

# E-government and GIS

The British Experience

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# Overview

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- GIS - a governance issue?
  - The UK Government perspective
  - Social Exclusion and Neighbourhood Regeneration
  - Applications
  - Necessary spatial data infrastructures
  - Conclusions
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# GIS - a governance issue?

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- ❑ GIS is NOT a governance issue but geography and geographical referencing are
  - ❑ When a citizen accesses government services electronically the link between place and service may be broken
  - ❑ Reliable mechanisms are often needed to re-establish that link. These involve frameworks to identify individuals and places
  - ❑ Places can only be recognised within a reliable geographical referencing framework.
  - ❑ That framework both requires and enables GIS
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# Citizens' views of government

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- Despite their consistent evidence to the contrary citizens appear to assume that:
    - Governments are omniscient (or at least they know most of what's going on)
    - Government departments talk to each other
    - That government departments can and do exchange data reliably
    - That government departments can assess need on the basis of past needs and learn from experience
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# E-citizens?

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- ❑ Citizens using E-government services are likely to have higher expectations than those involved in face to face contact
  - ❑ They will have less tolerance of failure when dealing with a machine than with a human being
  - ❑ They will expect systems to know about 'context' for example which health authority and which local authority they live in
  - ❑ They will expect information to be available
  - ❑ But they will also expect confidentiality to be respected
-

# The British context

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- New Labour government in 1997
  - Re-elected 2001
  - In first term respected the spending plans of the previous Conservative administration
  - Has a strong agenda of re-inventing government
    - Modernise public services
    - Involve the private and the voluntary sectors
    - Use private finance
  - Has kept firm control over public spending
  
  - Retained a commitment to a fairer society through a policy of reducing 'Social Exclusion'
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# Social Exclusion Unit

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Social Exclusion Unit

Cabinet Office - January 2001

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# Social Exclusion Unit

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- ❑ Established in the Prime Minister's office with his personal backing
  - ❑ Minimal funding but able to encourage re-direction of departmental spending
  - ❑ Aimed to change civil service practice and break down the 'silo' mentality of both service provision and information
  - ❑ Based on the premise that social exclusion is both an individual and a geographical phenomenon
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# Social Exclusion Unit

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- Reports with a geographic theme:
    - Making the connection – transport and social exclusion
    - National strategy for Neighbourhood Renewal
    - Unpopular Housing
    - Improving shopping access
    - Closing the digital divide: Information and Communications Technologies in Deprived Areas
    - Better information
-

# SEU – What is a neighbourhood?

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“The SEU’s work has focused on deprivation at the neighbourhood level because this is where the sharpest disparities are seen. Looking at a larger scale, such as a region or local authority conceals the most extreme pockets of deprivation”

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# SEU – What is a neighbourhood?

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**“There is no exact definition of what makes a neighbourhood. Local perceptions of neighbourhoods may be defined by natural dividing lines such as roads and rivers, changes in housing design or tenure, or the sense of community generated around centres such as schools or transport links. Neighbourhoods vary in size, but tend to be made up of several thousand people. Many are dominated by local authority or housing association property, but others have a higher proportion of privately-owned housing.”**

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# SEU – What is a neighbourhood?

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“To get an idea of what is going on at neighbourhood level, statistics from electoral wards are often used. This is only a proxy – but at the moment it is the best one we have. Some wards include several neighbourhoods and some neighbourhoods cross ward boundaries. Getting better statistics about small neighbourhoods is one of the priorities of the National Strategy.”

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# Two Examples

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□ Burglaries

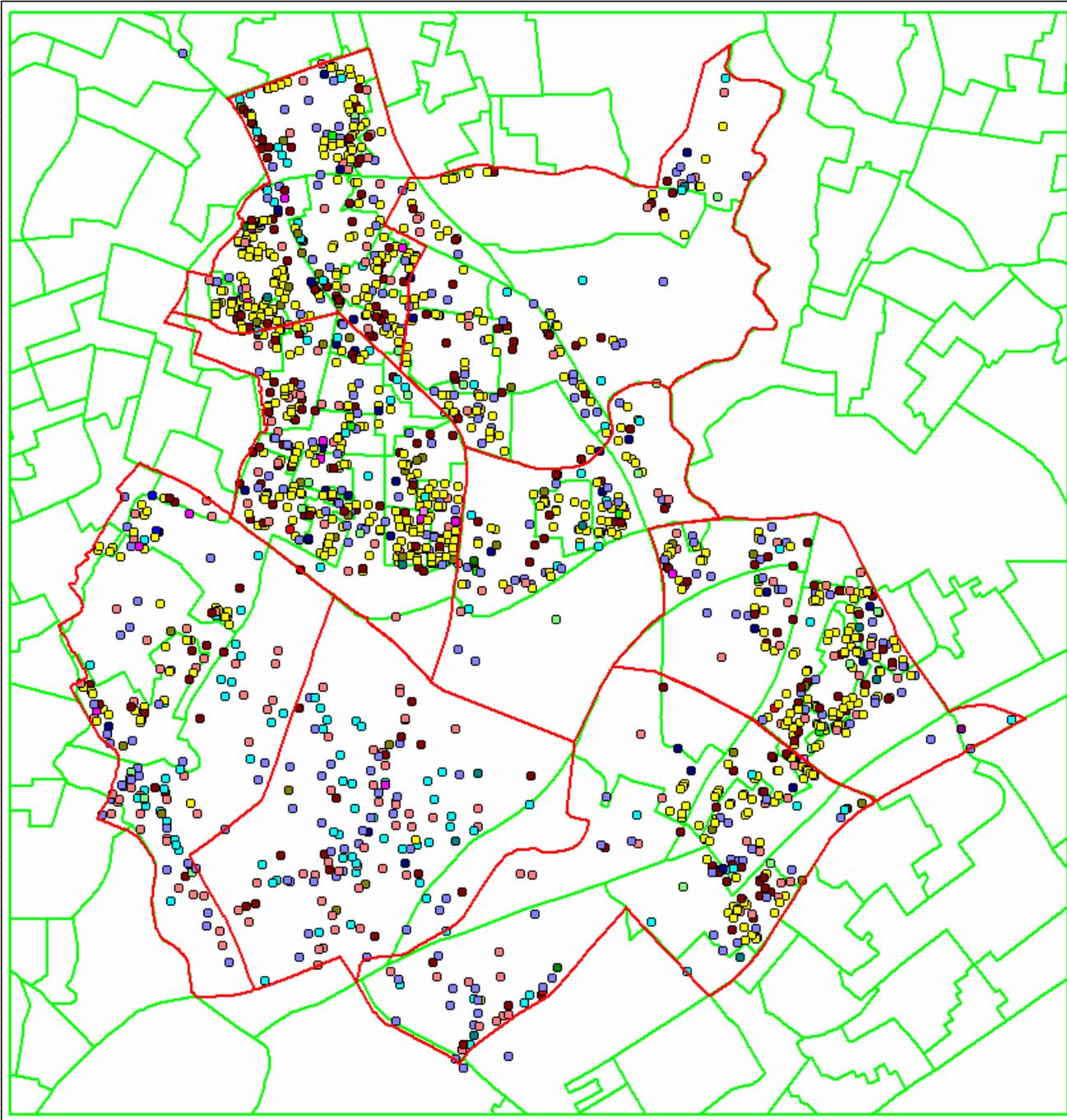
□ Hard to let housing

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# Burglaries

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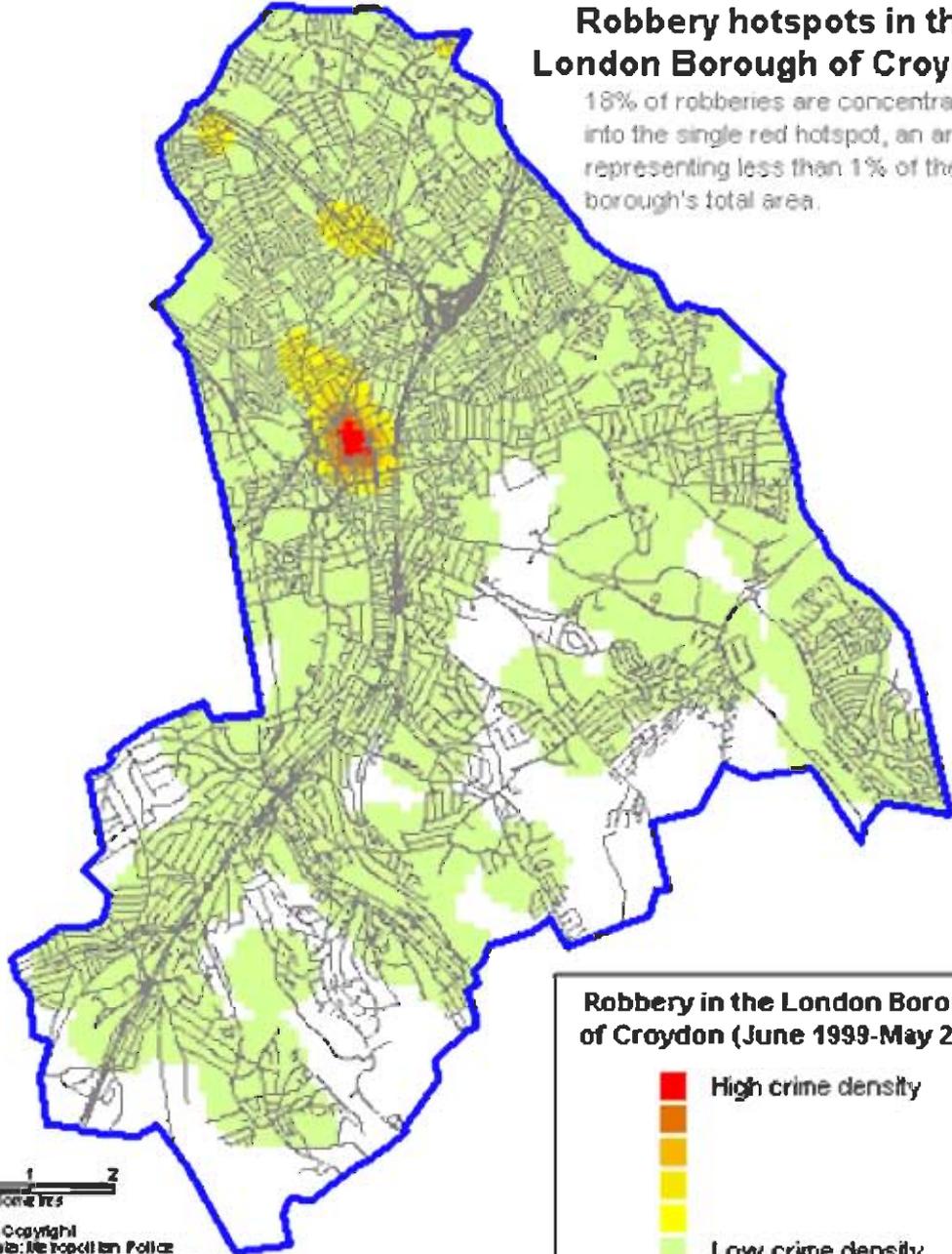
## Police Beats and Enumeration Districts

### Crime by Offence\_description

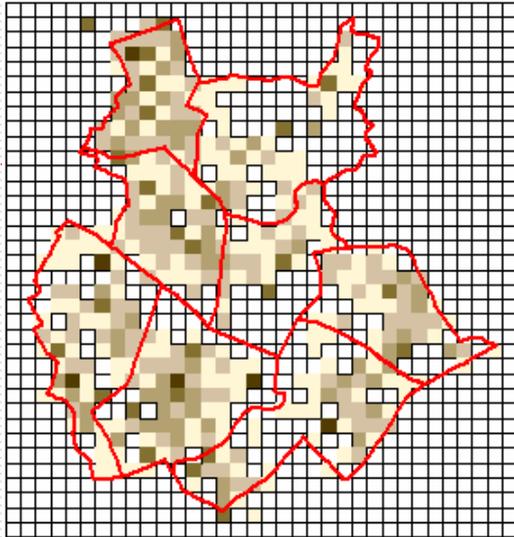
● Affray	(17)
● Aggravated burglary dwell	(7)
● Aggravated taking vehicle	(13)
● Arson	(34)
● Burglary dwelling	(1082)
● Burglary other	(582)
● Criminal damage	(867)
● Kidnap/Hijack	(8)
● Less Serious wounding	(139)
● Rape	(5)
● Robbery	(235)
● Serious Wounding	(42)
● Theft from motor vehicle	(1420)
● Theft from person	(220)
● Theft of motor vehicle	(1570)
● Violent Disorder	(4)

# Robbery hotspots in the London Borough of Croydon.

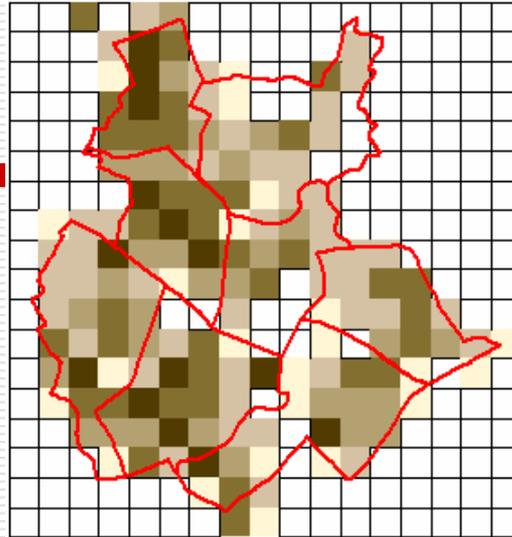
18% of robberies are concentrated into the single red hotspot, an area representing less than 1% of the borough's total area.



