



# Defended Small Towns and the Roman Britain Road Network

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# Agenda

- What are (defended) Small Towns?
- Reasons for Defending Small Towns
- *Cursus Publicus*
- Network Analysis in Historical Road Research
- My Research Hypotheses
- Roman Road Network and Small Towns
- Network Measures
- Defended and Non-Defended Small Towns
- Process and Pattern
- Monte Carlo Hypothesis Testing
- Defended Small Towns better than random?
- Conclusions





# What are Small Towns NOT?

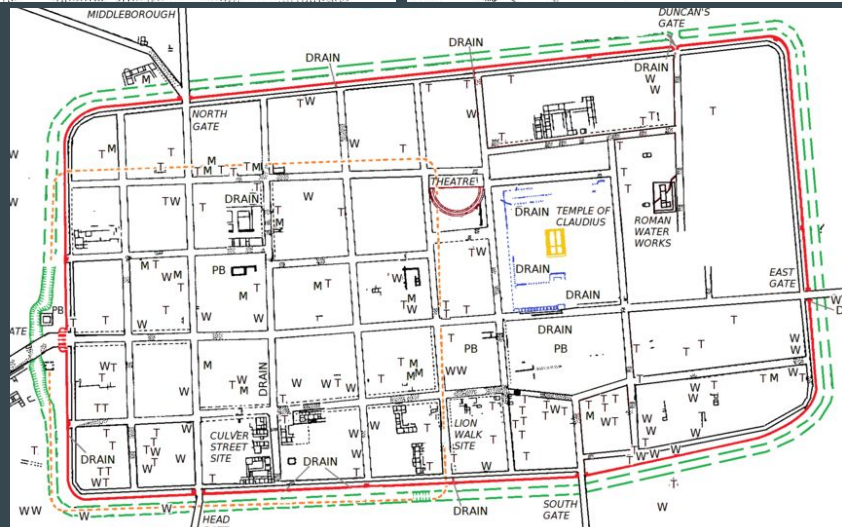
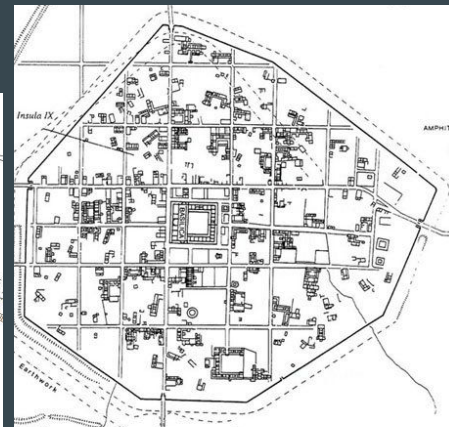
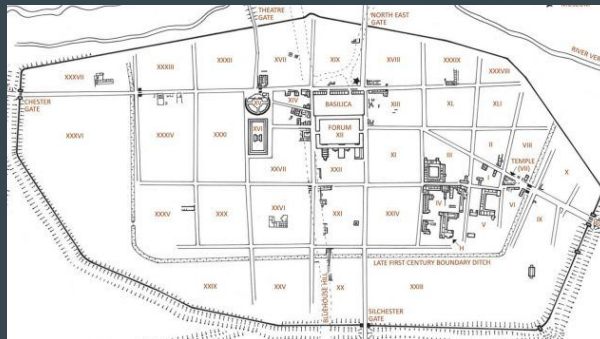
Londinium

