


Fig. 10 Map of main roads and settlements in part of south-east England, centred on Roman Sandy (after Burnham and Wacher 1990, fig.1) Note. Area in white shown in more detail on Fig. 3

organisation both before, and during, construction. Whether this was at a provincial, *civitates*, or even a more local level is unknown.

The single alignment of these roads does not mean that there were no minor amendments to suit local conditions, for example as described for RR224 to the west of the River Ivel. In addition, it has been suggested that road RR224 was sighted onto/from the hilltop known as Caesar's Camp, just north of the Roman Sandy (Luke 2021, fig. 7). This would ensure that only one crossing of the River Ivel was required. However, the E-W course of this road changed to a NW-SE alignment to enter the Roman town via its north-west gate (Luke 2024, 21, fig.7) (Fig. 2).

The roads leading away from the town have only been examined in a few locations. The current excavated evidence suggests that in most places, they were defined by parallel side ditches which



Fig. 11: Artist impression by Cecily Marshall, showing what one of the main Roman roads in the Sandy area may have looked like during construction

were 9-17m apart. The variation in separation, may in part reflect the different source of evidence, e.g. cropmarks are less reliable than geophysical anomalies, both of which are less accurate than excavated evidence. It may also reflect the difference between ditches defining the wider '*road zone*' (about 25m), as opposed to those defining the actual road, which may have been much narrower (Margary 1973, 22). In one part of RR224, between Cople and Willington, the road ditches stop at the edge of cropmarks indicating the location of a settlement (Simco 1984, 65–6, image 64). While Simco suggests '*either that the road was never finished, or that it was the work of someone other than the central authorities*' (1984, 65), it would seem possible that either the ditches were not required within the settlement area or have been masked by later settlement activity (as has been observed happening within Roman Sandy).

In contrast to the roads within Roman Sandy, there is currently only limited evidence that the major roads away from the town were constructed with an *agger* and/or metalling. The best evidence for this comes from the investigations associated with RR224, where a waterpipe crossed the route. Here a 'bank', 8–14m wide, was detected in two locations, c.600m apart (*Fig. 7*). It was described as consisting of sand and gravel with an upper gravel layer containing small cobbles (Northamptonshire Archaeology 2007c, 4–5), possibly representing the road surface.

The areas where the roads away from Sandy have been examined are all in arable fields and, therefore, it is possible that modern ploughing may have removed most of the evidence for road

surfaces and *agger*. However, where reports do comment upon evidence e.g. for RR22S (Oxford Archaeology 2020, 60), they note an absence of scattered stones in the ploughsoil where stones might have been expected if the road surface had been metalled. Interestingly at this site, metalling was found associated with a possible post-medieval road so if metalling had been associated with the Roman road, it should also have been present. However, the post-medieval road was only investigated near the edge of the field, as was the case with the water main investigations of RR224, where plough truncation may have been less severe.

It is, of course, possible that some lengths of road were left unmetalled, because the routes were well-drained and wide. This was tentatively suggested for RR22S due to only one small area of possible metalling being identified (Oxford Archaeology 2020, 60). However, if the multiple quarry pits, which have so far only been examined within evaluation trenches, are contemporary with the road, then these are likely to have been dug to extract material to be used to create an *agger* (Fig. 6).

A New Interpretation of the Layout and Development of Roman Sandy and its Roads

The reviews of Roman Sandy by Luke (2021; 2024) and the recent discovery of the Great Staughton road (Ratledge 2024a) provide an opportunity to consider the road network of Roman Sandy in a broader context. This new interpretation postulates that R1 and the Great Staughton road RR226(x) were important roads at the time the defences were built, but then, at some point after construction, the Godmanchester road (RR22N) assumed greater significance. The defences would have been imposed on a large settlement where significant buildings/areas already existed and there was already an established road network. Both of these factors will have, to some extent, influenced the siting of the defences and the location of gateways. As RR22N is believed to have superseded RR226(x) in importance, it would have been necessary to re-locate gateways to allow easy passage on the RR22N, through the defences and through town. The discussion below summarises the evidence and presents this perspective.

As is the norm for small towns (Burnham and Wacher 1990, 23), the layout of roads within Roman Sandy do not form a rectangular grid pattern and it is possible that a pre-existing road layout was adapted as the Roman town developed. R1 may have been the earliest road within the town, possibly originating as part of the Iron Age settlement (*Fig. 9A*). One possible interpretation (based on R1 continuing beyond the defences), is that when the defences were constructed, R1 was still an important road extending northwards, within the town. Its importance is also partly supported by the fact that its course was central within the postulated larger area of late Iron Age settlement (*Fig. 9A*) and, then later, the way it formed one side of the postulated official core of the Roman town (Luke 2024, 54–6). Another interesting feature of R1 in the Roman town is that it would appear to meet the road to Great Staughton (RR226(x)) at a central point within the defensive circuit (*Fig. 9C*). This is not likely to just be coincidence, and the centrality of this junction would suggest that both R1 and the Great Staughton road (RR226(x)) were significant thoroughfares in Roman Sandy, at the time the defences were built.

Additional support for the importance of RR226(x) is its possible link with the road to Baldock (RR22S). If RR226(x) is projected southwards, it coincides with RR22S, in the area to the west of The Bungalow (*Fig. 2*). This almost exact alignment could indicate that RR226(x) was once the northern

section of the road from Baldock (RR22S), passing through Sandy on a single alignment. This would have been a major road and when building the defences it would have been necessary to construct gateways to control entry and exits along this significant route, including a gateway for RR226(x) to the south-east. However, it is not possible to investigate this as the route is now under the present-day Stratford Road.

As already discussed, the course of RR226(x) within the town was more symmetrical to the defences than the other main roads, and when extrapolated, it would have passed through both the north-west and south-east side of the defences on a perpendicular course. The latter is also true for the courses of R1 and RR22N to the north, which also lay perpendicular to the line of their associated defences, suggesting they too were important at the time the defences were built. It is also interesting to observe at Sandy that R1 was located closer to the centre of the north defences, when compared with the Godmanchester road RR22N along the same boundary.

When arguing that RR226(x) was at one point the major road connecting Roman Sandy, it is also necessary to consider the layout and role of the Godmanchester road (RR22N). It is suggested that RR22N was present in the early Roman town, paralleling the Road R1. Projecting RR22N along the same alignment south-westwards into town, and keeping it parallel to R1, results in it meeting the road RR226(x) perpendicularly, in the centre of the undefended town (Fig. 9B). This supports the idea that in the early Roman period, RR226(x) was a significant road through Sandy, with RR22N forming a side road turning off to Godmanchester. However, at some point after the defences were constructed, it is argued that the status and course of RR22N changed. Before this change, to reach Godmanchester from the south, it is speculated that it would have been necessary to enter the town on the main road RR226(x), via a south-eastern gateway, travel to the town centre and then turn north-eastwards onto the RR22N. However, over time and perhaps because the road to Godmanchester became more significant than RR226(x), rather than going into the town centre, a new direct route developed with RR22N taking a N-S alignment to directly meet RR22S (Fig.9C).

It has already been noted that the courses of RR226(x) to the north-west, and RR22N and R1 to the north, lay perpendicular to the line of their associated defences, suggesting they were important at the time the defences were built. However, in contrast, the new route of RR22N would appear to have passed through the south-east defences obliquely before it joined RR22S. It is uncharacteristic for a major road to enter the defended area of a Roman town obliquely and this could therefore suggest that the RR22N gateway was a later addition. As this road assumed more importance, the southern gateway for RR226(x) would have been blocked and replaced by a new gateway, c.40m to the north-east; it is unlikely that two gates would have existed so close to each other at the same time. The obliqueness of RR22N, suggests this gateway was a later amendment to the defences, with its alignment constrained by the requirement to link RR22N to RR22S, the latter being an established major route. Also, at this time, Roman Sandy would have been well established, perhaps making it difficult to route the RR22N directly to the original gate or to build the road perpendicular to the defences.

If this evolution of the road network in the vicinity of Roman Sandy is accepted, then it is necessary to briefly consider what would prompt the diminishing status of the Great Staughton road RR226(x), and the increasing importance of the Sandy-Godmanchester road RR22N, in the later Roman period. To explain this, it is necessary to consider the development of Godmanchester and its relation to Sandy.

It is interesting to note that Godmanchester is the only settlement linked to Sandy by road, which also had defences. The similarity of the nature, extent and shape of the defensive circuit at Sandy and Godmanchester have been discussed by Luke (2024, 57) (*Fig. 12*). Although the date of the defences at both towns is uncertain, it is possible that at the time they were constructed at Sandy, Godmanchester was developing into an even more significant settlement in the area than it had previously been. Eventually, in response to this development, the Godmanchester road RR22N may have assumed more importance, and was re-routed to join the RR22S in order to provide a more direct route through the town (*Fig. 9C*). However, the dating of this sequence of events at Sandy will require further excavation and so this remains as speculation. Also, as yet, it is not known if other settlements connected by road to Roman Sandy other than Godmanchester also had defences, as up until five years ago the defences at Sandy remained unrecognised. Defences at other settlements may yet be discovered, with Baldock perhaps the more likely.

This new interpretation of the major roads to, and from, Roman Sandy has implications for our understanding of the regional Roman road network. To date, Roman Sandy has always been mapped

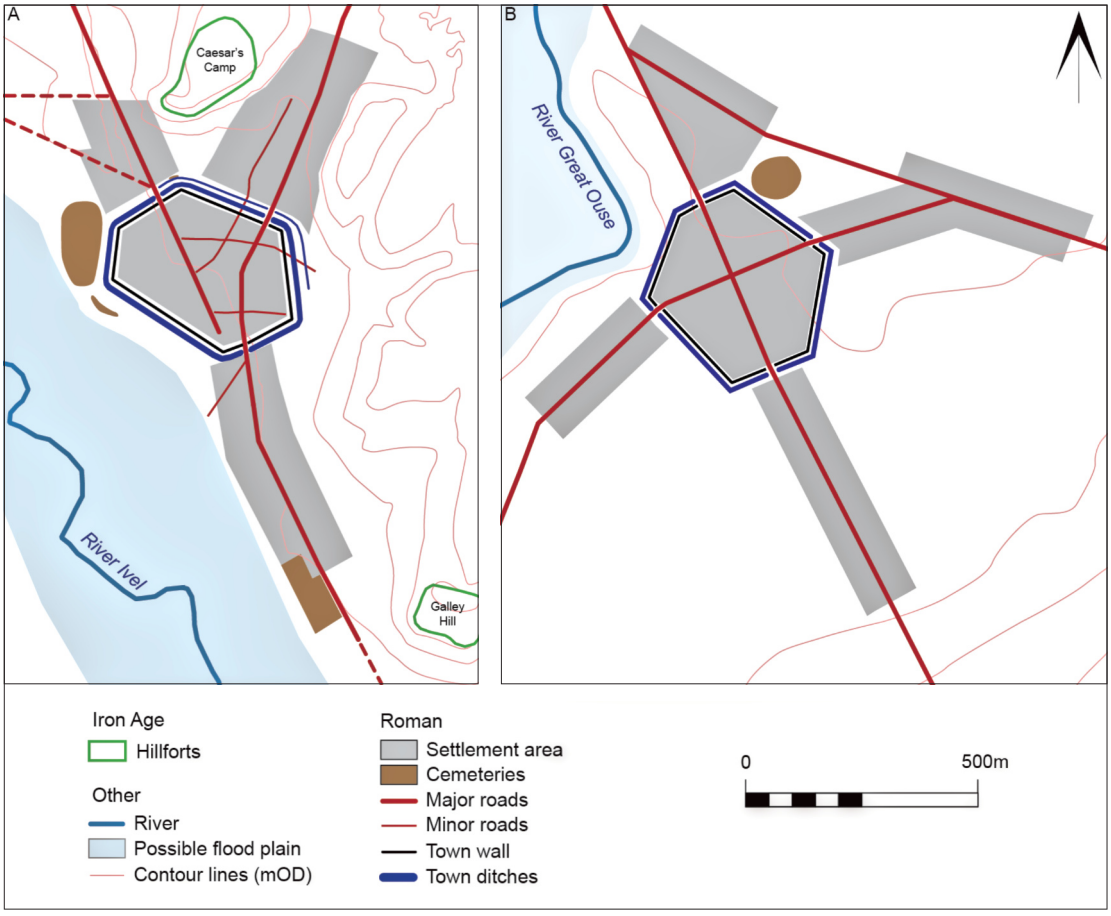


Fig. 12: Comparative plan showing the layout, defences and roads of Roman Sandy (A) and Godmanchester (B) (after Luke 2024, fig. 12)

as being located on a main road which came off Ermine Street at Braughing, passing through Baldock (R22S) before reaching Sandy. Once at Sandy, it changed direction (RR22N) and rejoined Ermine Street at Godmanchester. Therefore, until this review, it has always been assumed that the Baldock to Godmanchester road (RR22S/RR22N) was built as one road and was the most important in Roman Sandy. This is reflected in Margary's numbering scheme where this road is given the same number RR22. However, the recent identification of RR226(x) by Ratledge (2024a, 314), the recent reviews of the road network and defences at Sandy, and the better understanding that we now have of the nature and extent of the small town at Great Staughton (designated by Historic England in 2024), challenges the assumption that the Godmanchester Road was always the primary thoroughfare. The evidence and arguments presented above suggest instead, that the Great Staughton Road could have been the first main road through Roman Sandy.

If the Great Staughton road RR226(x) was the same road as the Baldock road RR22S, it would then appear to be a continuation of the road to Colchester. The latter is often referred to as '*Britain's first Roman town*' (Crummy 1997). Before the Roman Conquest it was the capital of *Cunobelin*, and after the conquest, it was initially the site of a legionary fortress which later became a *Colonia* and headquarters of the imperial cult (Wacher 1995 82). Perhaps it can be tentatively speculated that the Colchester road, RR22S, and RR226(x) were all part of the same road, whose route was established very early in the Roman occupation (perhaps even as a military road). After leaving Colchester it passed through several small towns including Braughing and Baldock before reaching Sandy, which may have been an important pre-Roman settlement. From here, based on the new evidence discussed in this article, it continued over the River Great Ouse initially to Great Staughton, then to Titchmarsh where it crossed the River Nene, after which it continued to Leicester (Fig. 10). The latter, which was located on the Fosse Way, has long time been believed to overlie a pre-Roman settlement where a fort may have been constructed (Wacher 1995, 343, Buckley and Morris 2021, 93-94).

This interpretation has significant implications for the development of the road network in the region especially around Roman Sandy, but it has to be stressed that currently, there is insufficient evidence to do more than suggest that this is just one of a number of possibilities. However, whether this interpretation proves to be correct or not, it is a timely reminder that the Roman road network should not be viewed as being constructed in a single phase, and that individual roads, and settlements would have evolved over time. It is also a useful reminder that there are considerable benefits to critically evaluating existing evidence alongside new evidence and considering alternative interpretations - alternative interpretations are fertile ground for discussions.

Continuation and disuse of roads

Where roads were in continual use, metalling and makeup layers would gradually have been worn away- a process that probably began in the Roman period (Fig. 13).

Following the '*end*' of Roman Britain, segments of the roads may have continued in use, often with little maintenance (Margary 1973, 23). It is possible that any surviving deposits not being used as a road would have been removed in the post-medieval period for use elsewhere e.g. in buildings or turnpike roads. There is a reference with regard to RR22S at Sandy, that states, '*Within living memory, the Roman road across the Chesterfield was almost completely removed by farmers as an obstruction to the plough*' (Johnston 1974, 35).



Fig. 13: Artist impression by Cecily Marshall, showing what one of the main Roman roads in the Sandy area may have looked like after several centuries of use

Acknowledgements

Sources of information are referenced in this article, including the grey-literature reports produced by Albion Archaeology, BCAS, GSB, Magnitude Surveys, Northamptonshire Archaeology and Oxford Archaeology. Many of these are available online but I am grateful to Hannah Firth at Central Bedfordshire Council for providing copies of others. A number of staff at Albion Archaeology have assisted in my research, in particular Helen Parslow who found many of the more obscure grey-literature reports, and with the creation of a GIS project, in particular Iain Leslie, Tori Guy and Catie Watts. All figures in this article were produced by Mike Trevarthen and his patience undertaking several rounds of amendments as ideas changed is much appreciated. The artist impressions of a 'typical' Roman road during construction, and after use, were created by Cecily Marshall. These are partly based on the archaeological evidence but inevitably required a degree of artistic licence.

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A Review of the Status of RR193. Greensforge, Staffordshire to Newtown, Powys

by Paul E Smith
paul@paulesmith.co.uk

Abstract

Margary (1973, 296) described a road he numbered RR193 running from Greensforge, Staffordshire to Newtown in Powys. This paper will consider the evidence for an engineered Roman road as championed by Dr. Houghton (1960, 233-243). The route will be discussed and the strong probability that this road was of Iron Age origin will be presented together with evidence for the use of the road during and after the Roman period. The road does not conform to the standard morphology usually associated with Roman military roads and there is no evidence of Roman military engineering along the route, yet excavations show an engineered structure (a demonstrable road). The evidence for Houghton's postulated river crossing at Bridgnorth in Shropshire will be considered and an argument will be advanced for a key crossing point probably dating from the Iron Age via a ford of the River Severn near Quatford in Shropshire. The paper will conclude that there is no evidence that RR193 is of Roman Military construction but was almost certainly used by the Romans and probably improved during the Roman period. It is suggested that RR193 should be withdrawn from the Margary RR number register and a new entry made for RBW193.

Introduction

The proposal for numbering non-standard Roman roads in Britain, published in *Itinera* IV, provides the opportunity to consider the evidence for RR193 as an Iron Age route or trackway used by the Romans (Haken 2024a). Margary described RR193 under the title: '*193 Greensforge – Bridgenorth* [sic] – *Halford – Bishop's Castle – Newtown 51½ miles*' (1973, 296). The route begins in present day Staffordshire 5.5 km (3.4 miles) east of the border with Shropshire and then crosses the entirety of the county of Shropshire, the heartland of the *Cornovii* tribal group. There is no evidence in Margary's text that he had seen this route for himself and it seems almost certain that he only adopted RR193 having read an account of research conducted by Dr. A.W.J. Houghton and published in the Transactions of the Shropshire Archaeological Society (Houghton, Op Cit). To be clear, the route was described by Houghton and adopted by Margary.

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Topography

Potential crossing points on the River Severn had strategic value: Webster (1991, 63) made the point that the river was '*large enough to have key crossing places where it could be forded or where ferries could be maintained*'. North of the point where Houghton described his river crossing the flow of water is constrained by the Severn Gorge. South of the gorge the river remains, for the most part, in a tight V shaped valley. The banks of the river spread slightly in the area around Danesford and Quatford 13.1 km (8.1 miles) to the west of Greensforge.

To the east of Quatford runs an undulating plain at a height of between 60 - 120 metres (167 – 394 feet); the plain is dissected by the deep narrow valleys of the River Worfe and its tributaries. After crossing the River Severn, much of Houghton's route is determined by the topography of the land it passes through. The route turns to the northwest to avoid the high ground of the Clee Hills which rise to 609m (2,000ft), then turns west, then south-west running down Corvedale parallel with Wenlock Edge - a 30.5 km (19 miles) long limestone escarpment. The route crossed the River Onny north of Craven Arms, where there is evidence of Iron Age occupation (Malim & Wellicome 2016, 51) and then crossed RR6b, the engineered Roman road which ran from Wroxeter to Leintwardine and provided a north-south route from Chester to South Wales. Westward from the Severn Valley the landform becomes progressively more rugged and dramatic with steep gradients and pronounced escarpments.

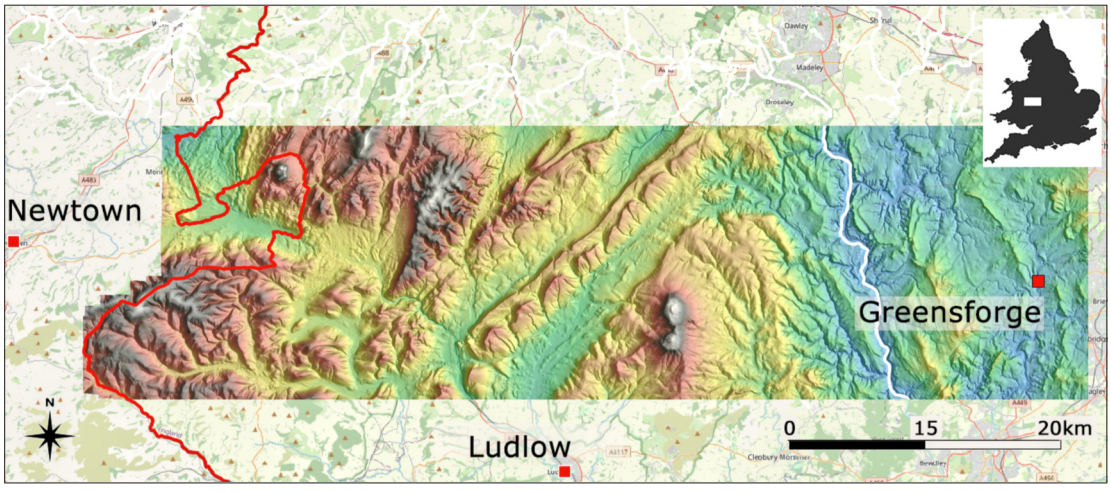


Fig. 1. Topography between Greensforge and the present-day border between Wales & England (red line). The white line shows the course of the River Severn. © Paul Smith. Base map © Copyright 1995–2025 Esri. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

The Pre-Roman Background

Tim Malim, now Principal Archaeologist at Clwyd-Powys Archaeology, implied prehistoric credentials for the route from Stretford into Wales (Malim & Wellicome 2016, 73), stating that it '*. . . would also have connected Craven Arms to the marching camps at Brompton and the forts at Pentreheyling (near Church Stoke) and Forden Gaer (near Montgomery), and prehistoric enclosures such as Wart Hill*

(Carwood) were located along its route. Its continuation west and south-westwards from Pentreheyling included the prehistoric Kerry Ridgeway. '

General evidence for trackways in early Pre-history.

The traditional name given to the Kerry Ridgeway is: '*Yr Hen Ffordd*' (Welsh – the Old Road). The route is traceable from Bishop's Castle into the parish of Llandinam in Powys, Wales (HER Number (PRN): 01963. Heritage Gateway). Clwyd Powys Archaeological Trust (CPAT) write: '*The ridgeway is thought to have formed part of an important route into central Wales from early times*' (CPAT 2024).

Lal Chitty, who Roger White described as the '*doyen of Shropshire's prehistory*' (White 2013, 4) wrote of - '*the astonishing number of implements of flint and of debris indicating their local manufacture found on fields flanking the Ridgeway through the Clun Region and scattered over that district*' (Chitty 1963, 172). The better, and larger flint pieces are imported - from Norfolk, East Yorkshire, and sources perhaps in Wiltshire, but the bulk of the worked flint in Shropshire is from the local glacial till (Woodward, forthcoming paper). To the best of this author's knowledge the routes by which unworked quality flint travelled such distances have never been described.

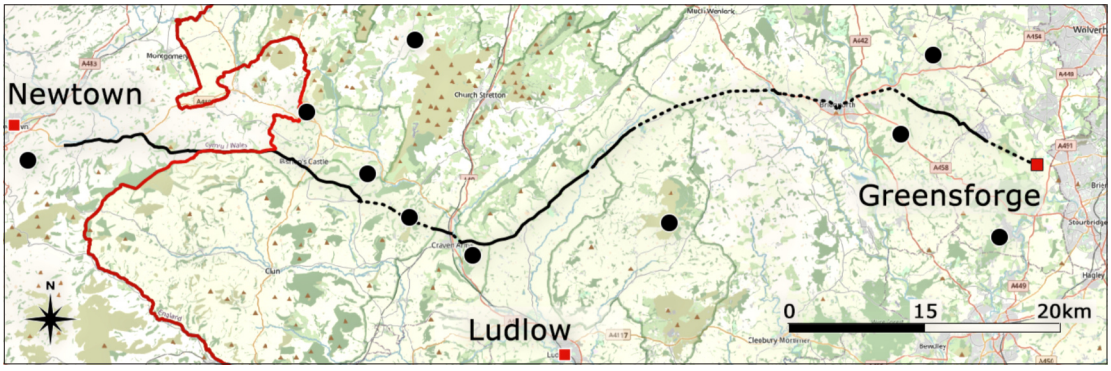


Fig. 2. Location of Hillforts (black dots) on Houghton's route (black line. The use of solid and dotted lines on the route is explained below, see Fig. 7. Three modern locations are indicated by red squares. © Paul Smith. Base map © Copyright 1995–2025 Esri. Lidar data © Environment Agency copyright and/or database right 2025. All rights reserved.

General evidence for trackways in later Pre-history.

Francis Pryor described the genesis of roads in the Bronze Age: '*Starting as early as 2000 BC in some areas, we see evidence for a more sedentary way of life. Fields, roads and trackways come into existence, and permanent settlements become far more common*' (Pryor 2003, 269).

Evidence from excavations at Bayston Hill in Shropshire shows that Iron Age people were capable of building engineered roads and could organise to do so. The question as to why the road at Bayston Hill had been so heavily engineered has been discussed at length, the conclusion arrived at was that the clear intention was '*to convey heavy materials along the route. This might suggest either metal ingots . . . or, perhaps more probably, salt'* (White & Wigley 2010, 5). More recently Andy Wigley wrote of the most numerous type of finds from hillforts in Shropshire being: *'sherds of briquetage salt containers, which originate from the brine springs at Droitwich in Worcestershire and Northern Cheshire*' (Hurst 2017, 98). Salt containers may well have made part of their journey via boat on navigable rivers but the distribution of salt containers to hillforts would again have been impossible without a network of trackways.

Further examination of potential trade routes is made difficult because the tribal group occupying most, or all, of the length of the area covered by Houghton's route were the *Cornovii* who *'had no coinage'* and no *'distinctive metalwork'* (Webster 1991, 6).

An Iron Age crossing of the River Severn at Quatford

Roads facilitate the movement of people and goods but continuous routes would have been impossible in pre-Roman times without simple bridges to cross minor streams and fords to cross rivers of the size of the Severn. Equally, the existence of a ford through a major river implies the existence of a route and since routes tend not to end unless they meet impassable obstacles, the sea for example, it seems likely that a ford through a major river like the Severn implies a route of some distance.

It is of interest to note that Wigley (2002, 182) discusses the practice of depositing bronze objects in rivers and mentions a bronze sword found in the river at Quatford. The location at which an iron-age road crossed the River Severn would seem to be confirmed by examination of the known old roads. Croom (1989, 15) used a technique described as '*Topographical Analysis*,' to identify a number of old roads in her area of study. These included two significant long-distance routes; Road 1 (see Fig. 3), a trackway or road from Wenlock Edge via Morville to Eardington, was described as '*almost certainly in use during the Roman period and quite possibly of prehistoric origin*' (Croom 1989, 68). The line of Road 1 was curtailed close to Eardington and '*traffic wishing to cross the river is diverted along Road 10 and Road 11.*' (Croom Op Cit, 302). On the west bank of the river close to Quatford in more modern times the patterns of old roads was disrupted by the building of the Kidderminster to Bridgnorth railway. To the north-east of Quatford on the east bank of the Severn similar disruption was caused by the enclosure of land and turnpiking of roads in an area formerly occupied by the Forest of Morfe - a medieval royal forest in east Shropshire.

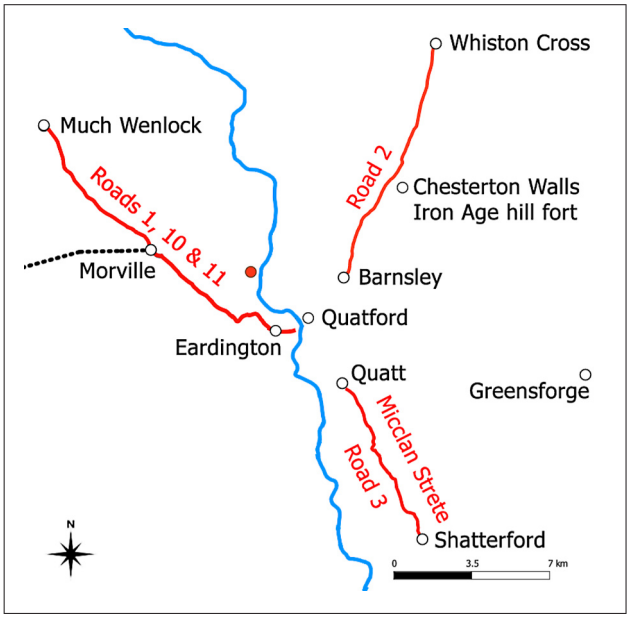


Fig. 3. Three old roads (shown in red) converge on a probable river crossing at or near Quatford, Shropshire. The roads to the west of the river are Croom's Road 1,10 & 11. On the east bank is Croom's 'Road 2' and 'Micclan Strete'; Croom's road 3. The red dot shows the location of the modern-day town of Bridgnorth. © Paul Smith 2024.

Old routes to the east of the River Severn include a long-distance route Croom labelled Road 2 (Croom. Op Cit. Vol2, 113). This road, shown on Fig. 3, runs from Whiston Cross (south-east of Albrighton) to Barnsley, both in Shropshire. It passes within 0.8 km (0.5 mile) of Chesterton Walls Iron Age hill fort. The route of this old road cannot be identified coming south beyond Barnsley because it was replaced by a ruler straight '*turnpike*' road. Croom identified another road to the east of the river (Road 3) which is of interest in the context of a river crossing. King (2006, 95 – 98) ascribed the name '*Micclan Strete*' to this road. The road runs from Shatterford, Worcestershire and goes over a 170 metre (557 foot) hill to Allum Bridge and then to Quatt with the last two places being in Shropshire. Dr King identified this route as the course of the Great Road (*Micclan Strete*) mentioned in the Wolverley Charter which King Burgred of Mercia granted to Worcester Cathedral in AD 866. There is little evidence that the Saxons built roads so a road in use in the 9th century was probably either built during the Roman period or was another Iron age route re-used during the Roman period and later. Webster suggested that there must have been a communication route alongside the east bank of the River Seven to enable control of the river and it's crossing points (Webster 1981, 78). If such a route existed, then King's suggested road could have been part of this long-distance military route. However, an examination of lidar data in QGIS has revealed no evidence of Roman engineering between Shatterford and Quatt.

The position of Roman camps and forts discussed in the next section of this paper will add to the evidence for an Iron Age route probably used by the Romans.

The Roman Landscape

A Roman temporary Camp at Quatt, Shropshire

In 1974 the cropmark of a Roman temporary camp at Quatt at Grid Ref : SO 73810 88980 was identified on air photographs taken by Cambridge University Collection of Aerial Photography (CUCAP). It

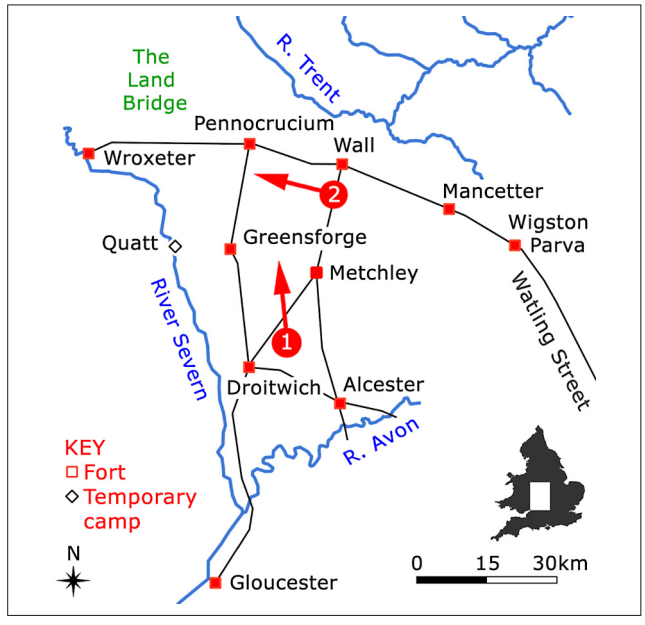


Fig. 4. The position of Greensforge & Quatt in the context of Scapula's campaign in Wales and the Marches. Prior to the advance to the west the River Severn and the River Trent had defined the limits of the occupied territory. Red arrows 1 & 2 show both the phasing and the probable lines of advance. Watling Street was built crossing the 'land bridge' between the two rivers. © 2025 Paul Smith

seems likely that this camp was built as a part of Ostorius Scapula's move *'to occupy by force the lands between the Trent and the Severn*' (Burnham 2010, 37). The camp covered an area of about 1.3 ha (3.3 acres) and commanded excellent views up and down the valley of the River Severn, see Fig. 5. The camp is located 12.44km (7.73 miles) to the west of the Roman military complex at Greensforge and 1.44km (0.89 miles) south of the postulated Iron Age crossing, via a ford, of the River Severn near Quatford.

Roger White argues that an invasion route from Greensforge, south of and perhaps slightly earlier than the well-known route up Watling Street, '*may represent the original line of advance*' (White & Silvester forthcoming). White writes:

> *'...the route described by Margary and Houghton would have split upon crossing the Severn. One route led due west towards Wales, the route they outline, while another road led north-west, crossing Wenlock Edge perhaps at Much Wenlock and then via Sheinton to Cound Hall' (White, forthcoming paper, 6).*

It is interesting to note that White confirms the Roman use of at least the section of Croom's Road 1 from Morville to Much Wenlock. Finally, in mapping the military sites in the *Cornovii* area. Webster (1991, 32) postulated a fort at Monkhopton but none has been found in or near this place. Nearby Upton Cressett is '*still unproven as a Roman military site, it nonetheless conforms to a predictive topographic model of where Roman military activity might be expected*' (White & Hodder 2018).

It is entirely possible that the camp at Quatt was constructed to secure a river crossing and act as a base for patrols on the west bank of the river. Burnham and Davies (2010, 43) use an interesting quote from *Vegetius* to show the Roman military would have used existing routes:

> *'...he should have itineraries of all regions in which war is being waged written out in the fullest detail, so that he may learn the distances between places by the number of miles and the quality of the roads, and examine short-cuts, by-ways, mountains and rivers, accurately described'.*

The use of RR193 as a '*patrol path*' would have prevented the British from attacking the Roman army from the rear and enabled the assembling of an overwhelming force at the military complex situated around the fort at Wroxeter.

Viewshed of Quatford from the temporary camp at Quatt

The evidence for a ford at Quatford discussed above would seem to be further confirmed by a viewshed analysis conducted in QGIS, see Fig. 5. The analysis uses a viewpoint located 1.8m (i.e. the height of a human) above ground level and just 460m north of the Roman temporary camp at Quatt. The analysis shows that the entire stretch of the River Severn can be theoretically viewed from a point just north of the Roman camp for a distance of 1.92 km (1.1 miles) in a northerly direction to a place where the river becomes hidden as it changes direction to almost due west. Not only can the postulated crossing point be clearly seen from this viewpoint but a length of over 1.5 km (0.93 miles) of Croom's roads 1, 10 & 11 would also have been visible. It is difficult to imagine that the location of this camp was chosen for any other reason than intending to control an existing crossing point of the river.

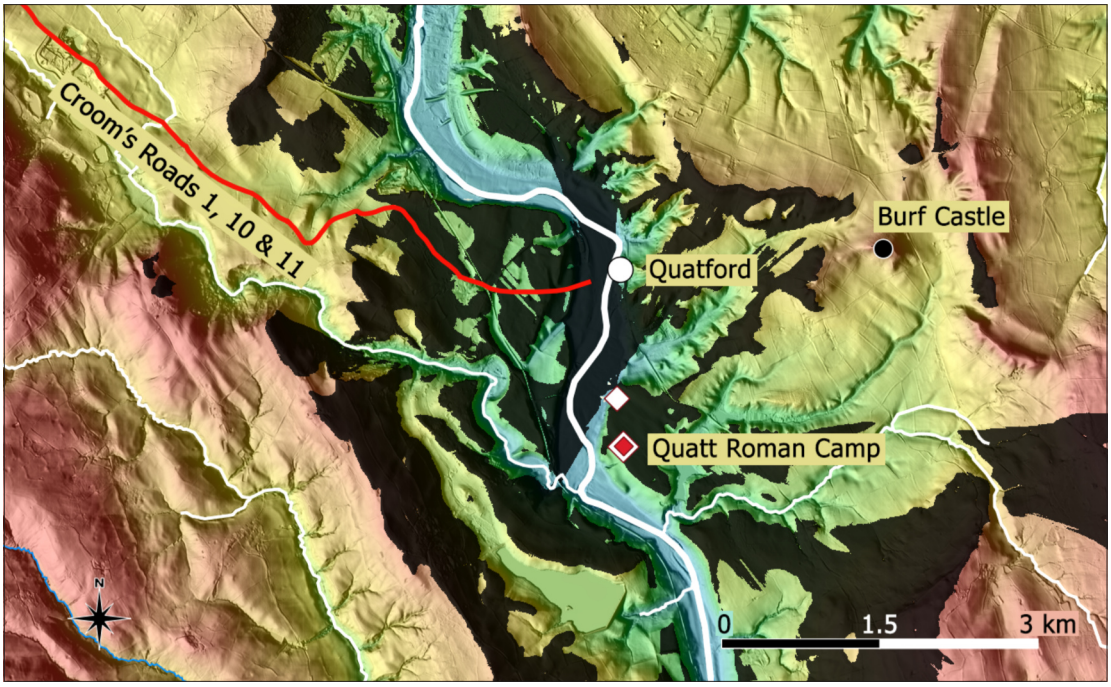


Fig. 5. Viewshed analysis from a viewpoint located just north of the Roman temporary camp at Quatt (white diamond). The land shown in black (80% opacity) would have been visible from the viewpoint. The red line represents Croom's Roads 1, 10 & 11, the white circle is the location of the postulated ford at Quatford and the white lines are watercourses – the River Severn is the thicker white line. © Paul Smith. © Crown copyright and database right 2024. Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

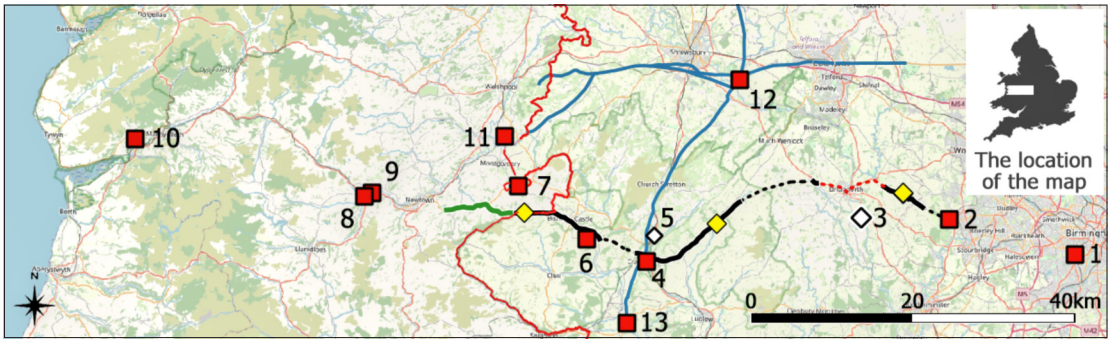


Fig. 6: The route of RR193 (black line), the border between Wales & England (red line), Roman forts (red squares) and Shropshire's Roman roads (blue lines). The red dotted line is Houghton's postulated route in the area of Bridgnorth which is discussed as an engineered road below. Forts are: 1: Metchley, 2: Greensforge, 4: Stretford Bridge, 6: Lydbury North, 7: Pentreheyling, 8: Llwyn-y-Brain, 9: Caersws, 10: Pennal, 11: Forden, 12: Wroxeter,13: Leintwardine. In addition, there were temporary camps (white diamonds) at 3: Quatford, 5: Upper Affcot and 7. Brompton (less than 0.5km from Pentrehyling so not displaying here. Yellow diamonds show the locations of Houghton's excavations. © Paul Smith 2024. Roman roads shapefile © Shropshire HER. Base map © Copyright 1995–2025 Esri.

Details of RR193

Greensforge, at the eastern end of Houghton's RR193, has a complex of two Roman forts and three camps. Moving westward, there is the temporary camp at Quatt, probably built to guard a crossing of the River Severn. Webster wrote (1981, 78): '*It seems inconceivable that the army would not have had complete control of the river side and It's crossing points during the time when the army was moving toward Wales*'. The road goes down Corvedale and crosses RR6b just south of the Roman fort at Stretford Bridge.