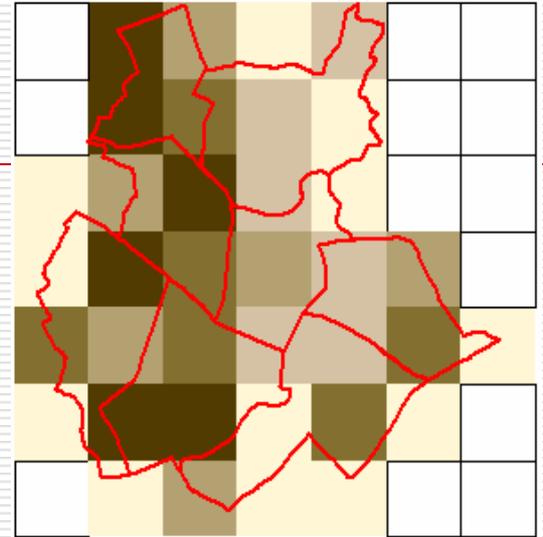
### 100m grid squares



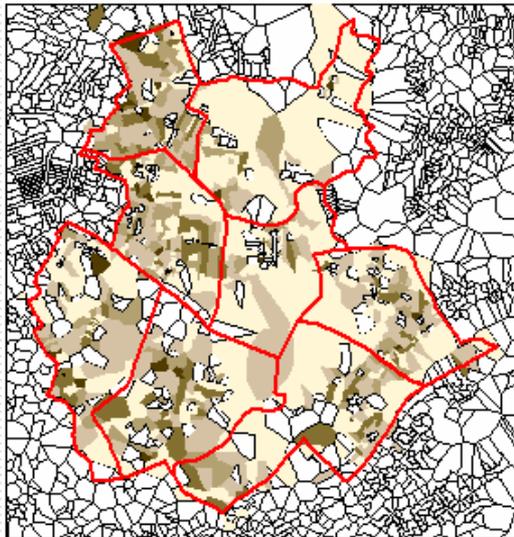
### 200m grid squares



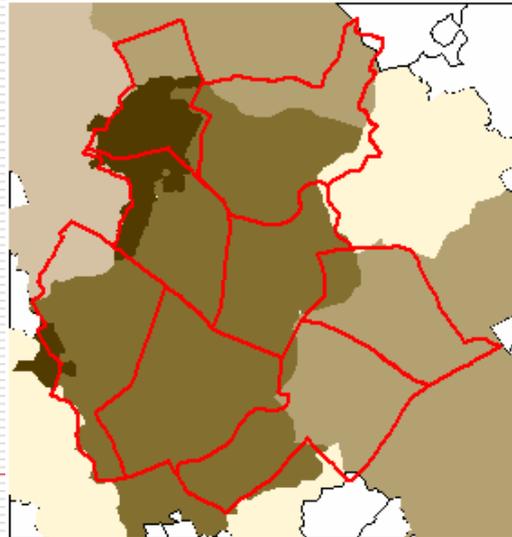
### 500m grid squares



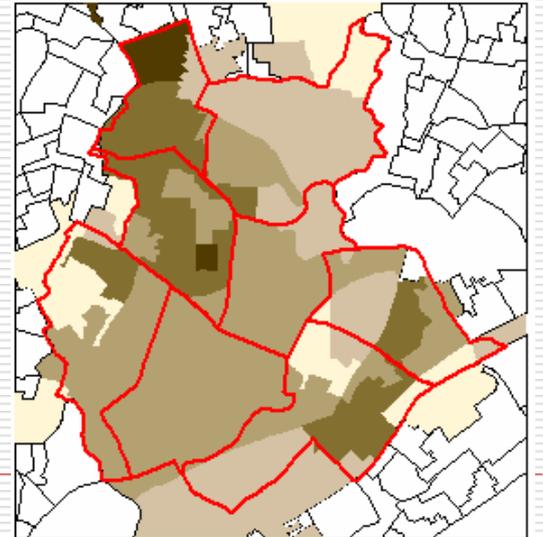
### Postcode units



### Postcode sectors

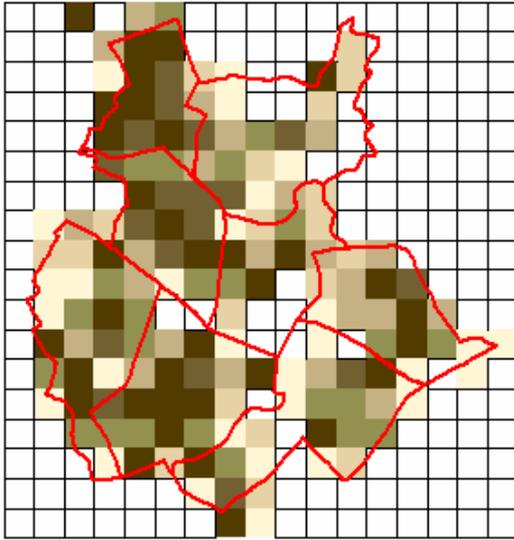


### Enumeration Districts

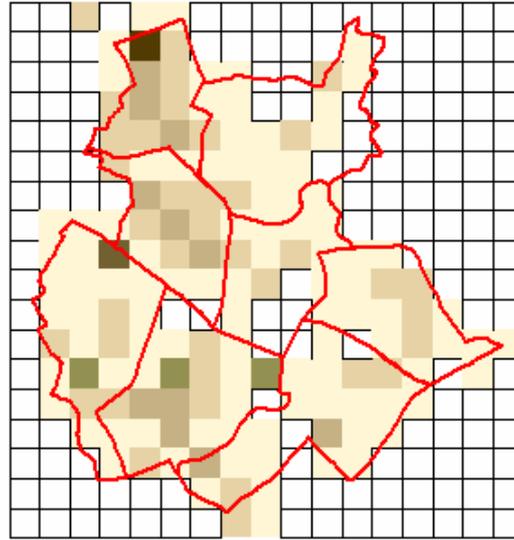