Coloniae

Municipium

Civitas Capitals

Small Towns





# What are Small Towns?

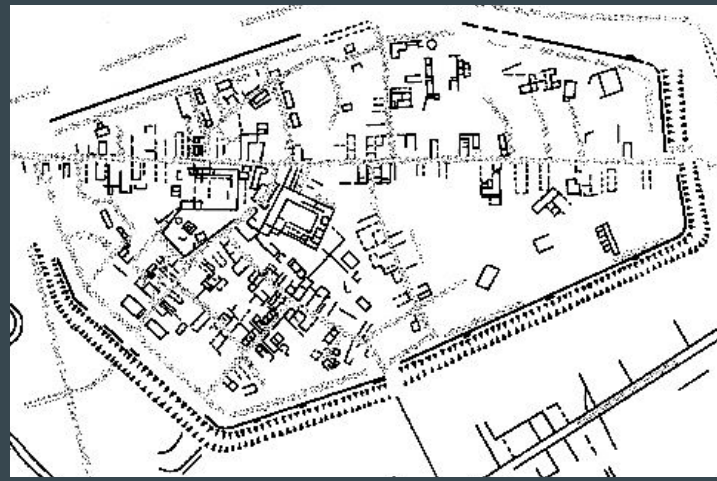
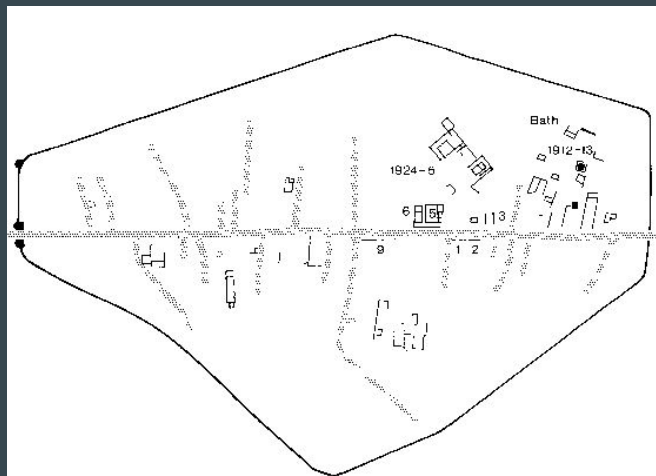
# Londinium

# Coloniae

# Municipium

# Civitas Capitals

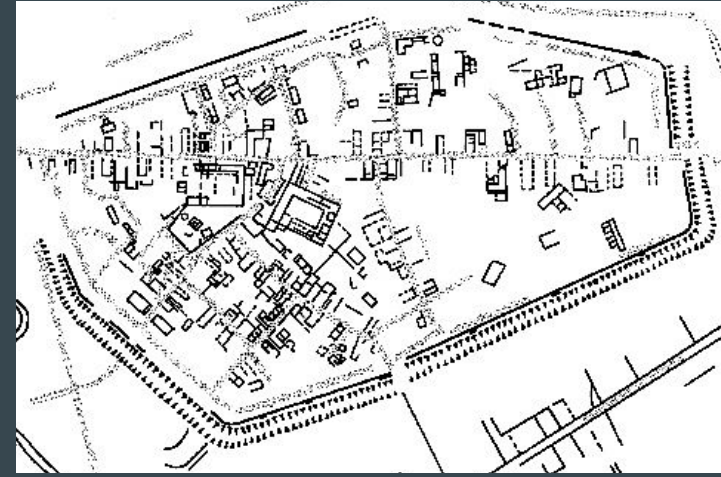
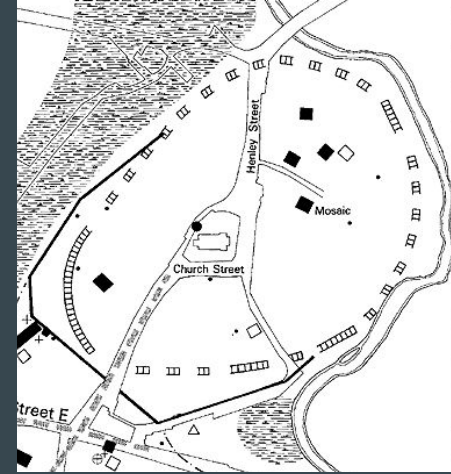
## Small Towns





# And the Defended?

- Large-scale defence of small towns in Roman Britain
- Earthwork defences in Second Century
- Stone Walls in Third Century