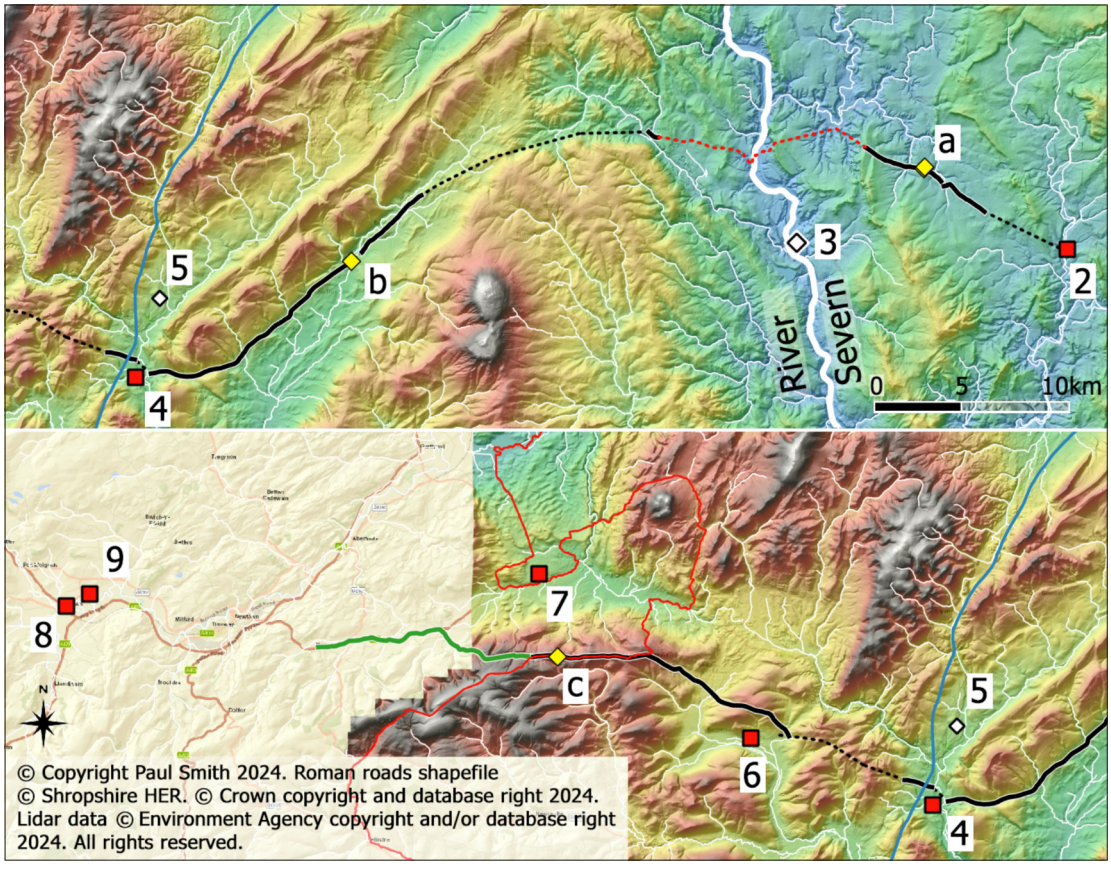


Fig. 7: Details of RR193 as described by Houghton (top: east, bottom: west) with associated Roman forts (red squares), locations identified as per Fig. 6. RR6b Wroxeter to Leintwardine is shown as a blue line. The line of RR193 is shown as a black solid line where the author is certain of the route of the road and dotted where there is a degree of uncertainty. The length of Houghton's route on either side of the River Severn (discussed below) is shown dotted in red. The green line represents the ridgeway running into Wales. Yellow diamonds labelled a, b & c are the locations of excavations. Note: The author has been unable to find Lidar data for the part of the route in Wales, hence the difference in appearance in the bottom left-hand quadrant.

The road then passes north of the triple ditched Roman fort at Lydbury North which was identified via aerial photographs in 2017 (Shropshire HER, PRN 33273) and then runs south of the fort at Pentrehyling, Shropshire; which was probably built for supervising the extraction of silver from lead.

The excavation report for the fort and the camps at Pentrehyling has been reviewed; however, the only possible reference to RR193 lies in the following: '*No remnant of road surface was detected during these excavations, and it was assumed to have been removed by agricultural activity. The alignment of the ditches suggested that the road was curving away to the south, possibly to take an eastern valley route*' (Allen et al. 2013, 26). Houghton only described the route of his road in Shropshire but the village of Kerry, Powys, Wales (at the western end of the Kerry Ridgeway) is only 14.5 km (9 miles) by modern road from the Roman fort at Caersws, Powys, Wales. It is acknowledged that this description of the road does not terminate at a '*Romano-British nucleated or agglomerated settlement*', (Haken 2024a, Op cit.) but this seems directly attributable to the fact that Houghton wrote his description for inclusion in the Transactions of the Shropshire Archaeological Society.



Fig. 8: Crop marks of the triple ditched Roman fort at Lydbury North, Shropshire. Image reproduced with kind permission of Shropshire HER © Shropshire Council. Ref: IR2530

Houghton's Excavations

Houghton provided details of 5 sections he drew at three separate locations (Houghton, Op Cit). The six-figure grid reference he used which pinpoint a location on an Ordnance Survey map to within 100 meters are frustratingly inaccurate, it is disappointing that it is not possible to provide more accurate grid references. Houghton's writing style is discussed in more detail below.

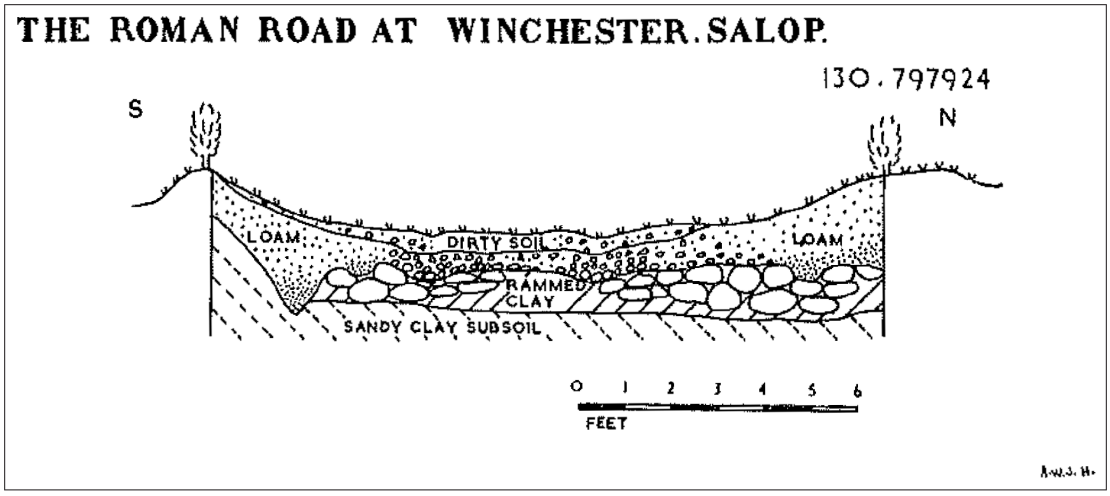


Fig. 9. Houghton's section through his RR193 at Winchester Farm, Claverley © Shropshire Archaeological Society. 1960.

Houghton's excavations were conducted at:

- See *Fig 7* (a): Near Winchester Farm, Claverley, Shropshire - one trench. Grid Ref given as SO 797 924. Place names containing 'chester' are sure to generate interest, however, there is no known Roman fortification at this place
- See *Fig 7* (b): At Beambridge Shropshire - one trench SO 537 884
- See *Fig 7 (c)*: Where the Kerry Ridgeway crosses Offa's Dyke - three trenches SO 258 896 see fuller discussion below

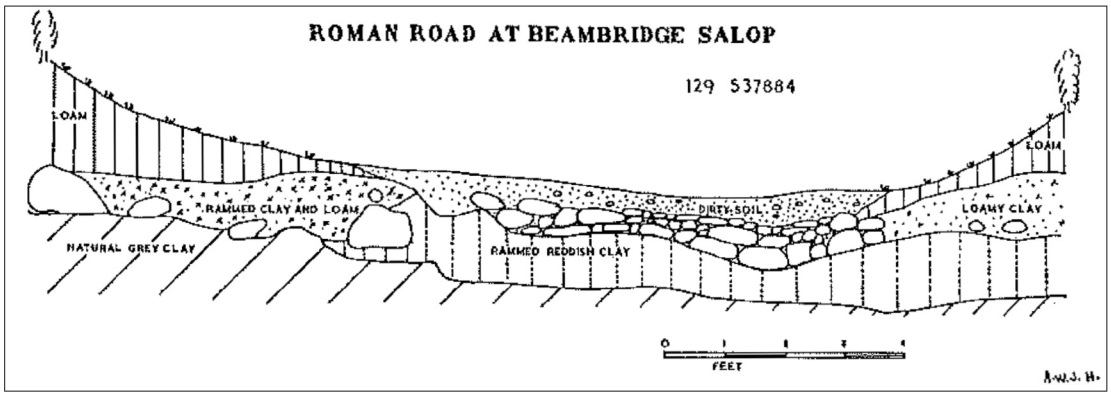


Fig. 10. Houghton's section through his RR193 at Beambridge, Corvedale. © Shropshire Archaeological Society. 1960.

Houghton's paper included 5 sections but only two have been included here. A brief description of each archaeological section is included but these do not add much to aid our understanding, the drawings are not produced to the modern standards we have come to expect neither are the descriptions. For example, the section east of Winchester farm near Claverley (Houghton, Op Cit, 241) is described as:

'A trench three feet wide was cut across a deserted section of the road at this point. It was found to be trench built a hard bed of rammed clay being laid on the natural sandy clay with a small ditch cut into the subsoil close to the clay base. No true kerb was found but great stones reinforced the outer parts of the clay bed.'

It seems entirely possible that the discovery of the fort at Greensforge encouraged Houghton to seek a road to the west. From this beginning he might have found straight alignments and in places he found Parish Boundaries running along the road. He seems to have concluded this was a Roman road and, in this context, excavations seem to be the final confirmatory check. The sections do suggest an old road that has been well worn down; that this is an '*old road*' certainly seems to be confirmed, at least east of the River Severn by the deep holloways on the road to both sides of the section at Winchester farm. There is every chance that this possible Iron Age track was surfaced during the Roman period. Following the checks described in '*Classifying with Confidence*' it would seem the road might be awarded the temporary status of a 'Possible Road' (Haken 2021). Although, as discussed below, there is no evidence that it was constructed to Roman Military standards.

Problems with Houghton's Route

There are three serious problems with Houghton's route.

1. Identifying features described in Houghton's account of the route of RR193

Houghton's writing style makes it very difficult to identify the precise locations he describes. For example, he mentions seeing the *agger* of his road '*on the north side of the road as the road crosses Highgate Common*' in Staffordshire. The Common is large (286 acres - 116 hectares) and the lack of an accurate location does not assist the search for the *agger*. Lidar data at 1m resolution has been used but this author has failed to spot any traces of *agger* in the area indicated. Houghton describes two other places where he spotted an *agger* but, again, a search of 1m lidar data failed to confirm. Further evidence of the difficulty described here is provided by CPAT: *'It has been suggested that Houghton claimed to have found traces of an agger to the west of Bishops Castle, although a re-reading of his text implies that he was referring in reality to an agger near Forden*' (Silvester & Owen 2003, 102). Given that Houghton's wording is ambiguous it is not possible to decide definitively between the two possible interpretations.

2. Houghton's interpretation of his route as a Roman military road

The OS Surveyor file for RR193, held by the RRRA, contains 43 pages. The OS surveyors found no evidence of Roman engineering along the entire 82.9 km (51.5 mile) route (OS Surveyor files, RRRA. Op. Cit.). Barry Burnham wrote '*there is no physical evidence at all for the Roman origin of any part of this road*' (Burnham & Davies 2010, 325).

If there is no evidence that RR193 was an engineered military Roman road then Houghton's interpretation of the excavations at Claverley, Beambridge and Offa's Dyke must be re-considered. Iron age road building at Sharpstone Hill is described by Tim Malim (Malim & Hayes 2009, 7-80). However, there is no evidence for long distance paved Iron Age roads elsewhere in the country and the idea that the whole of Houghton's route might be a paved road of Iron Age origin lacks any credibility; certainly, this author does not believe this was an Iron Age engineered road. It seems likely that a road on Houghton's route (or parts of his route) may have been constructed during the

Roman era after the army had moved away from Wales and the Marches as discussed in '*Viae Vicinales in the Northeast Midlands*' (Haken 2024b). The only remaining alternative is that it was constructed after the Romans left Britain, although, given the lack of any serious road building between AD 410 and the beginning of the Turnpike movement, that seems highly unlikely.

Lidar data at 1m DTM has been used in QGIS to attempt to find any trace of *agger* along the entire length of the route of RR193 between Greensforge and the border with Wales; a distance of 64km (39.9 miles). No evidence has been seen of *agger*, ditches, quarry pits or the terraces seen in '*the uplands when the road has to run along a sloping hill-side*' (Hopewell 2013. 9-10). It would seem that the development of Watling Street, 22 km miles (13.7 miles) north of Greensforge and of RR6b Wroxeter to Leintwardine were clearly given priority. Birgitta Hoffmann references Salway and tells us '*the beautifully engineered cambered roads with rammed gravel may have taken several decades to complete*' (Hoffmann 2019, 72). Given the distance of the route that has been reviewed, the lack of evidence of Military engineering and the network of known engineered roads in the area it seems probable that this was not a Roman military road.

3. Was there a crossing at Bridgnorth?

Before discussing the possibility of a crossing at Bridgnorth, it is worth noting that, to the east of the River Severn, the Digital Atlas of the Roman Empire (Åhlfeldt 2020) has conflated Houghton's route for RR193 with part of RRX057 Greensforge to Wroxeter.

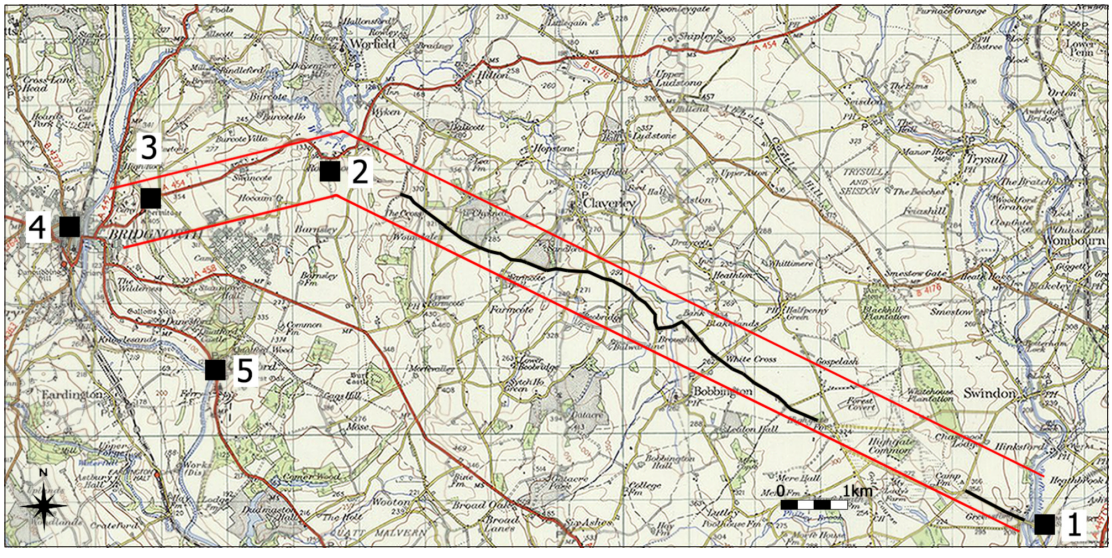


Fig. 11. Present day roads (shown in black) on Houghton's route from Greensforge (1) to Roughton (2) with red tram lines indicating the general direction of the route. A turn of 40 degrees would have been required at or near Houghton's postulated turn near Roughton to reach the top of the cliff at (3). This is the position of the only cut down the cliff to Bridgnorth in that area. Also shown are Bridgnorth (4) and the postulated early crossing of the River Severn at Quatford (5). © Paul Smith. Background image OS 1inch 7th Series 1955-61. Reproduced with the permission of the National Library of Scotland.

Fig. 11 shows that Houghton's route from Greensforge to Roughton followed a generally straight direction. However, the roads themselves do not present as a straight road at all; they are anything but straight. In a 1.9 km stretch of this route the present-day road crosses three small streams in the

vicinity of Houghton's section at Claverley. On either side of each of these streams is a pronounced holloway; the depth of each holloway was determined by analysing lidar data in QGIS using the Terrain Profile tool. The holloways vary from 7m (22.9 ft) to 16m (52.5ft) in depth from what seems to be the present field surface.

Houghton fails to explain quite why a Roman surveyor would have plotted a route to Roughton, see Fig. 11, which would then have required an approx. 40° turn to reach the only point within over 1.6 km (1 mile) where there is a cut down the steep rock cliffs which run as an almost unbroken feature to the east Bridgnorth, see Fig. 12. Certainly, there is no obvious topographical reason why a Roman engineer should have set out a route in this way. Houghton postulated that his RR193 crossed the River Severn at Bridgnorth yet there is no evidence of a Roman military road on either side of Bridgnorth, no evidence of Roman engineering to enable a road to negotiate the steep cliff here and

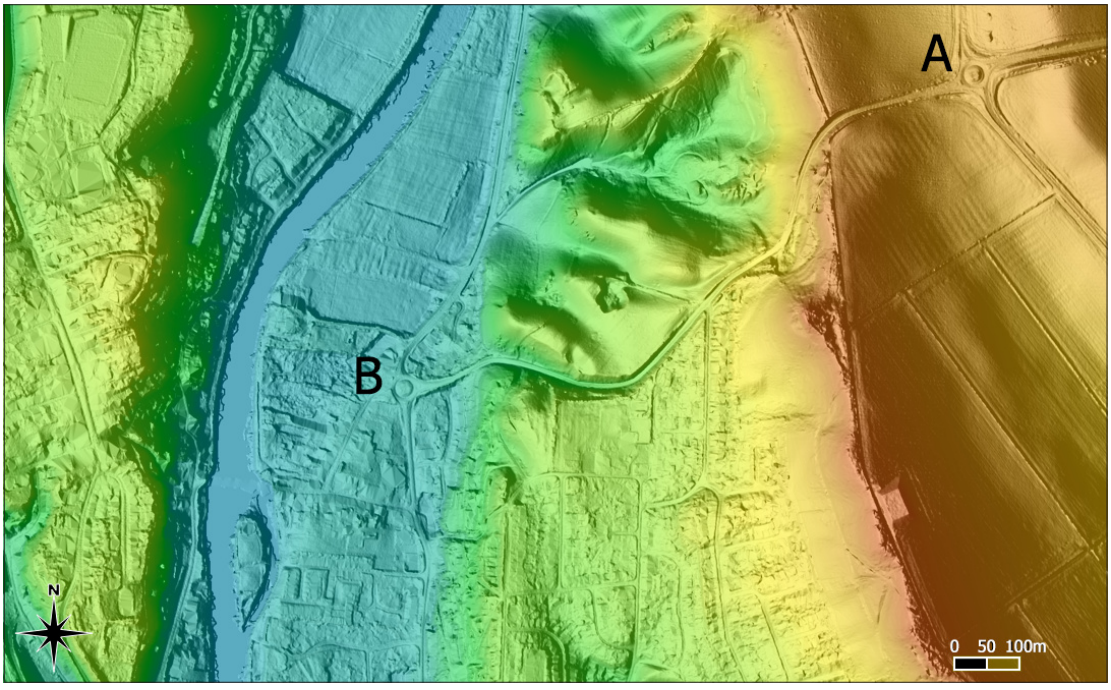


Fig. 12. Lidar data shows no evidence of Roman engineering in the descent of the present B4363 from a roundabout on A458 (marked A) down to a roundabout on A442 (marked B). Lidar data © Environment Agency copyright and/or database right 2024. All rights reserved.

no evidence there was ever any Roman settlement in the town. Roger White writes '*Bridgnorth would seem to be the likely spot for getting across the Severn*' (White, forthcoming paper, 5) but, for the reasons discussed above, if a large force had crossed in the vicinity of the town it would seem to this author that they did so without being able to rely on the logistical support provided by an engineered road.

It is of course entirely possible that there was an Iron age track leading through Bridgnorth although there is no evidence of one. As already discussed, an alternative crossing of the River Severn is to be found via the postulated Iron Age ford at Quatford approx. 3.5 km (2.2 miles) south of the present-day town of Bridgnorth.

RR193 after the Departure of the Roman army

An Iron Age route or trackway east of Craven Arms would almost certainly have followed the River Corve for topographical reasons. Further evidence for a pre-existing road comes from the Saxon period. Hookway (2015, 55) helpfully maps the location of Saxon Churches and sculptures in Shropshire. Her map shows three Saxon Churches, either recorded or indicated in Domesday, together with a 7th – 9th century Church and three religious sculptures were located along the route of RR193 between Stretford Bridge and the River Severn.

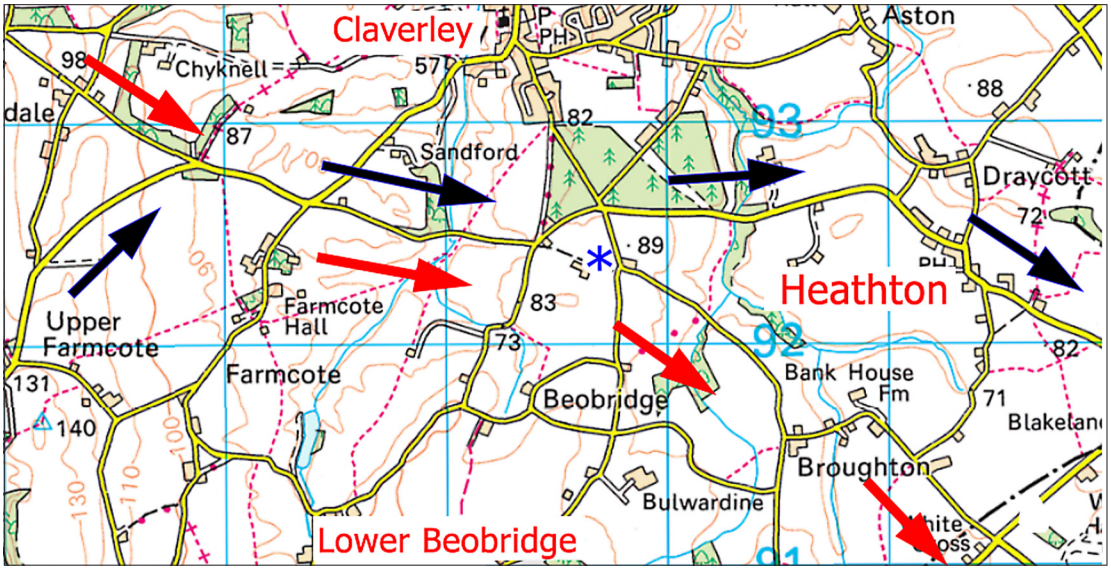
Later History of the Area around Bridgnorth

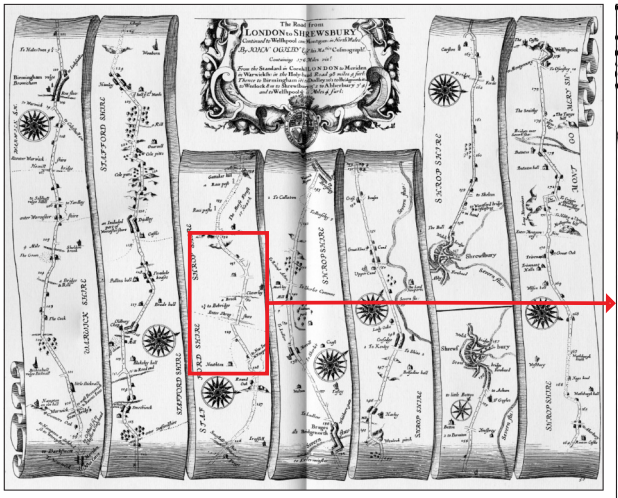
Readers might forgive this author for drawing attention to the fascinating history of the area between Quatford and Bridgnorth. However, before proceeding with this brief account, it should be understood that place names noted in the Anglo-Saxon Chronicles (Cwatbrycge and Brycge) have led to considerable debate among historians. Some historians, including Margaret Gelling, believe these were early place names for Bridgnorth and others believe them to be place names associated with Quatford which is approx. 3.5 km (2.2 miles) south of the present-day town of Bridgnorth.

Somewhere between Quatford and Bridgnorth the Danes wintered at a place called, Cwatbrycge in AD 895—6, possibly on an island in the River Severn. The Danish army, which had been ravaging along the west side of the Severn, crossed the River Severn in AD 910, immediately before it was defeated by a combined West Saxon and Mercian army at the battle of Tettenhall in nearby Staffordshire. Æthelflæd, King Alfred's daughter, built a burh fortification at Bricge' in AD 913.

Webster described the place name Cwatbrycg as Cwatt's bridge and wrote '*a bridge at this date could only have been of Roman origin, which seems to be clear evidence of a road crossing at this point*' (Webster 1981, 79). A cross shaped symbol is shown on the six-inch 1888-1915 Ordnance Survey map in the middle of the River Severn at Grid. Ref. SO 73659 90488 with the words '*Bridge*' (site of) to the side. At this point the Diocese boundary, which runs down the middle of the river for some considerable way, turns to the west and encloses six full fields and parts of two further fields on the west bank of the river into the diocese on the east bank. Horovitz provides this explanation: '*Many county and parish boundaries deviate at water crossings to ensure common ownership of the crossing*' (Horovitz D. Op Cit. Page 6). Readers might find it helpful if the two dioceses involved were identified; however, the two involved have changed over time. For example, the parish of Quatford was subject in 1291 to the Bishop of Hereford and it is worth noting that, in the eleventh century, the eastern boundary of the diocese of Hereford began at Monmouth and ends at Quatford (Croom Op Cit. Vol1 308). However, in 1333, the Bishop of Hereford denied that Quatford was in his see, and by the sixteenth century it was, at least territorially, within the diocese of Coventry and Lichfield.

Finally, it is worth noting that a motte and bailey castle was constructed at Quatford shortly after the Norman invasion of 1066. Although by no means conclusive it is worth recalling that M.C. Bishop discussed both the continued use of large parts of the Roman road network serving to explain why so many prominent English towns and cities have a Roman origin and the enduring importance of communications in medieval Britain being reflected in the siting of motte and bailey castles of the eleventh or twelfth century (Bishop 2014, 101-2).





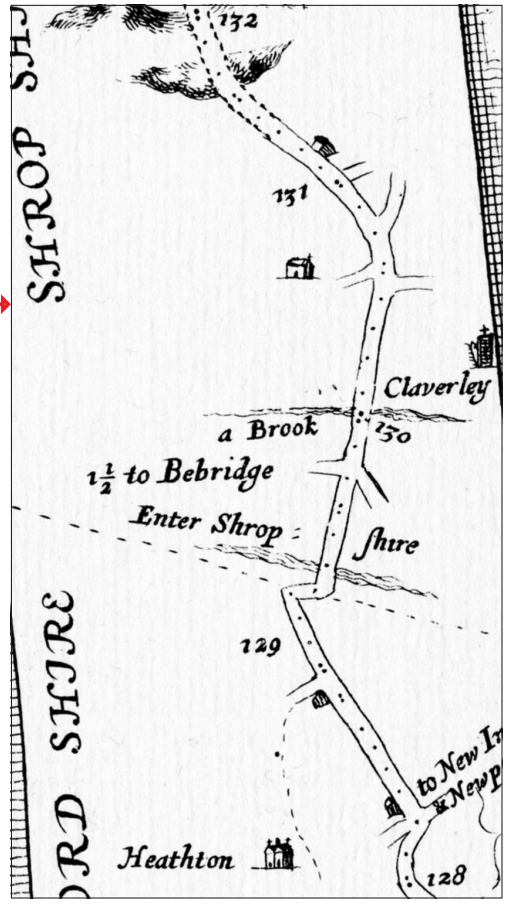


Fig. 13. John Ogilby's strip map of 1675 shows that a short section of Houghton's route was still in use near Claverley in Shropshire.

Top: OS map showing Houghton's route (red arrows) and Ogilby's 1675 route (black arrows). Site of excavation is shown by a blue star.

Above left: Ogilby's Sheet 50. Strip 3 is shown by the red number.

Right: Close up of part of Strip 3. Ogilby map image © Copyright Cambridge University Library. Licensed under Creative Commons Attribution- NonCommercial 4.0 Unported License (CC BY-NC 4.0). Contains OS data © Crown copyright and database right 2024.

A possible long-distance Iron Age route linking the Welsh coast with the Midlands

The numbering system we use for modern roads (M4, M5, A30 etc.) makes us think of each of these as distinct roads; they are in fact part of the same route; in the case of M4, M5, A30 this would be the route from West London to Newquay. The point is that, although parts of long-distance routes may go by different names or different numbers, the total route does not stop and, an Iron Age route beginning at Greensforge (described by Margery as RR193 with a length of 82.9 km (51.5 miles) heading west might well have continued to reach the sea at Cardigan Bay. Running eastward the route might have extended as far as the North Sea.

In 1675 John Ogilby published his *Britannia*, the first British road atlas. The atlas depicted most of the major trunk roads of England and Wales in strip form; these were roads used by horse drawn stagecoaches. Interestingly, the continued use of a section of Houghton's route on the east of the River Severn is confirmed on Strip 3, Plate 50 of Ogilby's Atlas. This Plate, see Fig. 13, shows the route from Welshpool to Meriden via Shrewsbury, Bridgnorth and Birmingham. Strip 3 of this plate shows the road from Bridgnorth passing just north of Houghton's section at Claverley on the way to Birmingham in the West Midlands. Houghton's route and Ogilby's main road pass two of the holloways mentioned above using the same piece of road for a distance of 1.04 km (0.65 mile). Travelling in an eastern direction the precise point where the two routes split, with Houghton's route going on to Greensforge, is located just 365 metres - 400 yards from Winchester Farm, where Houghton sectioned his route.

Ogilby's route ran through Birmingham on the way to the village of Meriden which was a nodal place on the road network in Ogilby's time; cartographers who were contemporaries of Ogilby, show a major trunk road from Meriden to Coventry and on to London. These routes (Welshpool to Meriden and Meriden to London), when combined, would have passed close to the Roman fort at Metchley and the fort at The Lunt, Baggington. To this author it does seem entirely possible that Greensforge, Metchley and The Lunt were all located at strategic points on an Iron Age route or trackway the Roman army might have used.

Conclusion

In conclusion there is no evidence that RR193 is of Roman military construction but there seems to be circumstantial evidence to indicate that the route was in use in the Iron Age, almost certainly used by the Romans and probably improved during the Roman period. It is suggested that RR193 should be withdrawn from the Margary RR number register and a new entry made for RBW193.

Abbreviations

CPAT	Clwyd Powys Archaeological Trust
CUCAP	Cambridge University Collection of Aerial Photography
DTM	Digital Terrain Model

ESRI	Environmental Systems Research Institute
HER	Historic Environment Record
Lidar	Light Detection and Ranging
PRN	Primary Reference Number, a unique identifier assigned to each record within the HER system
QGIS	The name comes from an abbreviation of its previous name, Quantum GIS.
RRX	A prefix allocated by the Ordnance Survey for 'new' roads they discovered. New roads were numbered sequentially as they were recognised but with no adherence to Margary's numbering system.

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Trails of Breadcrumbs: Predictive Methodologies used to Enhance Analysis and Discovery of Past Movement across Roman Britain

by Keith Abbott
keefandtrace@hotmail.com

Abstract

The Roman conquest marks a well-documented horizon of prolific road construction across Britain, with the transformative societal effects of this road network extending well beyond the Roman period. lidar analysis and geophysical surveys undertaken by researchers continue to reveal previously unknown Roman (and pre-Roman) roads suggesting that the full extent of Roman Britain's network of thoroughfares is far from complete – particularly minor roads and trackways which are notoriously difficult to both identify and date. This paper explores the potential for using the distribution of dateable material culture and soil types together with GIS analysis as an integrated methodology for predicting likely corridors of movement across the Romano-British landscape and locating extant remains.

Introduction

Archaeological research traditionally focuses on monumental remains which present a 'static' view of past occupation. The Roman Rural Settlement (RRS) study extends this 'static' perspective of Roman Britain by analysis of 3,562 grey literature site reports. Whilst the RRS study characterises the Romano-British rural settlement landscape as having an extensive network of major-roads, minor-roads, trackways and rivers used for travel and transportation (Smith *et al.*,2016, 176), it does not attempt "*dynamic*" analysis of the past movement of people and objects between these nodal settlement locations. Similarly, research exploring mobility and migration during the Roman period focuses on the analysis of DNA and isotopes from human burials (Eckardt *et al.* 2014; Eckardt and Müldner, 2016, 203-233) to identify the diverse ethnicity of individuals present within urban settlements of Roman Britain when they died. However, the "*dynamic*" patterns of movement and the narratives that created these urban diasporas remain largely unexplored. Modern West Berkshire is a mostly rural county within only 7% of its area classified as urban, and presents a fragmented and relatively sparse record of Romano-British occupation. The known Roman roads of West Berkshire mostly emanate from the *civitas* capital *of Calleva Atrebatum* (Silchester), and are thought to mostly date to the late 1st century AD. The distribution of Romano-British monuments

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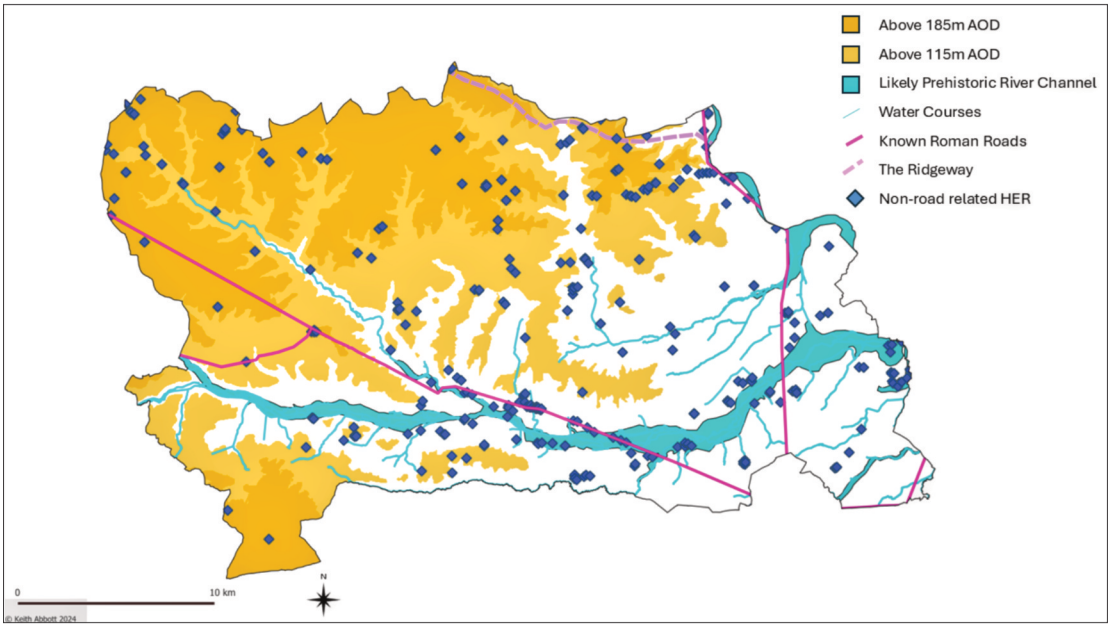


Fig. 1 - West Berkshire in relation to known Roman roads and settlements. Contains public sector information licensed under the Open Government Licence v3.0.

recorded across West Berkshire Historic Environment Record (HER) shown in *fig. 1* appears largely disassociated from the known major-roads, and *fig. 2* highlights the low number of minor roads/

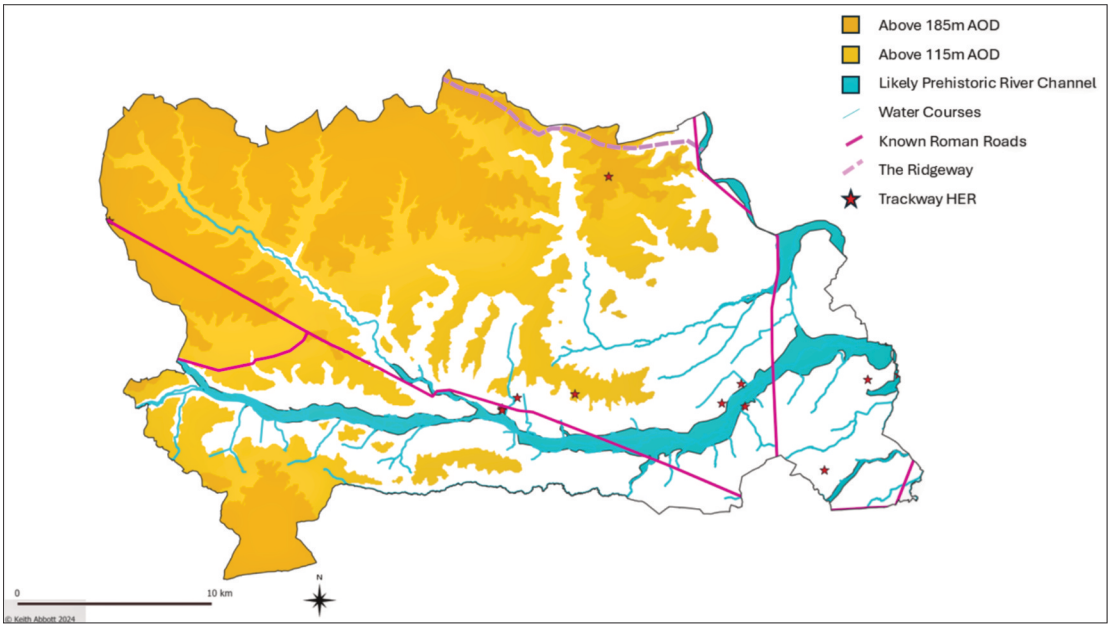


Fig. 2 - Non-road related HERs relative to known major-roads and predicted minor-roads/trackways of Roman West Berkshire. Contains public sector information licensed under the Open Government Licence v3.0.

trackways recorded as monuments on the HER database. Together this suggests that the minor roads and trackways of the Roman period are significantly underrepresented within the archaeological record.

Analysis of Material Culture Distribution across West Berkshire

Of the 1.6 million artefacts recorded on the Portable Antiquities Scheme (PAS) database, more than 90% are metal, 44% date to the Roman period with 74% of Roman period PAS artefacts being coins. Roman period artefacts are also recorded on the HER database and the catalogues of local museums, but these three datasets are rarely consolidated due to PAS data being so extensive and easily accessible compared to other datasets, and the lack of a scalable IT solution to integrate them. However, PAS data is subject to significant collection biases resulting from its reliance on metal detectorists who search almost exclusively in rural areas. Conversely, HER and museum data exhibits urban collection biases driven by commercial development, populations density and museums themselves being mostly situated in developed areas.

Distribution analyses of Roman material culture have long been used to identify the likely location of previously unknown Romano-British settlements. Other research correlates chronological patterns of Roman coin loss within site assemblages to predict settlement function (Reece 1991; Reece 1993). To utilise these methods to their fullest extent, the number of data points (i.e. find spots) needs to be maximised and inherent biases mitigated. Biases, particularly collection biases, can significantly distort distributions of find spots within each of the datasets as can be seen in *Fig. 3.* Consolidation of

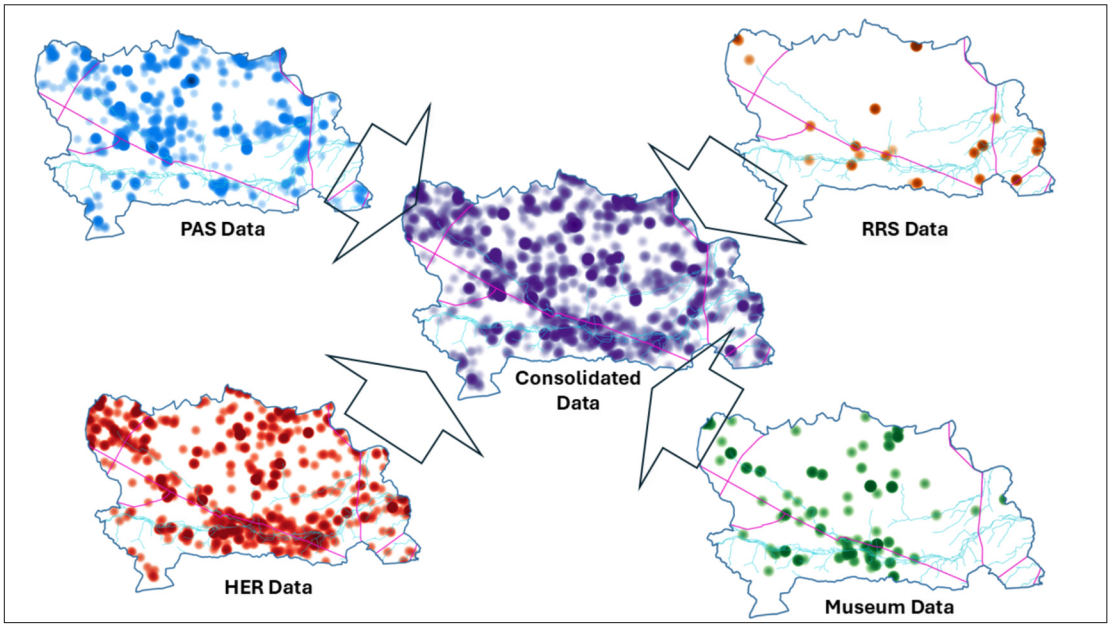


Fig. 3 - Illustration of the degree of bias inherent with West Berkshires PAS, HER, RRS and Museum data sets. Contains public sector information licensed under the Open Government Licence v3.0.

the West Berkshire Romano-British artefact assemblage results in a dataset of unique findspots that is 1.9x larger than the 'PAS only' dataset and largely neutralises inherent collection biases (Abbott 2024) as also illustrated in *Fig. 3*. However, analysis of bias was also extended to identify potential "*blind spots*" within the archaeological record (e.g. private estates that don't permit access to metal detectorists) and potential "*false positives*" (e.g. where metal detecting rallies or archaeological excavations have recorded isolated concentrations of finds) that require closer inspection.