# 200m grid

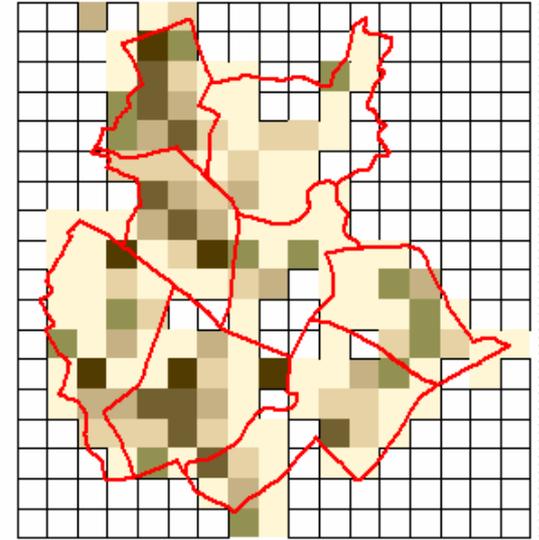
## Equal Count



## Equal Ranges

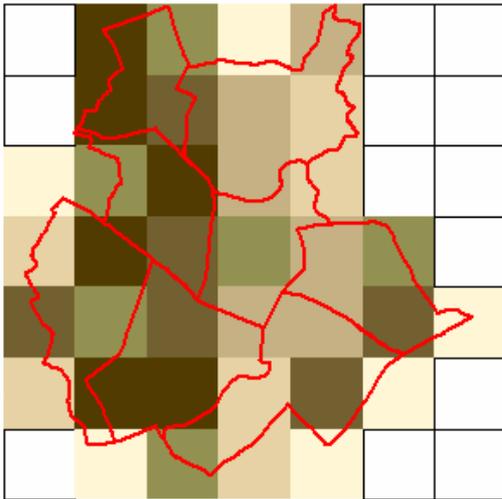


## Quantile

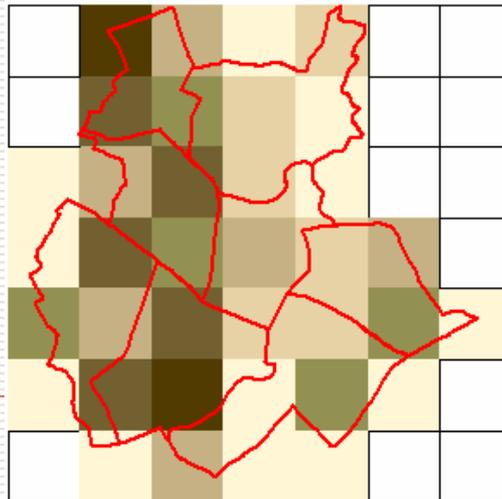


# 500m grid

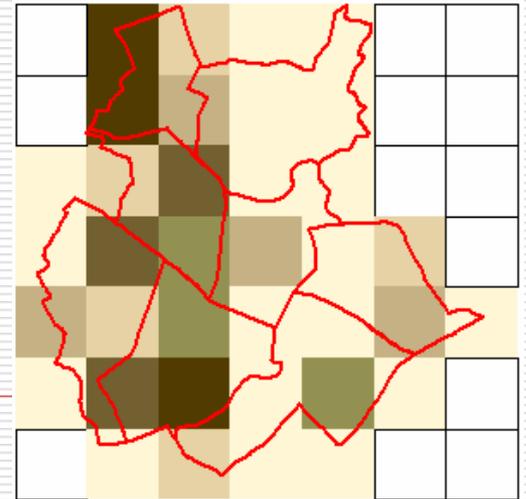
## Equal Count

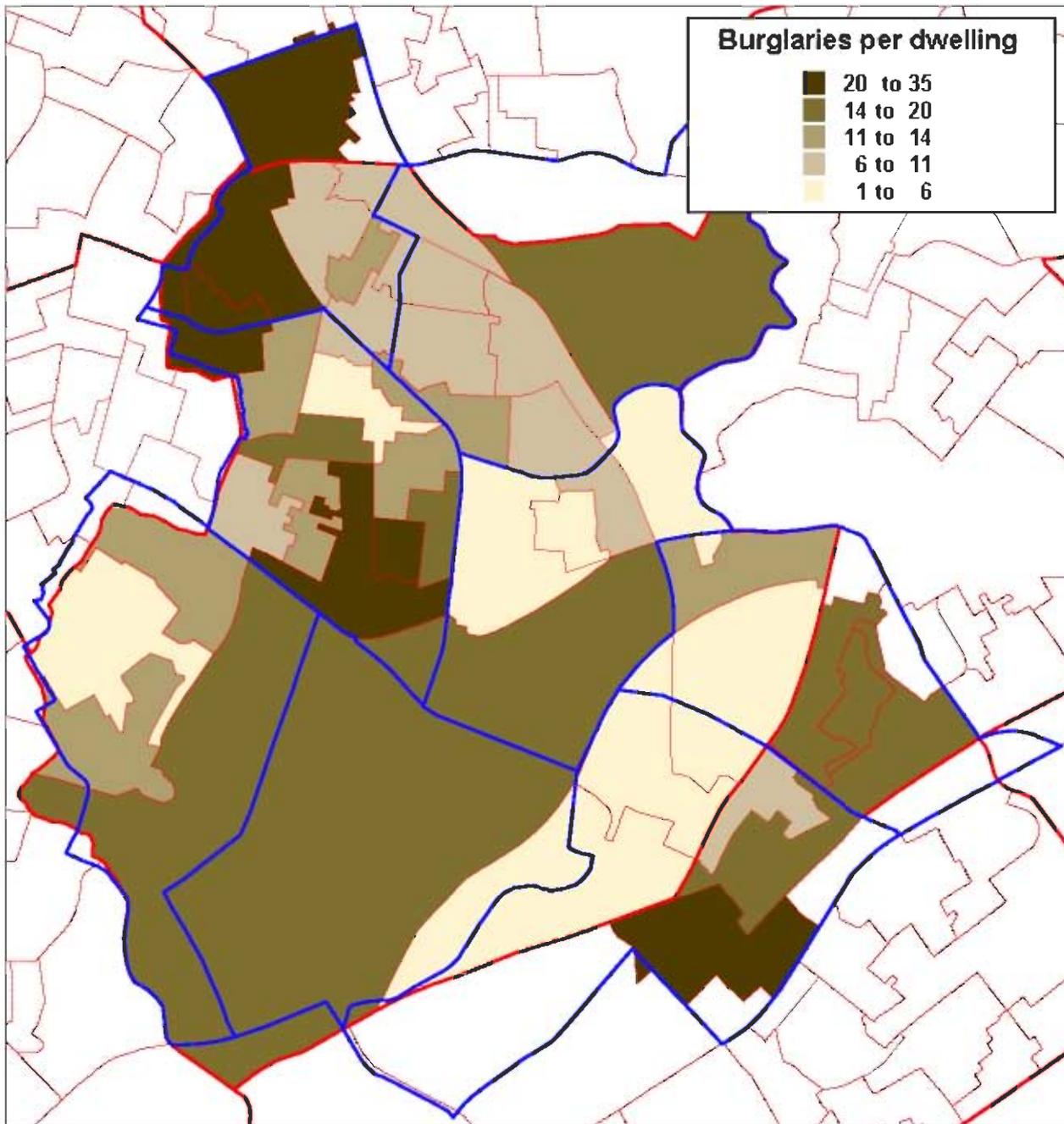


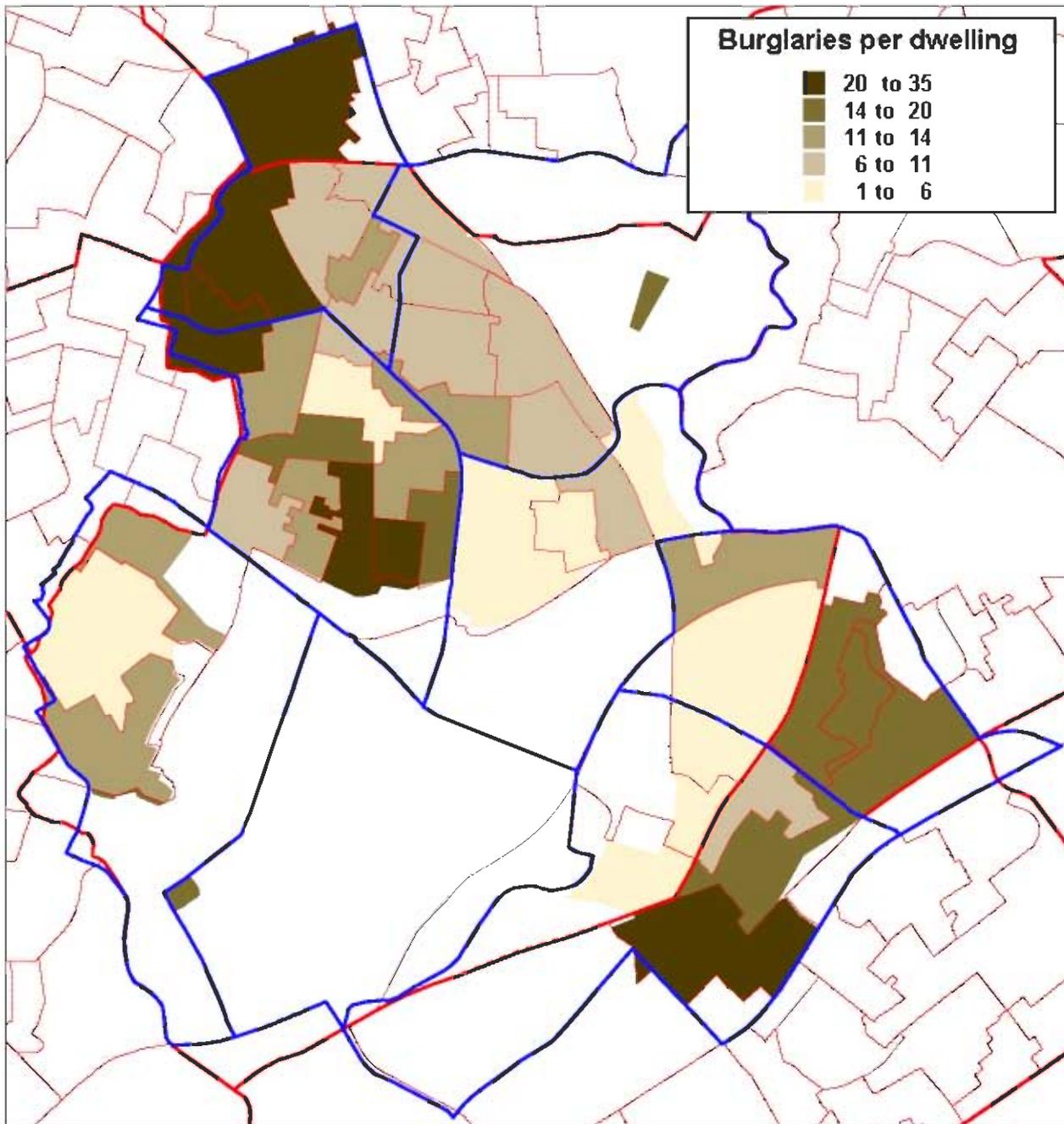
## Equal Ranges



## Quantile

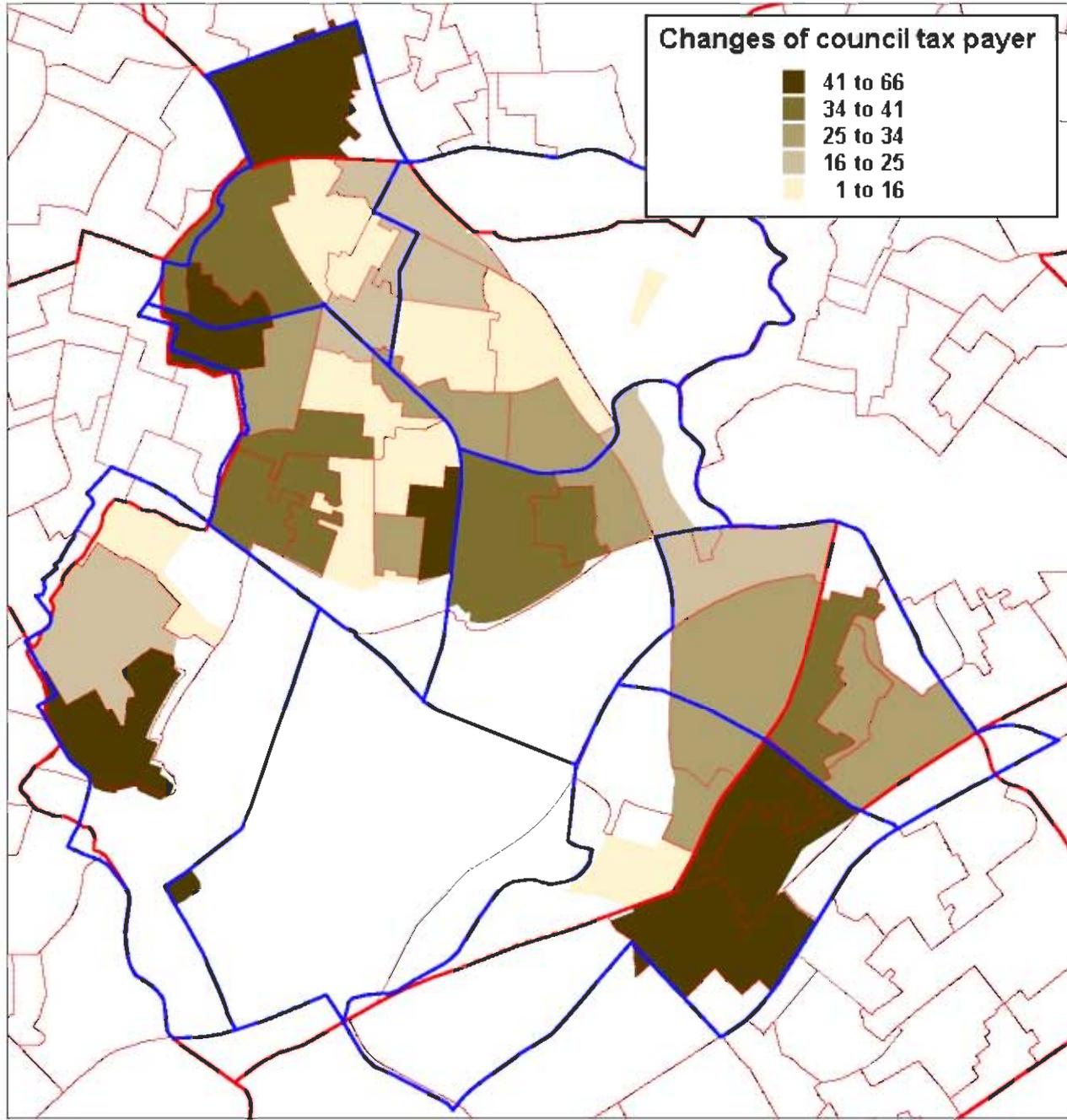