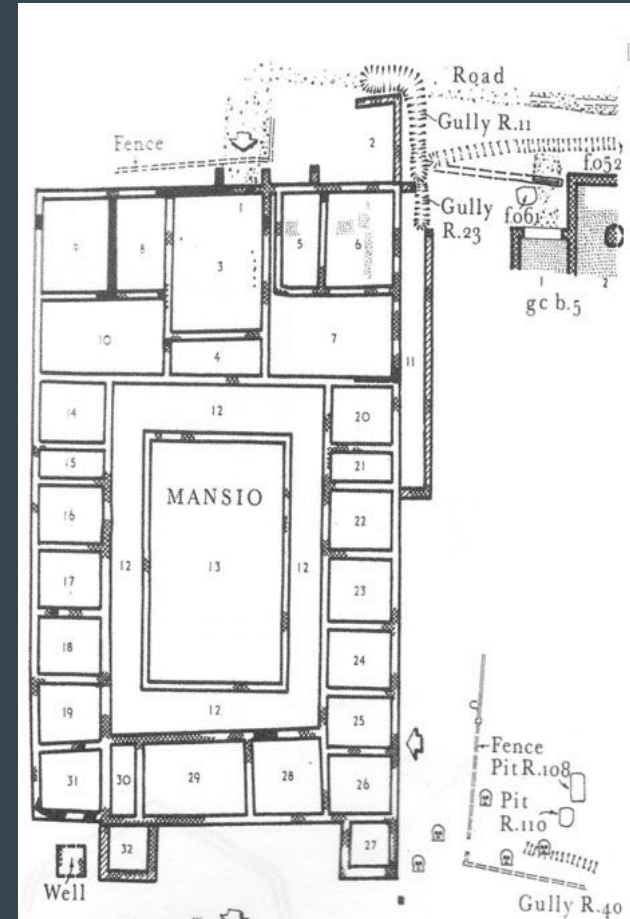
# Reasons for Defending Small Towns

- (1) A centralised government response to an actual or perceived **threat**;
- (2) A symbol of **civic pride** initiated by local authorities;
- (3) Protection of **administrative infrastructure** related to the *cursus publicus*

Settlement	Date of earthwork	Date of wall
Alcester ( <i>Alauna</i> ?)	200	360
Alchester		200
Ancaster		220
Bath ( <i>Aqua Sulis</i> )	150	220
Bitton ( <i>Claudentum</i> )	150	350
Brampton	180	
Brough ( <i>Crococalana</i> )	?	
Caistor		300
Cambridge ( <i>Duroloponde</i> )		300
Catterick ( <i>Cataractonium</i> )	150	275
Cave's Inn ( <i>Tripointium</i> )	300	
Chelmsford	160	
( <i>Caesaromagus</i> )		
Chesterton-on-Fosse		320
Dorchester on Thames	180	270
Dorn		?
Dropshort ( <i>Magiovinium</i> )	?	
Godmanchester		275
( <i>Durovigutum</i> )		
Great Casterton		200
Great Chesterford		350
Horncastle ( <i>Bannovallum</i> )		300
Ilchester ( <i>Lindinis</i> )	150	350
Irchester	200	200
Kelvedon ( <i>Canonium</i> )	200	
Kenchester ( <i>Magnis</i> )	180	300
Leintwardine ( <i>Bravonium</i> )	200	
Little Chester ( <i>Derventio</i> )	150	275
Mancetter ( <i>Manduessedum</i> )	300	300
Neatham ( <i>Onna</i> ?)	180	
Castle Hill ( <i>Margidunum</i> )	180	?
Mildenhall ( <i>Cunetio</i> )	200	360
Rocester	?	?
Rochester ( <i>Durobrivae</i> )	170	200
Sandy Lane ( <i>Verlucio</i> )	?	
Thorpe ( <i>Ad Pontem</i> )	170	300
Towcester ( <i>Lactodurum</i> )	?	175
Wall ( <i>Letocetum</i> )	300	300
Water Eaton		
( <i>Pennocrucium</i> )		
Water Newton ( <i>Durobrivae</i> )		200
Whilton Lodge	200	300
( <i>Bannaventa</i> )		
Whitchurch ( <i>Mediolanum</i> )	175	?
Worcester ( <i>Vertis</i> )	(Iron Age)	