Pottery finds recorded on the HER and PAS are generally not identified or dated to the same high level of provenance seen within specialist reports for site excavations, making PAS/HER records of pottery finds difficult to analyse meaningfully. Whilst site excavation reports contain detailed records of their pottery assemblages, the distribution of sites excavated is itself subject to a significant urban bias as seen for RRS data as shown in *Fig. 3*. Consequently, the methods used by past researchers to correlate material culture distribution to likely settlement locations tend to exclusively use metal artefacts (cf Brindle 2014, 7). Clusters of metal material culture are ranked using interpretation schema presuming cluster size to be directly proportional to settlement size as the cumulative outcome of frequent past human visits resulting in greater artefact deposition over a prolonged period. For this study, following Brindle (2014, 23), clusters are defined as the number of metal artefacts found within 200m proximity to each other with a notional central point (using GIS) ranked into "*small*" (2-4 artefacts), 'medium' (5-10 artefacts) and "*large*" (11 or more artefacts) cluster sizes. Hoards represent a significant distortion to cluster analysis as they comprise a large number of finds associated with a single act of deposition, so were excluded from this cluster analysis to be assessed separately.

RRS data for the wider Berkshire area (i.e. Central Belt Region) concludes that 77% of farmsteads and 89% of villas were located within 5km from major-roads (Smith *et al.* 2016, 177-179). The distribution of medium/large material culture clusters across West Berkshire shown in *Fig. 4* suggests the probable locations of additional settlements where monumental remains have yet to be discovered (and recorded on the HER) due to lower rates of rural discovery. The likelihood of the existence of a higher number of settlement nodes than previously thought adds further weight to the argument that the roads, minor roads and trackways interconnecting these settlements are under-represented within the archaeological record.

Using predictive methods to identify 'invisible' minor roads and trackways

As well as highlighting the possibility of a "*missing*" network of roads, minor roads and trackways, analyses of material culture deposition offer the potential to identify these past corridors of movement. Walton (2011, 31) argues that as well as locating settlement *foci*, coin distribution can indicate the routes of past thoroughfares particularly in under-researched rural areas. Objects are inherently portable - but don't move themselves, rather it is people that move them (Aldred 2020). This theoretical distinction supports the use of artefact distribution as a proxy for the past movement of the humans who carried objects prior to deposition. Having a significantly larger and unbiased dataset further increases the viability of this approach.

However, care must also be taken as different object types of have different "*usage-biographies*" (Dannehl 2017, 171-186) resulting from "*human-object*" interactions being influenced by factors such

as size, shape, value and material. These factors need to be taken into account when selecting proxy for past movement. Coins account for 74% of Romano-British artefacts on the PAS database, most of which are low denomination copper alloy coins. The inherent portability of such coins, their small size (i.e. high propensity for casual loss) and low value (i.e. low propensity for recovery) make them well suited for use as a proxy for past human movement. However, care is still required due the inevitable conflation of usage biographies of artefacts deposited as the result of monetary exchange (e.g. markets), taxation collection and/or religious activities. Conflation is also inevitable in the case of coin deposition occurring as a function of movement within settlements, and between settlements over various distances . Whilst coins are not a definitive indicator of the past movement of all people within a population, their distribution offers insights into the cumulative movement of those segments of the population using coin as part of their daily lives. Hence coins work best as proxy for past movement during the Late Roman period when use of coin by the rural population is thought to have peaked (Walton 2011, 31).

Other types of portable material culture can also be used as proxies to suggest the shared identity of the individuals who wore/used/deposited them. For example, the distribution of diagnostic brooch types may indicate the extent of movement of the groups of people who wore types of brooch, and the distribution of writing implements can be used to assess the past movement of literate persons. However, the much lower numbers of finds dilutes interpretations made across the wider area needed to ensure statistical significance.

Predictive archaeological modelling is routinely used in USA, Canada and Netherlands to identify areas under threat of development that are "*most likely to contain*" extant archaeology. Predictive methods have been used to analyse likely Roman settlement patterns across southern Britain by using HER data, topological factors (e.g. height AOD, water supply and soil character) and environmental archaeological data to model the likely distribution of farmsteads, field systems, trackways, villages and villas (Chadwick 2023). Middle-range theory argues that the "*static record*" of archaeological data gathered in the present is linked to the "*dynamics*" of past societies by assumptions made in the "*middle-range*" between the two (Johnson 2020). Thus, predictions of areas with high archaeological potential are justified so as long as three conditions are met:

- biases inherent within input data have been thoroughly assessed and mitigated;
- diagnostic assumptions made are explicitly listed;
- predictions made are tested against hard archaeological evidence.

Academic theorists have debated the merits of predictive archaeology since the 1980s, however improving information technology has seen the emergence of powerful tools such as Geographical Information Systems (GIS), Artificial Intelligence and Virtual Reality that are increasingly capable of processing large datasets. GIS "*least cost travel*" analysis has successfully been used to identify pathways taking account of topographical/environmental factors that require effort (i.e. "*cost*") to overcome such as gradient, wetness of soil or ruggedness of terrain. GIS "*least cost travel*" analysis of southwest Britain has predicted corridors of movement that have been subsequently correlated with the sections of "*lost*" Roman roads discovered by analysis of lidar data to identify landscape features with characteristic linear morphologies, such as parallel ditches and multiple quarry pits along their length (Parcero-Oubiña *et al.* 2023, 62-78). This does not imply that Roman engineers calculated "*least cost travel*" routes when surveying roads - indeed many major Roman major roads follow highly linear courses with limited accommodation of local terrain contours. However, study of prehistoric

trackways such as The Ridgeway demonstrates that many past corridors of movement do follow routes closely aligned with the "*least cost travel*" ideal (Bell 2020, 193). This is the likely result of an organic process of iterative convergence towards routes requiring least effort to overcome, rather than a single act of central planning. This raises the question of the degree that the minor roads and trackways of Roman Britain appropriated pre-existing thoroughfares connecting Iron Age settlements where occupation continued into the Roman period, compared to the "*planned*" network of major roads constructed after the Roman conquest. Little is known of the network of pre-Roman roads (Bishop 2014, 1-15) which is likely to have connected *oppida* settlements. Many *oppida,* such as that at Silchester, functioned as foci of pre-Roman trade suggesting they were nodal points for movement of people and goods. Silchester, like other *oppida* later designated as *civitas* capitals, continued to function as nodal settlements within the road network of Roman Britain (Fulford 2020, 7).

Initial lidar analysis across West Berkshire fails to identify any of the "*missing*" minor roads or trackways. However, whilst the extant remains of major roads such as Ermin Street (RR41) are visible from cropmarks, the modern road routes and field boundaries, sections of other major roads such as the road to Bath (RR53) also cannot be seen. This may be due to roads being overlain by modern thoroughfares, or because less robust construction methods were used for minor roads and trackways which resulted in them being more susceptible to agricultural damage. Deep ploughing was widely used across the clay on chalk geology of the Berkshire Downs, and is cited as being a major factor in the high degree of variability observed for survival of archaeological remains on agricultural land (Trow and Holyoak 2008).

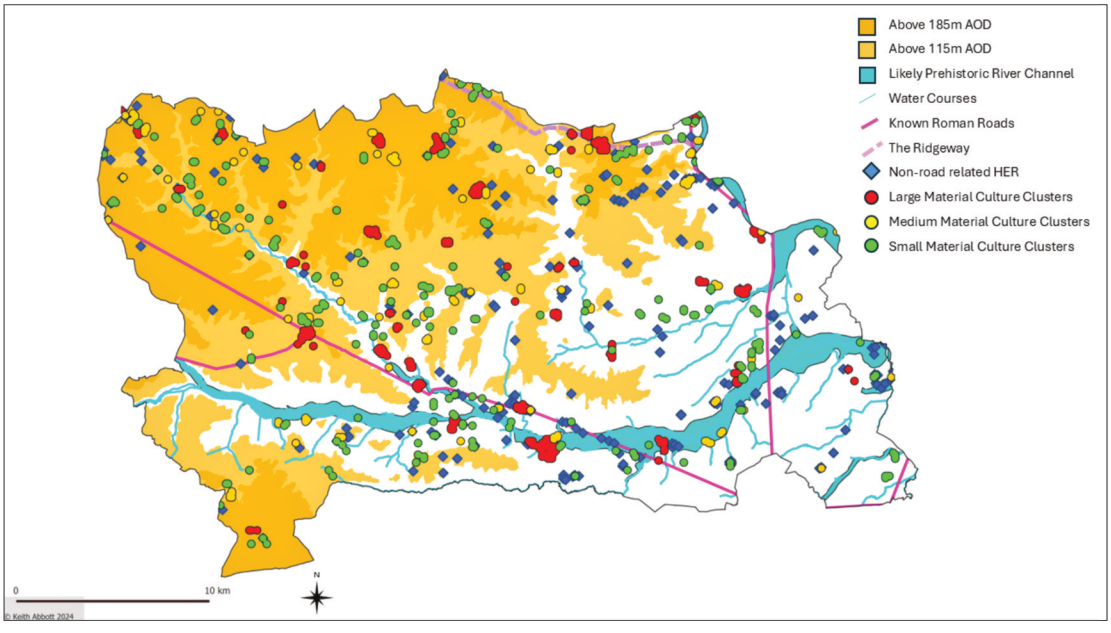


Fig. 4 - Locations of Romano-British material culture clusters and known (non-road) HER Monuments across West Berkshire. Contains public sector information licensed under the Open Government Licence v3.0.

Case study #1: Predicting corridors of movement across West Berkshire

Most of the evidence of the mobility of the population of Roman Britain comes from isotopic analysis of human remains found in context. This suggests that some rural populations of Roman Britain (and the food they consumed) may have originated <30km from the settlements where they were finally interred (Chenery *et al.* 2010, 156). But other research has shown that large Romano-British settlements contained individuals of varying status, professions and genders from across the Roman Empire. (Eckardt and Müldner 2016; Eckardt *et al.* 2014). We know from the historical record that military and government officials travelled widely across Roman Britain using the centrally planned network of major Roman roads described within the *Antonine Itineraries* (Black 1995), many of which survive within the archaeological record. However, the routes used by other segments of the population to move between settlements are largely invisible in the archaeological and historical records. Analysis of West Berkshire's collated PAS/HER/RRS/Museum material culture datasets identifies 'large' clusters of material culture deposits shown in *Fig. 4* which are interpreted as probable nodes of Romano-British occupation. The RRS project suggests that these settlement nodes are likely to have been interconnected by a network of roads, minor roads and trackways extending across southeast Roman Britain (Smith *et al.* 2016, 176) used for both long and short distance travel.

The Ridgeway, shown in *Fig. 5* running across the Downs in the north of West Berkshire, is one of several prehistoric trackways across upland southern Britain (Bell 2020, 193-195). Excavations along The Ridgeway suggests that minor-roads and trackways continuously evolved throughout the Late-Roman/Early-Medieval period, and may have featured metalling limited to a thin spread of gravel. This contrasts with the robustly engineered major roads constructed by the Roman military capable of sustained usage by wheeled vehicles bearing heavy loads (Margary 1973, 18; Davies 2012, 53).

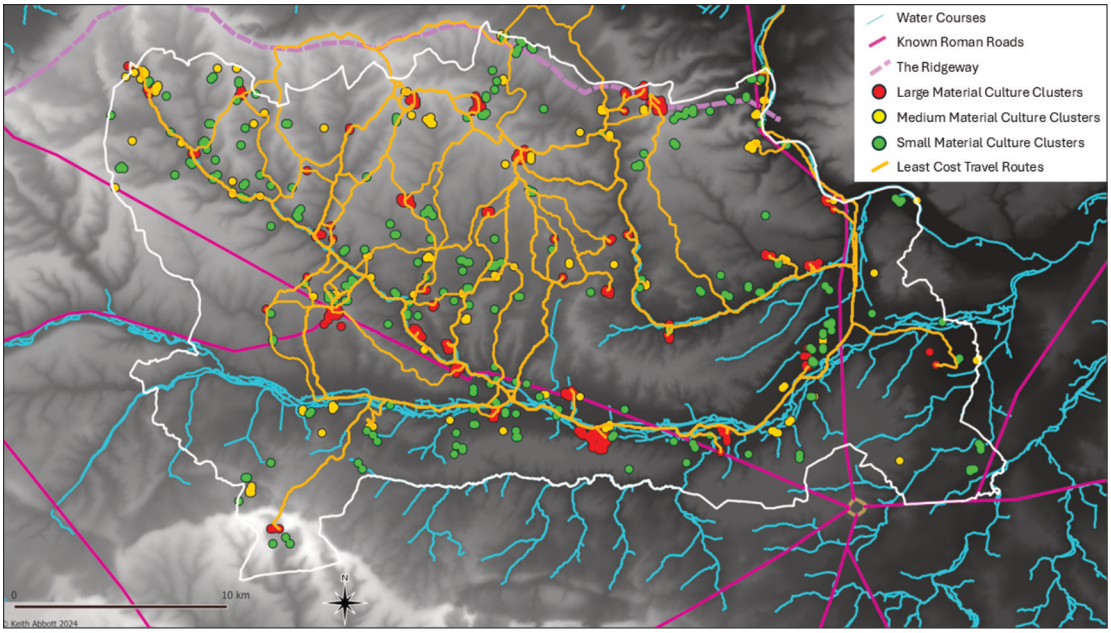


Fig. 5 - GIS derived 'least cost paths' between material culture cluster locations. Contains public sector information licensed under the Open Government Licence v3.0.

Analysis of lidar across West Berkshire has to date failed to reveal alignments of linear features, parallel ditches and quarry pits indicative of major roads (Parcero-Oubiña *et al.* 2023, 62-78). This suggests that the "*missing*" thoroughfares of Roman West Berkshire may have been mostly minor roads or trackways. Such less robustly constructed thoroughfares are more likely to have sustained agricultural damage, and their propensity for continued evolution/re-use may have resulted in many being overlain by later medieval/modern roads.

GIS terrain modelling identifies the "*least cost travel*" routes between each of these likely settlement nodes based on minimum ascent/descent gradient calculations. It is observed that some sections of the conflated "*least cost travel*" routes between clusters shown in *Fig. 5* are utilised multiple times. These dominant sections of 'least cost travel' routes are frequently associated with landscape features such as river valleys, ridgeways, gaps and passes such as The Ridgeway across the Berkshire Downs, the Goring Gap and the valleys of the Rivers Pang, Lambourn and Kennet. Research of prehistoric movement and trackways concurs with the observed frequent utilisation of such landscape features by prehistoric thoroughfares (Bell 2020, 193), whereas the routes of known Roman major Roads shown in *Fig. 2* (e.g. Ermin Street) appear to be influenced by these landscape features to a lesser extent. This suggests that there are likely to have been two generic types of thoroughfare connecting settlements across Roman West Berkshire: routes that developed organically over a long period that heavily utilised dominant landscape features; and centrally planned routes constructed over a relatively short period (e.g. Roman military roads) maintaining where possible assigned medium/long distance alignments.

Propensity for movement is driven by a myriad of socio-economic human factors resulting in decisions to travel between particular locations (and not others) being taken many times by many individuals over many years. Whilst 'large' material culture clusters correlate well with locations (e.g.

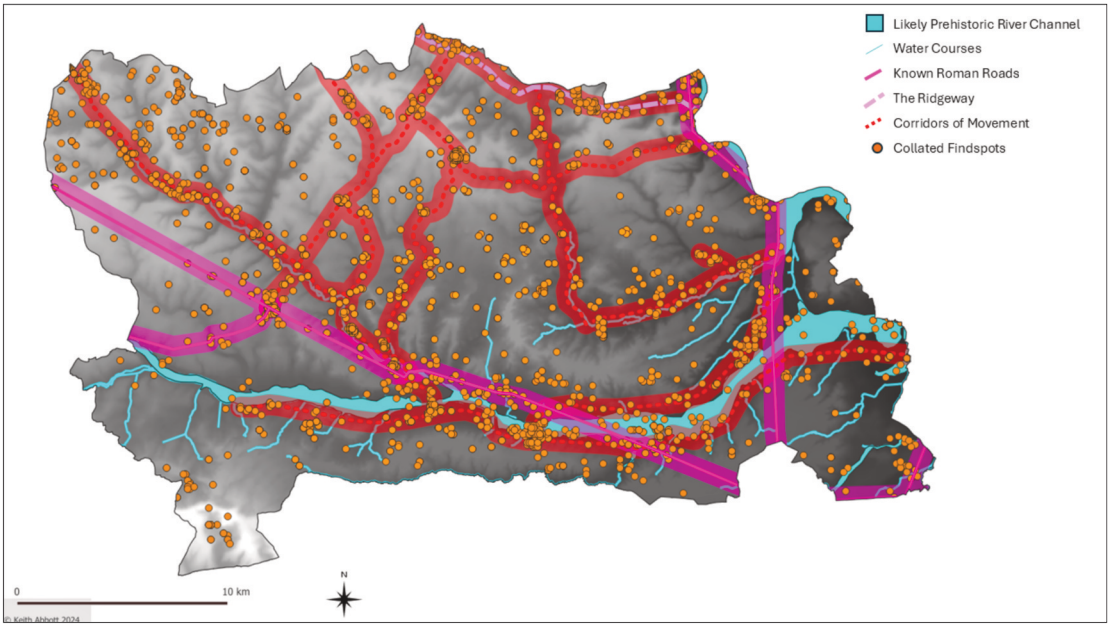


Fig. 6 - Romano-British material culture findspots within 500m/1000m of known Roman Roads, The Ridgeway and likely corridors of movement. Contains public sector information licensed under the Open Government Licence v3.0.

settlements) that people travelled between, it remains unclear which settlements people moved between most frequently and the routes taken when doing so. Assuming that travellers carried portable objects, as well as coins to purchase goods/services en route, over time the actions of travellers would result in higher levels of cumulative material culture deposition along frequently used corridors of movement compared to areas not visited less frequently. Coins in particular have complex "*usage biographies*" used by researchers as indicators of wealth, economic activity and/or religious devotion. However, as past human movement is intimately entangled with material culture deposition, cumulative dateable material culture deposits can be used as a proxy to identify likely corridors of past movement.

Likely corridors of movement were defined using GIS as the areas 500m either side of each "*least cost travel*" route and known Roman roads representing the zones most likely to have been influenced by travellers and exposed to increased rates of deposition. Finds/km of objects dating to the Roman period was used as a normalised indicator of the frequency of usage of the predicted corridors of movement across West Berkshire as shown in *Fig. 6*. However, ranking deposition rates along the identified corridors of movement was not straightforward as consideration needs also to be made of biases such as "*blind spots*" (e.g. large private estates where metal detecting has not taken place) as well as routes associated with natural landscape features with a high propensity for use as thoroughfares (e.g. river valleys, ridgeways, gaps and passes). The resulting empirical analysis identified the thoroughfares shown in *Fig. 7* as being the corridors most likely to have been used for travel between the probable settlement nodes of West Berkshire. GIS highlights that 71.4% of all Roman period artefacts are found <500m from these (known and predicted) routes showing that Romano-British activity was concentrated within these corridors. Material culture deposition

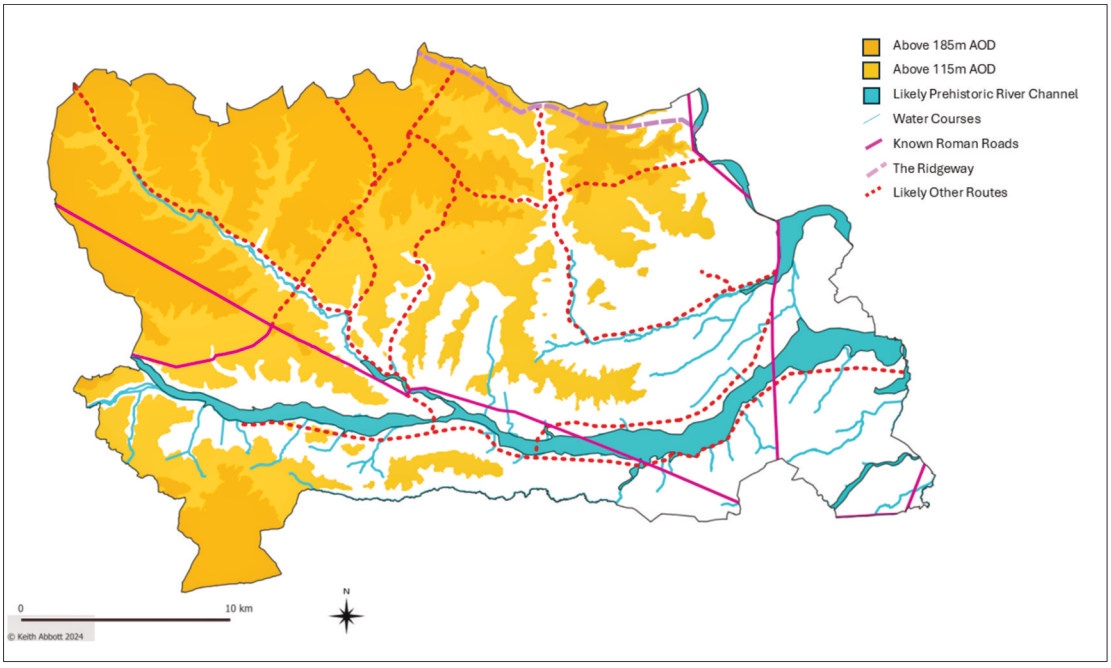


Fig. 7 - The likely routes of West Berkshire's minor-roads/trackways (also known as 'corridors of movement') relative to The Ridgeway and known Roman Roads. Contains public sector information licensed under the Open Government Licence v3.0.

suggests that river valleys, in particular the valleys of the Rivers Kennet and Lambourn, were both densely occupied and heavily utilised as corridors of movement between settlements. This suggests that riverine thoroughfares are likely to have been closely integrated with the network of roads, minor roads and trackways connecting Roman West Berkshire shown in *Fig. 8*.

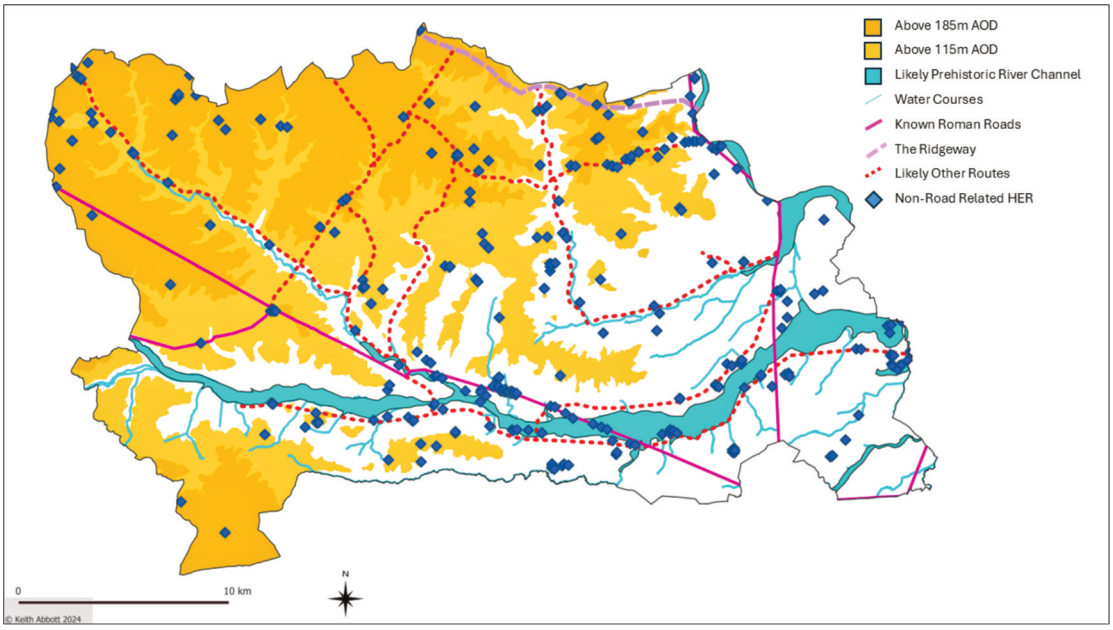


Fig. 8 – Comparison of Non-Road HER monuments with predicted corridors of movement. Contains public sector information licensed under the Open Government Licence v3.0.

Identification of likely corridors of movement using Roman period material culture deposition cannot be taken as definitive proof of a road or trackway having existed. Ultimately archaeological excavation and/or geophysical analysis is required to prove the existence of settlements associated with large clusters of Romano-British material culture and the roads/trackways that interconnected them. However, this methodology offers a credible starting point for much needed research to identify corridors of movement to be further investigated to reveal the "*missing*" major roads, minor roads and trackways of rural Roman Britain.

Case study #2: Locating the route of the road to Bath

The route of the Roman road, RR53, to Bath was extensively researched by Toller (2013, 52-65) heading west from Bath, through Mildenhall, to its intersection with Ermin Street, RR41, in West Berkshire (SU 4042 7113). However the absence of both visible remains and lidar/aerial photography anomalies resulted in the easternmost 2km of the road to Bath (and the location of its intersection with Ermin Street) being highly conjectural. The lack of physical evidence is probably due to sustained agricultural damage from deep ploughing across the largely clay-on-chalk geology of the Berkshire Downs during the 19th and 20th centuries.

Analysis of West Berkshire's collated PAS/HER/RRS/Museum material culture dataset identified a 'large' cluster Romano-British material culture interpreted as a likely settlement located at Wickham, West Berkshire some 1.5km northwest along Ermin Street of Toller's projected road intersection. The HER records Wickham as a probable Roman roadside settlement on the basis of material culture diagnostic of domestic occupation revealed during excavations (Mundin and Pine 2008, 47-55), but no definitive evidence of the Romano-British settlement itself was recorded. The collated PAS/HER/RRS/Museum material culture dataset identified no other "*large*" material culture clusters along Ermin Street between Wickham and Newbury (6.5km to the southeast) despite PAS finds from other eras showing this part of West Berkshire to have been heavily metal detected. *Itinera XIII/XIV* of the *Antonine Itineraries* describes the way-station of *Spinis* being located '*15 miles from Silchester*' which places it either at the intersection of Ermin Street/road to Bath or to the southeast of the intersection along Ermin Street. Antiquarian researchers identified Speen and Woodspeen as possible locations of *Spinis* (Peake 1931, 90-1, 229). However even allowing for the uncertainties associated with the likely distance of *Spinis* from Silchester, the HER contains little monumental evidence of Romano-British roadside settlement along Ermin Street between Wickham and Newbury.

Geophysical surveys at Radley Farm, shown in *Fig. 9*, some 3km west of Ermin Street, confirmed that earthworks visible within Stibbs Wood and Three Gate Copse were the remains of the Roman Road to Bath as proposed by Toller (2013, 52-65). A previously lost transcript of excavations of the Roman road to Bath within Three Gate Copse (SU 3770 7050) described the road's morphology in section in detail (Preshous and Bamister 1968, 1-2). However, east of Three Gate Copse the remains of the road to Bath heading towards Ermin Street were neither visible on the ground, from lidar or from aerial photographs. This resulted in a straight line between the earthworks at Stibbs Wood (SU 3674 7029)



Fig. 9 - Vertical section at a chalk quarry close to RR53 within Stibbs Wood.

and Three Gate Copse being adopted as the most likely projection of the road's route towards Ermin Street (Toller 2013, 53).

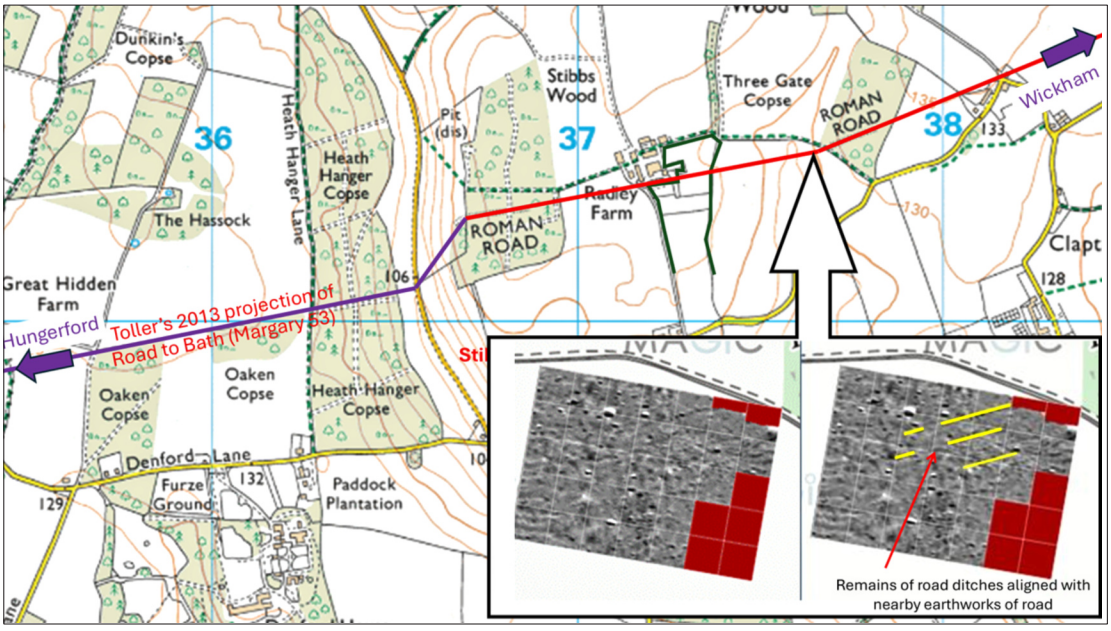


Fig. 10 – Remains of the parallel ditches of RR53 to the southwest of Three Gate Copse. Map © Crown Copyright and OS100022861.

Toller's projection placed the intersection of the road to Bath and Ermin Street some 1.5km southeast of Wickham along the B4000, but geophysical surveys carried out along this projected route failed to find any evidence of the Roman road. Furthermore, a topographical survey along this projection identified a swathe of permanently boggy ground along the foot of a steep escarpment to the north of the Wormstall Estate which would have presented a challenge to construction of a road. The shallow depth of the clay-with-flint soil over much of this area was apparent within a nearby post-medieval quarry some 100m from the Roman road in Stibbs Wood, which showed that the depth of overburden ranged from 0.4m to 1.0m as seen in *Fig. 9* Deep ploughing probably extended to a depth of >0.5m, necessary to release nutrients required to maximise the productivity and drainage, was therefore highly likely to have destroyed all traces of the Roman road

To assess why remains of the road to Bath were proving so difficult to locate, geophysical surveys were carried out between two surviving sections of the road's earthworks. The aim of this assessment was to analyse the extent to which negative results were due to the morphology of the road, local geology and/or the survey methods being used. Geophysical surveys along this 1.5km "*known route*" of the Roman road using a gradiometer and earth resistance meter proved comprehensively negative – apart from in one area where the bottom of the road's parallel ditches for some 40m were revealed by the 1.0m gradiometer close to Three Gate Copse as shown in *Fig. 10*. Closer inspection of this area revealed that whilst the surrounding area is mostly clay with flint soil, the locations where remains of road ditches were observed exhibited colluvial deposits of hill wash on top of the underlying clay. By contrast the two surviving earthworks in ancient woodland were well defined and in the section

excavated across the road in Three Gate Copse robust construction of the road using '*hard packed flints, smaller at the surface and increasing in size nearer to the natural layer*' was noted (Preshous and Bamister 1968, 2). This stark contrast in the survival of the road within ancient woodland and agricultural land confirms that sustained agricultural damage probably destroyed the road's remains. However, the assessment also suggests that damage of archaeological remains can be ameliorated by colluvial deposits of hill wash which is supported by other research (Bell 2020, 251; Trow and Holyoak 2008).

Whilst this assessment demonstrated that sections of the Roman road might have survived deep ploughing where protected by colluvial deposits, the 8,000m^2 surveyed revealed only 80m^2 of ephemeral remains of the Roman road. Not only does this represent a prospection productivity of just 1% along a known route, but also highlights that the ephemeral anomalies revealed may not have been recognised had they not been located along a known alignment.

The "*large*"cluster material culture deposits around Wickham suggested the presence of a significant roadside settlement along Ermin Street. Settlements are frequently located at Roman road intersections. The absence of significant material culture deposits and monumental remains along Ermin Street highlighted Wickham as a candidate for the location of its intersection with the road to Bath despite being 1.5km northwest of Toller's projection. However, the resulting extended search sector covered an area of >200ha across ground with a known low rate of survival of archaeological remains. This area would have required many months of effort to complete a comprehensive geophysical survey.

It was decided to prioritise the search sector by extending the conclusions reached in the assessment of the road to Bath's survival between two known points that highlighted the role of colluvial soil deposits in protecting extant archaeology from agricultural damage. The British Geological Society produces nationwide maps of superficial geological deposits using data gathered from borehole

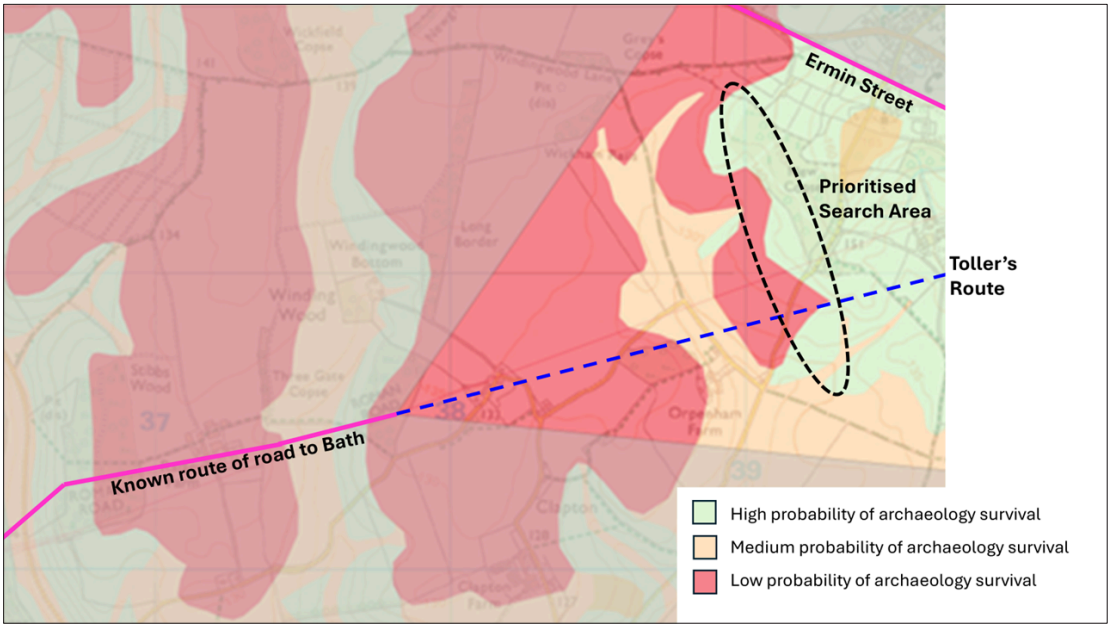


Fig.11 - Prioritisation of areas with an increased probability of archaeology survival based on soil type.

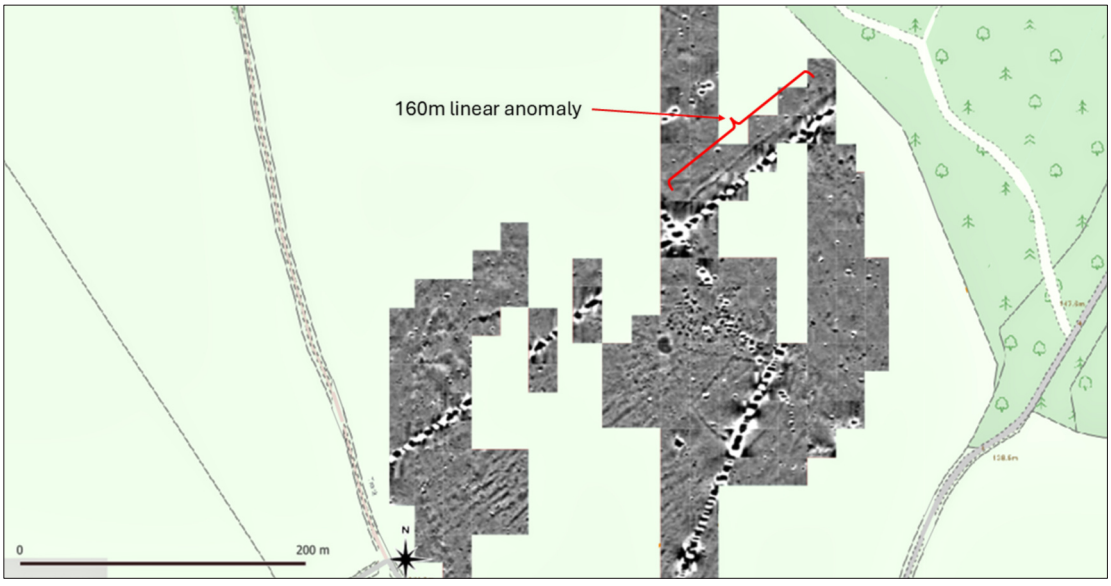


Fig. 12 – Gradiometer survey below New Copse revealing a 160m linear feature. © OpenStreetMap contributors.

surveys. However, many rural areas exhibit a greater distance between borehole samples when compared to urban areas that have undergone successive phases of commercial development. To address this potential gap, field observations of the local terrain across the search area were made to produce an augmented map of where colluvial deposits were likely to occur. This map was then used

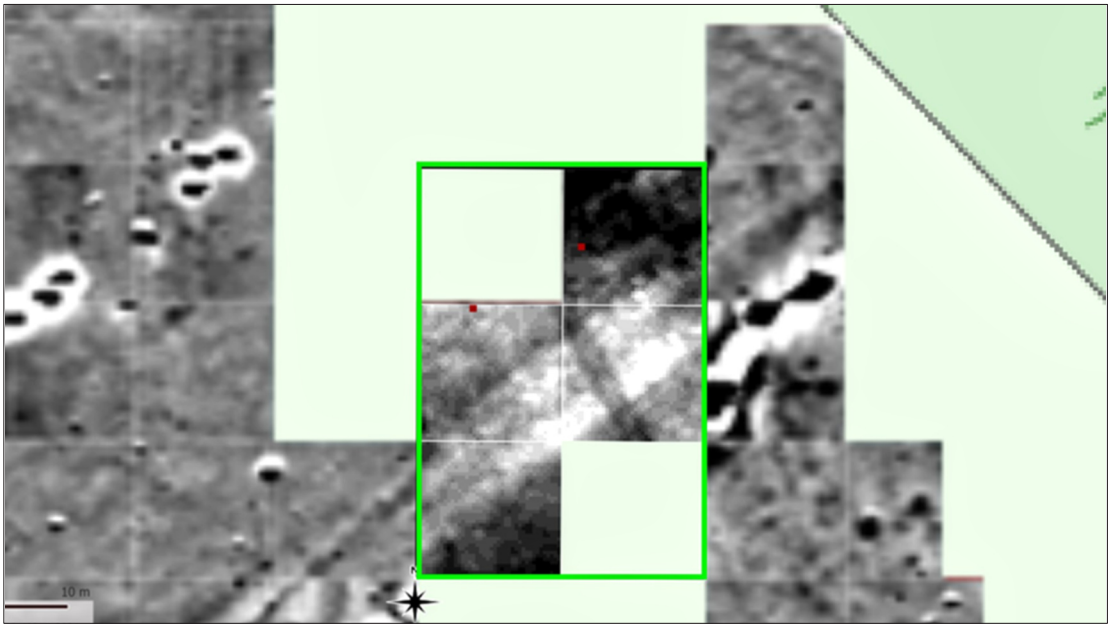


Fig. 13 – High earth resistance linear feature highlighted in green on top of the gradiometer survey image below New Copse.