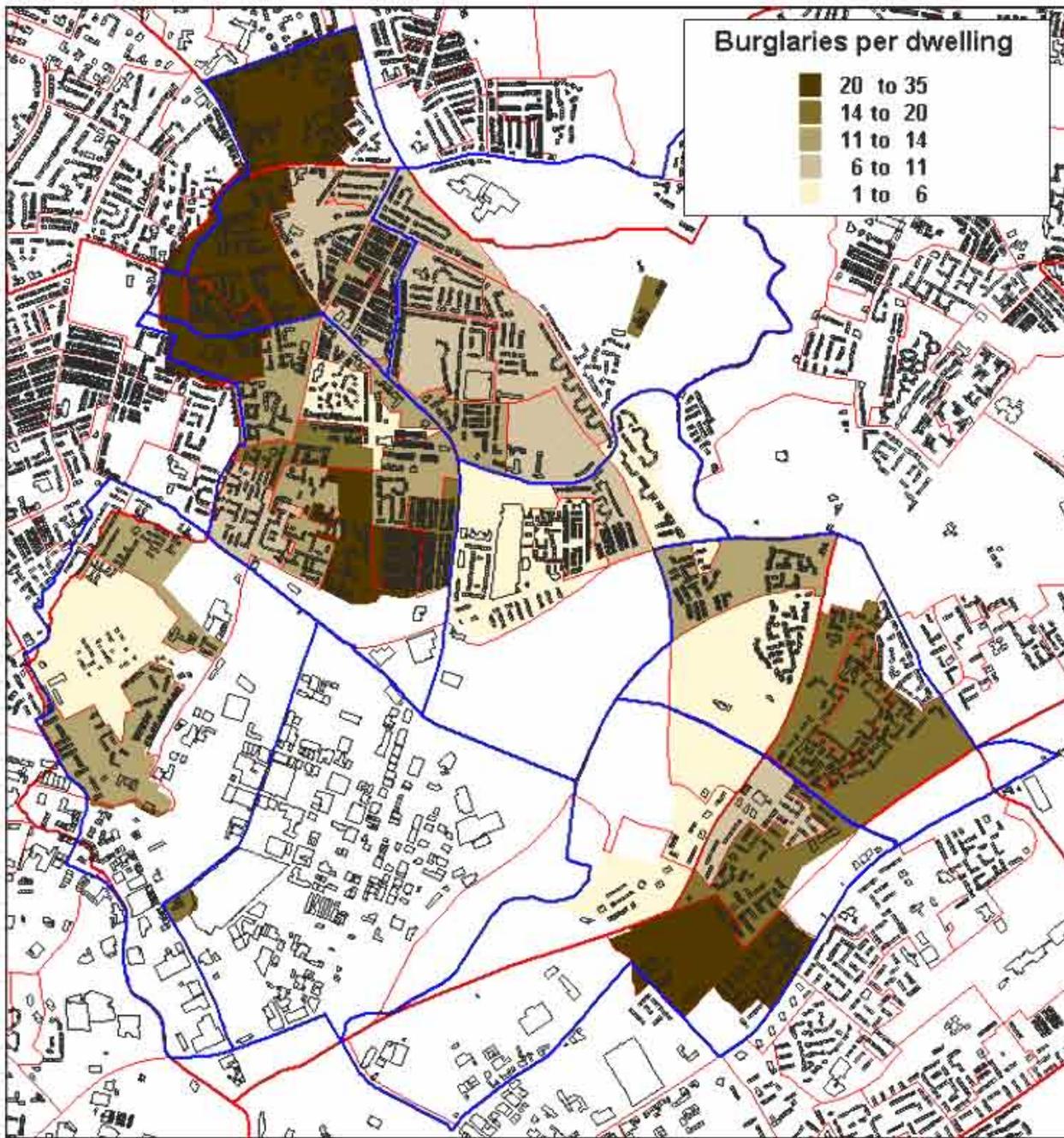


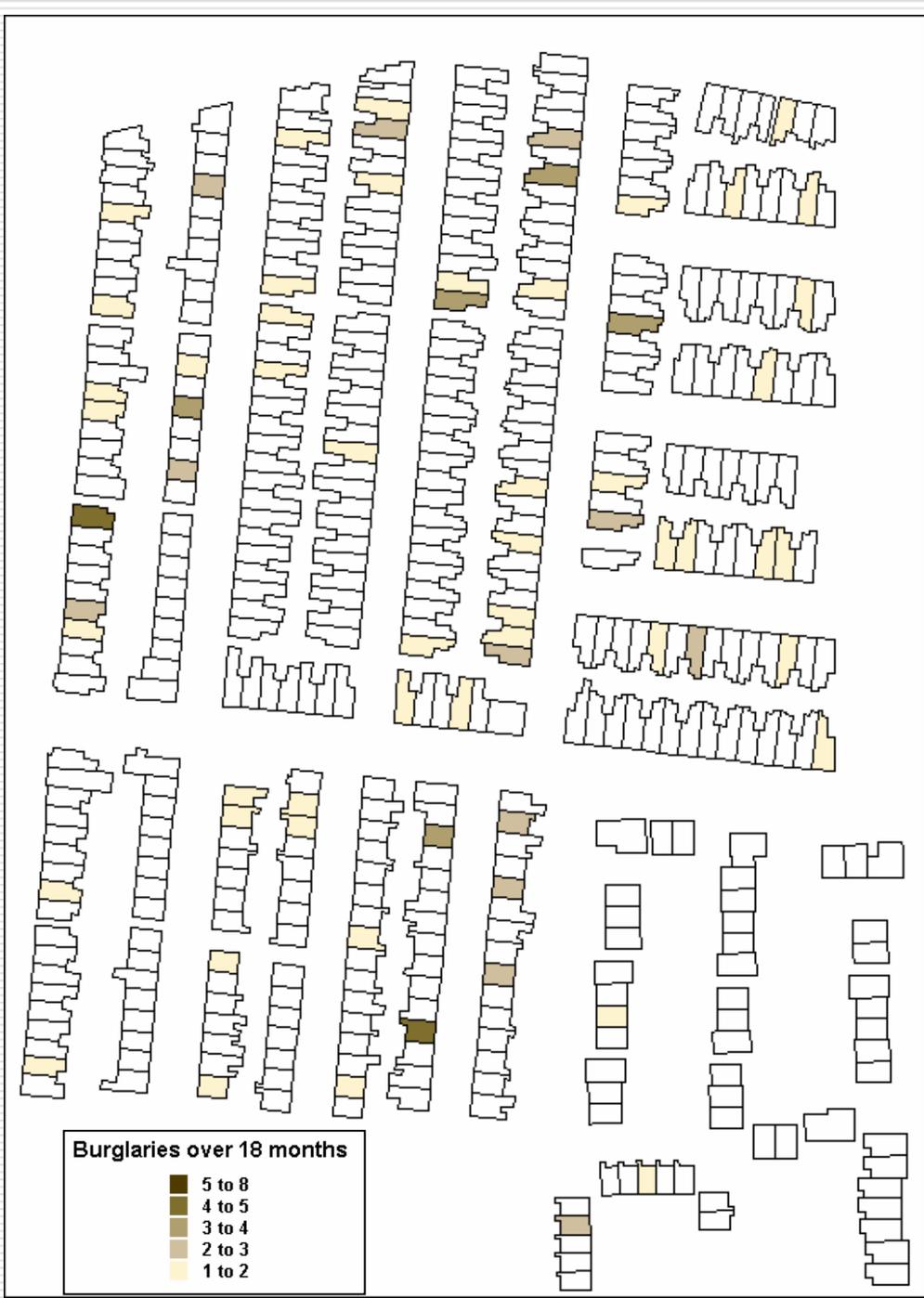


**Changes of council tax payer**

- 41 to 66
- 34 to 41
- 25 to 34
- 16 to 25
- 1 to 16





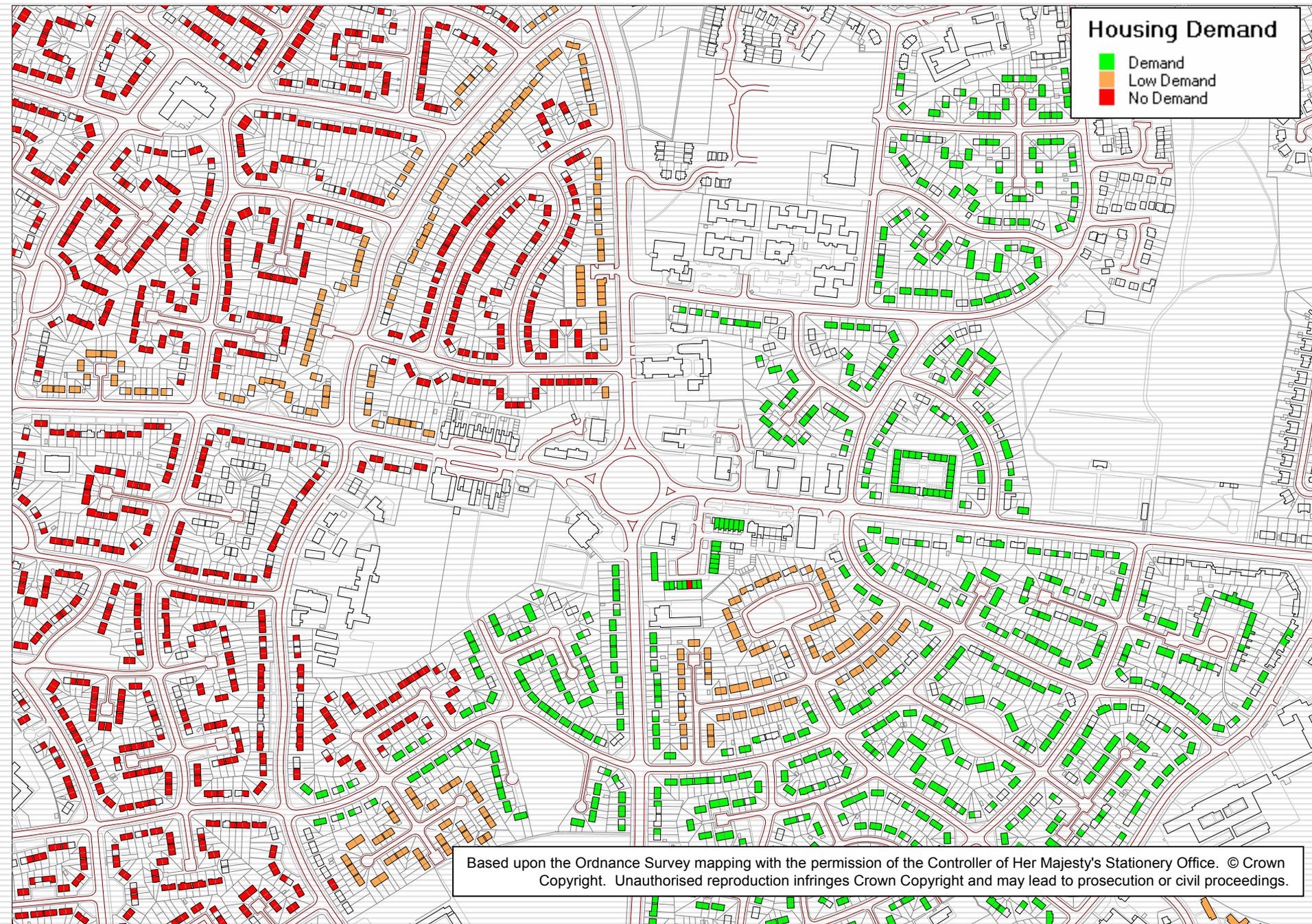


# Hard to let housing

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# Housing Demand

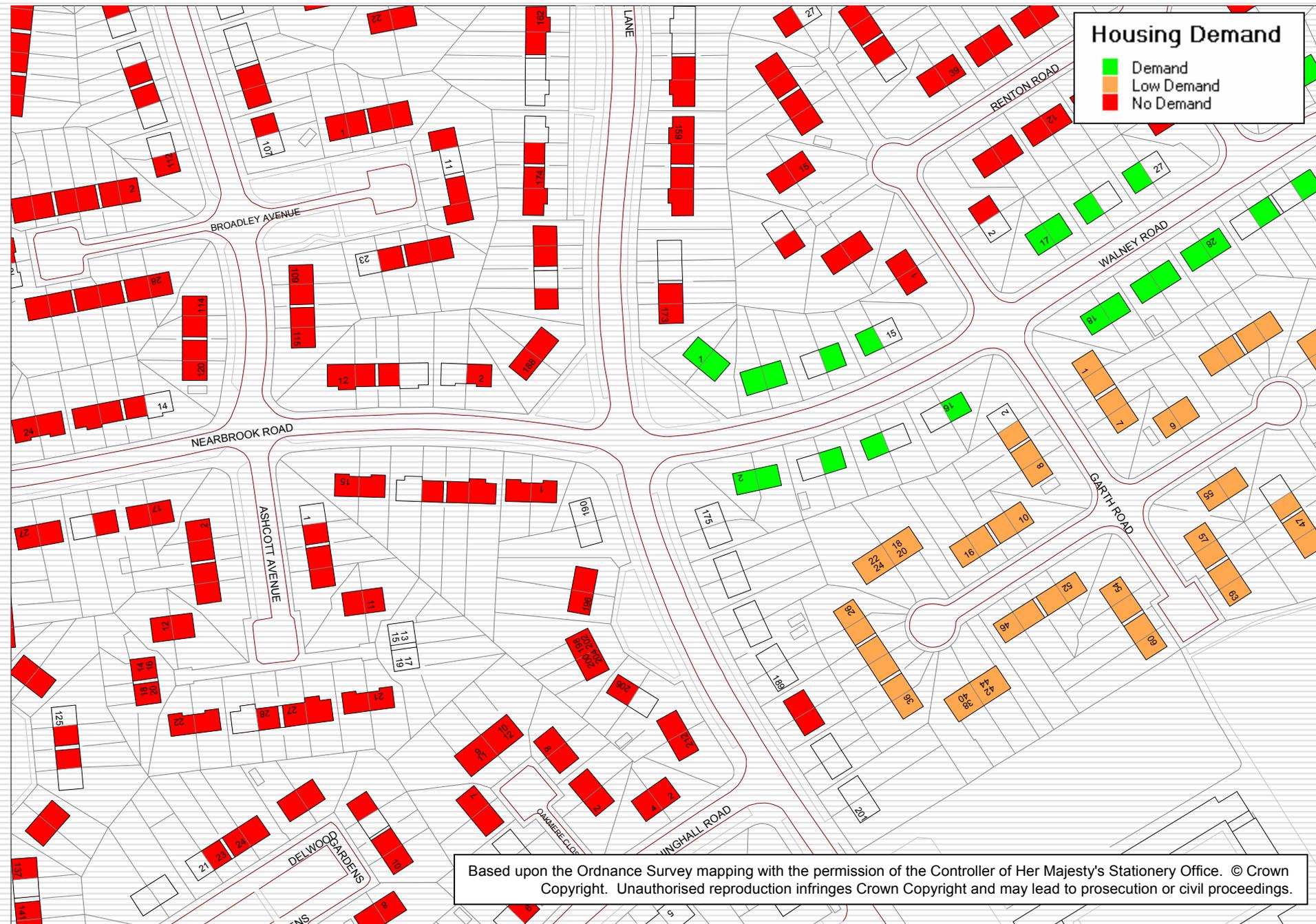
- Demand