# *Cursus Publicus*

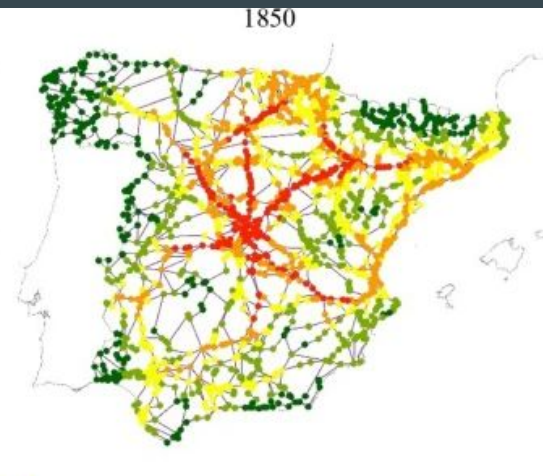
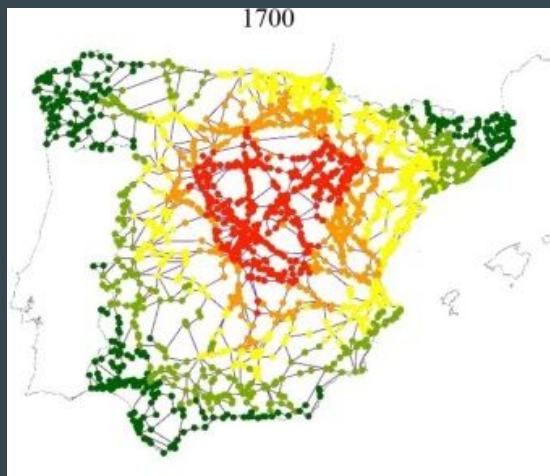
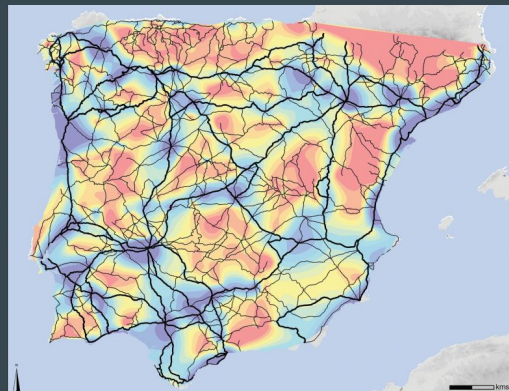
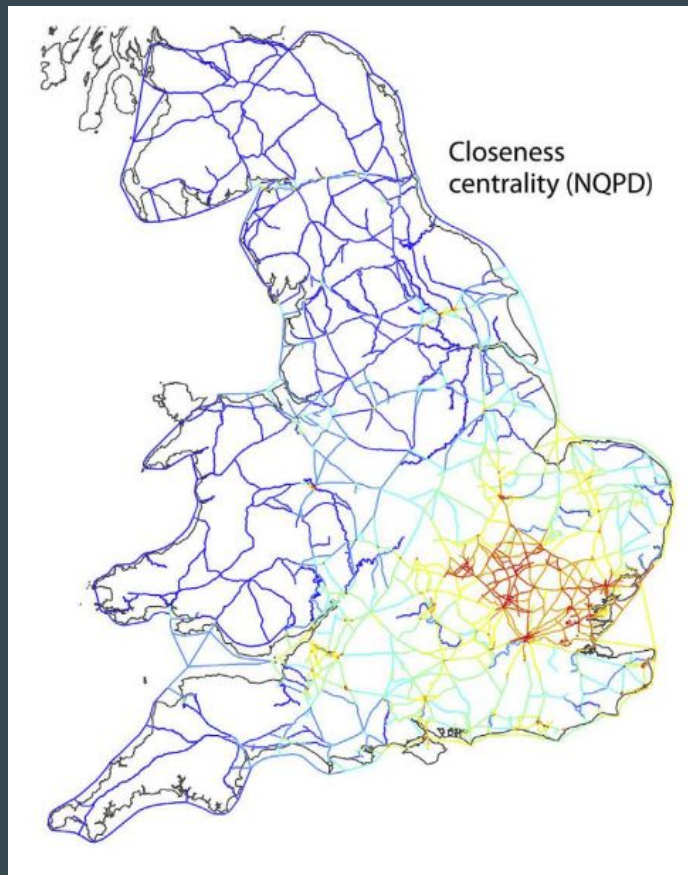
- Administrative Infrastructure essential for the functioning of the Roman provincial transportation system
- **Mansiones:** overnight stopping places along the main roads of the Roman empire
- **Mutationes:** way-stations where the horses and wagons could be changed