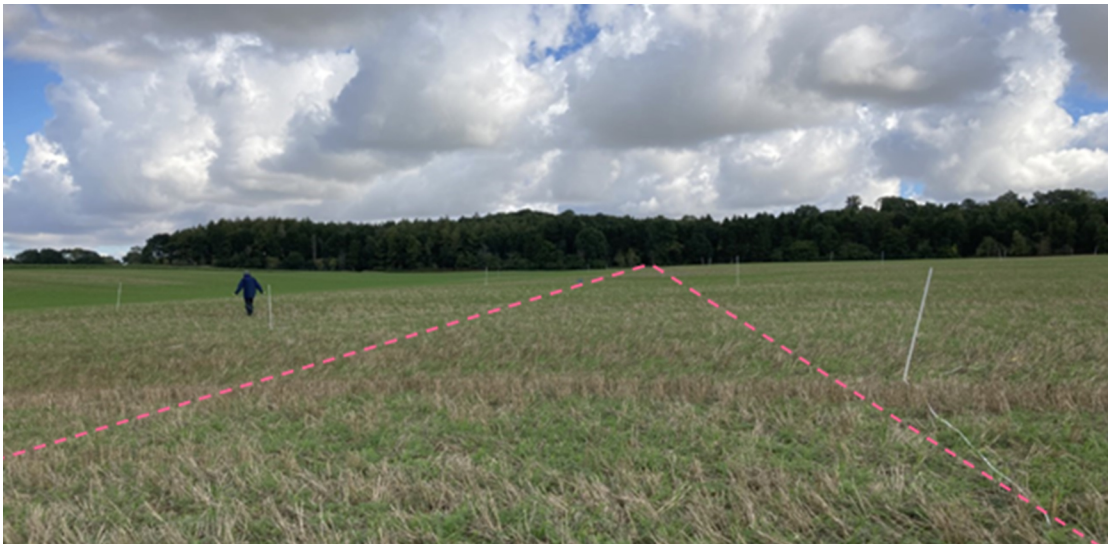


Fig. 14 -Modern day view along the likely route of the Road to Bath below New Copse.

to predict high/medium/low probability of extant archaeological remains having survived agricultural damage as shown in *Fig. 11*. This suggested that archaeological remains were most likely to have survived in the far east of the search sector at the foot of the scarp at New Copse near Wickham. Being located in the east of the survey sector this still required a large north-south transect

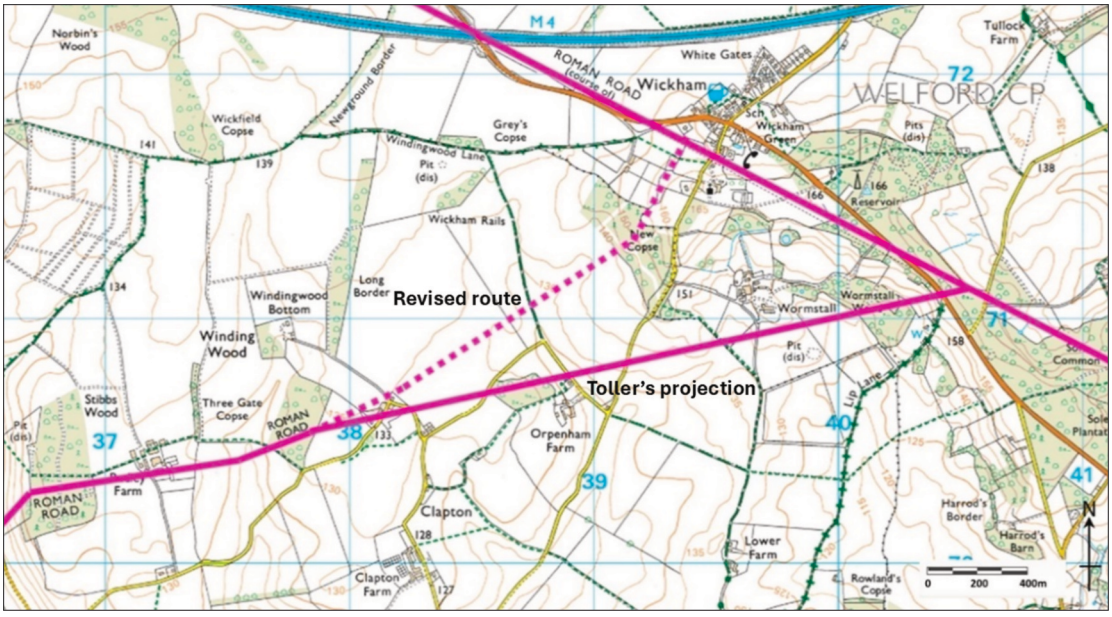


Fig. 15 – Revised route of the Road to Bath intersecting with Ermin Street at Wickham. Map provided by MAGIC on 14 Oct 2023. © Crown Copyright and database rights 2023. Ordnance Survey 100022861.

to be covered by the geophysical survey, but with an increased probably of finding any surviving remains of the Roman road.

Gradiometer surveys revealed a 160m linear anomaly below New Copse located within the zone predicted to have a high rate of survival of extant archaeology as shown in *Fig. 12*. The feature was surveyed westward until it eventually disappeared as subsoil reverted to clay with flint. The linear feature was interpreted as being the northern road ditch of the road to Bath, the ditch to the south being obscured by dipolar interference from a modern utility pipeline. Earth resistance surveys across this gradiometer anomaly were undertaken as shown in *Fig. 13* which revealed the characteristic high resistance linear response typical of a Roman road surface at SU 3910 7128 across the otherwise featureless pasture shown in *Fig. 14*. It should be noted that the linear high earth resistance feature is some 15m wide, whereas the excavated section of the road to Bath within Three Gate Copse showed the *agger* to be only 8m wide. This was interpreted as being due to lateral agricultural erosion of the road's *agger* before colluvial deposits had sufficiently accumulated. Further geophysical surveys were undertaken further to the west of this linear anomaly as far as the known location of the road at Three Gate Copse. This area is covered by clay with flint soil and no further evidence of the Roman road's remains were found, even as close as 50m to its surviving earthworks.

These road features identified require excavation to definitively confirm the presence of the Roman road, the state of its preservation and its morphology. The current projected route of the road is shown in *Fig. 15*. Whilst it is likely that the extended width of the high resistance road anomaly is due to agricultural erosion of the road's *agger*, this result could also be due to the presence of shoulders of compacted sand/clay either side of the road that could also exhibit high earth resistivity if present and dependent on materials used.

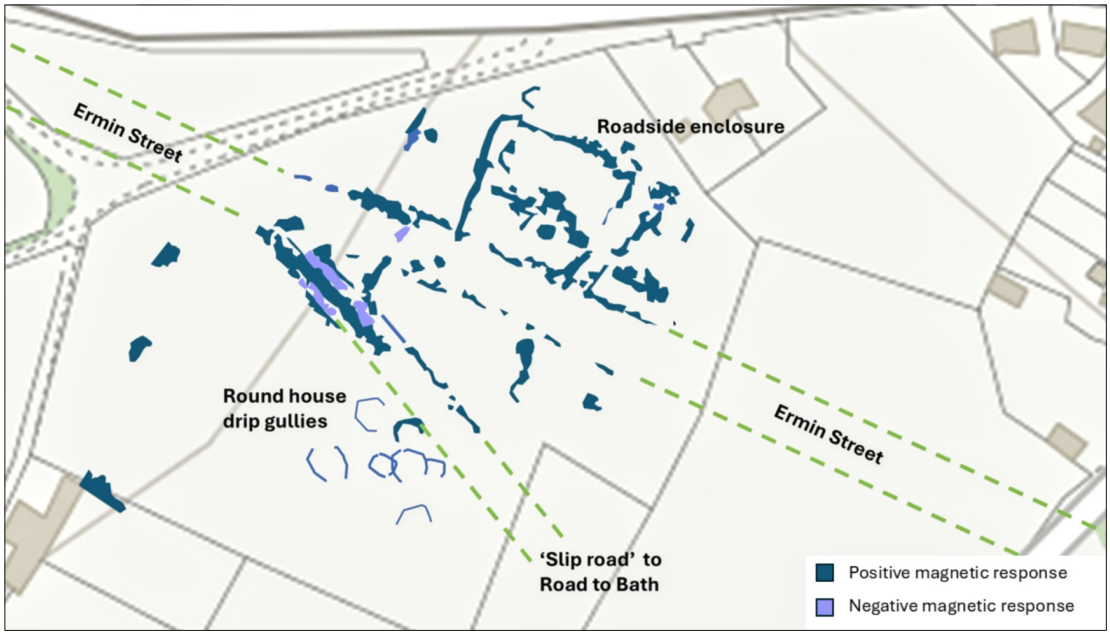


Fig. 16 – Results of geophysics survey of the Road to Bath/Ermin Street intersection. © OpenStreetMap contributors.

Extensive geophysical surveys of the likely Romano-British settlement at Wickham have revealed features suggesting roadside that the settlement extended along a 700m length of Ermin Street. *Fig. 16* highlights features interpreted as a possible 'slip road' of the road to Bath's intersection with Ermin Steet at Wickham, and offers the potential for future excavations to reveal the morphology and phasing of this important road junction as well as the function of the Romano-British settlement that most likely developed around it.

Conclusions

This study has demonstrated that the minor-roads and trackways interconnecting Romano-British settlements are significantly underrepresented within the archaeological record – particularly across modern day rural landscapes such as West Berkshire.

The predictive methods using material culture distribution and "*least cost travel*" analysis offer the potential for increased productivity for identifying the corridors of movement used by the past thoroughfares 'missing' from the archaeological record. Correlation of these likely corridors of movement with superficial geological deposits further increases productivity for geophysical surveys of areas geologically prone to agricultural damage of archaeological remains.

Further work is required to further validate these predictive methods, and to develop further methods to quantify past movement along Roman period thoroughfares to create new narratives of how thoroughfares were used and who used them.

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Itinera (online pdf): ISSN 2635-1587

Roman Roads in 2024

Collated by Dave Armstrong

dave.armstrong@romanroads.org

This section of *Itinera* briefly describes recent work on Roman roads, often in advance of formal reporting, in a similar style to Britannia reports. This data has been assembled by RRRA members in the local areas listed below and then collated by Dave Armstrong. For future years please contact these with any news via the mail address above. Data has come from enquiries to the relevant HERs and to local Archaeological Societies and we appreciate the help that has been willingly given, often while busy themselves.

Local correspondents

Neil Buckley;	Cheshire, Derbyshire, Greater Manchester and Lancashire,
David Brear;	Yorkshire and Lincolnshire,
Richard Hucker;	Dorset,
Eric Rose;	Wiltshire,
Elliott Mouelhi ;	Somerset,
Paul Smith;	Shropshire, Staffordshire, Warwickshire and West Midlands,
Geoff Lunn;	Essex, Suffolk and Norfolk,
Delwyn Matthews;	Devon and Cornwall,
Keith Abbott;	Berkshire,
Nigel Rothwell;	Buckinghamshire,
Chester Forster;	Cumbria,
Dan Murphy;	Glamorgan and Gwent,
John Byde;	Gwynedd,
Colin Adams;	Dyfedd,
Greg Morris;	Clwyd and Powys,
Paul Wood;	Mid Wales,
John Ashcroft;	East and West Sussex, Chichester,
Chris Webb;	Gloucestershire, east of the Severn,
Ian Dean;	Gloucestershire, west of the Severn,
Matt Sparkes;	Surrey and Greater London,
Ian Jardine;	Herefordshire,
Wayne Kirk;	Northamptonshire,
Peter Webb;	Hampshire,
Malcolm Fare;	Worcestershire,
Mike Luke;	Bedfordshire,
Paul Morris;	Scotland,
Dave Armstrong;	Durham, Northumberland and Tyne and Wear, as well as assisting with Cambridgeshire.

We are also grateful for contributions from Richard Whaley (NEHHAS Field Archaeology Branch) and the information in a series of YouTube blogs by David Staveley.

Summaries, on the following pages, are arranged first by Country (i.e. Scotland, Wales and England), and then in alphabetical order by county.

Itinera provides the information in this section in good faith. However, as it is collated from the contributions of our correspondents, we are not in a position to certify the accuracy or source of all data contained within it. Researchers can follow the links or contact the appropriate HER, commercial unit or Society direct.

Scotland

Stirling

Manor Powis and Manor Loan, NS 82753 94833

Summary by Paul Morris

Excavations at the site of Manor Powis Castle were led by Dr Murray Cook in 2024. These were at the site of a possible Roman fort on the north bank of the River Forth, at a point where the river may be forded at low tide (the River Forth is tidal to at least the city of Stirling). The crossing point and possible ford are located around 1 mile south of Dumyat, site of a significant hillfort of the Maeatae.

"*Logie; A Parish History*" notes that:

"The Manor Ford... dates back to the times of the Roman invasion. Some years ago the remains of a Roman causeway could be traced, leading south to Manor Ford, where there was a castellum, which was removed about one hundred and twenty years ago. This fact indicates that there has been little alteration on the bed of the Forth since the period of the Romans."

The excavation was undertaken on the location of the only recorded mapping point of the possible fort, illustrated in *Itinera* IV. This area has been extensively used for heavy industry, including coal mining, and no trace of the fort/fortlet was found. However, evidence of a ford is clear in the river bed at low tide: whether this was used by the Romans remains open.

It has been speculated that Manor Loan, a short road heading north from the site at Manor Powis towards Dumyat, may be Roman in origin. This will require further investigation. Excavations will continue in 2025 and beyond.

Reference: Fergusson, R. M., 1905. Logie; A Parish History, Paisley, pp103. Also available at <https://dn790002.ca.archive.org/0/items/logieparishhisto00ferg/logieparishhisto00ferg.pdf>, accessed March 2025.

Putative Milestone, Manor Powis, NS 82753 94833

Summary by Paul Morris

In 2024 a possible Roman milestone was investigated. This milestone, if found and positively identified, would potentially be linked to Roman activity at Manor Powis. A written record from the early 20th century, also noted in "Logie; A Parish History", contained in the text a description of a Roman milestone near to the East Lodge of Airthrey Castle – now on the grounds of the University of Stirling. The record noted that the stone had the letters "T V" inscribed.



The putative Manor Powis milestone, with Dr. Andrew Tibbs acting as an auxiliary ranging pole.

Investigations around the site of the East Lodge in 2024 identified a substantial stone which potentially fitted the description. After arrangements were made to lift the stone and investigate, it was concluded that the stone was in fact most likely a parish boundary marker. Research is scheduled to continue in 2025.

Reference

Fergusson, R. M., 1905. Logie; A Parish History, Paisley, pp103. Also available at <https://dn790002.ca.archive.org/0/items/logieparishhisto00ferg/logieparishhisto00ferg.pdf>, accessed March 2025.

Midlothian

RR8h(x) Dere Street, between Newbridge (NT 1119 7313) and Bridgend (NT 0629 7475), west of Edinburgh.

Research and summary by Mike Haken

It would be an understatement to say that the course of Dere Street near the Firth of Forth is very poorly understood. Until the late 20th century, the furthest it could be traced was the straight length of modern road from Pathhead northwest to Dalkeith, based solely on its straightness and references to it in that vicinity in two 12th century charters. The direction of this modern road led Margary and others to conclude that Dere Street had been going to Cramond (1973, 487). However, the discovery of the fort at Elginhaugh (from aerial photographs taken in 1978), with a major ESE-WNW aligned road leading through it (Maxwell 1983a, 172-6), raised the possibility that the original Flavian road may have headed west-north-west towards Camelon (possibly via Mumrills), rather than heading to Cramond. Indeed, a parchmark observed by Maxwell from aerial photos taken in 1973, cutting a bend in the modern A772 (then the A7), added more weight to the idea (Maxwell 1983a, 175). This tied in neatly with the realisation that Scotland's only known Roman milestone, suggested by the RCAMS in 1929 to have been found at Cramond, was in fact found at Ingliston in about 1690 (Maxwell 1983b, 382).

In 2007, less than 500m west of the probable findspot of the Ingliston milestone, excavations north of Edinburgh Road at Newbridge resulted in the chance find of a length Roman road, aligned ESE-WNW, although strangely the excavators saw it as a later extension of Dere Street linking the coastal forts of Inveresk and Carriden (Engl & Dunbar 2016, 1). An inspection of lidar imagery west of the Newbridge excavation has led to the discovery of almost four miles of previously unknown Roman road. The alignment of the 'new' stretch of road meets the projected line of the portion excavated in 2009 at the R. Almond (NT 1204 7289), confirming that they are part of the same road, with a dogleg and further change in alignment taking place at the crossing of the Niddry Burn at Faucheldean (NT 0796 7403). The practice of working from one watercourse crossing to the next is often seen in Roman road planning, for example RR274 in Lincolnshire, which is entirely set out that way.

Much of the road runs across fields, although the minor road west from Faucheldean roughly represents the course for 630m (NT 0783 7416 to NT 0725 7439), as does a modern track between NT 0674 7459 and NT 0634 7473, where the track bears south to Waterstone Cottage. Further west, there are occasional hints of the road, perhaps the most interesting being a partly terraced cutting at NT 0312 7592 on precisely the same alignment as the road from Faucheldean.

The new length of road has been given the new number of RR8h(x), to distinguish it from the rest of Dere Street numbered RR8g by Margary southeast of Dalkeith.

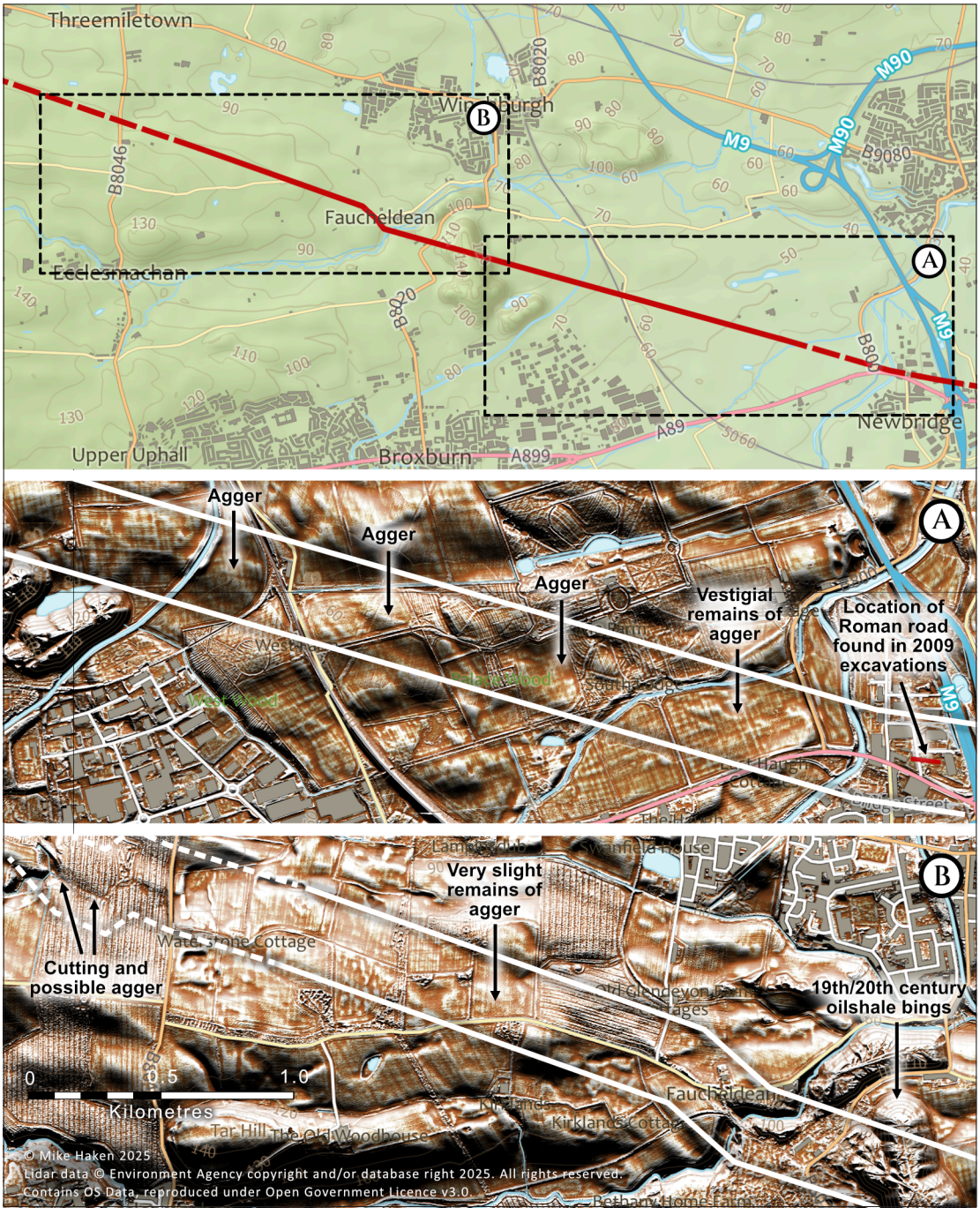
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Map and lidar visualisations showing the course of RR8h(x) between Newbridge and Bridgend © Crown copyright Scottish Government, SEPA and Scottish Water (2012)

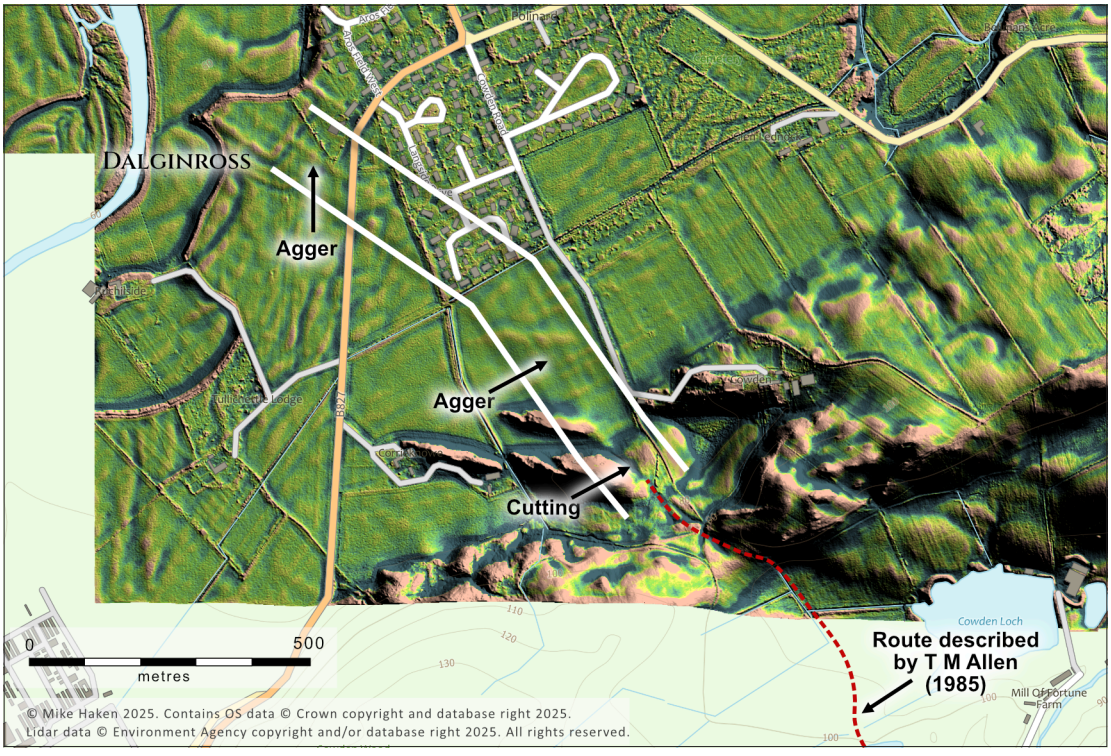
Perthshire

Potential road from Dalginross to RR9 near Muthill. NN 7734 2102 to NN 7799 2042

Research and summary by Mike Haken

A road heading southeast from the fort at Dalginross is known from aerial photography, however it is generally assumed to be a stub. Lidar imagery now suggests that the road may continue beyond the modern housing, turning southeast to meet a cutting at about NN 7792 2048 and continue southeast, where current lidar coverage runs out. This is not a recent idea, a similar route being described by Allan in 1985, although there seem to be errors in some of the published grid references. Topographically, Allan's route does make some sense, however much further work is needed on this putative road.

Allan, T. M. 1985: 'Roman Road Survey, Dalginross Fort : Strageath Fort and/or Kaims Castle Fortlet' Discovery and Excavation in Scotland, CBA Scotland, 51-52. Available at <https://www.archaeologyscotland.org.uk/wp-content/uploads/2022/05/1985.pdf>, accessed April 2025.

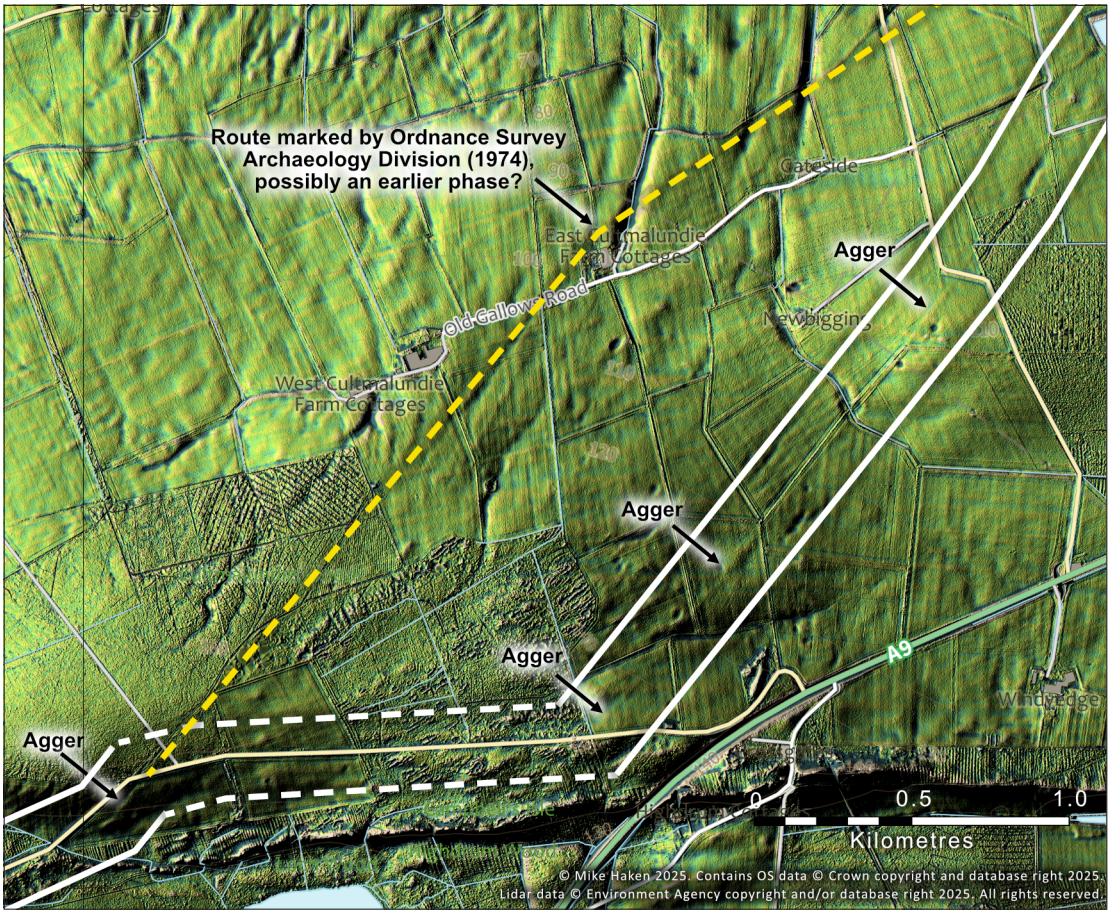


RR9b between Mayfield Wood (NO 0251 2058) and Blackruthven (NO 0721 2475)

Research and summary by Mike Haken

The Roman line from the south west is accepted as being beneath the modern road until NO 0251 2058, where a very obvious raised linear feature keeps straight for 170m, then turns northeast, after which

there has previously been uncertainty for the next 6km. Based on aerial photographic evidence, the OSAD presumed that the Roman line continued on that northeasterly line, however lidar imagery reveals a Roman road 1400m further east, traceable from NO 0424 2094 to NO 0634 2363. It is possible that both routes are correct (converging) at NO 0722 2476, the western lightly built one being Flavian, the eastern one Antonine, although this is of course speculation.



Lidar visualisation showing two possible courses of RR9b west of Perth, perhaps representing two phases. © Crown copyright Scottish Government, SEPA and Scottish Water (2012)

Kippen: possible Roman road. Centred on NS 650 947

Summary by Paul Morris

In 2023 a series of digs were undertaken in the historic village of Kippen. These digs provided an opportunity to investigate old routes and to photograph roadways in context.

Until a bridge was built over a gorge the main route into the village was via a roadway stretching up from the Carse and approaching from the south. This roadway could be Roman, but requires further investigation. Metalled surfaces were found close to the village and carbon dating of materials indicate that activity was present around the 1st to the 3rd centuries AD. The Statistical Accounts for



Potential Roman road to the south of Kippen

the area, published in the 18th and 19th centuries, indicate that there may have been Roman roads in the area, though further digs and the extension of lidar data to cover this part of Scotland will provide more solid information.

The roadway from Kippen to the Carse does indicate a possible route from Kippen to the Ford of Frew, which crosses the River Forth near to the village of Doune where a Roman fort has been excavated – with roadway. This was reported in *Itinera* II p310.

Source: Stirling Archaeology blog, available at <https://stirlingarchaeology.substack.com/p/the-birth-of-kippen-a0c>, accessed March 2025.

Wales and the Welsh Marches

Despite major advances in recent years thanks in no small part to the major re-assessments conducted by the four Welsh archaeological trusts in the early 2000s, when it comes to our understanding of the Roman road network in Wales, the comment by J. H. Randall in the *Archaeologia Cambrensis* centenary volume (1946, 105) remain as relevant today.

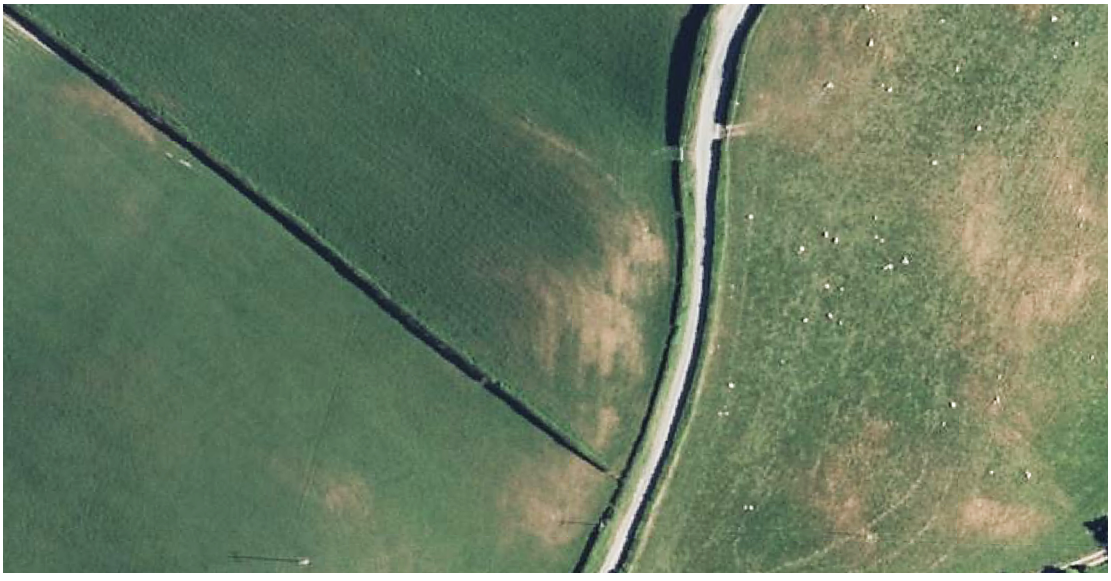
> *"The word that occurs most often in the small section of that work devoted to Wales is* 'supposed'*."*

As has been observed by many others before, the windows of opportunity within Wales can be limited given the climate and a less than forgiving terrain. However, during the hot dry summer of 2022, Bing aerial photography took place in many areas at just the right time. Taking advantage of this, Paul R Wood has carried out extensive investigations in Wales using Bing imagery, along with lidar analysis and a study of finds distributions recorded by the Portable Antiquities Scheme. This has not only brought to light new road segments but also shed light on some missing segments of previously known roads, with new possible fortifications being identified. A few examples of Paul's work are given below. Grid references have not been given for the two possible fortification sites to protect the anonymity of the location, but the full information can be supplied to the Association for members on request.

RR64 between Pen-y-Graig and Rhyd-y-Carw

Research and summary by Paul R Wood

A possible watchtower/fortlet site has been identified above Newtown, in Powys, with the northeast corner possibly showing amongst modern agricultural marks. The location makes sense, since it is possibly the only point a distant view can seen of the forts at Caersws and at Forden in either direction along the Severn valley.



Potential watchtower or fortlet site near Newtown, Powys. © 2025 TomTom, © OpenStreetMap & © Vexcel Imaging.

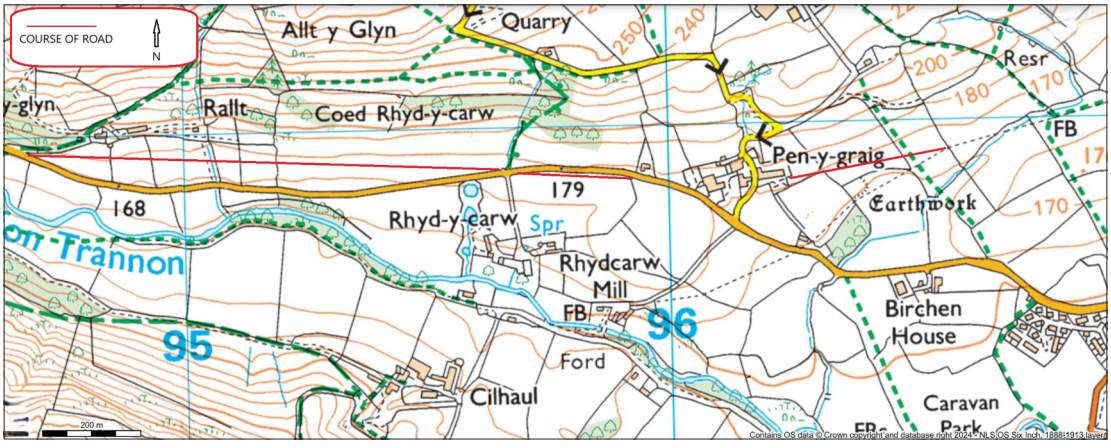
RR64 between Pen-y-graig and Rhyd-y-carw, SN 9688 9102 to SN 9508 9094

Research and summary by Paul R Wood

RR64 west of Caersws is often referred to as the Caersws to Penycrocbren fortlet road. The hot dry summer of 2022 exposed the course of the road in a number of places where previously speculation suggested a slight dogleg as shown on the current OS map to the farm/mill Rhyd-y-Carw. It is now clear the road on its alignment to Pen-y-Graig and reappears on the west side of the farm where the road can now be traced most of the way to Penycrocbren as parch mark, earth work or on lidar.



RR64 revealed at Pen-y-Graig by a parch mark in the dry summer of 2022. © Bing maps.



The route of RR64 westwards (red line) from Pen-y-Graig, not as the OS map as it approaches the river at Rhyd-y-carw. OS base map © Ordnance Survey.

RR66a at Druid, near Corwen. SJ 0312 4303 to S J0373 4329

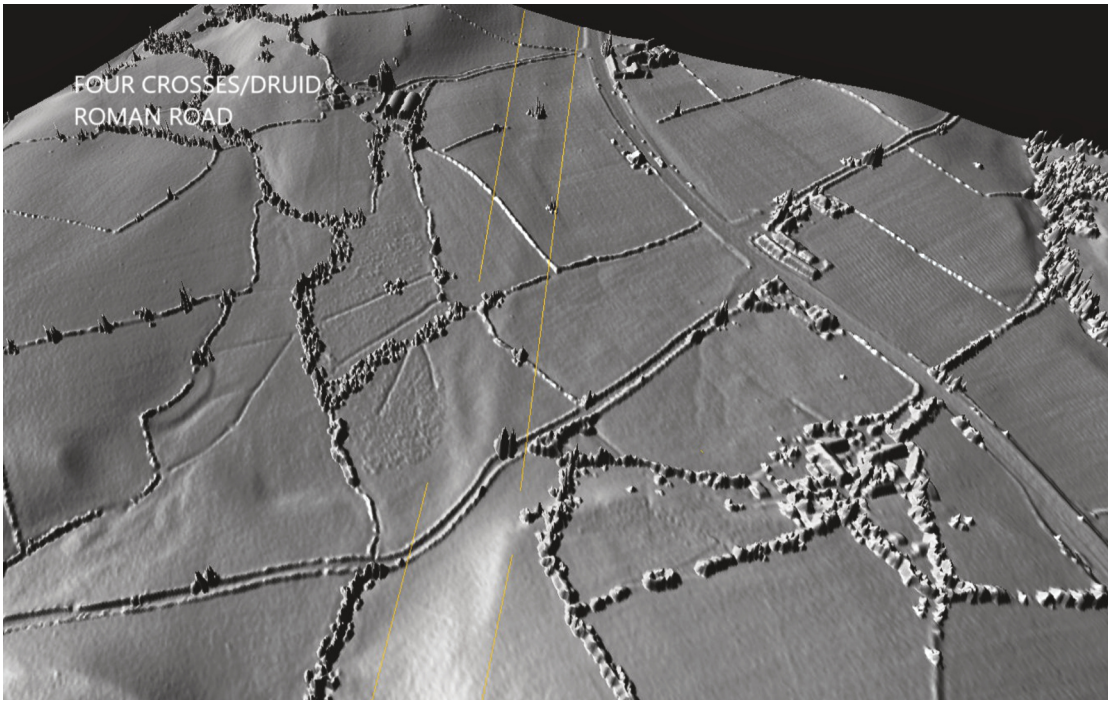
Research and summary by Paul R Wood

A Mid Wales road (RR66a) is now pinpointed between Four Crosses and Druid, near Corwen. Although it is generally accepted that a road existed, it has been one of the "proposed" routes. Bing aerial images from the dry summer of 2022 show a clear parchmark (as does lidar imagery), west of the

route recorded in the HER. These are consistent with a second length of agger identified from lidar imagery by Mike Haken, between SJ 0451 4376 and SJ 0558 4441. Both features are in need of much greater investigation.



Above: Parch mark of the suspected course of RR66a between Four Crosses and Druid. Image © Bing maps
Below: The same feature on lidar imagery.



New road?

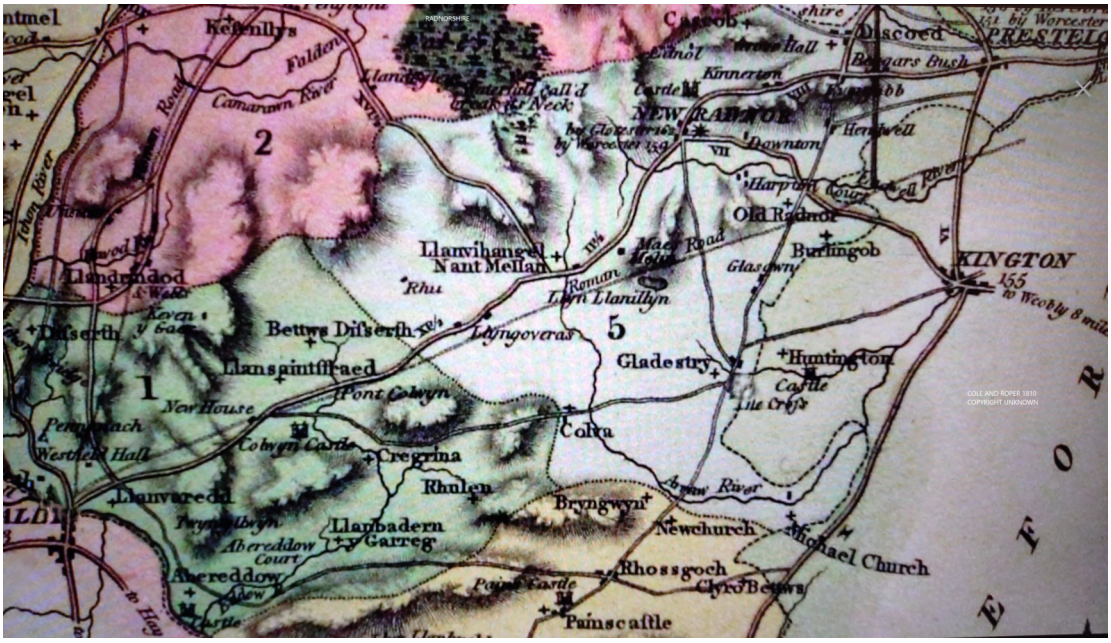
Research and summary by Paul R Wood

A possible new road stems from lidar and quizzing local metal detectorists at Hundred House near Builth Wells in Powys. It is well known that a roman fort sits under the medieval castle at Colwyn roughly seven miles (11.2km) east of Builth (CPAT SMR record PRN50273). In more recent years, the wider landscape around the fort and castle is revealing more Roman period material, in this case a possible road heading east to Hindwell fort (CPAT SMR PRN315) in Walton, Old Radnor, Powys eleven miles (18kms) to the east-north-east. Though heavily modernised and previously turnpiked, this section of the Roman road is still visible near Rhiw Villa farm. Metal detected finds and surface pottery finds strongly suggest Roman settlement in the area.