- Low Demand
- No Demand



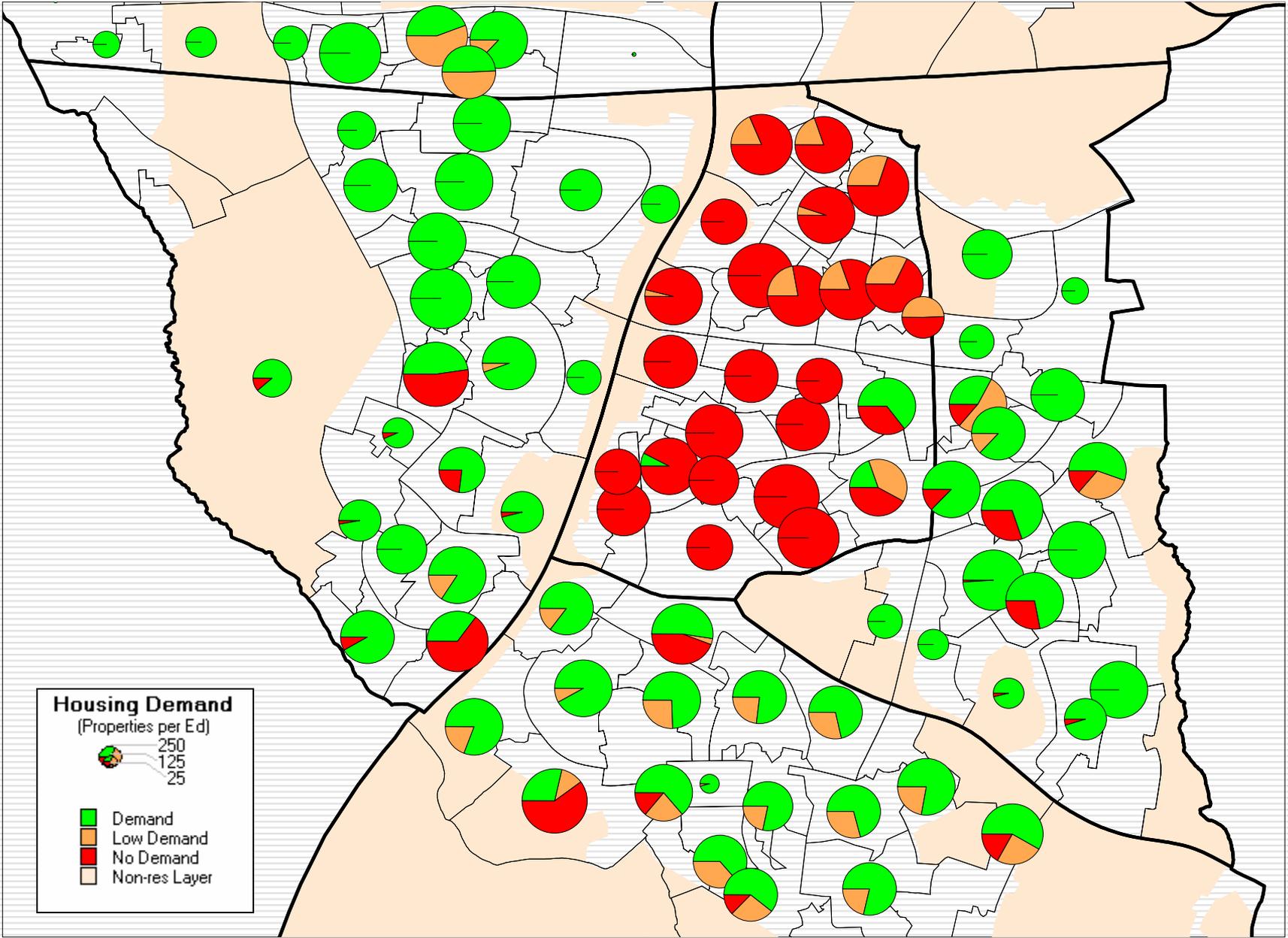
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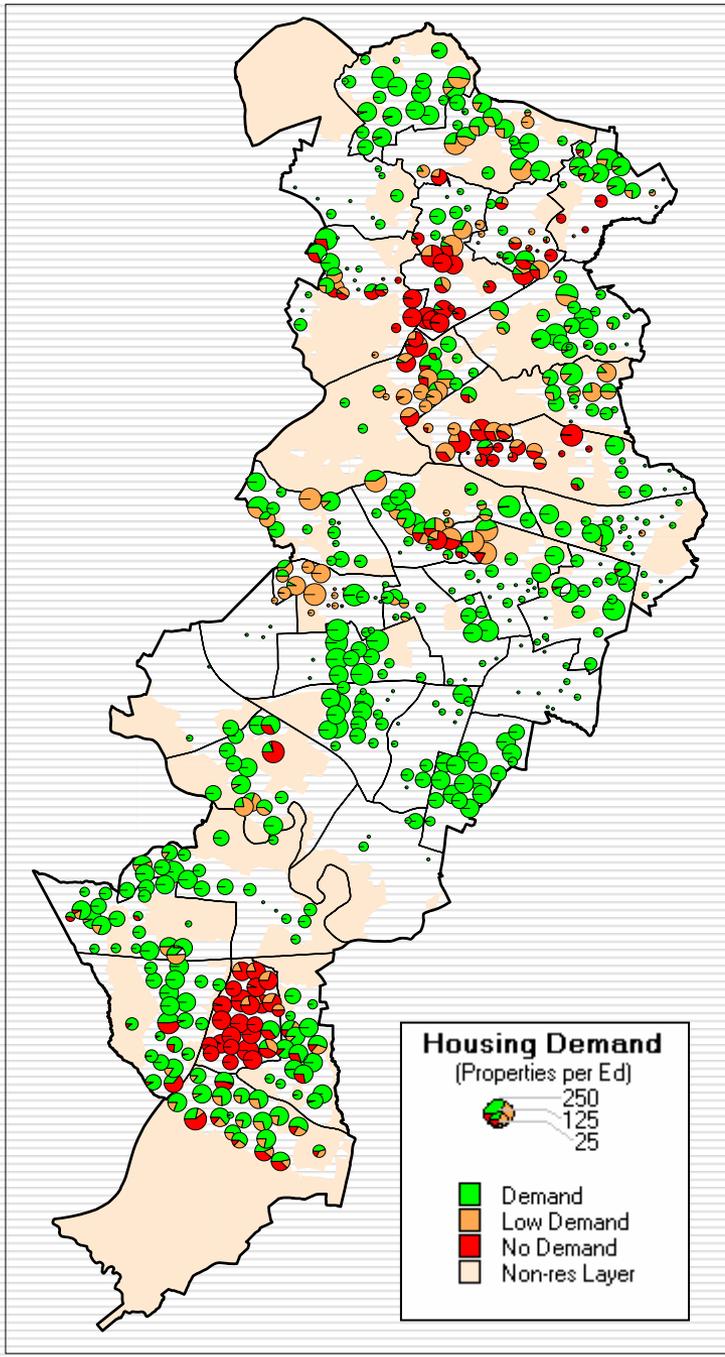
# Housing Demand

- Demand
- Low Demand
- No Demand



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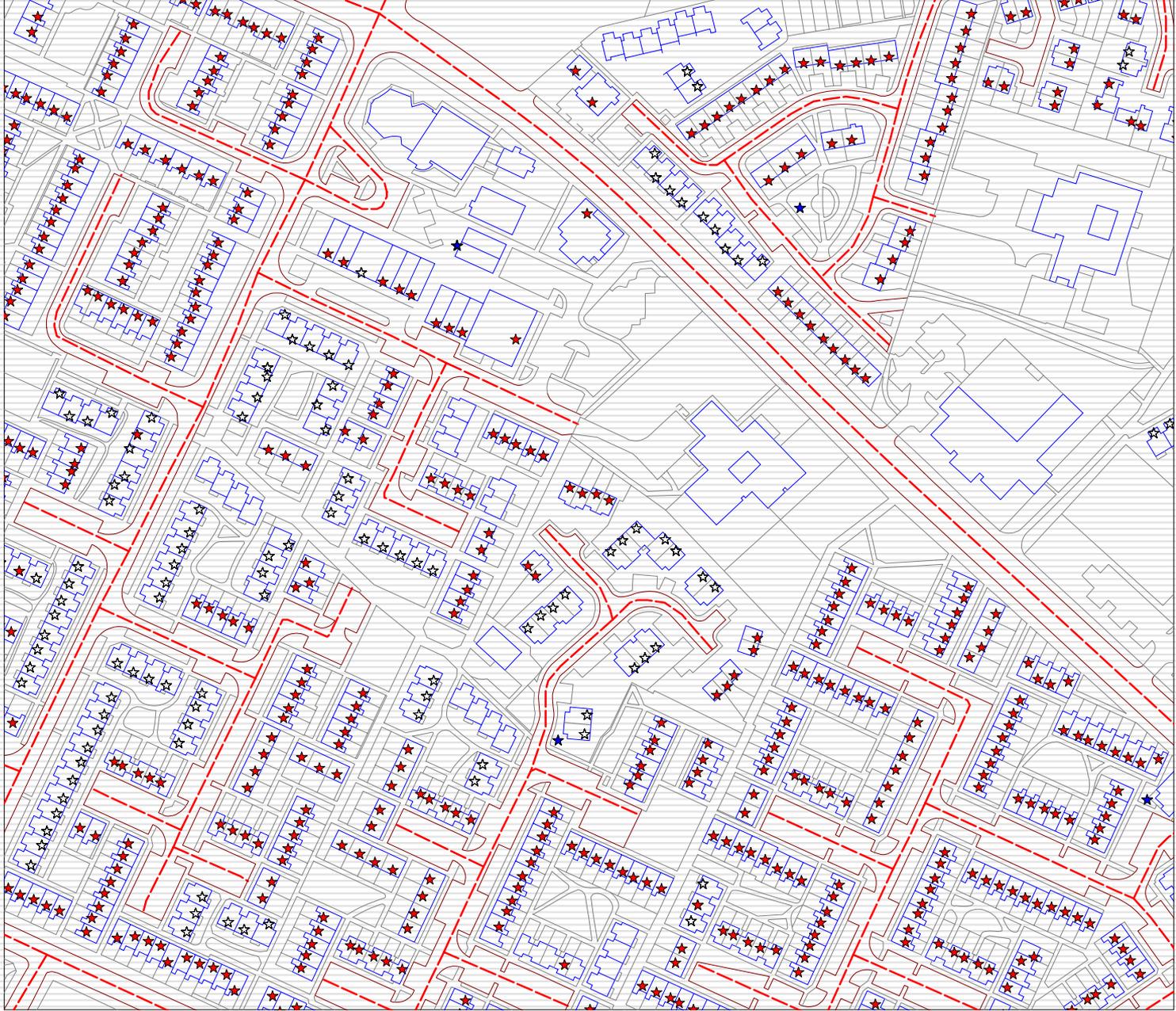




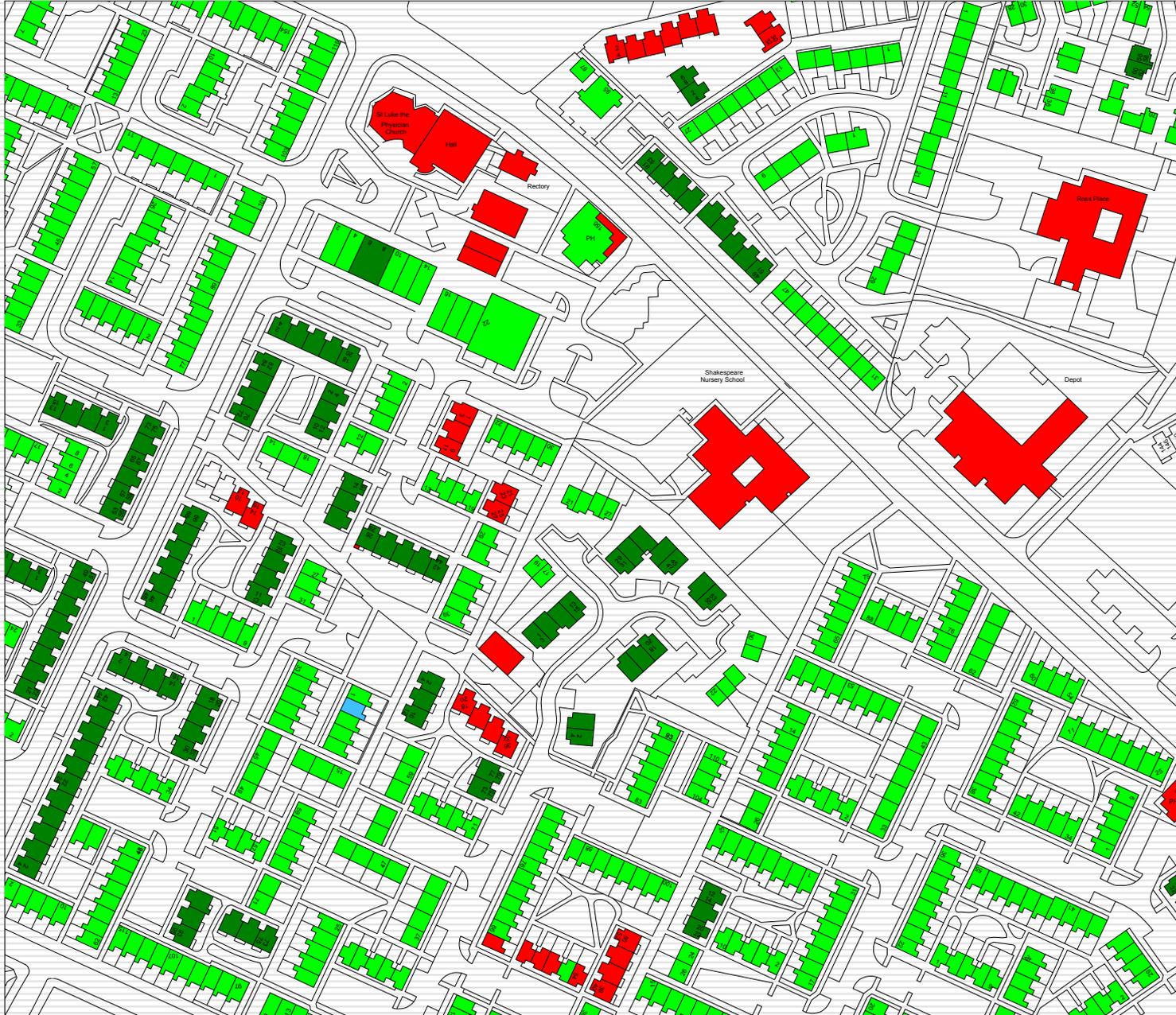
# The geographical referencing framework