# Network Analysis in Historical Road Research





# Research Hypotheses

- (1) Defended small towns were well integrated within the road network for the efficient transfer of information;
- (2) Defended small towns were located on roads that were important for controlling the flow of information across the road network





# Roman Road Network and Small Towns

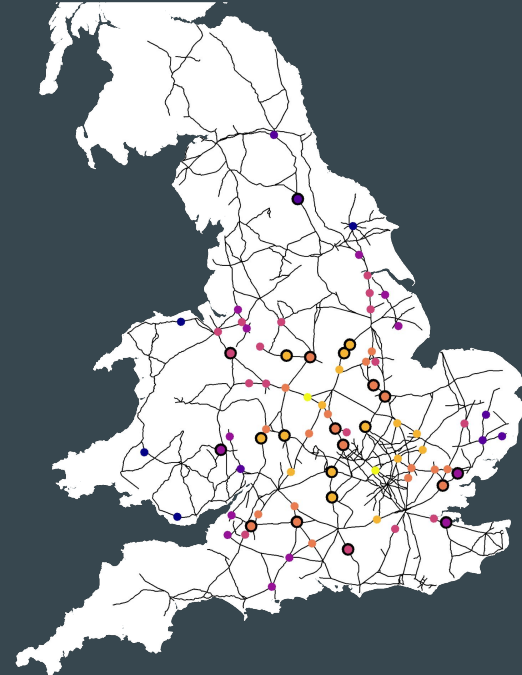
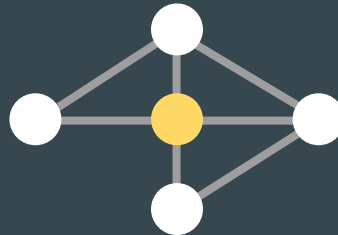
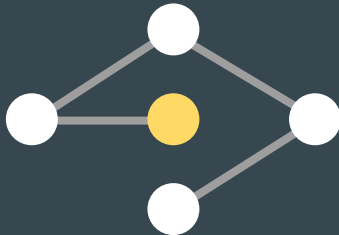


# Network Measures

1) Defended small towns were well integrated within the road network

## Nodal Efficiency

- Inverse of the average length of the minimum path length between a given node and all other nodes in the network
- Nodes with high nodal efficiency = higher efficiency in communicating with other nodes

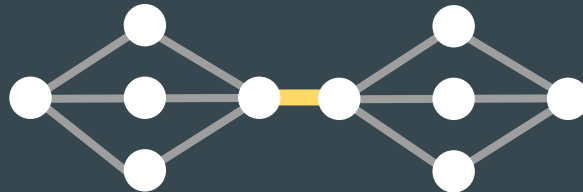
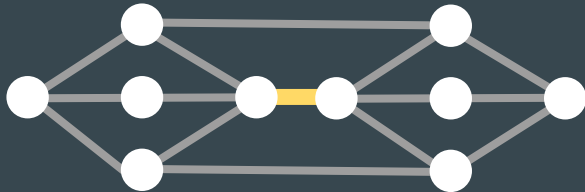