This brief but hopefully informing note is but a fraction of new material that is helping piece together a better picture of Roman Wales. There is a complexity of pipelines around the Edmund Waddelove and Margary RR67b routes near Betwys-yn-Rhos, Conwy or authenticating lengths of the Roman roads marked on the Cole and Roper map of Radnorshire in 1810 and exploring Beguildy. Also there is growing evidence for more than just a minor lead mining exploration where investigation has grown into another extensive area of Roman landscape.



Lidar image, © Houseprices, showing a holloway possibly marking the line of a Roman road between the Roman forts at Colwyn and Hindwell.



Extract from the 1810 Cole and Roper map of Radnorshire showing the course of a Roman road.



Potential fort/fortlet site near Kidwelly. © Bing.

England

Berkshire

Update collated by Keith Abbott and Lindsey Bedford

RR160. Silchester to Dorchester-on-Thames

Lidar analysis of the route of RR160c from Silchester to Dorchester-on-Thames across West Berkshire, Oxfordshire and Buckinghamshire, originally carried out by Hugh Toller in 2014, is summarised in an informative video presentation (Staveley, 2024). This research proposes an alternative route for RR160 from Silchester to Pangbourne and Goring which differs to that proposed by Margary (1973).

In July 2024, The Wallingford Historical and Archaeological Society (TWHAS) conducted a geophysical survey in the grounds of Brightwell-cum-Sotwell Primary School (SU 58211 90945, Fig.1) which confirmed the line of Roman Road RR160c.



Fig. 1 – Geophysical survey of RR160c and the surface of the road revealed by excavation (TWHAS, 2024; Google, 2020).

This led to an evaluation excavation along the line of the road in three places. The result of these was the exposure of a patchy 'cobbled' surface set in a sandy clay above a thick sandy gravel layer which was in turn above another possible layer of larger flint cobble stones. The presence of these water-worn stones at the lower level was interpreted as possible evidence for an earlier road surface. A subsequent test pit, approximately 8m south of the trench, revealed similar stratigraphy with the lower stones embedded in very wet and sticky Gault Clay (natural) at a similar depth of 1100mm. No side ditches were encountered but the trench length was limited so may have stopped short. Finds from the disturbed upper levels included Roman pottery, seven coins and hobnails. A formal report outlining the results of this excavation is in progress.

RR163. Silchester to St Albans

Work by David Ratledge and Mike Haken

Lidar analysis and fieldwork tracked the route of RR163 across Berkshire, South Oxfordshire and Buckinghamshire summarised in the RRRA Winter 2023/2024 edition newsletter, see Fig. 2. This was enhanced in an excellent animated YouTube video (Ratledge, 2024). This research in particular sheds new light on the likely location of where the road crosses the River Thames near Caversham in Reading shown in *Fig. 3*. The route is slightly different to that proposed by Rothwell in *Itinera* IV, p1-38, principally the route on the south of the Thames. As a consequence this route has been recorded as RR163. It could well be that there are parallel routes that may or may not have been contemporary.

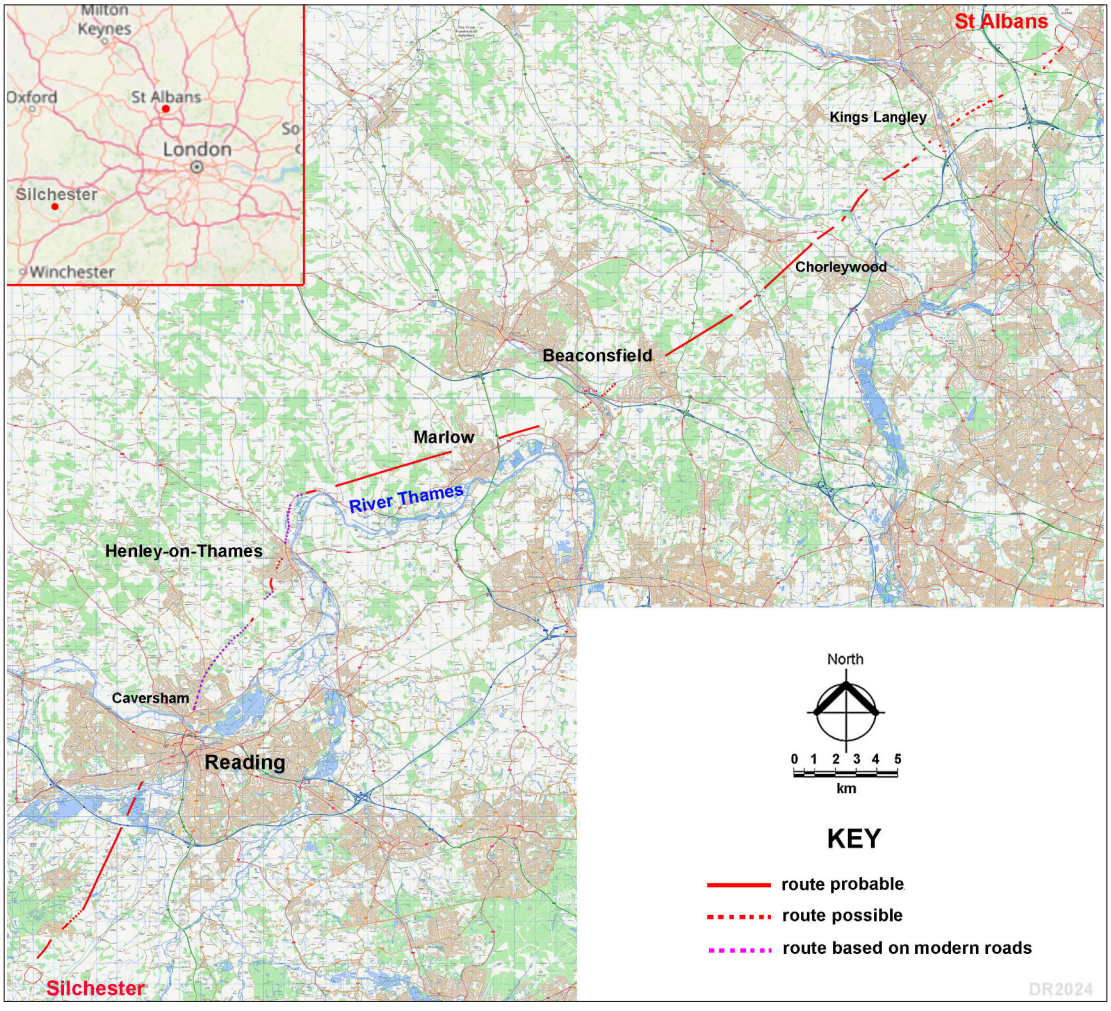


Fig. 2. The suggested route of RR163 angling around the Thames Valley to the north of Henley-on-Thames. Inset: location map. Contains Ordnance Survey data © Crown Copyright and database, 2024.

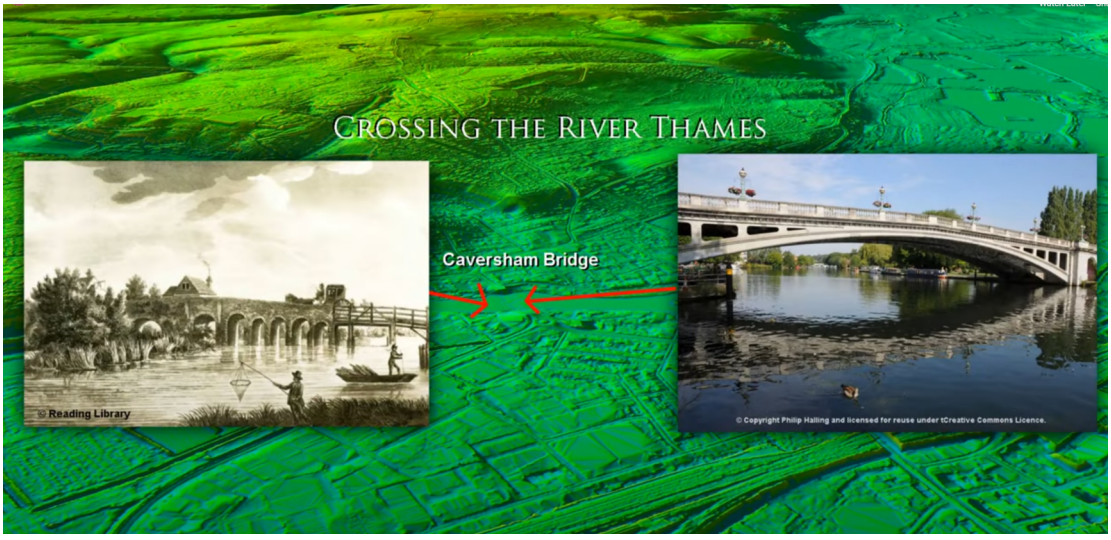


Fig. 3 – Likely location of where RR163 crosses the River Thames at Caversham, Reading (Ratledge, 2024).

RR41. Silchester to Cirencester (Ermin Street) and RR53 Road to Bath

Continued investigation by the Berkshire Archaeological Society at Wickham near Welford in West Berkshire (Abbott, 2024) has revealed further evidence of the intersection of the Road to Bath (RR53) with Ermin Street (RR41) at the Romano-British settlement that appears to have developed around it. Ermin Street was found to be located as projected by Margary (1973) and Fig. 4 shows the Road to Bath branching to the south from Ermin Street. The two sets of road ditches suggest that the width was different with Ermin Street (RR41) some 19m apart whereas the Road to Bath (RR53) are 15m apart. Future excavations of these road anomalies are being planned to explore the phasing of construction of the two roads, the morphology of the road intersection and to evaluate other nearby rectilinear



Fig. 4 - Gradiometer survey images of the intersection of Ermin Street (RR41) and the Road to Bath (RR53) (Abbott, 2024).

and circulation anomalies interpreted as enclosures, round house drip gullies and a lane branching off Ermin Street to the north.

References

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Toller, H. 2013: 'The Roman Road between Wickham (Speen) Berkshire and Fyfield, Wiltshire (Margary 53)', *Wiltshire Archaeological and Natural History Magazine*, Issue 106, p52-65.

Buckinghamshire

Summary provided by Nigel Rothwell

RR163B. Denham: Durdent Court, TQ 03464 89994

Excavation was undertaken in September and October 2020 in advance of HS2 construction on 0.14ha of land north of Denham Green and west of the River Colne. Two ditches, broadly parallel with the Shires Lane footpath to the north, which possibly represents the line of Roman Road RR163B, were dated as Romano-British.

Buckinghamshire HER Monument record 0436200000 Viatores Road 163B

Records of Bucks vol 62, p 289

RR16. Fleet Marston: Fleet Marston Cottages and Putlowes, SP 47807 21493

Work by COPA (Cotswold Archaeology, Oxford Archaeology, Pre-Construct Archaeology)

Between June and August 2020, COPA undertook a trial-trench evaluation measuring c.38.3ha between Fleet Marston Cottages and Putlowes, ahead of the construction of HS2. The evaluation was focused on the site of Fleet Marston Roman town and RR16 Akeman Street and comprised 119 trenches. The evaluation identified three main phases of activity: Middle Iron Age, Middle Roman (mid-2nd to mid-3rd century CE), and Late Roman (mid-3rd to 4th century CE). Judging by the level of pottery deposition, activity was concentrated in the central part of the site on either side of Akeman Street, and to the south-east in trenches targeting enclosures and other features either side of a minor road branching off Akeman Street on a SW-NE alignment. Parts of a Late Roman cemetery were exposed further to the south-east, inhumation graves being recorded in three trenches.

Buckinghamshire HER Monument record 0105000000 Akeman Street

Records of Bucks vol 62, pp 289-290

Bow Brickhill, South Caldecote, SP 89100 34170

Work by Albion Archaeology

Between May and November 2021 Albion Archaeology conducted a series of excavations in a c. 48ha development area on the east side of the A5 on the periphery of *Magiovinium*. Areas 1-3 revealed Late Iron Age and 1st-2nd century CE land allotments, a barrow, enclosure and roundhouses. Areas 4 and

5 revealed c. 1.5ha of enclosed Romano-British settlement, adjacent to a spur of RR1e Watling Street heading north from *Magiovinium*. The road, represented within the excavation by parallel ditches, had previously been identified to the south in a more substantial form with metalled surface by David Neal (Records of Bucks 29, 1-124).

Milton Keynes HER No. MMK5974

Records of Bucks vol 63, p 239

RR16. Aylesbury: Tring Road, SP 48288 21382

Work by Thames Valley Archaeological Services

Evaluation trenching in the former Tesco's car park in March 2022 revealed no sign of the expected line of RR16 Akeman Street, nor any features or finds of archaeological interest.

Buckinghamshire HER Monument record 0105000000 Akeman Street

Records of Bucks vol 64, p 247

RR173. Long Crendon: Larks Barn, SP 46964 20903

Work by John Moore Heritage Services

A watching brief was carried out during excavation for the foundations of a new building and boundary wall. The earliest features identified were three parallel ditches oriented NE-SW, parallel to the modern road, which is also the supposed route of the Viatores road RR173 which may suggest that the orientation of the ditches was influenced by the presence of the road, assuming the road exists.

Buckinghamshire HER Monument record 0203500000 Viatores Route 173A-D

Records of Bucks vol 64, p 250

Walton: Land adjacent to Walton Manor, SP 48871 23663

Work by Cotswold Archaeology

A watching brief identified Roman ditches forming part of a field system associated with an Iron Age to Roman settlement and a high-status Roman building previously recorded to the north of the site, approximately 1km east of RR175.

Records of Bucks vol 64, p 253

RR162. Granborough: Land at East Claydon, SP 4755 2251

Work by Museum of London Archaeology (MOLA)

A magnetometer survey was conducted over an area of c.40ha, between March and May 2023, commissioned by Statera Energy Ltd. Several sections of positive linear anomalies in the southwestern extremity of the site (Field F4) matched the proposed alignment of Roman Road RR162. These were interpreted as possible cuts and recuts of roadside ditches.

Buckinghamshire HER Monument record 0203400000 Margary Road 162

Manktelow, C (MOLA Northampton), 2023, Archaeological geophysical survey on land at Granborough, Buckinghamshire, unpublished report no. 23/049

Cambridgeshire

Collation provided by Ruth Beckley of Cambs. HER

East Park Solar – Great Staughton Roman town (ECB7446), TL 08004 63268

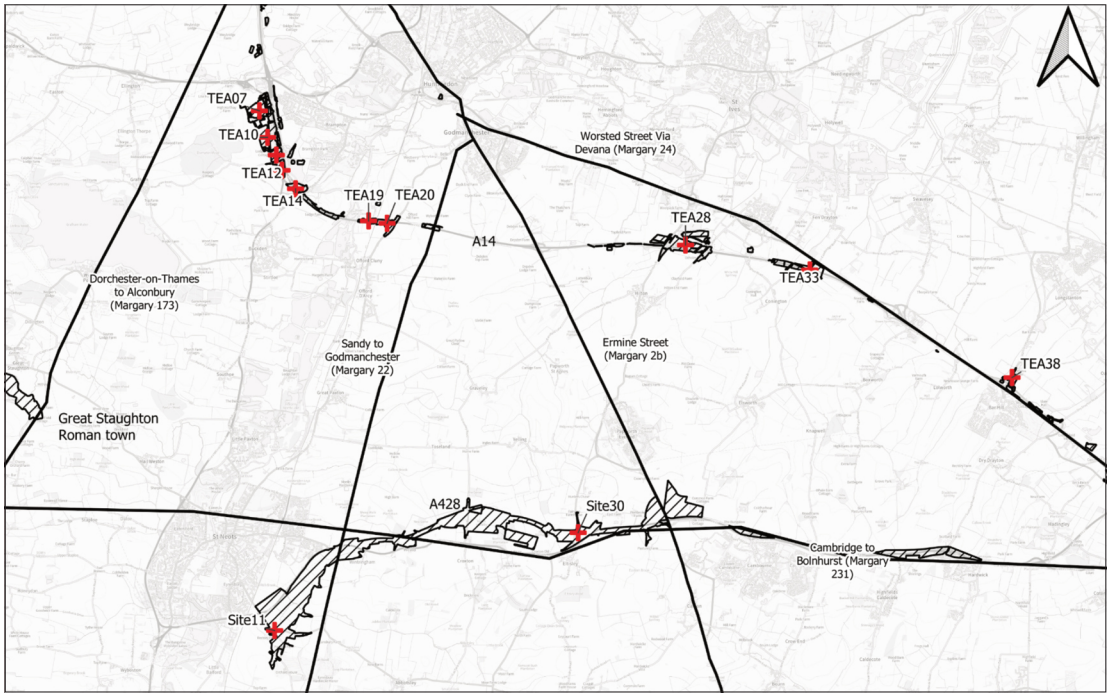
Work by Chimielowska, A. of AOC

Preliminary geophysical survey to inform a major solar scheme across Bedfordshire and Cambridgeshire identified an extensive Roman small town, now a scheduled monument (NHLE 1491190). Originally identified from cropmark remains evident in aerial imagery from the 2000s, the geophysical survey provided more detailed evidence of the settlement extending northwest from Margary RR173 Dorchester on Thames to Alconbury (see figure below). Numerous town roads and trackways were present in the survey results including a major road on a northwest-southeast alignment through the core of the settlement leading to Margary RR173.

A14 Cambridge to Huntingdon Improvement Scheme

Although this scheme was carried out between 2016-2020 (see figure below), final reports were completed in 2024. The scheme consisted of over 30 separate excavation areas that produced extensive archaeological evidence forming the final phase of a long running programme of archaeological investigation. Trackways or roads were identified at the following sites:

TEA7: East west aligned trackway of Early-Late Roman date recorded alongside road plots and three kilns. The trackway comprised two parallel ditches approximately 12m apart.



Sites recorded in the Cambridgeshire HER relating to roads or trackways. © Crown Copyright and batabase rights OS100023205

TEA 11/12: Early Roman small settlement including cemetery, kilns and structures with a trackway. Two ditches 6.5m apart with elements of a narrower section just 1.4m wide.

TEA10: Late Roman north-south aligned trackway comprising two parallel ditches 8m apart. Associated with several enclosures.

TEA14: Series of trackways and droveways established as part of a small early Roman settlement and kiln site. Principal trackway aligned east-west and identified over 500m on a relatively straight alignment. Consisted of two parallel ditches with evidence of multiple phases of recutting. approximately 6-10m apart. No evidence of a metalled surface but possible evidence of wheel ruts.

TEA19: Trackway associated with a field system and lazy beds with evidence of recutting. Two parallel ditches approximately 15m apart on a north-south alignment. Early-Middle Roman. Second possible trackway on a similar alignment at the southern end of the excavation area.

TEA20: Trackway on northwest-southeast alignment to the north of a field system. Following reorganisation of the site in the Middle Roman period a more narrow trackway on a north-south alignment was introduced associated with settlement in the area. In the late Roman period a probable villa site was established over earlier settlement activity with an east-west aligned trackway entering the villa on the eastern side. The trackway measured 7.5m wide with evidence of heavily disturbed metalling.

TEA28: Series of trackways bordering a wide complex of enclosures dating to the Mid to late Roman period. Trackway 17 lay to the eastern half of the excavation area on a north-south alignment. Trackway 15 on a similar alignment crossed the centre of the main excavation area, with two trackways perpendicular to, and adjoining it. Trackway 15 was picked up again in a second excavation area to the north where it merged with another trackway on a northwest-southeast alignment.

TEA33: Two early Roman trackways on a north-south alignment across the centre of the excavation area. Although the roadside ditches appeared well maintained, there was no evidence of a metalled surface.

TEA38: Identified a small Iron Age to Roman settlement. The Roman phase included a trackway along the eastern edge of the settlement. The trackway consisted of two parallel ditches that appeared to link two groups of enclosures.

A428 Black Cat to Caxton Gibbet Improvement Scheme

Series of excavation areas investigated between 2023 and 2024 with reports produced in 2024

Site 11: Evidence of a Late Iron Age to Roman trackway leading to a small enclosure settlement. Trackway comprised two parallel ditches on a northeast-southwest alignment approximately 15m apart.

Site 30: Evidence of two trackways as part of a small roadside settlement and field system. Trackway 1 extended north from the main settlement area while a second trackway crossed its northern end on an east-west alignment. The north-south trackway measured between 6.24 and 16.7m wide. The east-west trackway was a fairly uniform 10.8m apart.

Cambourne to Cambridge public transport project (ECB6988), TL 4031 5974
Work by Short, A. & Kesterton, H. LP Archaeology

Evaluation carried out in 2022-23 south of the present day A428 (Margary RR231: Cambridge to Bolnhurst) in order to inform a public busway identified several areas of probable Roman activity. The evaluation also crossed the supposed path of Akeman Street (Margary RR23a/b). Although no direct evidence of either major road was identified, several possible trackways were recorded close to Roman settlement at the University Sports Ground, Cambridge and west of the M11 at Coton.

Cambridge, Shelford Road (ECB7209), TL 45010 54241
Work by Pedro, R. PCA R17547

Excavation carried out in 2023 identified two parallel ditches that were interpreted as a possible trackway. Features on the same alignment were identified during earlier investigations to the northeast at Addenbrookes in 2007.

Litlington, Royston Road (ECB7278), TL 5322 2400
Work by M Collins, CAU 1591

A trackway originally identified by cropmark and earthwork evidence (MCB21087) and thought to be part of the Avenell Way. The routeway is primarily visible as a holloway, in parts flanked by banks, and is approximately orientated south-west to north-east for a total length of over 3.5km. Geophysical survey and subsequent evaluation over part of the route at Royston Road in order to inform a potential solar farm identified remains consistent with the trackway in a single trench. The features comprised a surface approximately 4.3m wide and 0.16m deep with traces of possible wheel ruts in the form of two gullies. Dating evidence was limited to a single sherd of Roman coarse ware.

Soham, Kingfisher Drive (ECB7058),
Work by Pedro, R. & Desibio, L, PCA R15798

Evaluation undertaken in late 2023 as part of an archaeological condition on planning permission for residential development identified a trackway of possible Roman date in two trenches. The trackway consisted of two parallel ditches approximately 2.4m apart, dating however was extremely limited with just two fragments of white pipeclay type fabric recovered from the lower fill of one ditch.

Somersham, The Bank (ECB7289), TL 3700 7823
Work by Middleton, L. CAU 1596

Archaeological evaluation undertaken as part of a planning permission for residential development identified an Iron Age to Roman settlement. The Roman remains included structural remains of at least one granary/barn, several rectilinear enclosures representing possible paddocks and a small inhumation cemetery bordering a trackway on a north-south alignment.

Wimblington, Bridge Lane (ECB6985), TL 4133 9295
Work by Sharrock P & Sherman A. MOLA 23/113

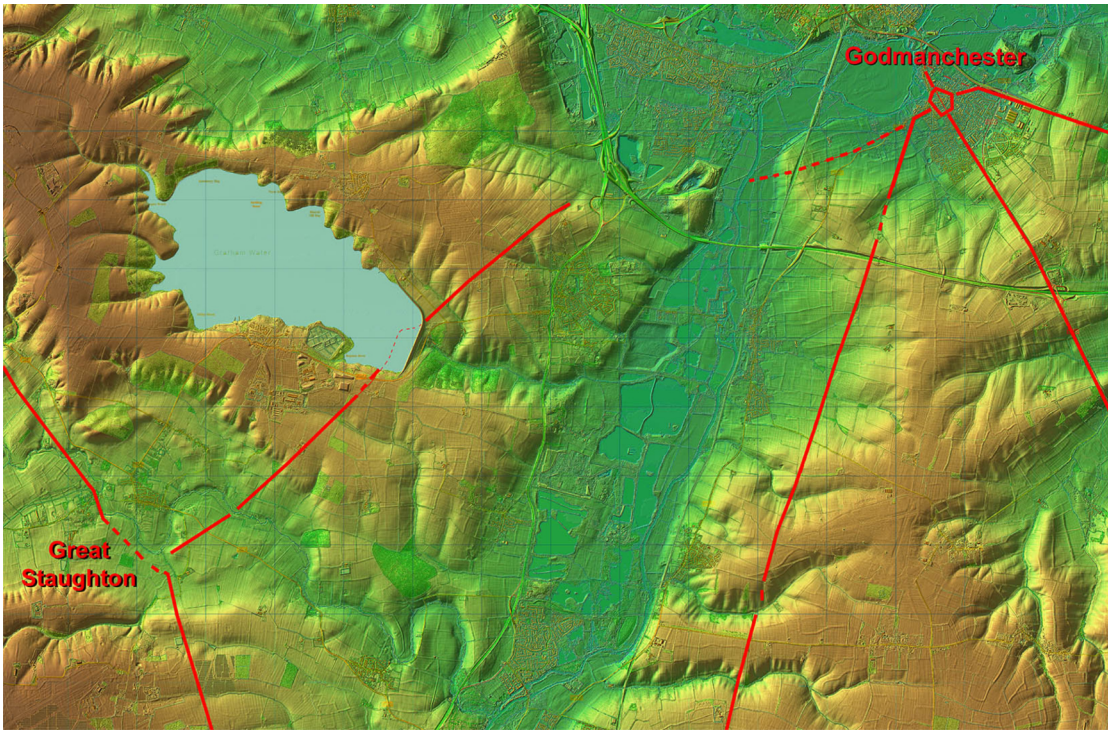
Archaeological excavation carried out following an earlier evaluation phase. A trackway on a northwest-southeast alignment was recorded across the centre of the excavation area. It consisted of

two parallel ditches approximately 6.5m apart with evidence of recutting and leading towards a watering hole in the north. Associated with a previously identified trackway to the south in 2018.

RR227(x). Godmanchester to Great Staughton

From lidar survey by David Ratledge

A new road linking Godmanchester to Great Staughton was described by David Ratledge within the Autumn 2024 RRRA newsletter, available at <https://romanroads.org/Newsletters/Members/Newsletter_30_Autumn_24.pdf> and his own site, <https://www.twithr.co.uk/cambridgeshire/godmanchester-gt-staughton.htm>. RR227(x) has been allocated for this new road.



Link road RR227(x) between Godmanchester and Great Staughton, courtesy of David Ratledge. Lidar data is © Environment Agency copyright and/or database right 2024. All rights reserved.

RR2bb(x). Yaxley to Longthorpe fort

Original work independently by Mike Haken and David Ratledge.

Ermine Street, RR2b bends near Yaxley to head towards Water Newton but the clear intent of the alignment was on the Longthorpe fort. Lidar suggests there was a continuation of the direct alignment towards Longthorpe. While this may have been the primary route, RR2bb(x) has been reserved for this possible road.

Cheshire

Collated by Neil Buckley

Suspected Roman Enclosure

Work by Chris Matthews and Nick Dawson.

A full report of the results of this community based September 2022 archaeological investigation was published in the 2024 edition of the Journal of the Chester Archaeological Society new series number 94, pages 93–107.

This enclosure was included in the Cheshire pages of the RRRA Roman Roads Gazetteer by David Ratledge in his analysis of Margary RR660, the branch road to the Roman industrial site at Holt. Because of its distinctive shape the enclosure is assumed to be the site of a fort but there are doubts, also it is not clear how it was connected to the road system. It is some distance from the conjectural route of RR660 and even further from RR6a the road to Chester.

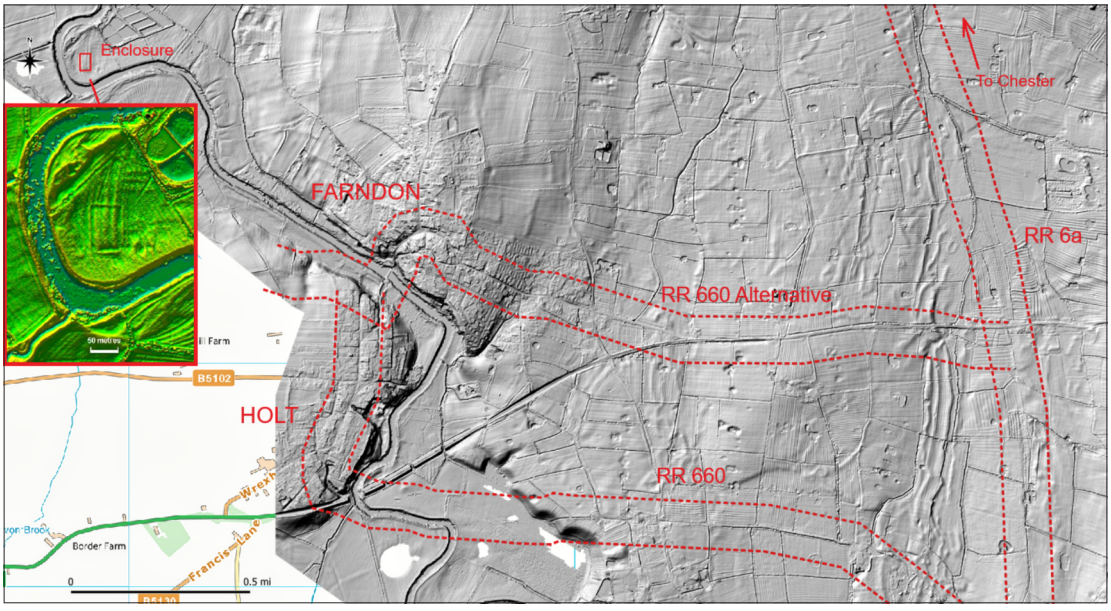


Fig. 1: Roman roads in the Holt/Farndon area as identified by David Ratledge. The enclosure site is north-west of Farndon. Lidar is © the Environment Agency 2021. Base map OS Openreach.

The investigation formed part of a community-based research project coordinated by the Holt Local History Society. The main aim of the excavation was to examine the archaeological deposits associated with the enclosure and establish a chronological sequence for the site. Guided mostly by the lidar map of the site, a magnetic gradiometer geophysical survey was carried out but the site was found to be magnetically very quiet. However there was an indication of what turned out to be industrial activity within the compound. Six trenches were opened to investigate the anomalies and features and as a result of these excavations a resume of the conclusions was as follows:

'As presently understood, the enclosure probably dates to the Roman period and may have been some form of temporary camp established during the late first and early second centuries AD, which also seem to have been the operational period of the Holt Roman tile and pottery works. This dating is based on the fragmentary but substantial presence of Roman materials from within the enclosure, although one diagnostic sherd could be as late as mid to late second century. '

The enclosure was also found to be the site of significant post Roman industrial activity including seventh century iron processing.

No progress was made in establishing access routes, no roads to the site were identified.

Chester Business Park, Excavation of a Late Prehistoric and Roman Rural Site 2002. Centred on SJ 3930 6286

Work by Dan Garner

An archaeological excavation in 2003 prior to a development at the Chester Business Park south of the city centre, revealed evidence of Iron Age and Roman activity. There were remnants of structures, cobbled surfaces, a field system covering almost a hectare, and a road. The dating evidence suggests

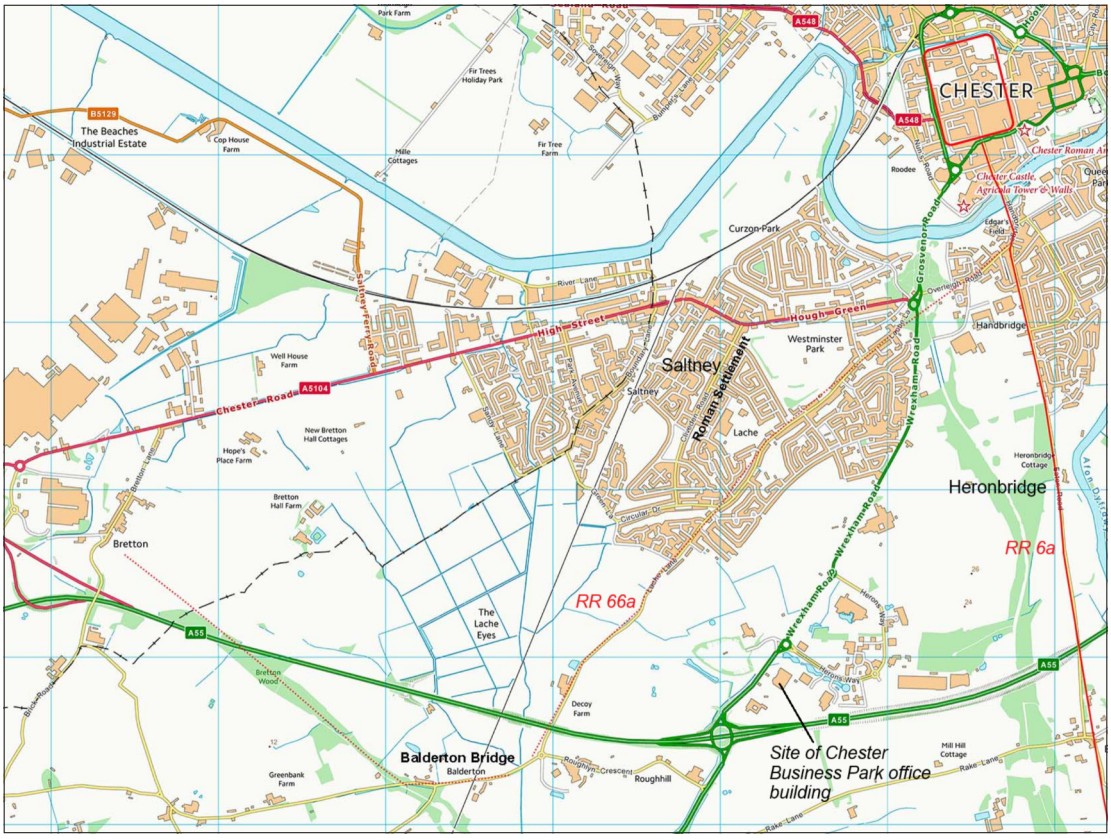


Fig. 2: Area map by David Ratledge showing the site of the excavation between RR 6a and RR 66a south of the Saltney & Heronbridge Roman settlements. Base map is OS Opendata.

that the main activity spanned the period from the mid to late Iron Age through to the end of the third century AD.

This article is intended to provide a summary of the results of excavations carried out by Network Archaeology in 2003 at Chester Business Park, prior to the construction of an office building. It is designed to put important site information into the public domain as full publication could not be achieved at the time. The full article was published in the 2024 edition of the Journal of the Chester Archaeological Society new series number 94, Pages 63-91. The report is written in five sections. The first section covers the site chronology and key dating information. The second section explores the site layout and provides an overview of the late Iron Age and Roman phases.

The dating evidence for the Roman period is primarily provided by the pottery assemblage which, on the basis of vessel forms and fabrics, spans the late first century to the third/fourth century AD. The road was found to have an east–west aligned metalled surface flanked by a pair of parallel ditches. The surface was poorly preserved in many parts of the excavation but it had been a relatively substantial design at between 5.0 and 6.5m wide. Pottery recovered from both the roadside ditches and the metalled surface suggests a date range from the late first to the late second century.

The road ran through an area characterised by numerous long, narrow fields, delineated by a combination of long ditches, gullies and short slots. There was some evidence of structures but the area appeared to be primarily agricultural. The regular field system was similar to that found at nearby Saighton although not as extensive.

If the road continued east on its excavated alignment, it would have joined the RR6a from Chester south of Heronbridge, going west it might have joined the RR66a heading for Belgrave Bridge and Wales. However it is possible that its function was merely as a local road, joining an agricultural settlement to the wider communications network.

Cumbria

Collated by Chester Forster

RR82, A66 North Trans Pennine Upgrade, Temple Sowerby to Brough (NY 624 262)

Work by Wardell Armstrong, M Jones

There were remains of archaeological interest in 77 trenches with 34 showing significant remains of the Roman Road RR82. These trenches, more or less on the line of RR82 showed higher concentrations of pits, gullies, ditches and post holes. Roman activity was found in six trenches and this may represent enclosures, tracks and field systems

Archive: Tullie House Museum

RR865 Askerton, Side Fell Common, (NY 5900 7300)

Work by Salford Archaeology, N Poundall

Signs of RR865 Birdoswald to Bewcastle road was identified in an assessment of the impact of peat restoration work in Side Fell Common The road, often erroneously called the Maiden Way, is fully described in *Itinera* 1 (2021) pp1-14 in a well illustrated article by David Ratledge. The proposed works were considered to have no impact on RR865 which is a scheduled monument.

Bowness on Solway, Bowness house Farm (NY2246 6270)

Work by Wardell Armstrong, A Buschmann

In a heritage statement on the impact of a proposed camping and car park adjacent to Bowness House Farm it was considered that despite the area having been subject to the formation of hard standing, the remains of hitherto buried Roman buildings and roads could still be affected by the new development.

RR7/RR85b? Carlisle Cricket Club, Edenside, Carlisle (NY 399 566)

Work by Wardell Armstrong

Further work on the west side of the Cricket Club site which has been earmarked for the construction of the new Carlisle Cricket Club pavilion revealed a further section, on a slightly different alignment, of the road uncovered in 2017, 2021 and 2023. The road previously uncovered revealed metalling up to 1.1 metres deep but the new section of road showed that it was of a much lighter construction with metalling only down to a depth of 20 to 30 cm.

This road may have been reconstructed for reasons which are not obvious but it was also noted that the drain from the main building -- the largest ever discovered adjacent to Hadrian's Wall,-- had also been rebuilt on the western side. The easterly section of drain yielded almost 70 intaglios and contained considerable amounts of fine silt. It was noted that both sections of drain respected the road alignment and the road was therefore earlier than the drains.

A new dig for 2025 is being undertaken in June 2025 which will investigate the eastward extension of the heavily metalled road.

RR74, Martindale, High Street (NY45 18)

Work by Eden Heritage

A community project to assess and record an embanked trackway and a holloway on Wether Hill was undertaken and consisted of a desk-based assessment, topographical and geophysical surveys and trial trenches.

Following the surveys this determined the positions of the trial trenches but no sign of the reputed Roman road could be found to the north of Wether Hill or the southern slopes of Loadpot Hill. Archaeological evidence was lacking to indicate any sign of a typical Roman road and it was concluded that the evidence indicated that the Romans may have used a pre-existing trackway which may have varied in composition over the course of the route.

RR752 Moresby Hall (NX 9855 2105 to NX 9800 2100)

Work by CFA Archaeology, M Kirby

This is in close proximity to the known Roman fort at Moresby and a geophysical survey was carried out in advance of road improvements to the A595. The survey revealed potential archaeological anomalies. These included a trackway which was shown on the first edition of the Ordnance Survey map of the area.

The trackway may be medieval or Roman in origin and several pit features were observed. Margary lists this road as RR752 Moresby to Papcastle. A watching brief was recommended during the construction groundworks.

Devon

Collated by Delwyn Matthews

RR492(x)? East of Mardles Farm, Colebrook

The line of the Roman road is clearly visible as a cropmark on aerial photos taken in 2016 and 2018, running across a broadly triangular field to the east of Mardles Farm. Aerial Photograph. Bluesky International Ltd/Getmapping PLC, 2015 onwards.

HER Monument ID MDV135451

Dorset

RR4dd(x). Lake Farm eastwards

Research and summary by Mike Haken

Geophysical survey by a team from Bournemouth University published in Britannia in 2020 showed that a road branches from RR4d and passes through the fortress at Lake Farm. It has been previously suggested that this might continue to an unknown destination to the east, possibly an inland port or wharf, although lidar analysis suggests it may turn to the southeast before it is lost under modern Oakley. The A341 may potentially fossilise its course towards Charminster, but this is pure speculation. RR4dd(x) has been reserved for this possible road.