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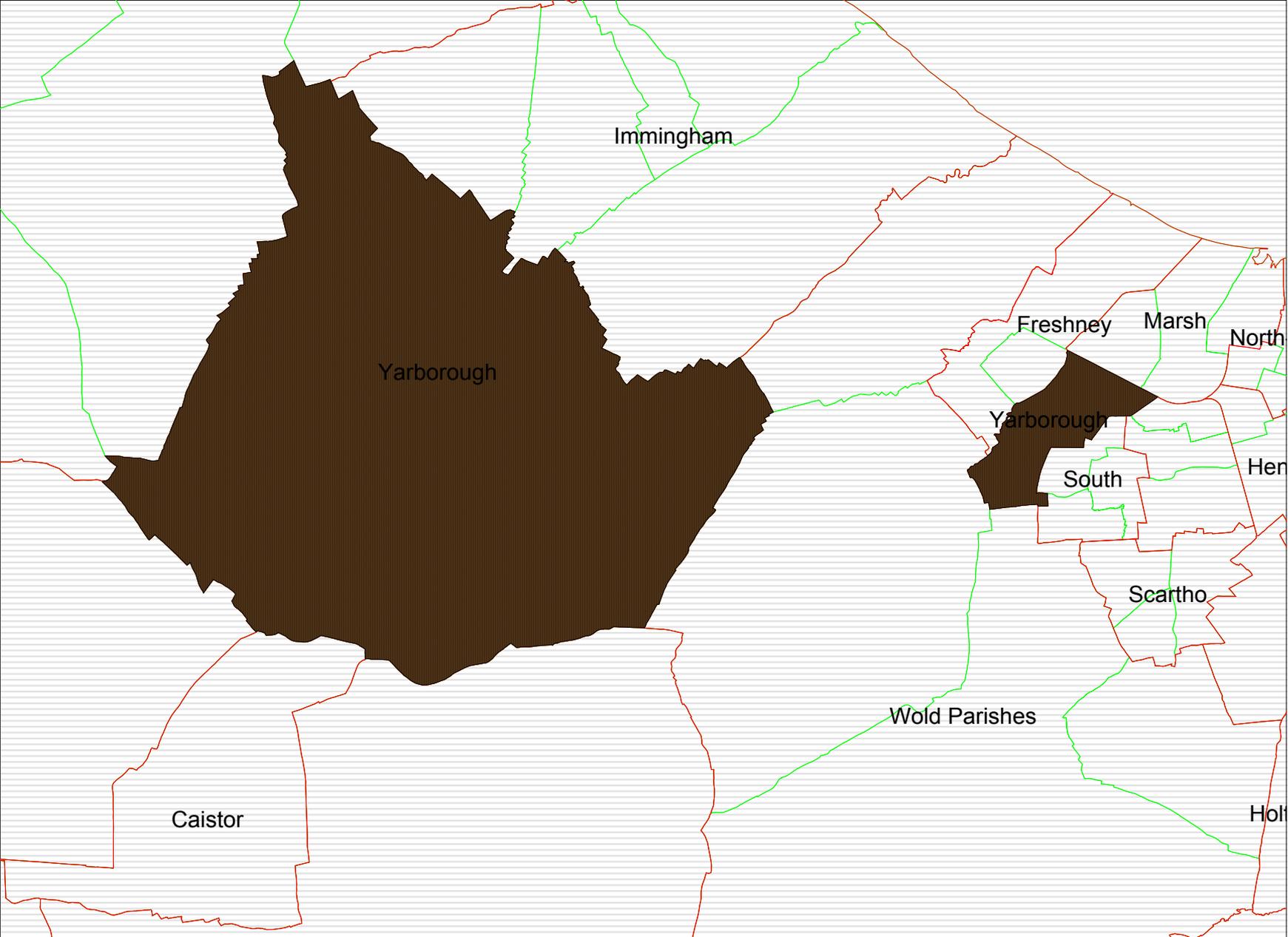
# Address geocoding



# Address assignment to buildings

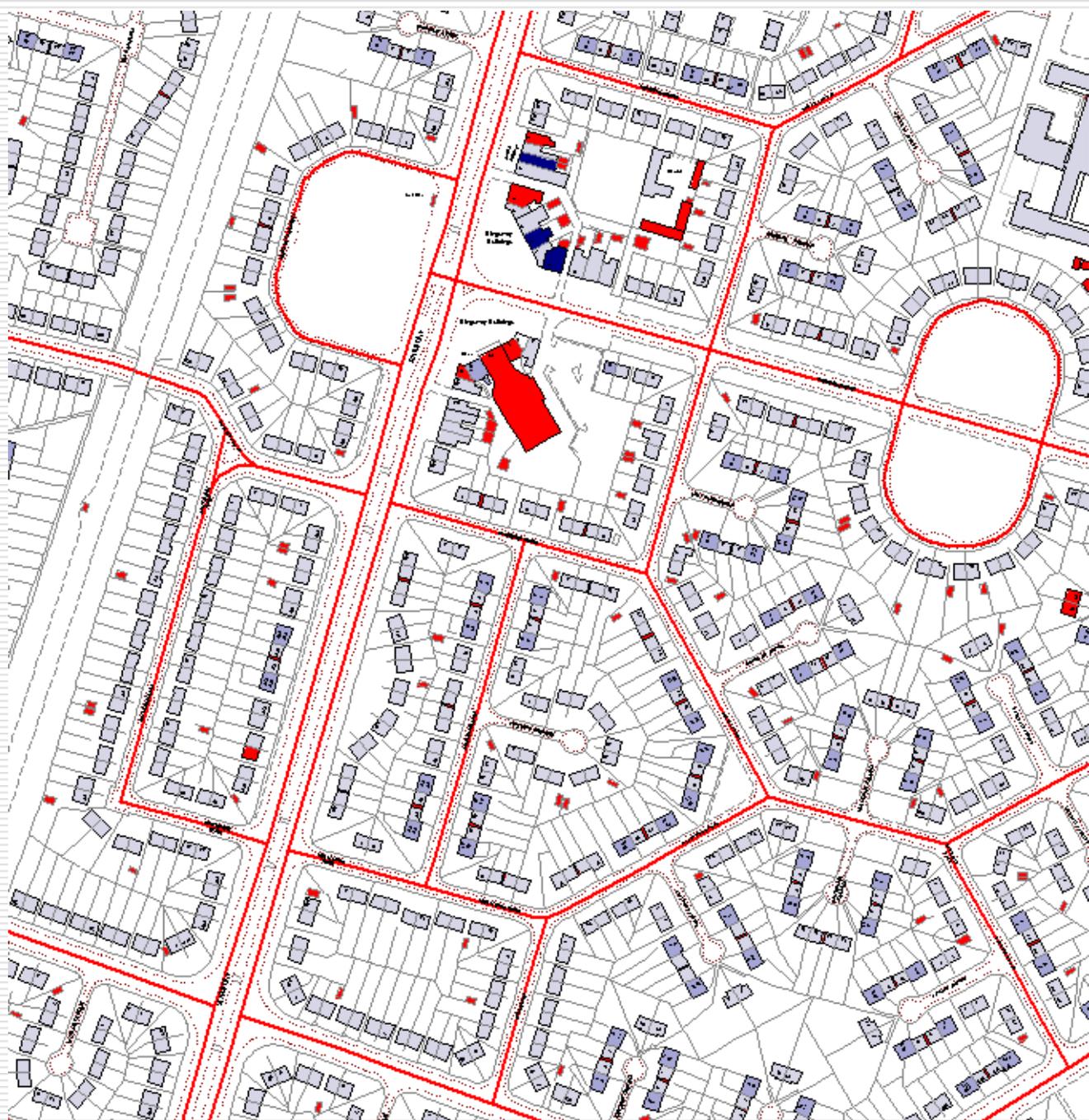


# Ward change



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# Address Points



# UK Postcode

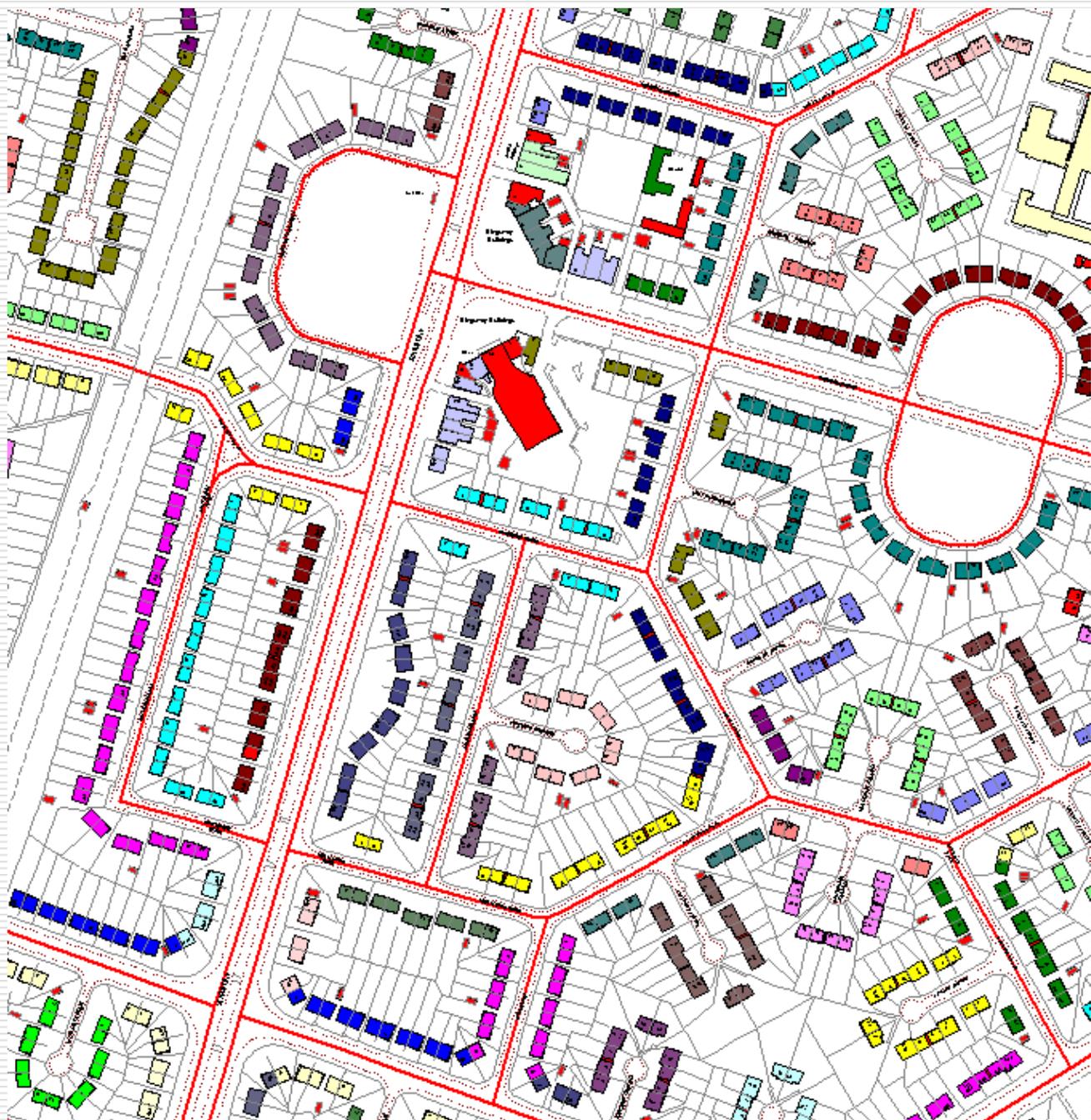
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- Alphanumeric code e.g  
M13 9PL  
WA13 9DH

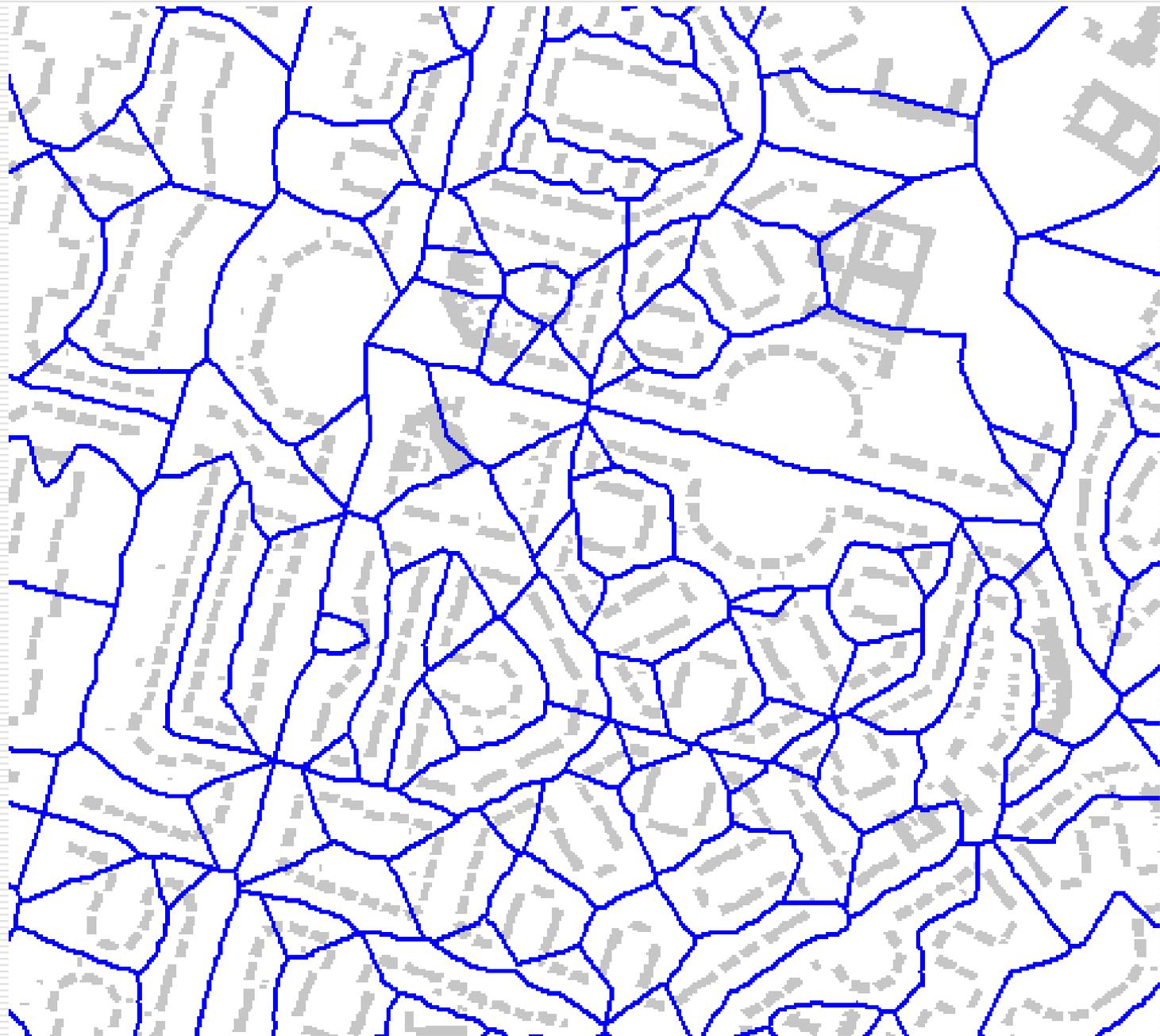
Over 2 million postcodes

- Minimum 1 delivery point
  - Mean 14 Delivery points
  - Maximum 99 delivery points
  - Individual level Postcode Address File available
  - Change rate
    - Over 100,000 addresses per month
    - Over 10,000 postcodes affected
  - Owned by Postal Regulator administered and commercially exploited by Royal Mail
  - Widely used for statistical purposes
-