# Network Measures

2) Located on roads that were important for controlling the flow of information

## Edge Betweenness

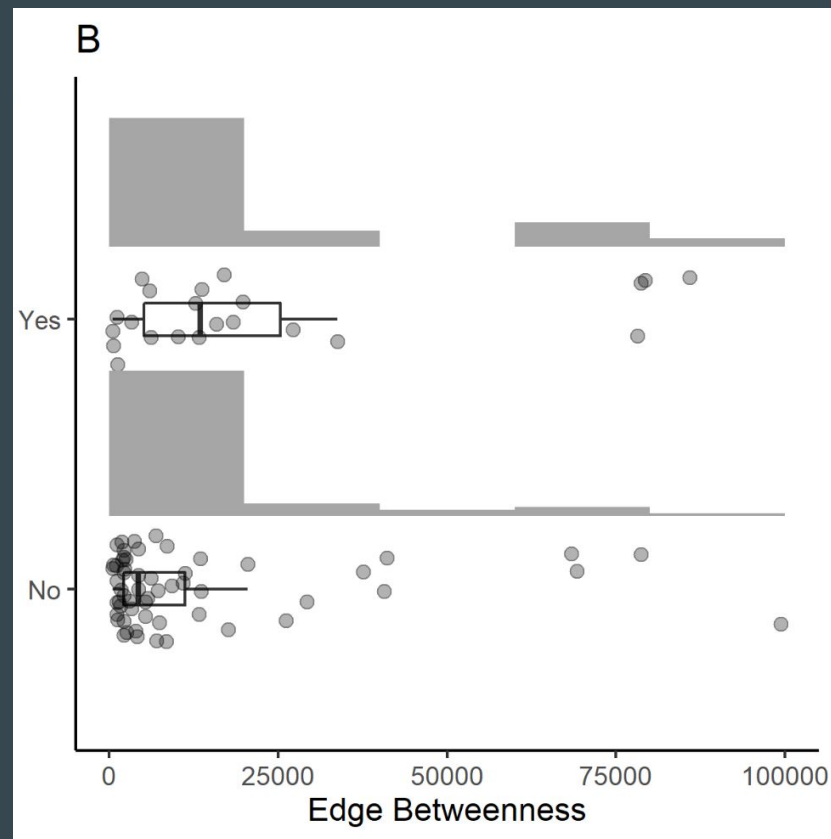
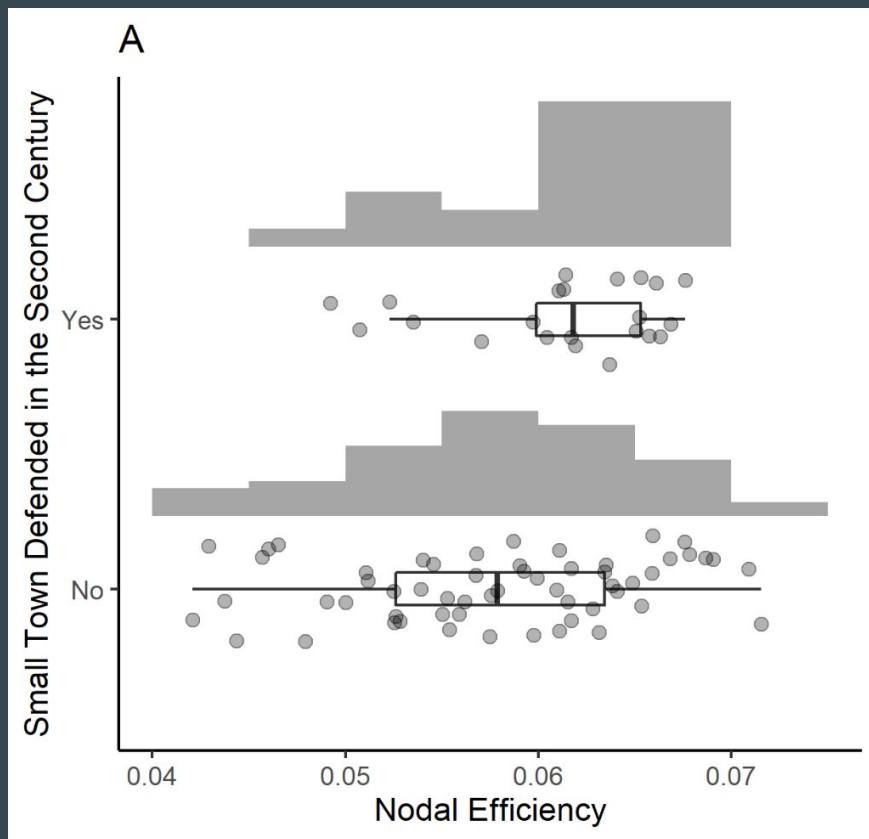
- Number of shortest paths in the network that pass through a given edge
- Roads with high edge betweenness = controls flow of information and act as 'bridges' to other regions