Durham

RR805(x). East Park northeastwards

Research and summary by Mike Haken

The various geophysical surveys conducted on the Romano-British roadside settlement at East Park, Sedgefield, Durham, between 2005 and 2009, not only showed the main road coming up from York (RR80a), but also a branch road heading northeast out of the settlement. Crucially, the branch road has a number of plots and enclosures facing onto it, suggesting that it conveyed at least a modest amount of traffic and was not just an internal street. Lidar analysis seems to have gone some way to confirming this, since a length of probable *agger* leading from a cutting has been identified immediately southwest of Howle Hope, along with a possible fragment just northeast of the farm. The cutting aligns perfectly with the road leaving East Park, and suggests that the road could be continuing some distance, although there is no obvious destination, and it has not yet been traced further. The new length of road has been given the new number of RR805(x).

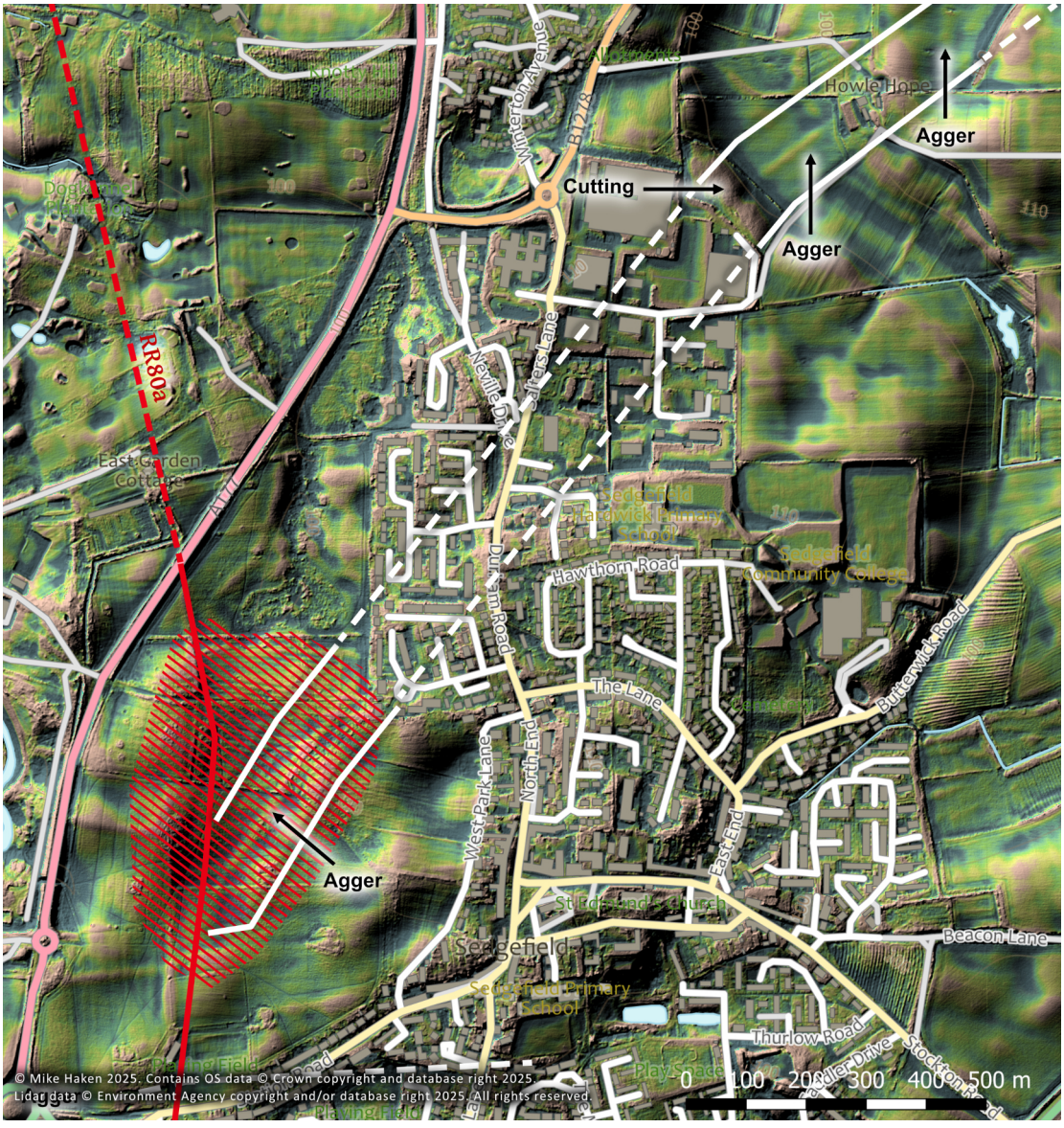
Essex

Collated by Geoff Lunn

RR323(x). Land west of Hill House Farm, Bromley Road, Essex TM 03215 26208

Work by Colchester Archaeological Trust Ltd. (CAT)

An archaeological evaluation (three trial-trenches) was carried out on land south-west of Hill Farm House, Parsons Heath, Essex, in advance of the construction of a new residential development. The



Lidar visualisation showing the probable course of RR805(x), branching from RR80a at the Romano-British Settlement at East Park, Sedgefield, Durham (see p. 247) . Lidar data is © Environment Agency copyright and/or database right 2024. All rights reserved.

route of a Roman road (RR323(x)) thought to have linked Mistley with Colchester is projected to run through the southern part of the site, which also lies north-west of an area of ancient woodland, and south-east of the site of a former fulling mill dating back to at least the 16th century. No trace of the Roman road was found along its projected route. Two parallel ditches were uncovered in the northern half of the site, however, and it is possible that these represent the roadside ditches of this thoroughfare, although a lack of finds means this cannot be confirmed without further investigation.

HER Ref EHER 2573, **Archive** Essex County Council ARBR24, **Report** CAT Report No: 2033

RR329(x). Across Harlow, Essex

Work by David Ratledge

Work reported in the Winter 2024/25 RRRA newsletter, available at <https://romanroads.org/Newsletters/Members/Newsletter_31_Winter_25.pdf>, has clarified the route of RR329(x) across the centre of Harlow.



Ordnance Survey mapping old and new showing the locations of the sites referred to the text. Left map © 2024 National Library of Scotland under the terms of the Creative Commons Attribution (CC-BY) licence. Right map and inset contains Ordnance Survey data © Crown Copyright and database, 2024.

Gloucestershire

Collated by Chris Webb

Excavation at Manor Gardens in Barnwood Gloucester. SO 86390 17790

Roman period road or trackway found during an excavation at Manor Gardens in Barnwood Gloucester. Two parallel ditches running on a north east to south west alignment and approximately 10m apart and form part of an informal trackway running perpendicular to Ermin Street to the north of the site. The western trackway ditch, is truncated to the south by a demolished building footprint and runs for approximately 36 m where it is truncated by a service trench and does not appear again. The eastern ditch measures approximately 13 m and extends beyond the limit of excavation to the north and is truncated by a demolished building footprint and later medieval boundary ditch to the south.

Gloucs. HER source 18350.

Hampshire

Excavations at Exton

Work by Richard Whaley of NEHHAS FAB

Here is our 2024 work. Most of the new information relates to the section drawings and plans of our excavation at what we believe to be *Clausentum*, with the streets and Roman road lanes crossing it.

Much of the activity has been writing up the excavations at *Clausentum*, by the A32 at Exton. The farmer was keen to use his digger to take off the soils, so much more was achieved with the manpower available, but this does not help with the writing up, available at <www.nehhas.org.uk/sha19-22.htm>, sites 6 - 9 on the Base Line. The two principal streets, Sites 6 & 7, were cut into the natural chalk which held the Street material in place - the main components were chalk and sand coloured clay. A running surface of hard white chalk rounded lumps was apparent for 6m of the 11m for the E - W Street. For the N - S Street this running surface was best preserved and covered most of its width.

Site 8, Southern Street crossing the mid Roman road lane of mainly hard white chalk, but where the Street crosses the Roman Road material is replaced by the sand coloured clay street material.

Site 9 was initial machine trench experiments, first where no structures were expected, then over part of the Northern Roman Lane - which was made of hard white chalk 38cms thick, on the soft chalk natural which had been rammed. Later the rest of this Northern Lane was uncovered, but a basin had been cut into most of it, dated to sub Roman - Early Anglo-Saxon, which may have been active for some time as a ritual.

The only excavation we undertook was where 3 parallel feature come out of Chawton Park Wood, see <www.nehhas.org.uk/rd13-14j.htm> for map. The outside features are Roman Roads. The central feature is a 60 Roman feet wide ditch - which has stone running lanes built into both edges. There is also evidence of something in the middle of the ditch. The 2024 excavation found that orange material came up. There had been an earlier excavation through difficult woodland, but the photos showed the occurrence of this orange material, and its height is above the two running lanes. The interpretation has been that this is a water feature running from the top of the downs to a mill pond in the valley.

Possibly logs could be slid down the clay bottom of the ditch, assisted if necessary by horses on the running lanes. This will be written up and reported further. Other water features have been found around this Winchester - London Roman Road.

RR426(x). Possible Roman Road between Winchester and Coombe Wood.

Original work by NEHHAS. Summarised by Mike Holmes

NEHHAS Field Archaeology Branch report ongoing work to establish the course of this possible road. The following is the route suggested so far. The road left Winchester by Telegraph Hill and the present day A272. Excavations were made at Chilcombe zig-zag. Terrace-ways were identified at Exton. The suggested route then followed Old Winchester Hill to Teglease Down, Chidden Down and Coombe Wood (SU 673 180). NEHHAS suggest that the destination of this road may be Chichester. Alternatively, if it continues in an easterly direction, it may have crossed RR155 and joined with RR140 (the Greensand Way) at Hardham. Further work is awaited. In *Itinera* 1 page 378 the number RR425(x) was reserved for this possible road. This number is now withdrawn and RR426(x) is reserved. Information from Richard Whaley of NEHHAS FAB.

RR425. Probable Roman road from Rowlands Castle to Havant and Hayling island

Original work by Grahame Soffe and David Johnston. Summarised by Mike Holmes

Margary continued to collect information for newly discovered roads, and allocate new road numbers, between publication of the last edition of his book in 1973 and his death in 1976. These are not well recorded.

Following a report made in 1974 (Soffe and Johnston 1974, 114-116), the Ordnance Survey surveyed this possible Roman road in the NW quadrant of sheet SU70. The road was believed to run from SU 730 095 to SU 733 102. It is reported that the metalling was seen at SU 7272 0867 and at SU 7212 0719 in 1966. Margary allocated the number RR425 at that time but the report was too late to be included in Margary 1973. For further details see: OS Surveyors report RR425 on RRRA website at https://www.roadsofromanbritain.org/members/os/rr425.pdf, accessed April 2025.

Reference

Soffe G. and Johnston, D. E. 1974, *Route 421 and other Roman roads in south Hampshire*, RAH 2, Rescue Archaeology in Hampshire, published by the South Hampshire Archaeological Rescue Group.

RR42aa(x). Roman Road from North Walsham, Hampshire to junction with Port Way (RR4b)

Original work by David Staveley, summarised by Mike Holmes

RR42a is the well established Roman road from Winchester (*Venta Belgarum*) to Silchester (*Calleva Atrebatum*). Staveley has identified a previously unknown branch road which leaves RR42a near to North Walsham (SU 567 452) and takes a northward course until it meets the Port Way (RR4b) near Pamber Green (SU 594 596). He makes the observation that the purpose of the road is not clear. It duplicates RR42a and does not connect to any known Roman settlement. However, the lidar images are quite clear. Staveley also points out linear earthworks believed to be Iron Age to the east of RR42a. These earthworks are parallel to the Roman road and their purpose is not clear. RR42aa(x) has been allocated for this road. The Staveley blog can be viewed at: <https://youtu.be/lqtToiDTFe8?list=PL5U75tDHi68ufamyzGQx74wFTaOOR0M80>

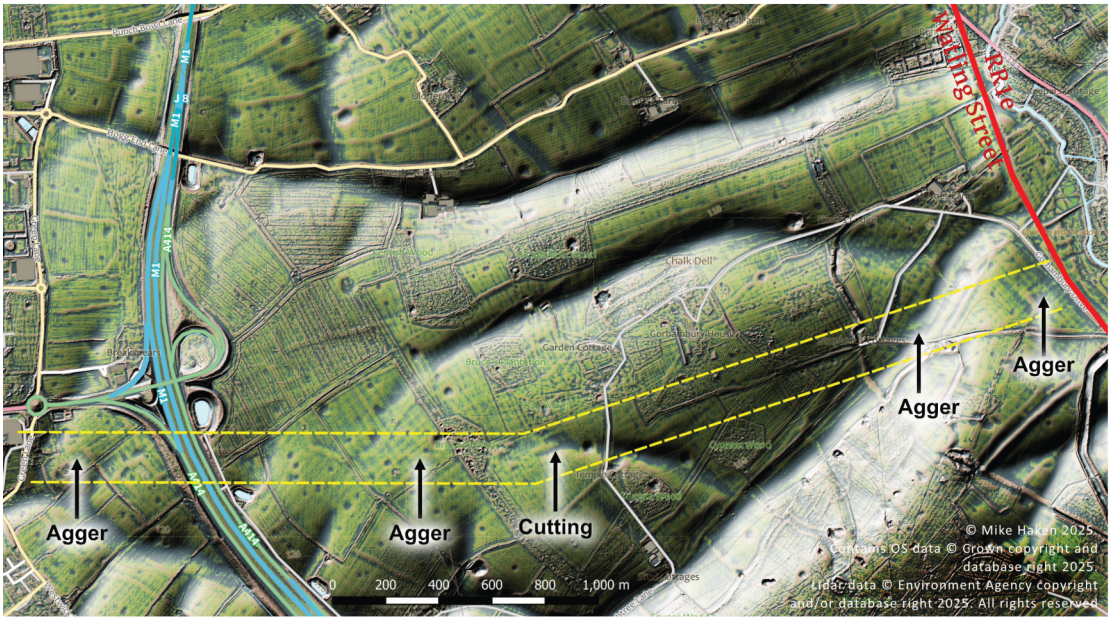
Hertfordshire

RR16 St. Albans to Alchester, eastern end.

Research and summary by Mike Haken, with a contribution by David Ratledge

There has long been a suspicion that this road branched from Watling Street north of St. Albans at Gormanbury and then headed west through Hemel Hempstead, rather than the nonsensical route proposed by the Viatores from the Silchester gate. Until now though, evidence has been thin. Lidar analysis conducted in summer 2024 revealed a broken linear feature leaving Watling Street at TL 1278 0805, following a straight alignment which takes in the known length of road (HHER 14626) west of Shepherd's Cottages. The former trackway between TL 1293 0784 and TL 1207 0782 (not highlighted on the illustration) has been suggested by David Ratledge to be a late Roman 'shortcut' running direct to the northwest gate of the late 3rd century defences.

Lidar shows the Roman line in a cutting across a low ridge at TL 1091 0743, after which it changes alignment (TL 1073 0737) to head almost due west. Again, this is just traceable on lidar (image attached) to about TL 0887 0740, west of the M1, confirmed by Google Earth imagery as a pair of parallel cropmarks 16m apart on Google Earth 22/5/18 and 24/3/20. Curiously these are reverse cropmarks in both images. It then disappears beneath Hemel Hempstead.



Lidar visualisation showing the faint remains of RR16a heading west from Watling Street.

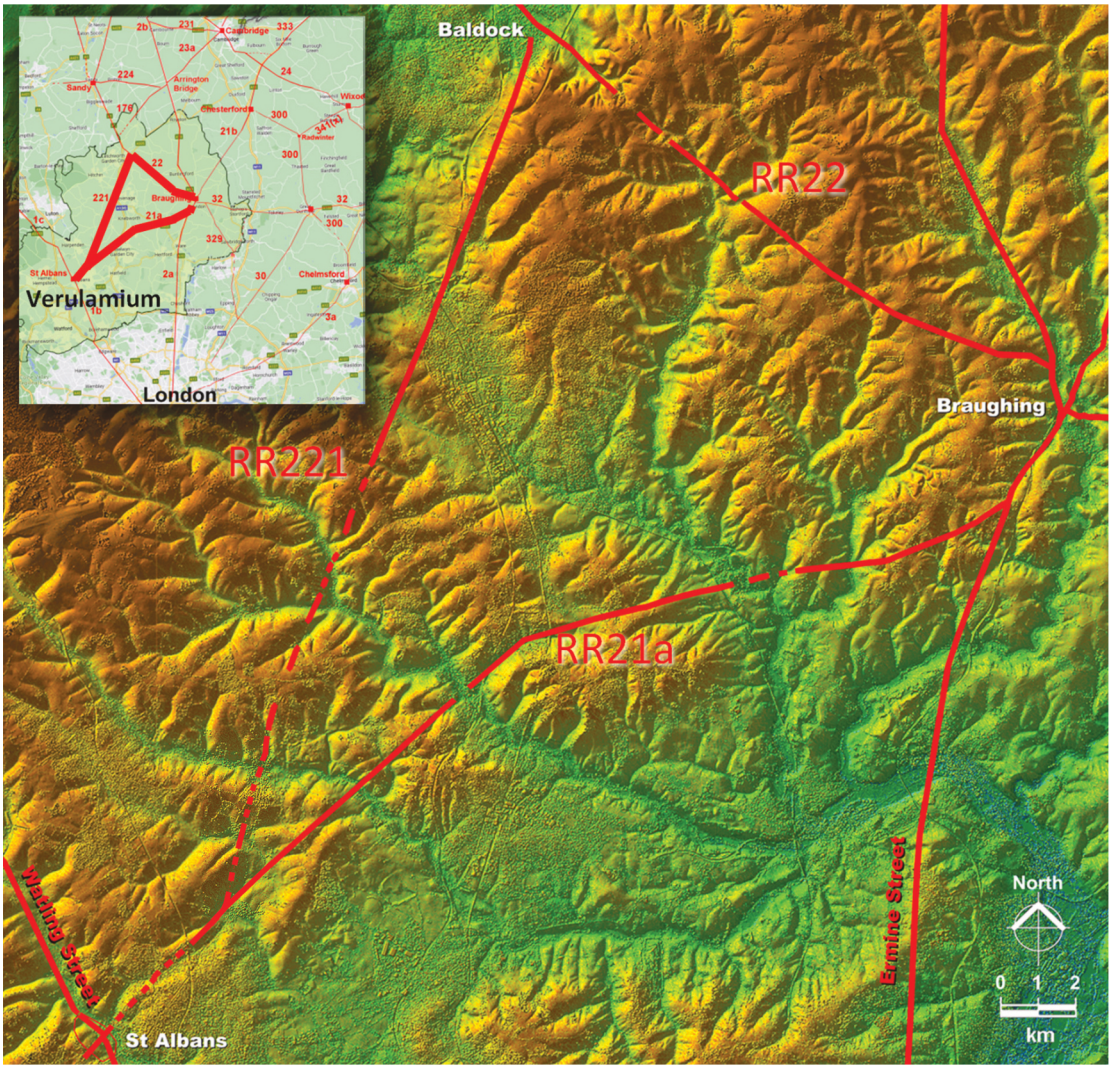
From this point westwards the line is mainly conjectural, although the line coincides with former field boundaries between TL 0509 0745 and TL 0509 0745, where Google Earth imagery from 30/6/2009 shows two parallel linear features, again about 16m apart. If this line is correct, there is no need to change alignment again until somewhere near TL 0357 0744, where it would have needed to turn WSW to avoid a steep sided valley. This segment does not reveal itself on lidar, however with the eye of faith there is a discontinuous and diffuse cropmark on Google imagery from March 2022 between

TL 0272 0724 and TL 0155 0697, although it could be nothing. The road would then cross the R. Bulbourne and turn again near TL 0097 0684 to run up the Bulbourne valley towards the settlement at Cow Roast.

RR21a, RR22, RR210a and RR221. *Verulamium*, Wheathampstead, Braughing and Baldock

Work by David Ratledge and Phil Sparrow

Two complementary articles in the RRRA 2024 Summer newsletter, available at <https://romanroads.org/Newsletters/Members/Newsletter_29_Summer_24.pdf>, considered the possible intersecting routes of these four roads.



Northwest of St Albans (Verulamium) were the small Roman towns of Baldock and Braughing, which were linked by RR221 and RR21a respectively. A third road connected the two small towns, R22, forming a triangle. Base Lidar data is © Environment Agency copyright and/or database right 2023. All rights reserved. Contains Ordnance Survey data © Crown Copyright and database, 2023.

Lancashire

Collated by Neil Buckley

RR70d. Walton-le-Dale to Lancaster. An archaeological excavation at Moons Farm, Catterall, (SD 50134 42738).

A private excavation by A Jackson in March 2022.

A private excavation was carried out by Andy Jackson at Moons Farm in Catterall in March 2022. The location was on the suspected alignment of the Roman road from Walton-le-Dale (RR70d), just north of a hedge line and track at Moon's Farm.

The road stones were encountered only around 150mm below the surface and there was a slight camber. There was only time to excavate about 4.5 metres of the road but its appearance was virtually identical to that excavated on the same alignment at Matshead Farm, Bilsborrow, south of Catterall. In view of its similarity to that at Matshead Farm, the exposed section was not disturbed and left intact. There was no reason to doubt that it would have been of the same or very similar construction i.e. 500mm thick (surviving) and 8 metres wide. Beyond this section, at the junction of the two roads, lidar shows a depression so the assumption is the road stones have been robbed away from there.

PRN43043 (ELA3352) Date 07/03/2022 - 07/03/2022

RR703, Ribchester to Kirkham. Archaeological Evaluation at the proposed Cottam Parkway Railway Station, nr Preston, Lancashire: (SD 4909 3150)

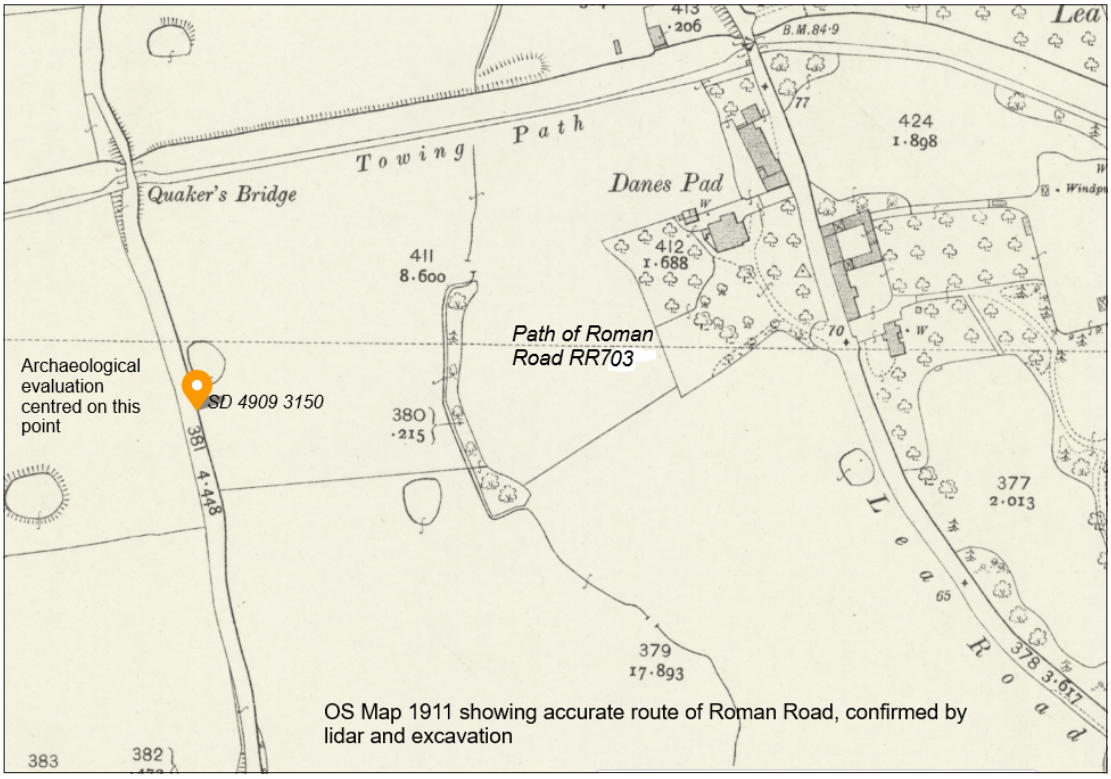
Excavation by Rocket Heritage & Archaeology Ltd

Rocket Heritage & Archaeology Ltd was commissioned by Lancashire County Council (LCC) to undertake an archaeological evaluation at land off Lea Road and Sidgreaves Lane, centred on National Grid Reference SD 4909 3150. The work was commissioned by LCC in response to conditions on Planning Permission Reference LCC/2022/0049. The proposed development is for the construction of a new railway station and associated works including access roads and a new bridge over the Lancaster Canal. This report presents the results of the archaeological evaluation, which was accompanied by a Strip, Map and Record excavation.

The work was undertaken over eight days between 16th and 25th October 2023. Two trenches were excavated measuring 30m by 2m. They were targeted on the suggested line of a Roman road (Margary RR703) between Ribchester and Kirkham.

No archaeological remains were identified which supported the presence of a Roman road or other Roman-period activity. The evaluation confirmed the long-term agricultural use of the site, with five furrows attesting to the historic ploughing regime. A further feature was interpreted as either a pond or marl pit.

Note by NB: The lidar map of the RR703 *agger* between Lea Road and Sidgreaves Lane confirms that it is badly damaged but still detectable, mostly behind Danes Pad House. In the field beside Sidgreaves Lane it is ploughed out. However the line on the OS Map from 1911 is accurate and places the road some 50m north of the dig site centred at SD4904 3150, so it was unlikely that the road would be uncovered at this location. The alignment indicated by lidar was confirmed by excavation at Ward's House Farm, Salwick in June 2022. (PRN44007 (ELA3617) Date: 16/10/2023 – 25/10/2023)



RR703 at Westleigh near Cottam, Lancs

RR70d. Possible Roman milestone.

Reported by David Ratledge

An article in the RRRA 2024 Autumn newsletter, available at <https://romanroads.org/Newsletters/Members/Newsletter_30_Autumn_24.pdf>, speculates that a cylindrical stone near RR70d in Garstang could be a previously unrecorded Roman milestone

Greater London

Collated by Matt Sparkes

RR1c. Borough of Southwark, Old Kent Road (junction with Ilderton Road), SE15, TQ 3520 7733.

Work by Dave Taylor (MoLA) and Chris Constable (Southwark Council)

In Summer 2024, a section of Watling Street was located under the Old Kent Road during the installation of underground pipes by utilities company Veolia. This was the first occasion in this part of London where Watling Street had been found to be located below the present road, with previous finds having been limited to locations where the modern road diverged from the original Roman line.

The road surface (exposed in a 2m transect) was found directly beneath the modern road surface and was described as 'well preserved'. The Roman fabric measured 5.8m wide and sat between areas where the remains had been destroyed by utility trenches. The original width therefore could not be established but had previously been found to be c.14m about 1km to the northwest at Cantium Retail Park (TQ 344 778), at which point the road surface was c.30m south of the Old Kent Road.



Watling Street revealed under Old Kent Road during the installation of services. Image courtesy of BBC

The construction of Watling Street at the junction of the Old Kent Road and Ilderton Road consisted of '*[a] solid foundation of compacted gravel sealed by two layers of chalk, [...] topped by another layer of compacted sand and gravel*'. This material measured, in all, 1.4m thick.

The project to install new pipes continues in the general area and it is hoped that further light may be shed on two topics of particular interest.

1) The section of the Old Kent Road where the present find was located runs very straight for c.1km and appears to represent the original Roman alignment. Further to the northwest, for example at Cantium Retail Park, the Old Kent Road runs at a similar bearing but apparently slightly to the north of (and parallel to) the Roman line. The find at Cantium Retail Park would seem to be on or very close to the Roman alignment running from the southeast, which would appear to suggest that the Roman road would be found consistently along that line. However negative evidence approximately halfway between the Ilderton Road and Cantium Retail Park finds indicates very strongly that this is not the case and that the Roman road must have shifted alignment at some point between these two locations. The exact course of Watling Street in this area thus remains to be firmly established.

2) About 400m to the northwest of the Old Kent Rd / Ilderton Road site is the presumed location of the junction between Watling Street and the London-Pevensey road (RR14). It is anticipated that work to the south of this location may shed light on the exact alignment of the northernmost part of RR14 and thus clarify the precise location of the junction.

(The text above is based largely upon discussion with Dr. Chris Constable, to whom my thanks.)

RR150. Borough of Croydon, Central Croydon and Purley Way Playing Fields.

Research by Matt Sparkes

An article published in Surrey Archaeological Collections volume 106 has reassessed the evidence for the course of RR150 (London-Hassocks) as it passes through Croydon.

The route originally proposed by Margary back in the 1930s had been increasingly overlooked by local archaeologists because the majority of Roman settlement evidence had been uncovered perhaps 400m to the east, along the line of the modern-day high street through the town. The high street was thus commonly suggested to represent the actual line of the Roman road, despite a marked absence of road evidence to support this theory.

The recent SyAC article points to two excavations (post-dating Margary's work) which were directly on Margary's proposed route and which uncovered evidence very similar to multiple established Roman road finds close to the Greater London / Surrey border. These two finds (located southwest of Croydon, on or close to Purley Way playing fields) were not recognised as Roman at the time of the excavations but can now be seen to be linked by a c.1km very straight lidar feature, which is apparently crossed by signs of medieval ridge and furrow agriculture.

Further evidence (including early maps, a medieval document, antiquarian accounts and the long-established Roman alignment to the north of the town) indicates that all sources are strongly in favour of the route originally proposed by Margary.

Margary's route passes through the part of Croydon inhabited in Saxon times, dominated by the extensive Minster/Palace complex (which dates back to c.800 AD and has been continuously occupied from then into the present day). This complex has not been subjected to significant archaeological excavation, which is suggested to be the reason that most of the Roman settlement evidence has been found further to the east along the High Street line.

The online version of the article is available at <https://archaeologydataservice.ac.uk/library/browse/details.xhtml?recordId=3257499>.

RR3a. Borough of Tower Hamlets, Iceland Wharf, Iceland Road, E3, TQ 3735 8370.

Work by Ross Johnson and Lee Waters of AOC.

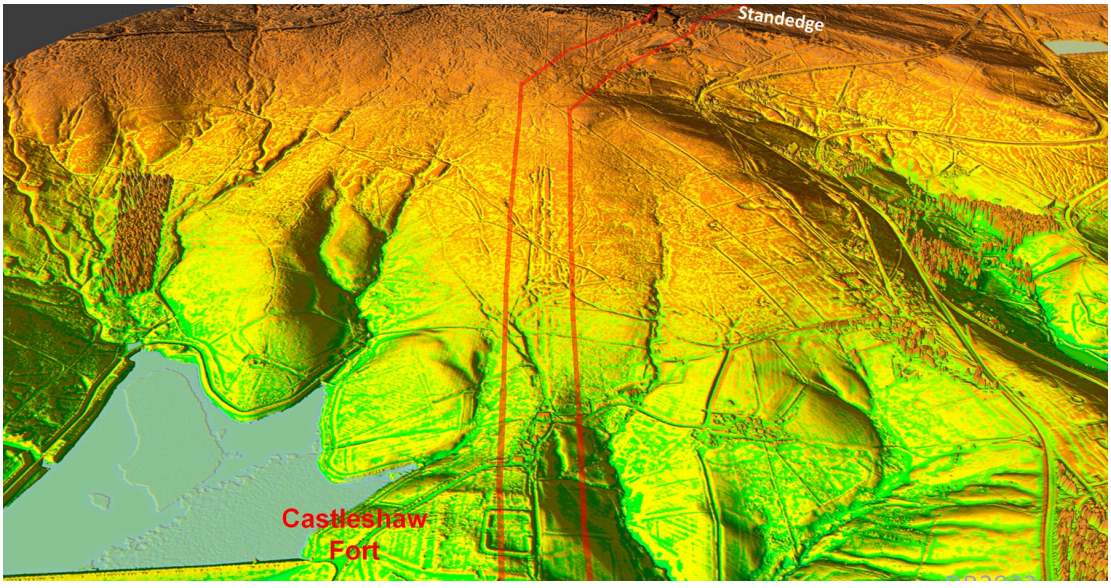
A small scale watching brief discovered (in at least two locations) a feature described as a '*hard gravel layer*', close to the assumed alignment of RR3a (London-Colchester). The location is close to the crossing of the River Lea. The existence of a Roman building in the near vicinity was interpreted as indicating '*either the presence of a Roman period waterfront or [a] support structure for the road as it crossed marshland*'. (Source: London Archaeologist 16 (s2) p69.)

Greater Manchester

RR712 Searching for the Roman Highway beside Castleshaw Roman Fort: Geophysics in Daycroft Field. SD 99870 09550

Work by Tim Jeffery with support from Phil Barrett and Norman Redhead

A series of geophysical surveys were carried out on a 270 m long and 30 m wide strip of Daycroft Field to the south of Castleshaw Roman fort in the summer of 2023. The project was instigated by the Friends of Castleshaw Roman Forts with the aim of determining the presence or otherwise of the Roman road termed Road 712 in Daycroft Field (Margary, 1973). The surveys were carried using earth resistance, gradiometer, and ground penetrating radar (GPR) techniques. The earth resistance survey work was carried out by Phil and Sarah Barrett on behalf of the Friends of Castleshaw Roman Forts. The gradiometer and ground penetrating radar surveys were carried out as part of an MA dissertation at the Department of Archaeology of the University of Sheffield (Jeffery, 2023). In addition, a re-examination of lidar data in and around Daycroft field was carried out to aid interpretation of the geophysical surveys.



A David Ratledge 3D visualisation of RR712 passing Castleshaw. Base Lidar data is © Environment Agency copyright and/or database right 2023.

The site comprises part of a pastoral field immediately to the south of Castleshaw Roman Fort, known as Daycroft Field, located at grid ref 399870 409550. Note that it forms part of the Scheduled Monument for which a Section 42 licence for the geophysical survey was granted on 17th April 2023.

The earth resistance survey was carried out between 20th May and 30th July 2023. The gradiometer survey was carried out between 20th and 22nd May 2023. The GPR survey was carried out between 26th May 2023 and 6th June 2023.

The reinterpretation of the lidar data provided strong evidence of RR712 at the western end of Daycroft Field and to the east of Castleshaw hamlet in the form of two parallel carriageways climbing towards the Standedge escarpment.

The earth resistance survey provided good contrast between low and high resistance features. Evidence for RR712 was most clear at the western end of the survey. The gradiometer survey provided evidence of activity to the south of the fort but with insufficient detail to distinguish individual features. The ground penetrating radar survey provided evidence of a larger number of features and gave approximate information on the depth of the features. This included agricultural features at shallow depths, evidence of buildings to the south of the fort and strong evidence of a deep southern ditch of RR712 connecting to the south gate of the fort.

The location seems to be where David Ratledge's lidar predicted in 2016.

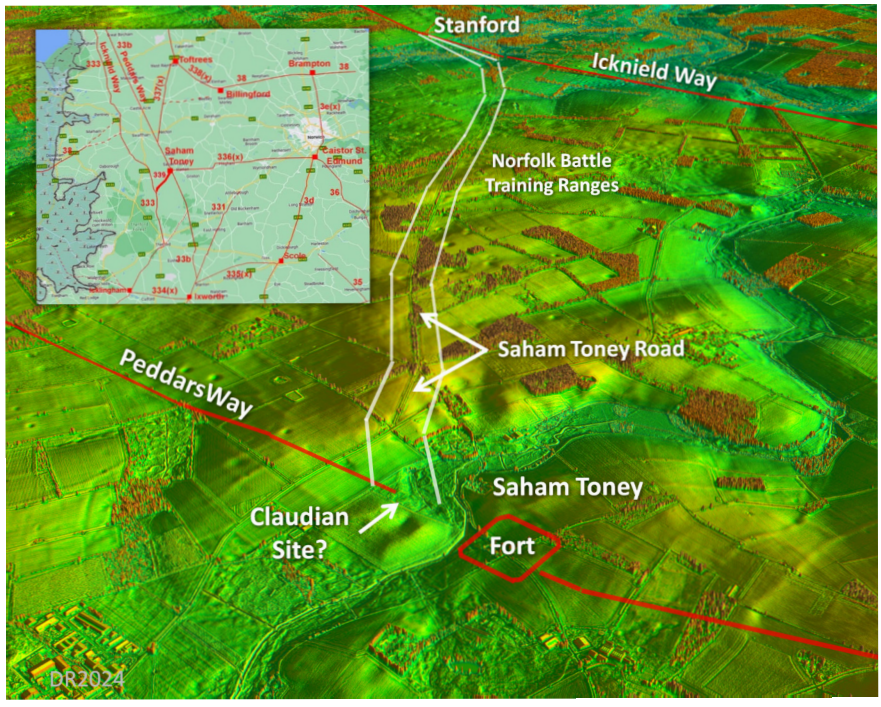
Reference: **Jeffery**, T., Barrett, P., and Redhead, N., 2024: *Searching for the Roman Highway beside Castleshaw Roman Fort: Geophysics in Daycroft Field*. Available at <https://www.castleshawarchaeology.co.uk/documents/Castleshaw_Daycroft_Field_2023_Geophysical_Survey_Report_Final.pdf>, accessed April 2025. See also other research documents relating to Castleshaw on The Friends of Castleshaw site <https://www.castleshawarchaeology.co.uk/documents.htm>, accessed April 2025.

Norfolk

RR339(x). Saham Toney to Stanford.

Work by David Ratledge

An article in the RRRA 2024 Autumn newsletter, available at <https://romanroads.org/Newsletters/Members/Newsletter_30_Autumn_24.pdf>, demonstrated that there was a linking road between Saham Toney and Stanford. RR339(x) has been allocated for this road.



Oblique Lidar image looking across the Saham Toney Roman settlement site towards Stanford and the Icknield Way. Lidar data is © Environment Agency copyright and/or database right 2023. All rights reserved. Inset: Location map - base map copyright Google 2024.

Northumberland

RR873(x) formerly RRX110. Whinney Hill to Longshaws

Original work by Mike Haken

Suggestions of a possible road have been observed on lidar imagery heading south-south-east from Whinney Hill, where the Devil's Causeway (RR87) makes a major change in alignment. The recorded features are two short lengths of possible *agger* at NZ 1221 9211 and NZ 1305 9017 along with two probable cuttings at stream crossings at NZ 1273 9090 and NZ 1335 8916. If these represent a road, it seems to be heading to the fortlet at Longshaws, half a mile further on. No trace has yet been found south of the fortlet.

If these indications are part of the long sought link road between Newcastle and the Devil's Causeway, previously allocated the OS number RRX110, (OS data available to RRRA members at <https://www.roadsofromanbritain.org/os/rrx/RRX110.pdf>), this could prove to be a valuable discovery. Road number RR873(x) has been reserved.

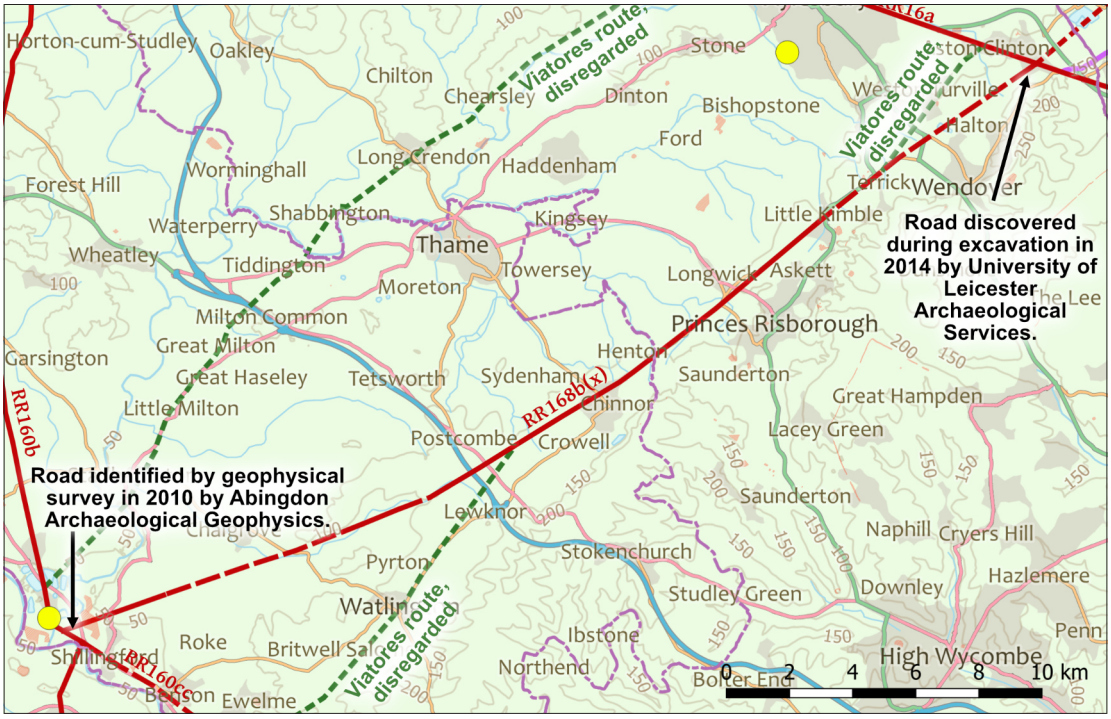
Oxfordshire

RR168b(x) Dorchester-on-Thames to Aston Clinton

Research and summary by Mike Haken

The Viatores (1964 55-6) described a road they referred to as The Lower Icknield Way (RR168b) from Lewknor (Oxon.) to Aston Clinton (Bucks.), on Akeman Street, which they claimed to be a continuation of RR168c, a supposed 'contemporary trackway' from Streatley. There is no substantive evidence in support of the latter, but the road they numbered RR168b is a rare example of the Viatores getting it almost right. However, rather than starting in Lewknor, it was identified in a geophysical survey (Booth 2024, 83) branching from RR160cc in Dorchester-on-Thames, although not recognised at the time for what it was. It does not survive well here, the only length of *agger* visible on lidar imagery (on precisely the same alignment) being between SU 6081 9464 and SU 6126 9480, although former field boundary features between SU 6316 9545 and SU64179580 preserve the line. It appears to make a 3° turn more northeasterly just after the B480 crosses it, being visible again on lidar imagery for 1200m between SU 6768 9708 and SU 6880 9755, partly beneath modern field boundaries. It changed alignment more northeasterly again (about 10°) when crossing the stream at South Weston (SU 6983 9794), after which heavily truncated and fragmentary remains visible on lidar imagery confirm the new alignment which is then taken up by a modern trackway at SU 6983 9794, just north of Aston Rowant, where the route coincides with that recorded by the Viatores.