# Postcodes

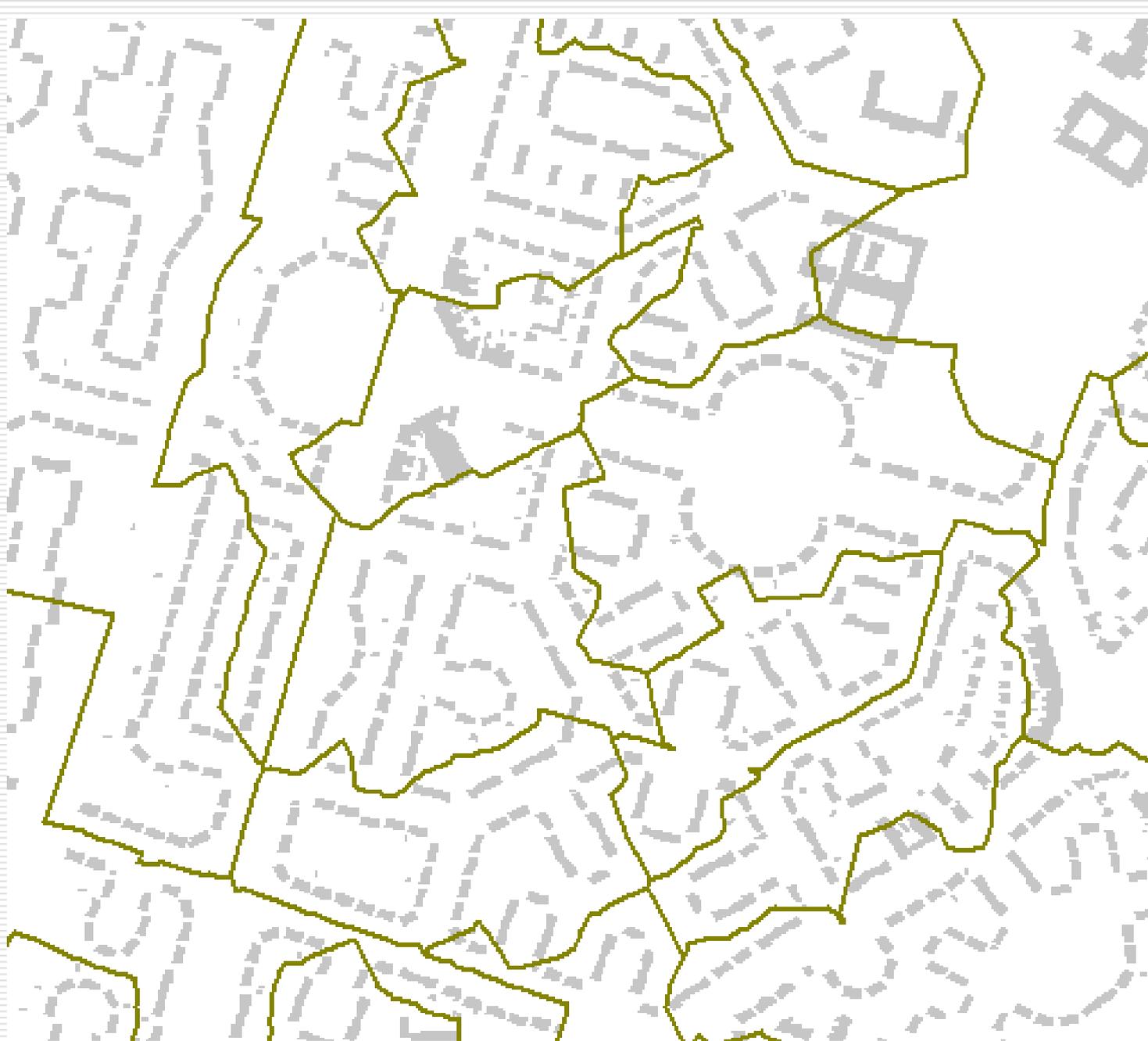


# Postcode Thiessen Polygons



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# Draft 2001 Output Areas



# 1991 EDs



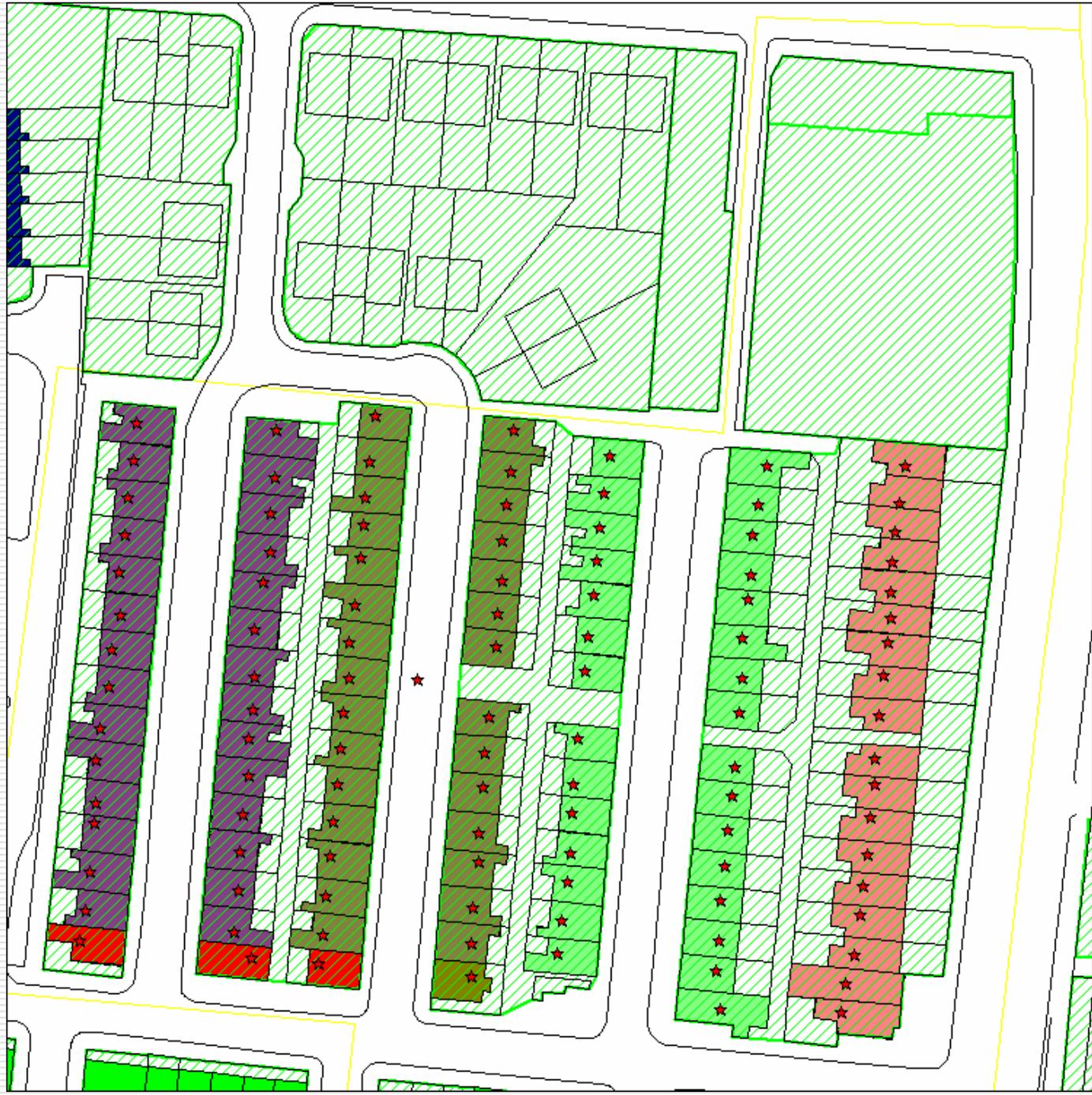
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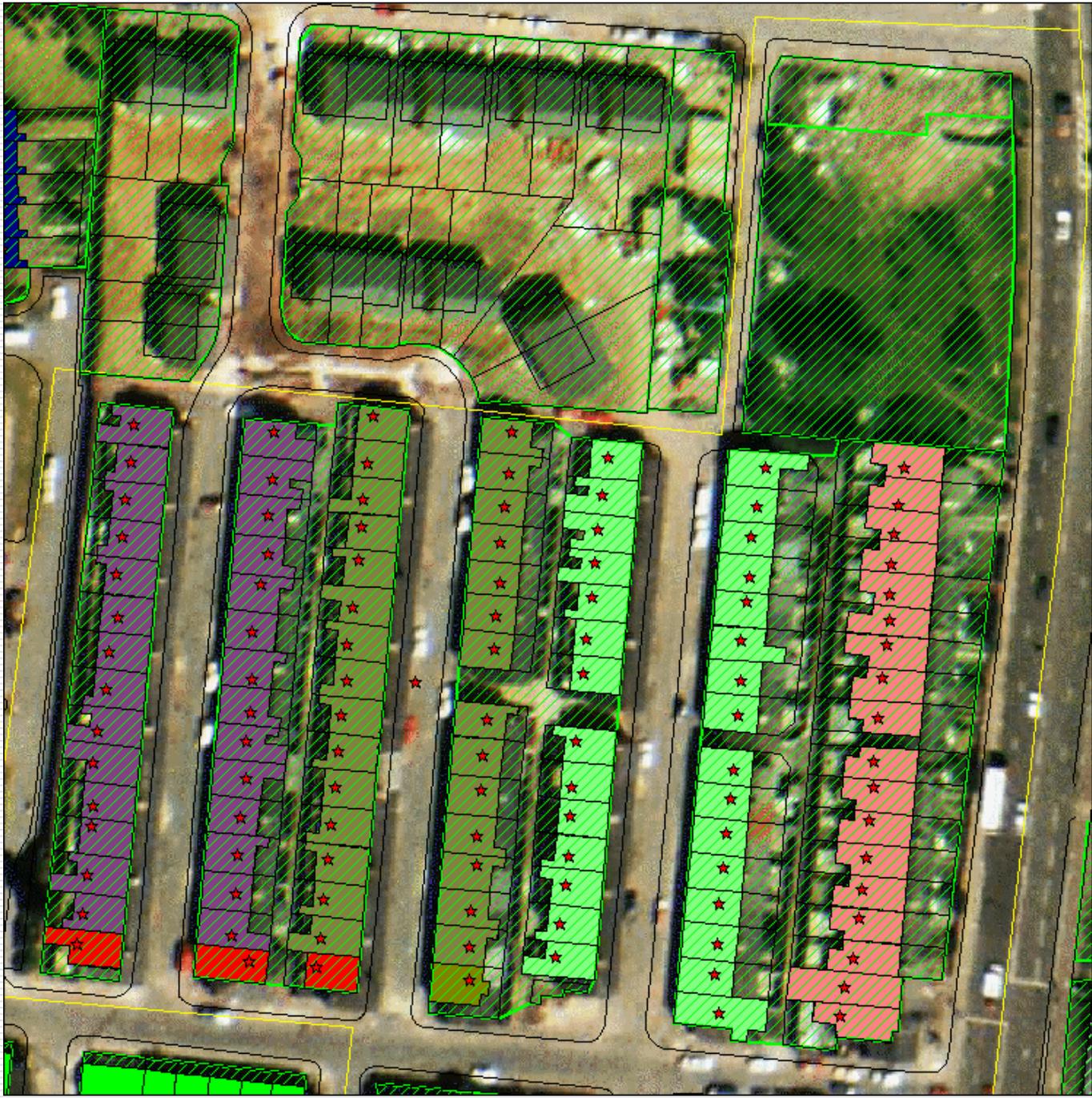
# Blocks