# Defended vs Non-Defended



# Process and Pattern

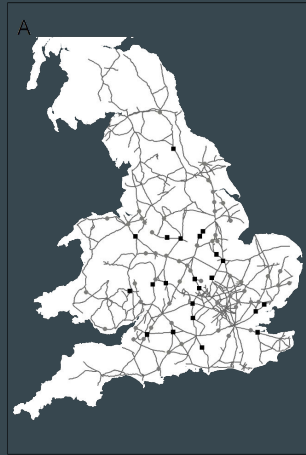
“How likely is it that the observed spatial pattern of defended small towns has arisen from a random process given the underlying spatial distribution of small towns?”



# Monte Carlo Hypothesis Testing

**Alternative Hypothesis:** Defended small towns were well integrated within the road network for the efficient transfer of information

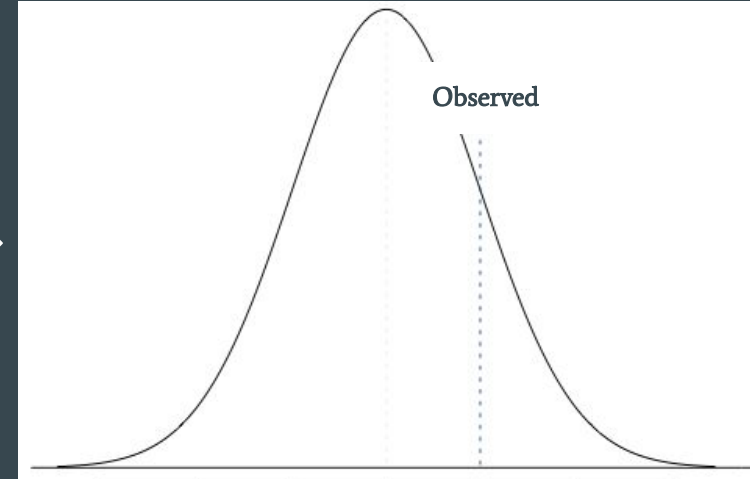
**Null Hypothesis:** Defended small towns were no better integrated within the road network for the efficient transfer of information than random



Mean Nodal Efficiency (observed)