Mill Lane takes up the Roman line, becoming the B4009 in Chinnor, with another slight alignment change (about 5° more northeasterly) on a slight rise at SP 7583 0159 then keeping straight through Bledlow, Pitch Green and Smokey Row and presumably keeping straight where the modern road (A4010) deviates northwards at Little Kimble and Nash Lee, although there are no traces on lidar imagery. The final tweak in alignment (4.3°), this time southwards, seems to be at the stream crossing at SP 8433 0845, where the Viatores' supposed route diverges to the northeast. The *agger* is almost certainly entirely ploughed out here, as it was found to be when its truncated ditches were discovered by chance in 2014 during an excavation on the eastern edge of Aston Clinton, as the road approaches Akeman Street (Morris 2018).



Map showing the course and location of RR168b(x) in Oxfordshire and Buckinghamshire

Assessing all the evidence collectively, there can be no doubt that the course described represents a Roman road from Dorchester-on-Thames to Aston Clinton, incorporating fifteen kilometres correctly identified by the Viatores. There can be little doubt of the route, although it would be useful to have confirmation near Little Kimble and Nash Lee, perhaps by geophysical survey. It seems possible, even likely, that the road continued in some form northeast of Akeman Street to the Romano-British settlement at Dunstable, although for the time being at least that remains conjecture.

I am aware that David Staveley has released a video on the lidar evidence for this road, correctly identifying the southwestern section, however his route takes it to Cow Roast, not Aston Clinton, which given the 2014 excavation evidence at Aston Clinton (Morris 2018) seems improbable, although a branch road cannot be entirely ruled out.

Road number RR168b(x) has been allocated.

References

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Viatores, 1964: *Roman Roads in the South-East Midlands*, Victor Gollancz, London.

Shropshire

Collated by Paul Smith

RR64 near Wroxeter and Severn crossing

The author of this section is grateful to RRRA member Ed Griffiths and Secretary Dave Armstrong for drawing his attention to a Zoom presentation from the Council for British Archaeology about archaeological work in progress at several key National Trust sites including Wroxeter, Shropshire.

The Wroxeter Roman City (*Viroconium*) lies within the Attingham estate near Shrewsbury in Shropshire. Wroxeter was one of the largest cities in Roman Britain and a nodal point on the road network. I.D. Margary showed at least four Roman roads running into the town: RR1h Watling Street, RR6a to Chester, RR6b to Caerleon and RR64 to Caersws. In addition, at least three other roads have been postulated; Hugh Toller's route to the west, RRX5 leading from Wroxeter towards the Wrekin and an alternative to RR64 which would have seen travellers crossing a bridge south of Wroxeter and the proceeding to the west on a road located south of Toller's route.

Wroxeter was subject to one of the most intensive campaigns of geophysical survey during the 1990s; most of the area of the town was surveyed. In 2023/4 the survey was extended outside the city when the largest geophysical survey ever undertaken on National Trust land was carried out. Over 1,000 hectares (2,471 acres) of the Attingham estate were subject to a magnetometer survey undertaken by Magnitude Surveys. The survey was carried out to help the Attingham Estate plan for future nature

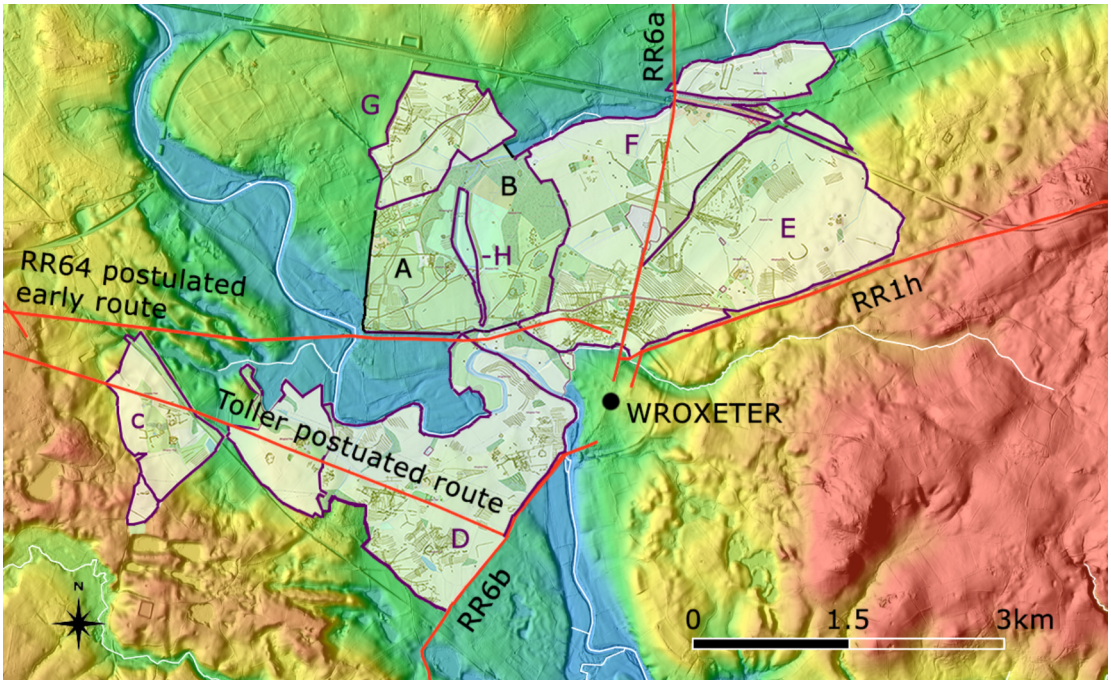


Fig 1: Known and postulated Roman roads leading to Wroxeter shown against a topographical map. The light coloured areas labeled A – H are the geophysical survey areas used by Magnitude Surveys © Paul Smith. © Crown copyright and database right 2024. Lidar data @ Environment Agency copyright and/or database right 2024. All rights reserved.



Fig 2. Magnetic Gradient (Region C (Detail). The orange line is Toller's postulated road. @ Magnitude Surveys 2024. Contains Ordnance Survey data @ Crown Copyright and database right 2024

conservation and tree-planting schemes across the landscape, as part of its ambitious targets to address climate change.

Janine Young, an archaeologist with the National Trust, said '*the extent of the discoveries was a surprise*'. Eight ditched enclosures were identified during the work, likely Iron Age or Romano-British farmsteads, along with two previously unknown Roman villas. Features here included floor plans with internal room divisions and associated outbuildings and each exhibiting evidence of at least two construction or occupation phases; this adds to the six other villas known in Shropshire. The survey also revealed new features associated with a known Anglo-Saxon Great Hall complex and provided further insights into RAF Atcham airfield, including runways and perimeter defences from the Second World War.

Of most interest to members of the RRRA were the conclusions drawn from the technical report on the second phase of the geophysical work which covered areas C – H as indicated on the *Fig 1* above.

Young advised that;

'*The geophysical survey identified a linear anomaly interpreted as the route of a Roman road, running se-nw near to Lower Betton. As can be seen in figure 2 the line of this road clearly lines up with the Roman Road identified and excavated at Sharpstones quarry* (route shown in orange)*, and further confirms the route postulated by Toller as discussed in the introduction to the article', An Engineered Iron Age Road, Associated Roman Use (Margary RR64), and Bronze Age Activity Recorded at Sharpstone Hill, 2009, by Tim Malim and Laurence Hayes in the Transactions of the Shropshire Archaeological and Historical Society, Vol 85, 2010.*' The

introduction is titled: '*Sharpstone Hill and Meole Brace in the Iron Age and Roman Periods: Introduction*' by Roger White and Andy Wrigley.

The authors of the introduction to the discussion of the excavation at Sharpstone Hill explain that RR64, which could arguably be seen as an extension of RR1h, was '*briefly established prior to the creation of Wroxeter fortress that crossed the Severn at Atcham*' (White 2006, 155). This was neither proved nor disproved by the discoveries reported on by Malim & Hayes. Following the diversion of Margary RR64 into Wroxeter consequent on the foundation of the fortress, Margary postulated a dog-leg that connected to the original route on the east side of Sharpstone and further south than Toller's postulated route as shown in Fig. 1. The evidence in the report on the excavation at Sharpstone Hill establishes:

'that this line is incorrect. Instead, the route recently (in 2010) independently established by Toller from crop mark evidence and shown on Figure I is to be preferred as this coincides exactly with the excavated evidence (H. Toller, pers. comm; Evans et al. 2010, 321).'

Mike Haken holds all Hugh Toller's aerial photos (along with his digital archive) however the photos have never been catalogued, and many are difficult to identify. There was no time to find the AP which Hugh used to support his postulated route as referred to by White and Wrigley, for inclusion in this piece. This must be considered work in progress. It seems certain more analysis will be required in the future.

Somerset

Collated by Elliot Mouelhi

RR5b. (Fosse Way), Bath

Trial trenching by Cotswold Archaeology

An evaluation by Cotswold Archaeology at the site of the former Homebase store on the south bank of the River Avon in Bath failed to locate either of the two proposed diversions of the Fosse Way (RR5b), whose roughly parallel projected lines cross the site. The westernmost of these diversions (Fosse Way early diversion) was located on a previous evaluation by Cotswold on the same site in 2019, when a metalled surface was uncovered at a depth of 2.13m below the extant ground level. As part of the more recent evaluation, a trench was placed across the projected line of the easternmost diversion (Fosse Way Wansdyke-Royal Crescent) down to a depth of 3.75m below ground level, without locating any traces of a Roman road. This suggests either that the projected course of the Fosse Way Wansdyke-Royal Cresent diversion is incorrect or that it has been completely truncated by modern development.

BaNES HER: 70869. Nowlan, J. (2024) Former Homebase Site, Pines Way, Bath, Bath and North East Somerset: Archaeological Evaluation. Cirencester: Cotswold Archaeology.

RR5c. (Fosse Way), Batheaston

Watching brief by J.L. Brigers

The installation of a 58m-long drainage pipe along the eastern edge of Fosse Lane, in the village of Batheaston, was monitored to see if any deposits associated with the original Roman road still survived. Along much of the trench, all archaeology had been destroyed by a modern sewer. In places however, several deposits, all consisting of small or medium limestone rubble in a clay matrix, formed

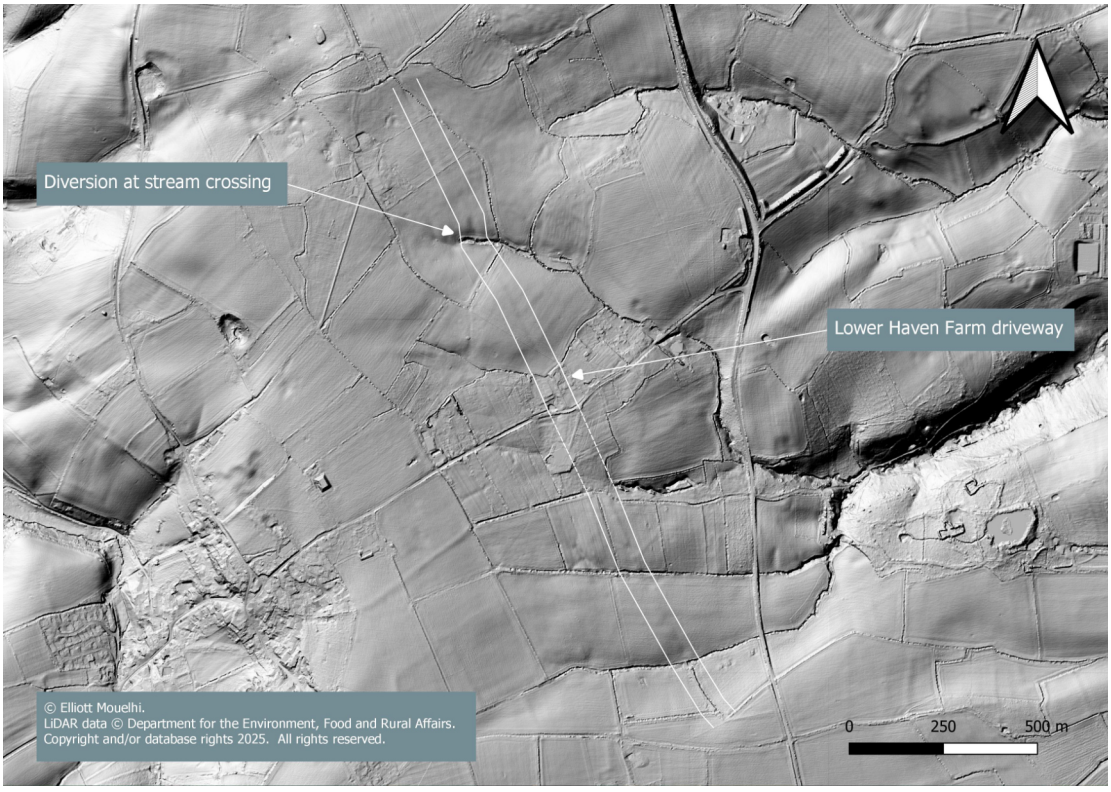
a thin spread directly overlying the natural geology. These were interpreted as possibly belonging to the very lowest layers of the original Roman road, the rest of which has been truncated. One particular metalling deposit was found to extend east of the road's edge, under the verge and possibly further still. This suggests the Fosse Way occupied a corridor wider than the one occupied by Fosse Lane today and that encroachment onto the eastern side of the road over the millennia may have preserved more substantial deposits beyond its extant limit.

BaNES HER: 70993. Brigers, J.L. (2024) Fosse Lane, Batheaston, Bath & North East Somerset: The Results of Archaeological Monitoring. Middlezoy: James L Brigers.

RR52. Norton St Philip

Lidar analysis by Mike Haken

A c.1.7km-long, intermittent but straight linear earthwork, probably marking the line of a Roman road leading south from Bath usually assumed to go to Kingston Deverill, and perhaps beyond to Badbury Rings (RR46) and Poole (RR4d), has been located east of the village of Norton St Philip. Examination of lidar imagery has confirmed that a short holloway, previously postulated as belonging to this road, was indeed part a longer earthwork.



Lidar image of RR52 at Norton St Philip. Base Lidar data is © Environment Agency copyright and/or database right 2023.

An *agger* is visible from ST 7786 5725 heading in a straight line southeast until a stream crossing forces it to pass through a cutting in the north bank of the combe, making a minor 'V' deviation before

returning to its alignment, typical Roman road planning. The holloway continues south of the stream until it is obscured by modern settlement around Farleigh Road, although it appears to align perfectly with the long driveway to Lower Haven Farm, which follows the line of a former field boundary that can be seen on the old OS maps. A prominent *agger* resumes south of Foxholes Lane, reverting to a negative earthwork again after it crosses another stream, before vanishing on the other side of the field at ST 7860 5575. However, the alignment seems to be continued by a short, mostly linear field boundary, southwards to ST 7870 5560.

The earthwork follows a more easterly path than the 'old' courses of this section of RR52, found on the Somerset HER map (24223) and OS file, though the route it took south of Norton St Philip remains unclear. Margary seemed quite sure it followed a green lane west of Woolverton (labelled "ROMAN ROAD (course of)" on the modern OS map), whose original northern extent all the way to the Frome Road can be seen on the tithe map. However, for this to join up with the newly-discovered length of road would require a significant change in alignment, which seems unlikely, though not impossible. Further south, the road may have crossed the River Frome at Oldford, where a section was claimed to have been exposed by groundworks in c.1999 (Somerset HER: 26295).

Somerset HER: 42076; BaNES HER: 60189.

RR494(x) Elworthy

Aerial photography analysis by S. Kaye

A close inspection of Historic England aerial photography taken in the exceptionally dry Summer of 2018 has located a short (c.190m), north-south aligned stretch of the Exeter-Watchet road between ST 0869 3597 and ST 0868 3617, north-east of Elworthy. An intermittent, linear parchmark indicating the road surface is flanked on both sides by verdant lines representing bounding ditches. Large, green patches along the route likely represent quarry pits. The road continues the general alignment of Maunsborough Lane to its south and runs closely parallel with Silverdown Hill, into which it eventually merges. The same aerial photography also reveals a sub-square enclosure c.100m to the west of the road. See Ratledge (2024, pp. 139-40) for a description of this section of the road prior to the discovery of the aerial photography, which has allowed for a slightly more precise route to be traced.

Exmoor HER: MEM24800; Somerset HER: 39966. Ratledge, D. (2024) 'Some Roman Roads around Exeter: A Tribute to the Late Hugh Toller', *Itinera*, 4, pp. 121-174.

RR540. Stanton Drew - Publow

Research by T. Richards, with contributions from E. Mouelhi

A NOTE FROM THE CORRESPONDENT: Independent research by Mr T. Richards, compiled in an unpublished report sent to the BaNES HER Officer in 2022, may have made progress in tracing the course of RR540 northeast of Stanton Drew. This work should have been mentioned in Volume II of *Itinera*, but was unfortunately missed by myself, for which I apologise. A brief summary of Mr Richards' research on RR540 follows. Occasionally his theories are supplemented by my own thoughts.

According to Richards, RR540 was accidentally exposed by a digger in May 2022 at Old Down, near the River Chew, though unfortunately an exact location is not provided. It apparently consisted of a shale surface with stone borders, somewhat similar to the section excavated by Rahtz and Greenfield in the

1950s under what is now Chew Valley Lake. Southwest of where RR540 crosses the River Chew here, its course is attested by an *agger* visible on lidar. To the north however, the road is not as easy to trace. Richards suggests that a terrace centred on ST 6180 6415 may represent its continuation. However, this seems unlikely for two reasons: firstly, lidar shows that this '*terrace*' is in fact a narrow trackway, whose crisp, well-defined outline suggests a modern origin; secondly, Richards' proposed road would climb up from the Chew's low-lying meadow, onto a steep spur and then back down again to the Chew, a course which seems improbably steep. It is more likely that after crossing the Chew, the road ascended the narrow dry valley at the northern end of Culvery Wood, where the gradient is much gentler than to the south.

Northeast of the valley, a very low, very broad, southwest-northeast aligned, linear earthwork is just about visible on lidar. This may be the continuation of the road, though this is purely speculation.

Richards' essential hypothesis is that the Wansdyke (a long bank-and-ditch earthwork thought to date to the sub-Roman or early medieval periods), deliberately incorporates RR540 into its design, forming a fanned gateway for the road to pass through. At Cottles Farm, north of Publow, the Wansdyke appears to turn south, with the bank running along the western side of a brook, which forms a natural ditch. Richards suggests that RR540 crossed the brook at around ST 6239 6480, where it appears the bank may have been engineered to incorporate a holloway that heads east from Publow Farm, which he postulates is the Roman road. Across the brook, the Wansdyke follows an easterly bearing, while Richards' proposed course of RR540 takes a slightly more northerly path, represented by some extant field boundaries skirting along the southern edge of a small combe.

Just as several Iron Age hillforts were refortified and integrated into the Wansdyke's defensive line, it seems highly plausible that the dyke may have been designed to incorporate the existing Roman infrastructure network. Therefore while many details remain uncertain, Richards' main thesis regarding the relationship between the Wansdyke and RR540 seems quite plausible and certainly warrants further investigation in the field.

BaNES HER: 67018; 62363. Richards, T. (2022) M540 Roman Road- Publow/Pensford. Unpublished.

Kingston Deverill (Wiltshire) to Trudoxhill - see Wiltshire, pp 274-5

Staffordshire

Collated by Paul Smith

RR181 through Stoke on Trent

A programme of archaeological investigation (DBA, geophysical survey, trial trenching and a watching brief) undertaken on a site located on the potential course of Ryknield Street (RR181) through Stoke-on-Trent. The site was located off Lordship Lane, Fenton (NGR SJ 88566 45458). The grid reference relates to the centre-point of the development area, the boundary of which included the probable course marked on the map. The course of the road has never been verified archaeologically within Stoke-on-Trent, although physical remains have been found just over the administrative boundary in Newcastle-under-Lyme. There are antiquarian references to its possible route through Stoke and I suspect the course shown on your map reflects that presented in the most oft-cited (and detailed) of these sources – Ward's '*The Borough of Stoke-upon-Trent*' (1843).

Unfortunately, fieldwork identified no traces of the road, but could not rule out the possibility that evidence might survive within an undeveloped area to the NE.

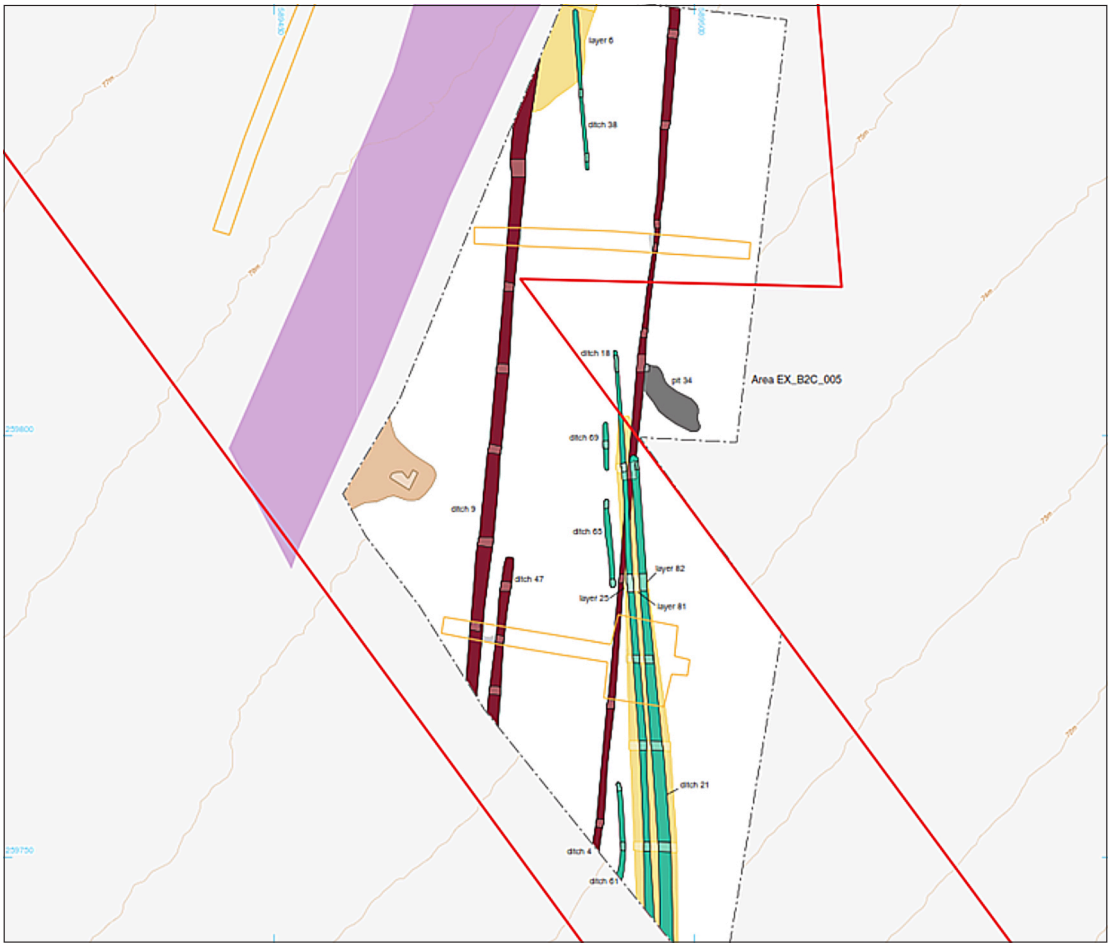
Suffolk

Collated by Geoff Lunn

RR33a. Part of the Anglian Water Pipeline scheme at Little Whelnetham, Suffolk TL 89410 59866

Work by Cotswold Archaeology (Suffolk) Ltd.

A section of Roman Road was excavated in Little Whelnetham as part of the wider Anglian Water Bury St Edmunds to Colchester Pipeline scheme. It was bounded by two ditchlines with a distance of 15.60m between them. No evidence of metalling remained, suggesting it was either highly truncated



RR33a at Little Welnetham as revealed by the installation of water pipes. Red is the site boundary and the chain line the extent of excavation. Roman parallel ditch lines as in maroon indicating the ditches of a Roman road. Post medieval in green. Image courtesy of Cotswold Archaeology.

or represented a less structured trackway. The road was recorded in Margary's *Roman Roads in Britain* as travelling between Long Melford and Pakenham (Margary 1973, 255).

HER Ref WLL019, Archive Suffolk County Council, Report Cotswold Report No: SU0636_1

RR33a. Geophysical Survey on land to the south of Thurston, Suffolk TL 91271 65182.

Work by Suffolk Archaeological Field Group (SAFG)

In 2024, members of SAFG were asked by Thurston Relief In Need Charity (TRINC) to undertake a geophysical survey of land to the south of the village of Thurston, Suffolk. The aim of the project was to see if any traces remained of the known Roman road (RR33a) which nearby cropmarks and lidar traces suggest would cross the field in question. The aim was also to evaluate if any traces of occupation or human activity could be seen adjacent to the road. Both magnetometer and earth resistance surveys were successful in showing traces of the Roman road-side ditches, and there is a possibility that a high resistance area between the ditch lines might have been as a result of compaction of lower soil levels due to construction of the metalled *agger* of the road. No trace of human occupation or activity was detected elsewhere on the site.

SHER Ref SUF098, Archive Suffolk County Council, Report SAFG

Surrey

Collated by Matt Sparkes

RR151. Rowhook to Farley Heath Road.

Research by David Calow and Emma Corke of the Surrey Archaeological Society

Previously mentioned briefly in last year's round up (*Itinera* 4, p.367), this interesting work regarding the nature of RR151 has now been published in Surrey Archaeological Collections volume 106 (pp217-230). RR151 runs approximately northwest from Stane Street, with the alignment conventionally being assumed to extend for c.13km, up to the vicinity of the Farley Heath Roman temple. Whether this represents the full extent of the road remains unclear, as a continuation of the known alignment would potentially link Stane Street to either RR4a (London-Silchester) or the assumed RR400x (London-Winchester).



Excavated surface of RR151. Image courtesy of Chris Gibson.

Recent investigations (via probing etc) led to the Roman road surface being exposed at three different locations (5 trenches in all). The metalled surface (of local sandstone and chert) was found to measure 3.6m wide and 15-25m thick, with indications of a camber of about 7cm (1:17). There was also '*evidence for side*

ditches and, in one place, an apparently contemporary adjoining area of stones that might be the base of a stone pile for road maintenance, a passing place or the entrance to an access track'. These excavations mean that the presence of the road has now been proven along 10.5km of the distance towards Farley Heath temple, 1.5km further than was previously the case.

An additional unusual feature are the two post holes seemingly constructed into the road structure rather than subsequently cut (marked by black circles on the nearby image).

A construction date in the 1st century AD has been suggested based on the engineering details and the link to Stane Street. It remains unclear whether the road remained in use throughout the Roman period. The lack of cart ruts and potholes may suggest that an alternative route was in use by the time that the nearby Rapsley villa was enlarged in the 3rd century.

Sussex

Collated by John Ashcroft

Update on archaeological excavations in 2023 and 2024 which may throw light on the Roman road network

The information in this update derives from Historic Environment Records supplied by East Sussex County Council, West Sussex Country Council and Chichester District Council, for whose rapid and helpful responses I am most grateful. The period covered is relatively short as the update in *Itinera* IV last year covered evidence from the previous decade or so.

In summary, no direct evidence of Roman roads has come to light in the last couple of years. A few reports do, however, throw some light on the possible course of roads, notably two on the edge of Hailsham in East Sussex:

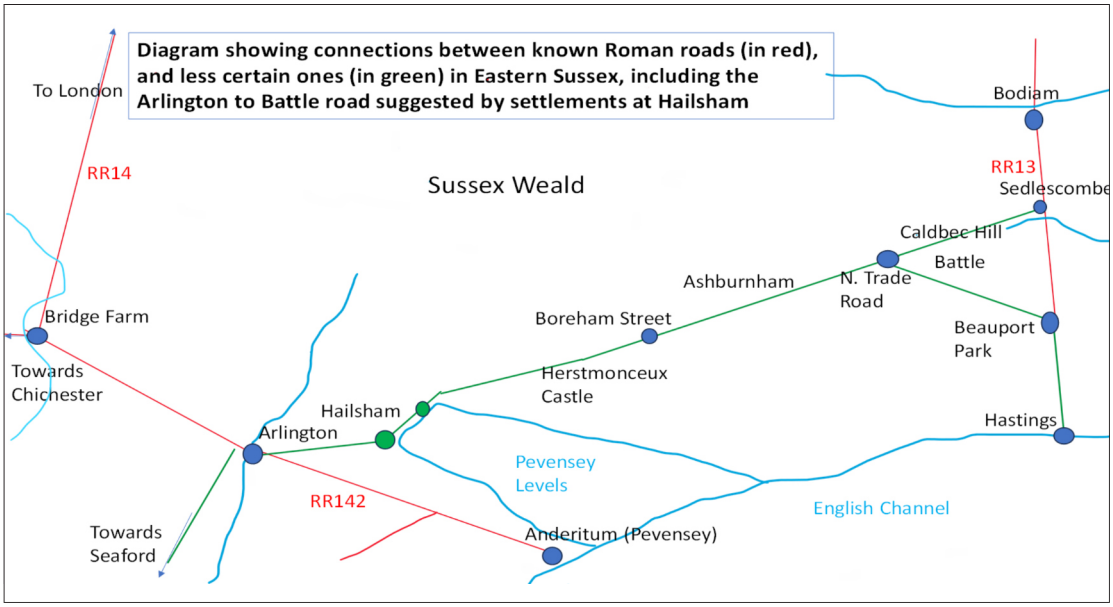
Cuckoo Fields and Ersham Park (TQ 59162 08373 - MES 39145/59431):

Excavation just south of the modern town, unearthed a large number of late Iron Age and Romano-British features indicating substantial occupational activity which was considered likely to extend well beyond the area covered. Finds included pits, pots and ditches, plus equipment associated with salt panning, which is not surprising given the Pevensey Levels sea-marsh close by.

It seems unlikely that a settlement this big, with presumed industrial activity, would be off the Roman road network. The most obvious road would connect to the Romano-British settlement at Arlington about 5km to the west. No traces are visible on the ground but much of the likely course is buried by forestry. Arlington was linked to the major settlement at Barcombe Mills (Bridge Farm) and thence by the Greensand Way towards Chichester (RR140) or by Margary's RR14 towards London. Roads also ran thence to *Anderitum* (Pevensey) (RR142), and probably Seaford, making Arlington quite a transport hub. It seems plausible that the road from Arlington did not end at Cuckoo Fields. Continuing it eastwards would help fill the major gap in the known network that currently exists between the far east of Sussex and the rest of the county.

Old Marshfoot Farm (TQ 60249 09467 - MES 39131/59260):

Excavation at this site east of Hailsham and 1.5km due NE from Cuckoo Fields revealed Late Iron Age/ Roman pottery, with multiple features indicated an isolated area of activity, suggestive of field



Sketch map showing the settlement pattern and postulated road layout in Sussex.

systems, from potentially different phases of Late Iron Age/Roman occupation. Any road headed east of Cuckoo Fields would have to start by heading NE to avoid the Pevensey Levels, taking it right past this site. Thereafter an ENE course to the substantial Romano-British site at North Trade Road, a little west of Battle, the subject of much excavation in recent years, would be plausible. En route there is evidence of a substantial settlement at the suggestively named Boreham Street which led Margary to speculate that a '*high level track-way*' ran thence eastwards to Battle and beyond, taking maybe the course similar to a road recorded on Gough's map of 1360. Artefact finds close to the potential route have also been reported in the vicinity of Herstmonceux and Ashburnham.

From the North Trade Road settlement, it is speculated that a road could have joined Margary RR13 somewhere near Sedlescombe and/or at the major industrial site at Beauport Park (Westfield) just north of Hastings (near which further finds have recently been unearthed, See in particular "*Early Eastern Sussex before 410*", K. Foord 2017, Battle & District History Society, 2017, available on-line at <http://www.bdhsarchives.com/Archives/Collectanea/R5.1%20Early%20Eastern%20Sussex%20to%20410.pdf>. The diagram below shows how the 'new' road joins the others. Incidentally, Battle's place within the Roman road network, assuming these roads were still usable, could explain why King Harold chose to await William of Normandy's army at Caldbec hill, about a km north of Battle and close to the putative route from North Trade Road to Sedlescombe. William could not have advanced further into England whilst Harold camped there controlling the roads and receiving reinforcement.

Turning to West Sussex, recent archaeology at a few sites in the centre and west, at Hassocks, Lavant, Billingshurst and Westhampnett add nothing to our knowledge of the Roman roads to which they were close (although a spectacular Roman timber-lined well was found at the last of these). More might be learnt from what three recent reports may tell us about the settlements that lay south of the

possible course of the road from Westhampnett (ex Chichester) to Shoreham/ Brighton (RR153), and the possibility of a more southerly road, as follows:

- Kingston Lane, Kingston near Angmering (TQ 07825 02720 - MWS 15502): An excavation has unearthed pottery from the first two centuries CE, suggestive of some kind of settlement, to join other settlement evidence found in the Angmering area.

- Land south of Barnham Station (SU 95679 04067 - MWS15665): An excavation has disclosed evidence of settlement including pottery assemblage on a scale significant enough to suggest an import business, which would presumably have needed connecting to the road network.

- Most relevantly, a gradiometer survey at Church Lane Climping (SU 99997 02030 – MWS 15473) has revealed a significant late Iron Age and Roman period laddered or ribbon settlement, with a track-way or road system traversing the site. It is well located relative to a potential crossing of the River Arun, being just 1.5km south of the village of Ford, a place-name suggestive of a crossing without recourse to a ferry.

The three settlements are sort of aligned and the latter two at least might be expected to connect to the Roman road network. However, they lie well south of the road Margary proposed, which has received support from lidar imaging, covered in *Itinera* IV. The alignment, however, has a dearth of significant Romano-British settlements, in contrast with dense settlement of the plain to the south (The substantial settlement reported at Tangmere would be an exception were it not that it was so close, (within a km) from the junction with the London to Chichester road at Westhampnett.

Excavation at Tangmere is scheduled to re-start in 2025). The crossing of the River Arun at Arundel is particularly problematic as the only settlement reported there is a villa located close to the presumed crossing place (were it to transpire that the settlement were larger than a villa this would change things, but excavation in this built-up part of the town is challenging). Crossing further up would require the road to traverse a cliff, and any river crossing here would, as Margary recognised, require a ferry, which is not attractive to the commercial traffic likely to be the road's main users. On the other hand, a ford near the newly identified Climping settlement would have been more convenient and better aligned to pass other settlements such as Barnham and Kingston - maybe a road should be sought here.

Warwickshire

RR184(x). Mancetter towards Grimstock Hill (and Metchley?)

Original work by David Staveley, summarised by Mike Holmes

The south-westerly road from Leicester RR57b met RR1g at a tee junction at Mancetter. Staveley suggests that the Roman road continued across RR1g in the direction of the Roman fort at Metchley, Birmingham. He shows evidence of this continuation as far as Grimstock Hill and a particularly clear section at Butlers Wood. He notes that the Roman settlement at Grimstock Hill is possibly where the Roman road crossed the River Tame. However the evidence for the crossing is not clear. As RR57b does not form a crossroad with RR1g Watling Street and the new southward road is another junction slightly further north on Watling Street, a new number RR184(x) has been allocated for this road. The Staveley blog, and others in his series, can be viewed at: <https://www.youtube.com/watch?v=ckY9StjZDg4>.

West Midlands

Collated by Paul Smith

RR18b. Prince Albert School, Perry Barr.

Work by Worcestershire Archaeology

An excavation at Prince Albert School, Perry Barr in Birmingham during the Autumn if 2019 on the line of the RR18b (Ryknild Street or Icknield Street). This excavation has not previously been noted in *Itinera*. RR18b led from the Roman fort at Metchley in Edgbaston, to the south of the excavation area, to the Roman military base at Wall (*Letocetum*) in Staffordshire to the north on Watling Street RR1g. The excavation was conducted by Worcestershire Archaeology at land to the east of Wellhead Lane and was reported in '*Archaeological excavation at D of E Prince Albert School, Perry Barr, Birmingham*,' March 2020.

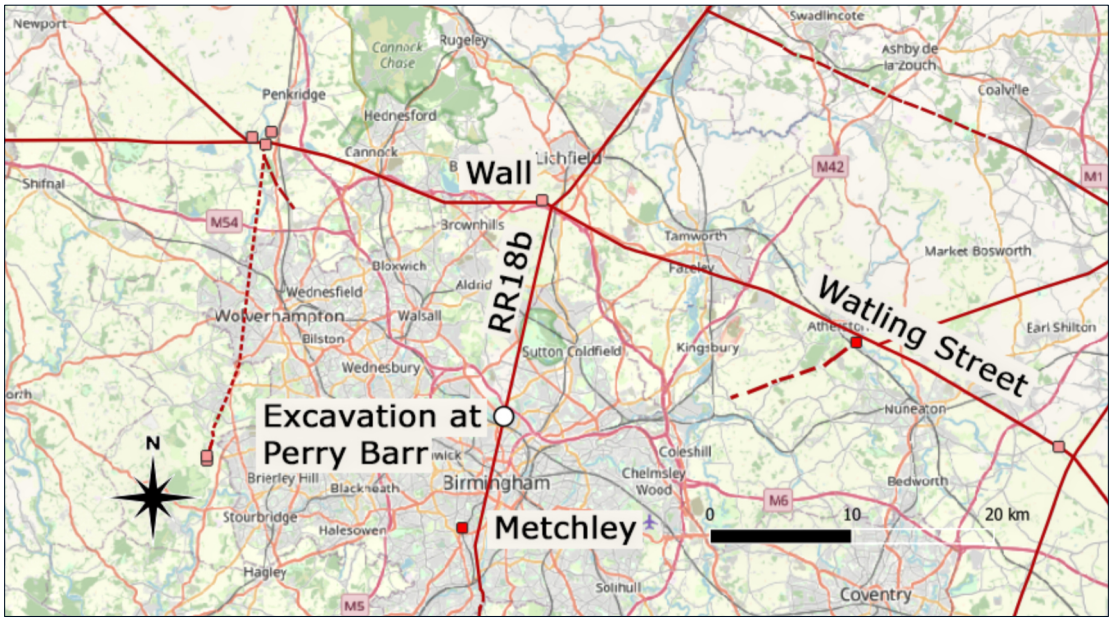


Fig 1. Map showing the location of the excavation at Perry Barr. Background image © OpenStreetMap

Archaeological excavation focused on a length of the possible road to the north-west of the site in the footprint of a proposed new secondary school. A subsequent geophysical survey of the site identified two linear anomalies aligned roughly north-south which were thought to derive from ditches flanking the road. Subsequently an archaeological evaluation of the site was carried out in which the truncated remains of the ditches were identified, although no dateable material was recovered.

The two ditches crossing the site from NNE to SSW were not clearly dated and interpretation of their function was not clear. They are perfectly parallel and a 18m apart which is very comparable to the distance between ditches on other sections of Ryknild Street (for example on the well preserved section of RR18b 4.9 km – 3.09 miles to the north in Sutton Park) and on a section excavated at the junction with RR1 Watling Street. However, no evidence of a road surface survives and an alternative



Fig 2. Plate 1 from 'Archaeological excavation at Department of Education Prince Albert School, Perry Barr, Birmingham' shows the site, looking north-east. The parallel ditches referred to in the text are indicated by red lines. © Worcestershire Archaeology, 2020

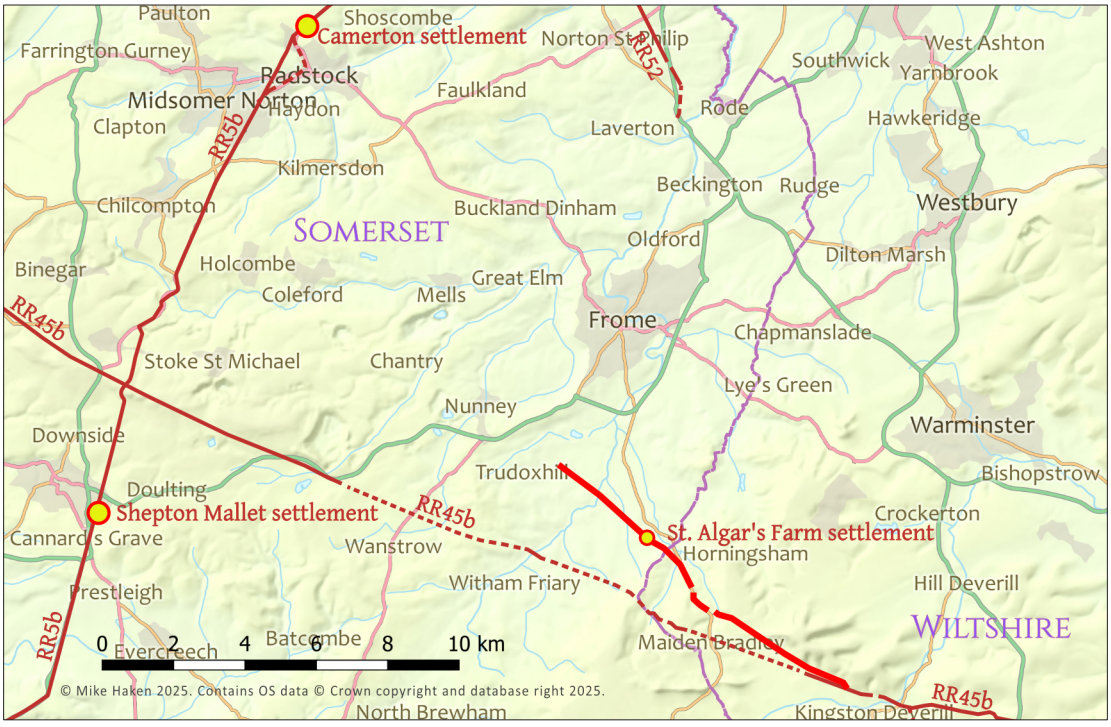
view was that the ditches had no relation to Ryknild Street and that the eastern ditch represents the remains of a section of a Bronze Age pit alignment. If this were the case the western ditch on exactly the same alignment is likely to have been contemporary, perhaps forming part of an enclosure or droveway.

Wiltshire

Kingston Deverill to Trudoxhill (Somerset)

By Mike Haken

A very obvious length of Roman road is visible on lidar imagery as a discontinuous raised linear diverging from the probable course of RR45b at ST 8382 3768. Substantial evidence for the feature was recognised by the Ordnance Survey Archaeology Division (OSAD) in the 1960s as far as ST 8129 3920 near Proutly Wood, and lidar imagery allows us to trace the 'new' road further to just beyond Partridge Farm after which the line is temporarily lost as the road negotiates the steep valleys north of Maiden Bradley, possibly masked by modern roads and tracks. Because of the alignment, the OSAD felt it doubtful that it could be part of RR45b. That conclusion has a slight flaw, since the 'accepted' route has gradients as steep as 1 in 5 crossing the difficult terrain in Great Bradley Wood, whereas our road skirts around the steepest slopes to the north. It is possible, therefore, that the 'new' road could still be part of RR45b until somewhere near Kate's Bench Farm (ST 7963 3999), where the two roads would then diverge, although there is currently no sign of such a junction.



Location map showing the 'new' road which seems to branch from RR45b at Kingston Deverill, traceable as far as Trudoxhill

Further northwest, where our road cannot realistically be part of RR45b, there is certainly evidence of an earlier road immediately east of the B3092, just north of Mill Lane, and fragments of agger are then traceable in a line north-west from ST 7928 4106 with a slight alignment change at ST 7922 4115 before it crosses a stream at ST 7911 4127 with a slightly terraced approach to the former bridgehead surviving on the eastern side, 1.5m above the stream. If any further proof were needed, it becomes conclusive west of St. Algar's Farm, where a small roadside settlement was observed in geophysical survey in 2009/10 (Lambdin 2011; see also Somerset HER 24463), probably associated with a nearby winged villa. The agger seems to survive best at about ST 7799 4218, just south of Shots Thicket, about 600m before it crosses a small stream at ST 7752 4261 near Broadway Farm, with typical shallow cuttings either side, then heading on to the crossing of the R. Frome at ST 7685 4320, again with the typical cuttings either side. All trace of the road ceases at a stream crossing at ST 7583 4393, northwest of which we have to assume it has been largely ploughed out. The destination of the road remains unclear, although the Romano-British settlement at Camerton, near Radstock, must remain a possibility.

Since we cannot be certain if the southern part of this road is a branch from RR45b, or actually RR45b itself, with equal uncertainty regarding the nature of the northern part, the numbering of this road has, for the time being, been deferred.

Reference:

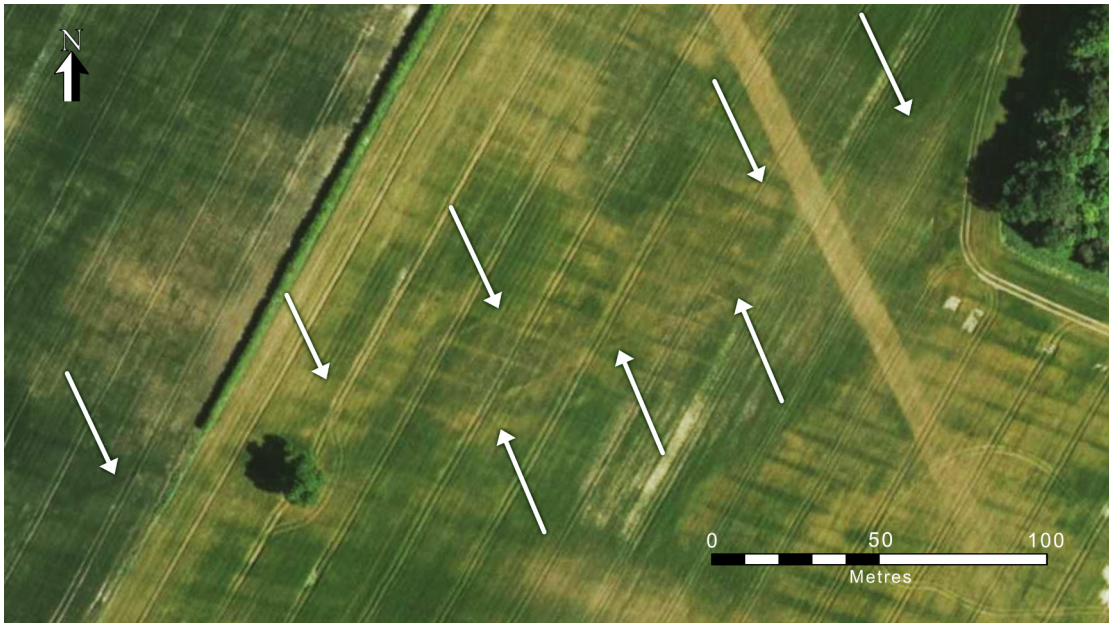
Lambdin, Ceri, 2011: 'The St Algar's Project.' Camertonia 49, 18 – 19. https://www.bacas.org.uk/wp-content/uploads/2017/08/2011-18-19.pdf

Yorkshire

Collated by David Brear

RR81a. Stamford Bridge, Hendwick Hall Farm, 2.21 km to the south-east of Stamford Bridge, centred on SE 69526 54027

Work by James Lyall of Geophiz.biz, for RRRA working with the Battle of Stamford Bridge Heritage Society



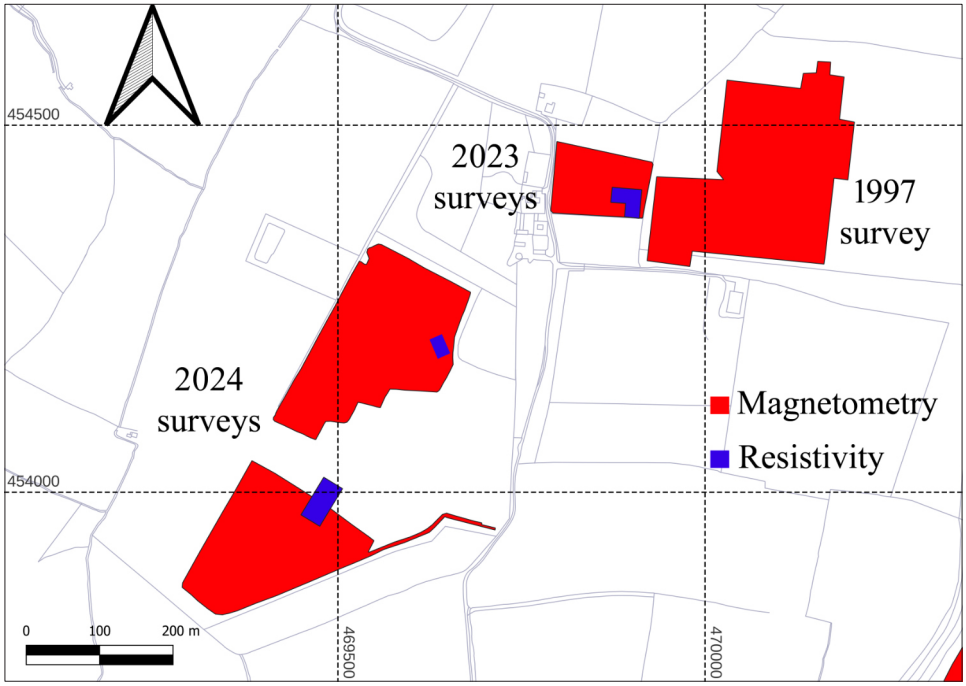
Above: Aerial photo centred at about SE 6952 5415 showing Roman road and roadside features highlighted with white arrows. This is in the field west of Scoreby Lane, the northernmost of the two red area titled '2024 Surveys' in the following map. © Bing maps.

Bing 2022 aerial photographs have revealed the course of RR81a and roadside features (as well as a number of what appear to be prehistoric features) in fields southwest of Stamford Bridge.

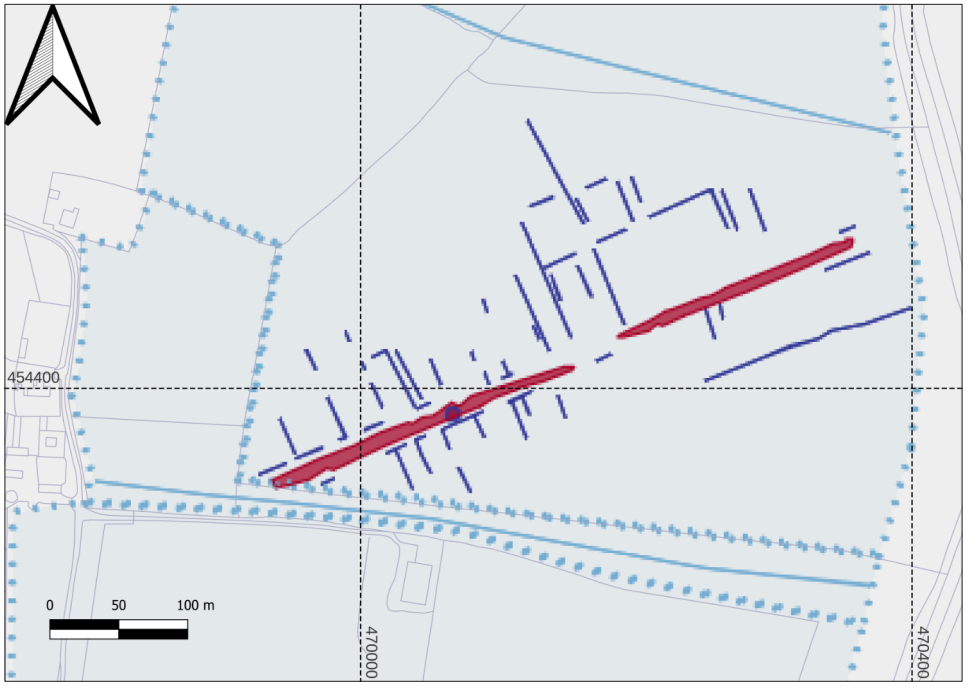
A total of 6.685 Ha was surveyed magnetically (shaded in red and titled 2024 surveys on the map below), and 0.24 Ha with the resistivity meter (shaded in blue). Note that these areas only refer to the 2024 surveys. indicated on the map below, which also shows previous surveys (from 1997 and 2023) which have been carried out near Scoreby Lane.

The final illustration shows the plot derived from the National Mapping Programme (part of the Vale of York project, completed in 2001). The cropmarks are derived from photographs taken predominantly in the early 1990's. The Roman road is shown in red, with the roadside settlement in blue.

What is also clear is that there are virtually no anomalies which might be associated with the Roman road. It is also relevant that none of the other known field boundaries were detected, so it is likely that the detected linear anomaly may have a more recent origin. Many of the aerial views (both Bing and Google Earth) show evidence of ridge and furrow ploughing across the field. The magnetic survey shows no hint of this, which is always a bit of a warning sign, because normally (though not always)



Map showing the various survey areas carried out at Scoreby Lane



Interpretation of the Roman road and roadside features east of Scoreby Lane, derived from the National mapping Programme. These features, and more were also recvealed in the 1997 magnetometer survey .

this form of cultivation can be detected magnetically. Having said this, we had already noticed this phenomenon in the 2023 survey, so it must now be assumed that magnetic survey is not responsive to archaeological feature detection, at least in the areas we have now surveyed.

Because of the lack of response from the magnetic surveys, it was decided to conduct two small scale resistivity surveys on the site, the first across the line of the Roman road (see Figure 12), and the second across one of the assumed prehistoric features in the south The resistivity survey across the line of the Roman road, was once again disappointing in terms of the results. Although a number of linear anomalies were detected, none of them were on the correct alignment, and all of them could be attributed to a modern origin.

In conclusion, it can be stated that the magnetic surveys were unsuccessful in detecting either the Roman road or the potential prehistoric features identified by the Bing 2022 aerial imagery. The resistivity survey also failed to detect the Roman road, but did detect eight anomalies, five of which could relate to archaeological features, a further two of which are the remains of ridge and furrow ploughing, and the final anomaly associated with a now removed tree plantation boundary. The RRRA Report is forthcoming.

RR810. Land north of Bad Bargain Lane, Osbaldwick, York YO31 0LA (SE 633 533)

Work by Allen Archaeology

In November 2023 Allen Archaeology Limited to undertake a geophysical survey using magnetometry on development land north of Bad Bargain Lane, Osbaldwick, York, prior to submission of a planning application for a residential development. A significant amount of Roman activity has been recorded within the development area: excavations associated with drainage work in the late 1950s and 1960s produced pottery findspots, identified the presence of a Roman road, and burials within the site, and excavation at Apple Tree Farm in 1987 revealed pottery kilns.

The survey disclosed boundary ditches and enclosures flanking the Roman road running from York to Stamford Bridge, together with settlement features, including enclosures and boundary ditches.

The report notes that the 1959 excavation revealed cobbling and gravel metalling of the road. The geophysics results do not appear to show a clear difference between the area between the flanking ditches and the surrounding areas, possibly indicating poor survival of metalling across the length of the road.

Reference:

Evershed, R. 2023: *Archaeological evaluation report: geophysical survey by magnetometry on land north of Bad Bargain Lane, Osbaldwick*, York, Allen Archaeology Limited, No. AAL2023147.

RR8a. South of New Lane, Green Hammerton, North Yorkshire YO26 8FU (SE 4645 67)

Work by the Green Hammerton Archaeology Society, under the supervision of Dr. Jon Kenny.

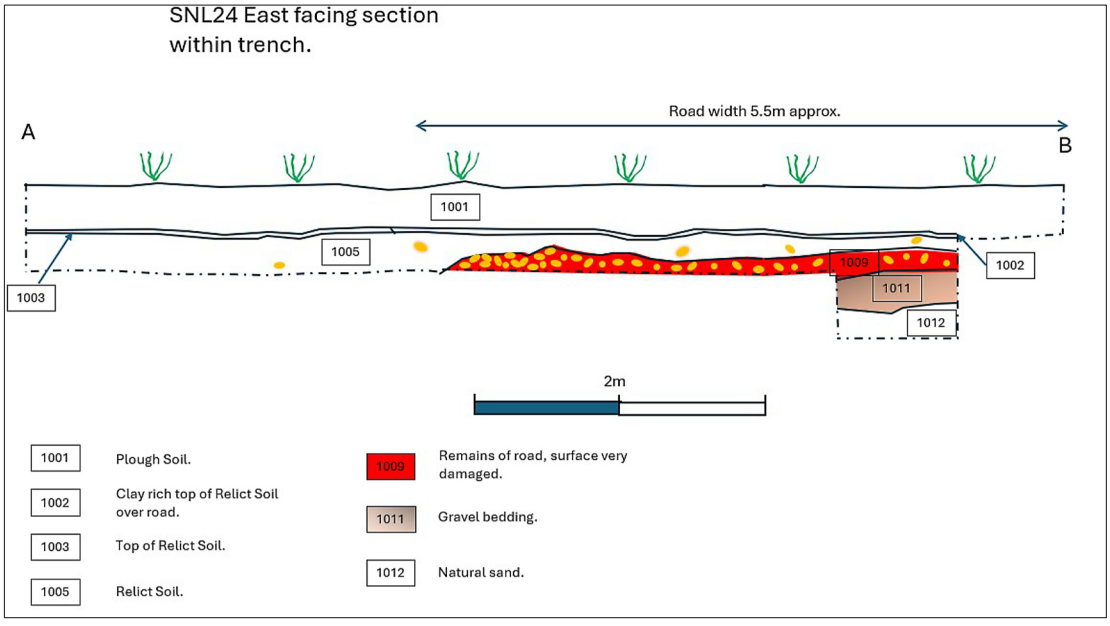
Preparatory field walking, and an excavation, has been carried out on the line of Dere Street east of Green Hammerton. A trench, 15m x 2m, disclosed both edges of the road, here 5.5m wide. A gravel bedding layer on the natural sandy soil supported a compacted cobbled surface. Time prevented a successful search for roadside ditches. Soil immediately overlying the cobbled surface contained Northern Gritty Ware (approximately twelfth century), suggesting the road fell out of use in the early medieval or Norman period.

The group plans further research to establish the route RR8a takes through the village before it meets RR280 (Rudgate) around 1 mile north of the village.

Unpublished excavations 1 km eastward in 2008-9 by Northern Archaeological Associates Ltd on the line of Dere Street, on the line of the Marton-Acomb water pipeline, found a previously unknown Roman roadside settlement with pottery kilns over an area of c.5ha., and exposed the road at Pool Lane, Skip Bridge Farm, Moor Monkton and Shirbutt Closes. At Pool Lane the road was defined by



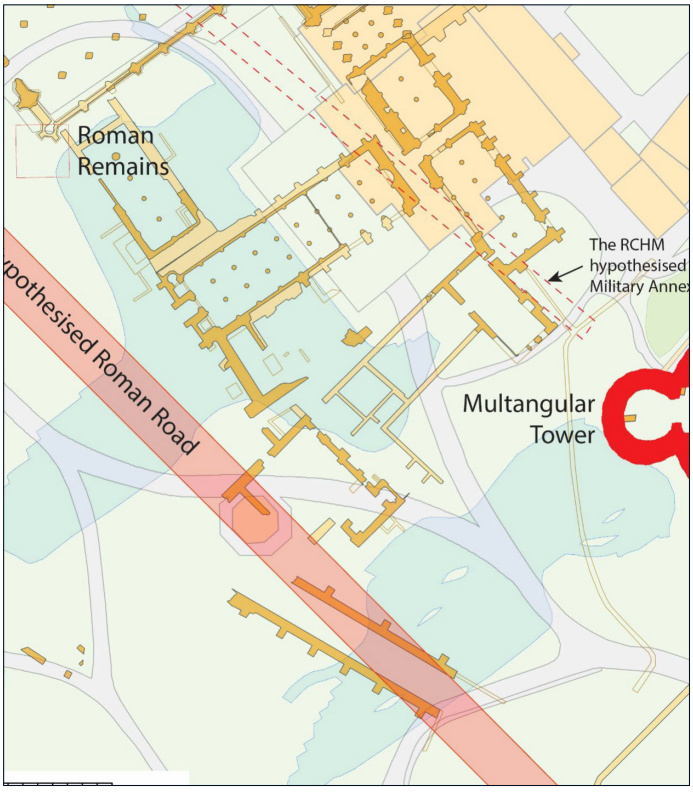
Above: Section through RR8a east of Green Hammerton. © Chris Holloway.
Below: Drawing of the section.



flanking ditches which delineated a series of cobble and pebble layers, with evidence that the foundations were constructed on organic material, possibly brushwood.

Reference: Ambrey, C., Cooper, O., Leary, R., and Hartley, K., 2017: *Roman Dere Street and an Associated Roadside Settlement, East of Green Hammerton, North Yorkshire*, Barnard Castle: Northern Archaeological Associates Ltd, Archive report.

RCHM Road 5. Museum Gardens, Museum St, York YO1 7FR (SE599520)



Ground Penetrating Radar Survey within the Precinct of St Mary's Abbey (York Museum Gardens) Image courtesy of Martin Millett, FSA.

Ground-penetrating radar survey found no evidence of the hypothesised road, shown in the RCHM *Eburacum* as road 5, running between the fortress south-west frontage and the River Ouse, north-west of the south-west gate. *Roman York: beneath the streets* notes that the slope down towards the river was always unlikely to accommodate a road in this area.

The line further north-west is secure, the road having been found at Greencliffe Drive, Water End and St Peter's School Swimming Baths.

Reference:

Creighton, J., Verdonck, L., Millett, M., and Boehmer, T.M. 2025 Ground Penetrating Radar Survey within the Precinct of St Mary's Abbey (York Museum Gardens): AHRC/University of Reading/University of Cambridge, GPR Report No. 2. Available at <https://doi.org/10.17863/CAM.115023>, accessed April 2025.

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Newly Allocated Margary Road Numbers

By Dave Armstrong & Mike Holmes
dave.armstrong@romanroads.org & margaryregister@gmail.com

Following the protocol published by Armstrong (2021, 279-284), a number of new Margary road numbers have been allocated. These fall into two categories: new roads identified in 2024 since publication of Volume IV of *Itinera* and numbers for new roads reported in this volume. All are laid out below. Numbers are either reserved, or fully awarded, using the status rating criteria laid out by Haken (2021, 285-318);

1 A Roman Road number is reserved where there is archaeological evidence sufficient that at least one road segment has the status *2. Road, probable*, i.e. some evidence of a Roman road.

2 A Roman Road number is awarded where there is sufficient evidence to have at least one road segment of status *3. Road, known,* i.e. convincing evidence of a Roman road.

These allocated numbers are recorded in RRRA's master register of Margary road number and cross references. The RRRA master database is securely retained and maintained by Mike Holmes. For any queries contact him on the above mail address. It is intended to make this information available for reference on our website in due course.

As noted in previous volumes, there remains the potential for a previously unrevealed network of roads and Roman occupation in the three south-western counties of Somerset, Devon and Cornwall. Determining the connections between some of the isolated fragments of probable road has proved difficult with long lengths of road yet to be found and the connections often less than obvious. Similarly the road layout in Scotland and Wales are not certainly mapped. These gaps are being addressed and will be updated in future volumes.

Margary Numbers allocated during 2024

S**aham Toney to Stanford.** Status, possible road (Ratledge, 2024 (1) and this volume). **RR339(x)** reserved.

Godmanchester to Great Staughton. Status, known road (Ratledge, 2024 (2) and this volume). **RR227(x)** allocated.

Margary Numbers allocated from work reported within this Volume

The preceding Roman Roads in 2024 section, along with other papers in this volume, provide reports of new roads found recently. These are listed below with the new Margary number allocated or reserved.

Road through Salcey Forest, Newport Pagnell towards Northampton. Status, known road **RR172(x)** allocated (Kirk, this volume).

Irchester to Olney, Northamptonshire. Status, known road **RR175aa(x)** allocated (Kirk, this volume).

From the above work **RR170a**, **RR172a** , **RR175**, **RR172b** and **RR210** are withdrawn and are no longer supported.

Dere Street, Dalkieth to Falkirk(?). Status, known road, **RR8h(x)** allocated. (Haken, this volume).

North Walsham, Hampshire to junction with Port Way (RR4b). Status, known road **RR42aa(x),** allocated. (Staveley (1), this volume).

Rowlands Castle to Havant and Hayling Island. Status, known road, **RR425** allocated (previously by Margary). (Mike Holmes, this volume).

Winchester to Chichester(?). **RR425(x)** was reserved for this possible road. This number is now withdrawn and **RR426(x)** is reserved. (Mike Holmes, this volume).

Mancetter towards Grimstock Hill (and Metchley?). The south-westerly road from Leicester RR57b met RR1g at a tee junction at Mancetter. Staveley suggests that a Roman road continued across RR1g in the direction of the Roman fort at Metchley, Birmingham. He shows evidence of this continuation as far as Grimstock Hill and a particularly clear section at Butlers Wood. He notes that the Roman settlement at Grimstock Hill is possibly where the Roman road crossed the River Tame however the evidence for the crossing is not clear. RR57b does not form a crossroad with RR1g Watling Street and the new southward road is another junction slightly further north on Watling Street. Status, known road **RR184(x)** is allocated. (Staveley (2), this volume).

Dorchester-on-Thames to Aston Clinton. The Viatores (1964, 55-6) described a road they referred to as The Lower Icknield Way (RR168b) from Lewknor (Oxon.) to Aston Clinton (Bucks.), on Akeman Street, which they claimed to be a continuation of RR168c, a supposed 'contemporary trackway' from Streatley. There is no substantive evidence in support of the latter, but the road they numbered RR168b is a rare example of the Viatores getting it almost right. As an alternative route similar to what was described by The Viatores, this road has been allocated RR168b(x). (Haken, this volume).

Greensforge, Staffordshire to Newtown in Powys. Work reported within this volume suggests that this road has insufficient evidence to be classed as a Roman road. **RR193** is no longer supported but should be superceded by **RBW193**. (Smith, this volume).

Yaxley to Longthorpe fort. Ermine Street, RR2b bends near Yaxley to head towards Water Newton but the clear intent of the alignment was on the Longthorpe fort. Lidar suggests there was a continuation of the direct alignment towards Longthorpe. **RR2bb(x)** has been reserved for this possible road. (Ratledge and Haken, this volume).

Lake Farm eastwards. Geophysical survey by a team from Bournemouth University published in Britannia in 2020 showed that a road branches from RR4d and passes through the fortress at Lake Farm. It has been previously suggested that this might continue to an unknown destination to the east, possibly an inland port or wharf, although lidar analysis suggests it may turn to the southeast before it is lost under modern Oakley. The A341 may potentially fossilise its course towards Charminster, but this is pure speculation. **RR4dd(x)** has been reserved for this possible road. (Haken, this volume).

East Park, Sedgefield northeastwards. The various geophysical surveys in the 2000s at the settlement at East Park, Sedgefield, showed that it was a roadside settlement formed along Cade's Road (RR80a). However they also revealed a branch road heading northeast, alongside which settlement had also developed. Lidar shows a cutting east of Sedgefield on this alignment, and a short length of raised linear feature leading to the western edge of Howle Hope. Its course beyond this point is currently unclear. **RR805(x)** has been reserved for this possible road. (Haken, this volume).

Whinney Hill to Longshaws, Northumberland. Suggestions of a possible road have been observed on lidar imagery heading south-south-east from Whinney Hill, where the Devil's Causeway makes a major change in alignment. The recorded features are two short lengths of possible agger at NZ 1221 9211 and NZ 1305 9017 along with two probable cuttings at stream crossings at NZ 1273 9090 and NZ 1335 8916. If these represent a road, it seems to be heading to the fortlet at Longshaws, half a mile further on. No trace has been found south of the fortlet. This conceptual road was previously numbered **RRX110** by the OS. **RR873(x)** has been reserved and cross referred. (Haken, this volume).

Dorchester-on-Thames to Aston Clinton. Status, known road **RR168b(x)** allocated. (Haken, this volume).

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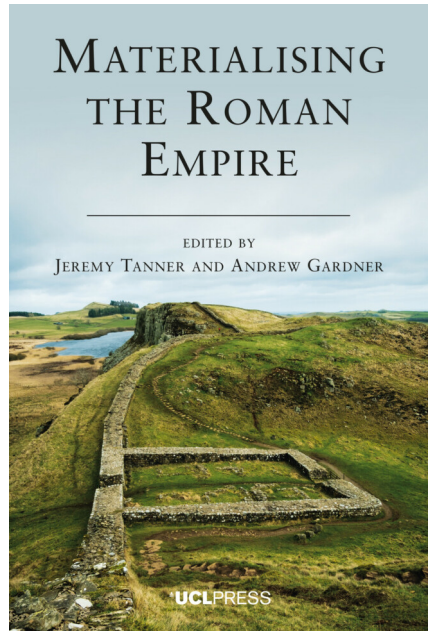
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Book Review

Materialising the Roman Empire.

By Jeremy Tanner and Andrew Gardner (Editors).

UCL Presss. Pp 352. Price £55.00. (Hardcover), £35.00 (Paperback). Open access at <https://doi.org/10.14324/111.9781800083981>.
ISBN 978 800083998.



This recent edited volume from UCL comprises a short Preface (by the first editor), a longer Introduction (by the second editor) and eleven chapters by individual (mostly British) authors covering a wide range of aspects of the Roman empire, with an explicit aim to consider *'how material culture was integral to the process of imperialism, both as the empire grew, and as it fragmented, and in doing so provide up-to-date overviews of major topics in Roman archaeology.'* (1).

There is much of interest and value here, not least in Gardner's Introduction which traces developments in theoretical approaches to the application of material evidence to the study of the empire. What will be of primary interest to members of the RRRA, however, is Chapter 1, 'Roads and communications', by Ray Laurence (19-44). As with the other chapters there is not the space here for a comprehensive account of the subject (even given the focus of all almost exclusively on the western half of the empire), and Laurence's admitted focus is on 'roads, rather than other forms of pathways that might act as transport routes' (19), while communication by water receives only a passing nod (though it does get some treatment in Andrew Wilson's chapter on 'Trade in the Roman empire'). Some of Laurence's contribution will be familiar from his recent Zoom presentation to the RRRA, and in both there is a distinct concentration on the roads of Italy. More fundamentally, the framework and many of the themes discussed are recognisable from his 1999 book *The roads of Roman Italy*: Mobility and cultural change. Perhaps unsurprisingly, therefore, the present contribution might be seen as an updated summary of aspects of that book.

The chapter is divided into several short sections, many reflecting aspects of the earlier work and some with a strong Italian focus. By no means all the points that appeared particularly striking to this reader are necessarily new ones – some important ones are based primarily on well-known documentary sources, but even here new interpretative angles can be developed (e.g. 33, in relation to *beneficiarii*). Either way, Laurence's starting point is a restatement of the emphasis on the distinctive role of the road system as a fundamental feature of the empire: '*... it is land transport that characterises the Roman Empire and creates a materiality that is distinctive.*' (19).

The strongly Italian-focused section 'The origins of Roman long-distance and local roads' contains an observation of considerable potential significance in relation to 'local roads', which 'have been found in late twentieth and early twenty-first century development economics to be more effective in creating sustainable agriculture' (21), a point repeated at (40), where it is suggested that '*these local initiatives, rather than the major roads associated with the Roman emperors*' will need to be examined as evidence for roads bringing economic benefit (presumably for the most part in enabling the ready movement of agricultural produce from producers to markets). Legal definitions of broad road types are fairly clear – '*public roads were seen to have very definite end points ... local roads may trail off at a point that was not defined*' (25). While the construction of principal routes was essentially a state matter, responsibility for construction, and presumably maintenance, of other roads lay (in an Italian context) with local 'cities' (23-4) - and therefore by analogy with *civitas* authorities in provinces like Britain.

This point may raise questions of what were considered to be local roads (*viae vicinales*) in locations far from the developed legal framework established for Italy. It also again prompts questions of resourcing – to what extent did the system whereby *viae vicinales* '*were paid for by the local towns or villages arrangement and were maintained by the work of landowners or possessors of the land*' (25) work in a province like Britain? The political importance of maintenance of the major roads is reemphasised at the end of the chapter (40), and leads to the final 'Conclusion', consistent with Laurence's original position, that '*the material well-being of the roads [was] ... a metaphor for the well-being of the state*' – a statement that might perhaps have been followed with the single word - 'Discuss'.

Before reaching that point, however, there are sections on 'The technology of Roman roads', where we find the observation that '*what is perhaps more impressive [than the scale of some structures] is the diffusion of bridge technology across the Roman Empire ....*' (27) – a good point perhaps too easily taken for granted. Further sections concern in various ways the importance of roads in what might loosely be termed an official or administrative sphere - 'Boundaries and taxation' and 'Space and territory' are both based primarily on legal and epigraphic sources. Under the latter heading comes the interesting point that a transport route itself potentially '*defines the area of authority*' – i.e. can be used as the basis for description of a territory. Laurence uses the examples of *Umbria*, based on Strabo, and Arabia in the east, defined on the basis of Trajan's 'new' *Via Nova* (in fact overlying an earlier route) (31) – the message being put across through inscriptions on milestones and specific coin issues. In 'The state and the road' Laurence is emphatic that the definition of the *Cursus Publicus* as a 'postal system' is '*one of the greatest misconceptions in the modern literature*' (32). He draws on relatively recent work relating to *stationes* and *beneficiarii* to underline the role of the *Cursus* in providing facilities specifically for persons travelling on official business (33). The following section, 'Marking the beginning of the road', concerned with commemorative arches, might have passed without comment but for a paragraph on Richborough (37-8), here summarised as '*dated by coins to the late Flavian period, but completed under Trajan*'. A late Flavian date has become the consensus view (e.g. recently, Hingley 2022, 163-4), although a Trajanic or even early Hadrianic date has been considered possible (Coombe et al. 2015, 72). Most recently, however, re-examination of the finds and stratigraphic evidence suggests an Antonine date (Smither 2022), with (speculatively) the completion of the Antonine Wall as a context for the construction of the arch. If correct this does not necessarily affect the significance of the monument as marking the *Fines Britanniae* and/or the beginning/end of a journey in Laurence's terms, but it does shift its emphasis from being a relatively early marker of the establishment ('completion' – *'Britannia perdomita*') of Roman power in Britain to one linked with a more mature stage in the development of the province

In short, while very concise (owing to the constraints imposed by the editors of the volume) this is a useful summary of many aspects of the roads of the Roman empire, going well beyond their purely physical characteristics and chronology to explore significance and meaning and their impact in shaping the character of empire. Many of the themes set out in Laurence's 1999 book are carried forward, and some quite new ideas introduced. Finally, the References at the end of the chapter provide a useful resource: of c 105 references just over half postdate the appearance of the 1999 book.

Paul Booth
(Oxford Archaeology)

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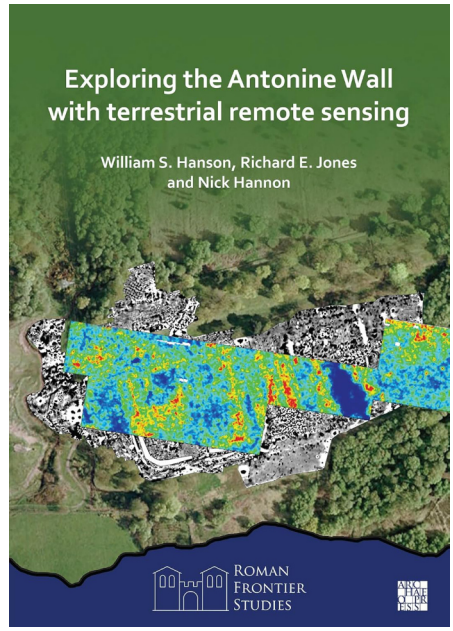
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Book Review

Exploring the Antonine Wall with terrestrial remote sensing.

By William S. Hanson, Richard E. Jones and Nick Hannon.

Archaeopress Archaeology. Open access at <https://www.archaeopress.com/Archaeopress/download/9781803278018>. Pp 256, Price £41.40.
ISBN 978-1803278018.



In contrast to Hadrian's Wall, the development of which is now fairly sorted, the planning, design and construction of the Antonine Wall in Scotland still poses many questions and much debate. In addition, frustratingly, as so often seems to be the case with the Antonine Wall, there frequently is never quite enough evidence for the various possibilities which are mooted to be proven or disproven. Hence the publication of this volume is very welcome. Even though it does not provide all of the answers, by any means, it is certainly valuable to have such a consolidated body of evidence to hand.

What this volume does is to bring together and report on the various geophysical studies which have been carried out along the Antonine Wall, past and present, many reports of which had not been published up to now. As such it forms a significant contribution to the literature for those who are serious students and scholars of the Antonine Wall. This volume does not cover every site along the Wall, though, naturally confining itself to just those sites which have undergone geophysical surveys at some time. To refer to all of the sites along the Wall, the Handbook to the Antonine Wall, edited by Lawrence Keppie and published by the Glasgow Archaeological Society, most recently in 2015, is the source to consult.

In all, thirty-five sites are reported upon, and for each of them a standard format is used, consisting of:

- national grid reference, and Canmore number
- features examined (e.g. rampart, ditch, Military Way, etc.)
- specific references to the site (e.g. Dunwell et al, 2002, etc.)
- a list of the geophysical surveys carried out at the site, by which organisation and when, the instruments used, the areas covered , and the spatial resolutions employed at the time
- a brief history of previous excavations and other investigations at the site
- a description of the geology and other factors which could affect the geophysical surveying at the site
- the results from the geophysical surveys,

and each account is accompanied as appropriate by a variety of maps, geophysical and LiDAR images and, occasionally, aerial photographs.

This corpus of reports is preceded by an account of the development of archaeological understanding of the Antonine Wall, together with textbook explanations of how crop marks are formed, and how LiDAR and the various methods of geophysical surveys work. There is a list of all known geophysical surveys carried out on the Antonine Wall, and by which organisation, and there is another list of the operational techniques and processing procedures used by each organisation.

After the conclusion of the reports there is a Discussion section which summarises the picture which emerges from the surveys with regard to the linear barrier, the forts and fortlets, the Military Way, etc. and also the design, planning and construction of the Wall. The style of the narrative is balanced and authoritative, but it does not shy away from describing the current debate about the planning and design of the Wall. On one side it is proposed that the Antonine Wall had first been planned as a copy of Hadrian's Wall, with forts spaced along it at about eight Roman mile intervals, between which several secondary forts were then inserted into the line of the Wall as a result of a change of plan. On the other side it is argued that the locations of all the military installations had been planned at the outset, and that the undeniable differences in dates of construction had simply occurred through the application of priorities. The authors opt for the former, whereas your reviewer resides in the other camp.

As might be expected, the Discussion section also contains a lengthy commentary upon various aspects of geophysical surveying, and what has been learned about them along the Antonine Wall. Although geophysical surveying lies outside your reviewer's area of expertise this would appear to be a very useful tract for anybody to study who wishes to embark upon a geophysical exercise themselves.

With regard to the Military Way, which runs not far to the south of the Wall, the geophysical surveys were, it seems, not able to cast much new light upon this Roman road. In a few places slight corrections to its line were provided, but perhaps the most significant finding was that, where certain stretches could be identified with some confidence, accompanying ditches were - as it is put in the Discussion - not infrequently notable by their absence.

Overall, although this volume will perhaps be most relevant for students and scholars who area engaged in serious studies upon the Antonine Wall, the result is an up to date and very readable account of the archaeology of the Wall as it stands at present and so should be readily approachable for the general reader.

The volume has a Bibliography which runs to nearly nine full pages, but no Index. However, the structure of the narrative is clear and straightforward, so that the list of the reports on the Contents pages should enable readers to find their ways to what they want quite quickly. The volume is available as an Open Access document on the Archaeopress web site, or else it can be obtained as a printed version for £45, which price probably reflects the cost of printing and binding on demand. An impressive amount of work has gone into this volume and it reflects credit upon the authors, and to Archaeopress for shepherding it into the public domain.

John Poulter
john.poulter8@btconnect.com

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