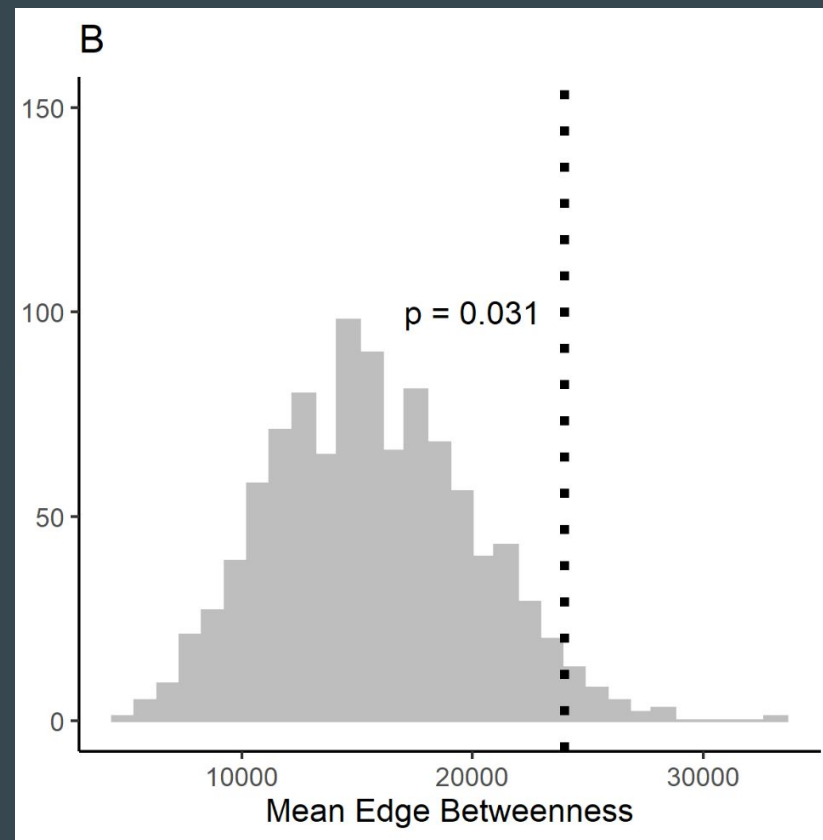
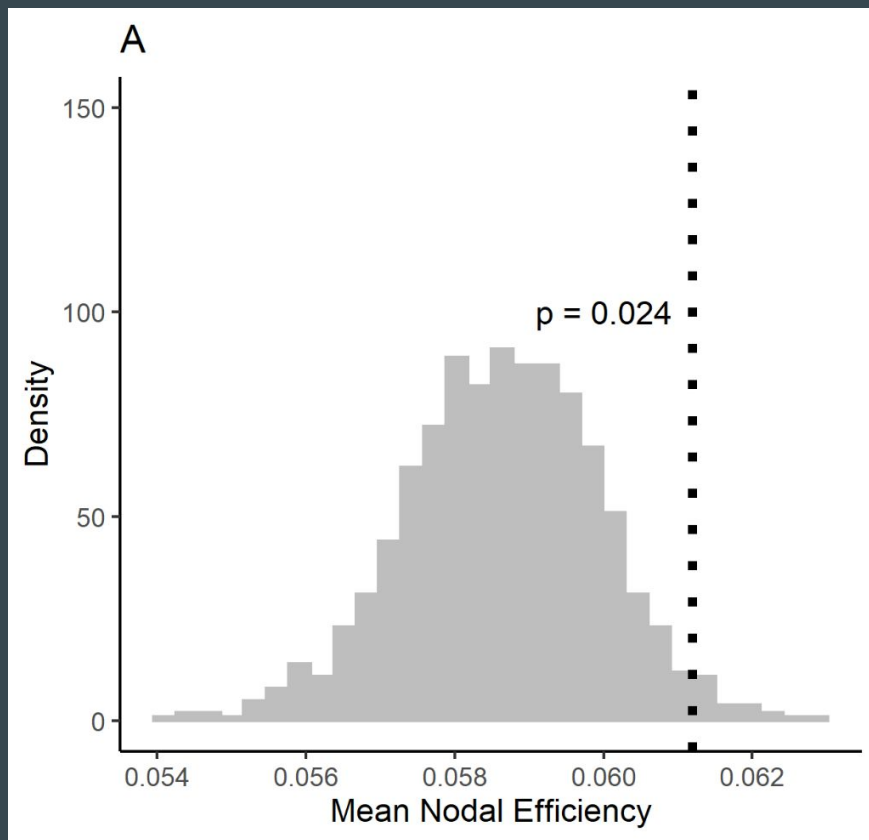
Mean Nodal Efficiency (randomised)



Mean Nodal Efficiency under null hypothesis



# Defended Small Towns better than random?







# Conclusions

- Defence of small towns linked to the protection of administrative infrastructure related to the functioning of the *cursus publicus*
- Roman road network connectivity structured which small towns were defended