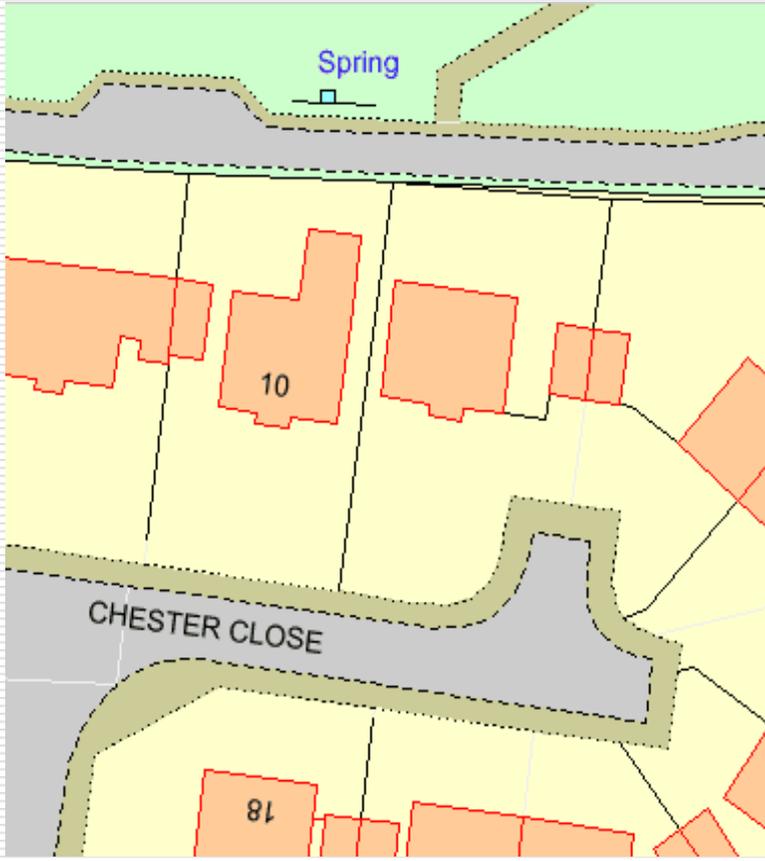
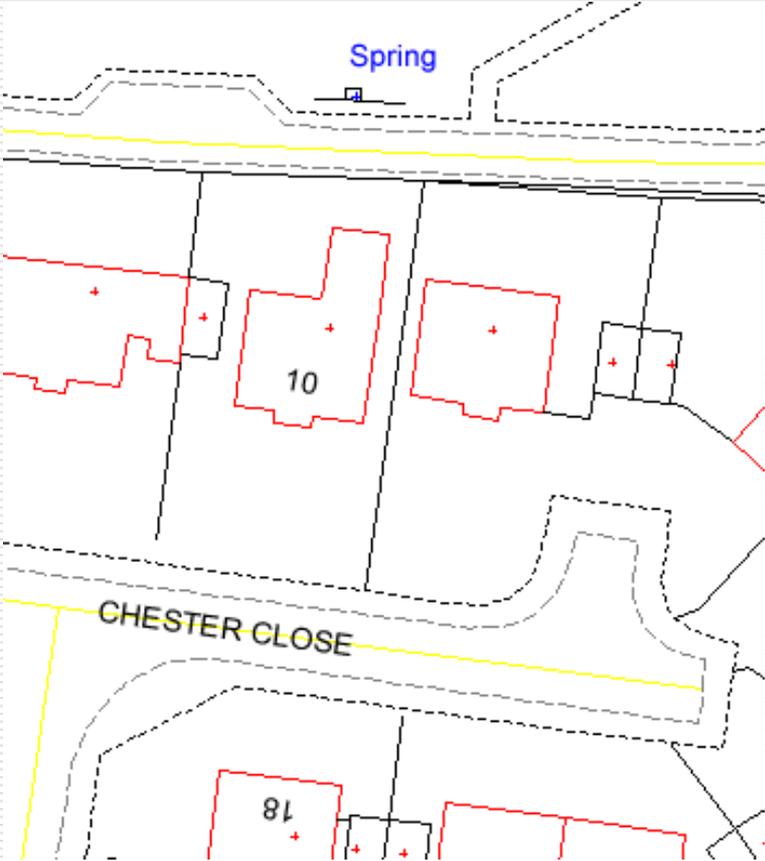
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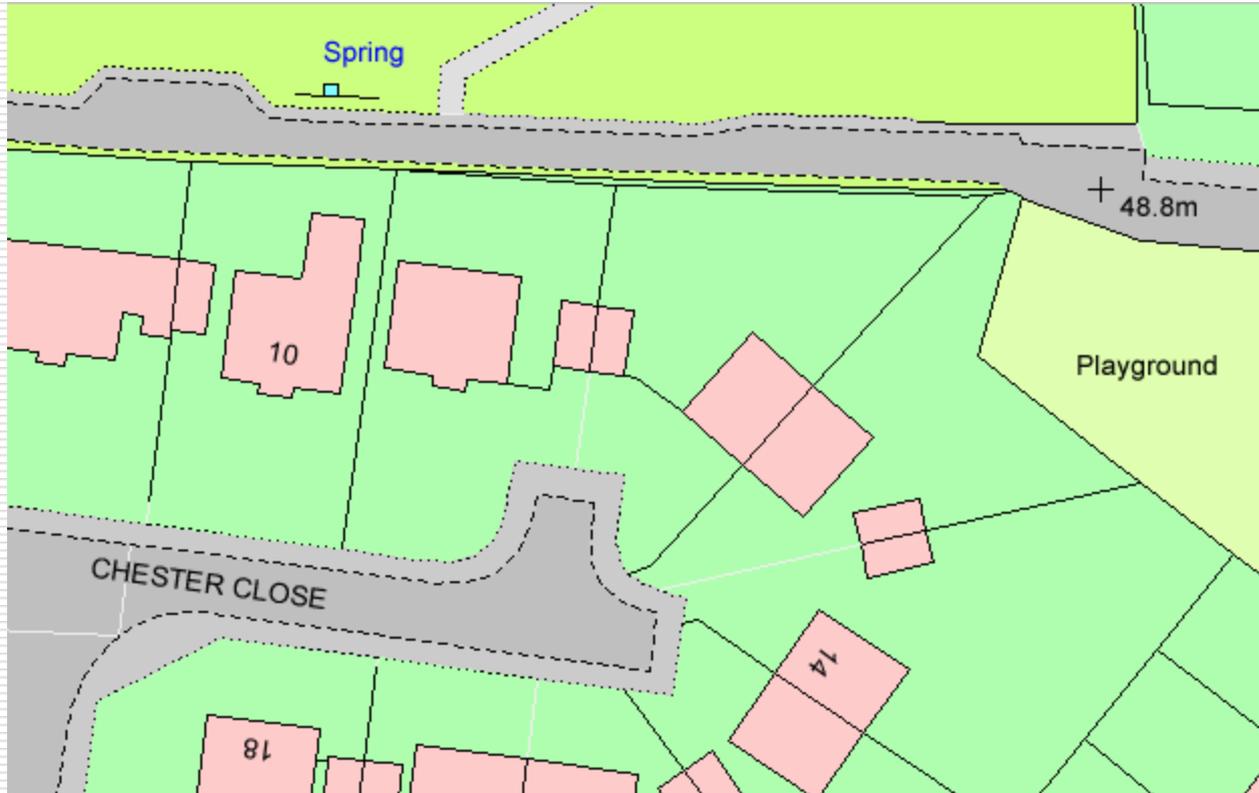




# LandLine to MasterMap



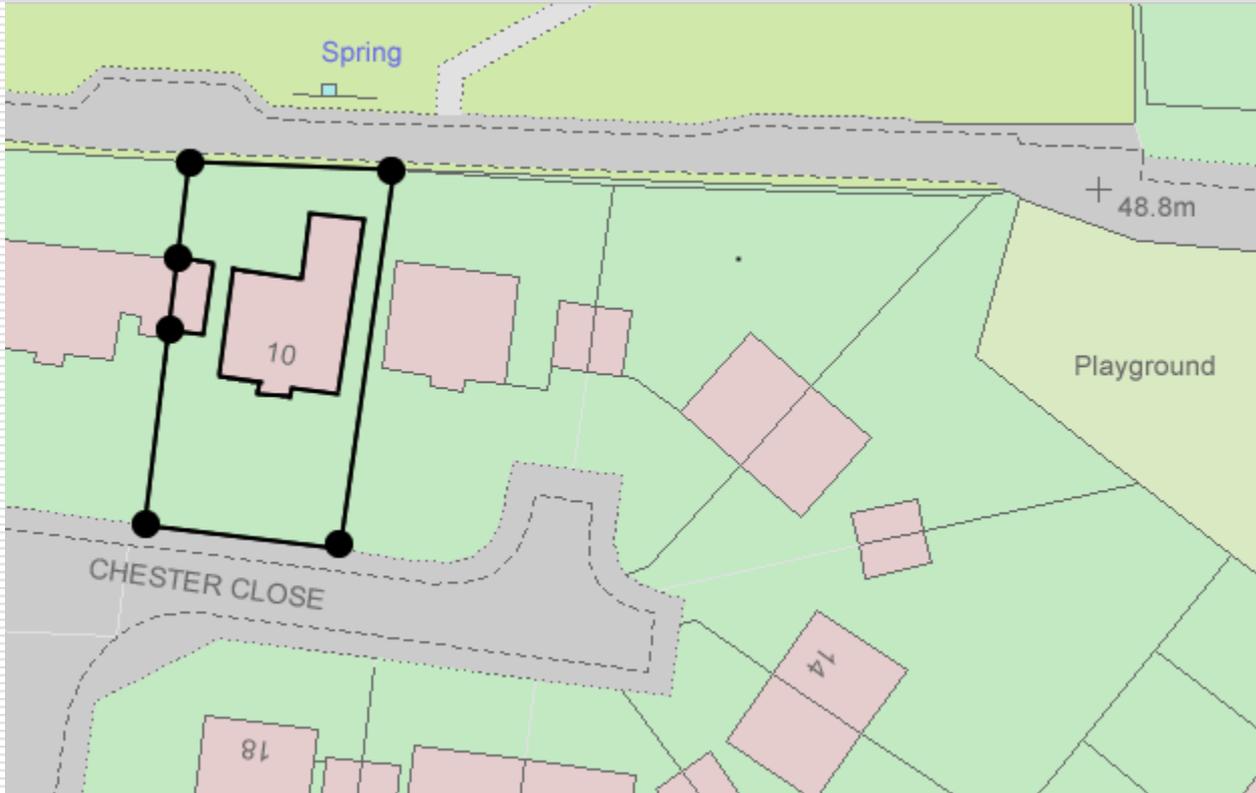
# Intelligent data ...



OS MasterMap

Intelligent

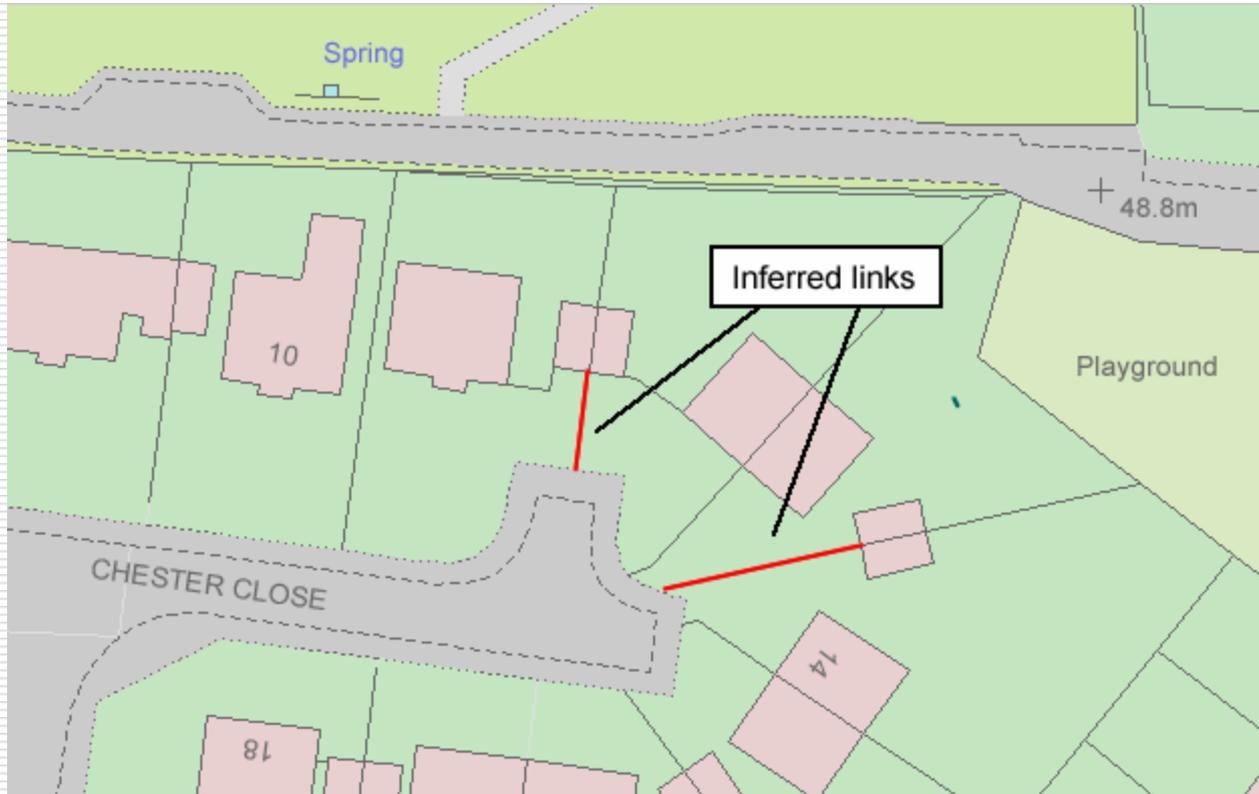
# Intelligent data ...



True polygon data

Intelligent

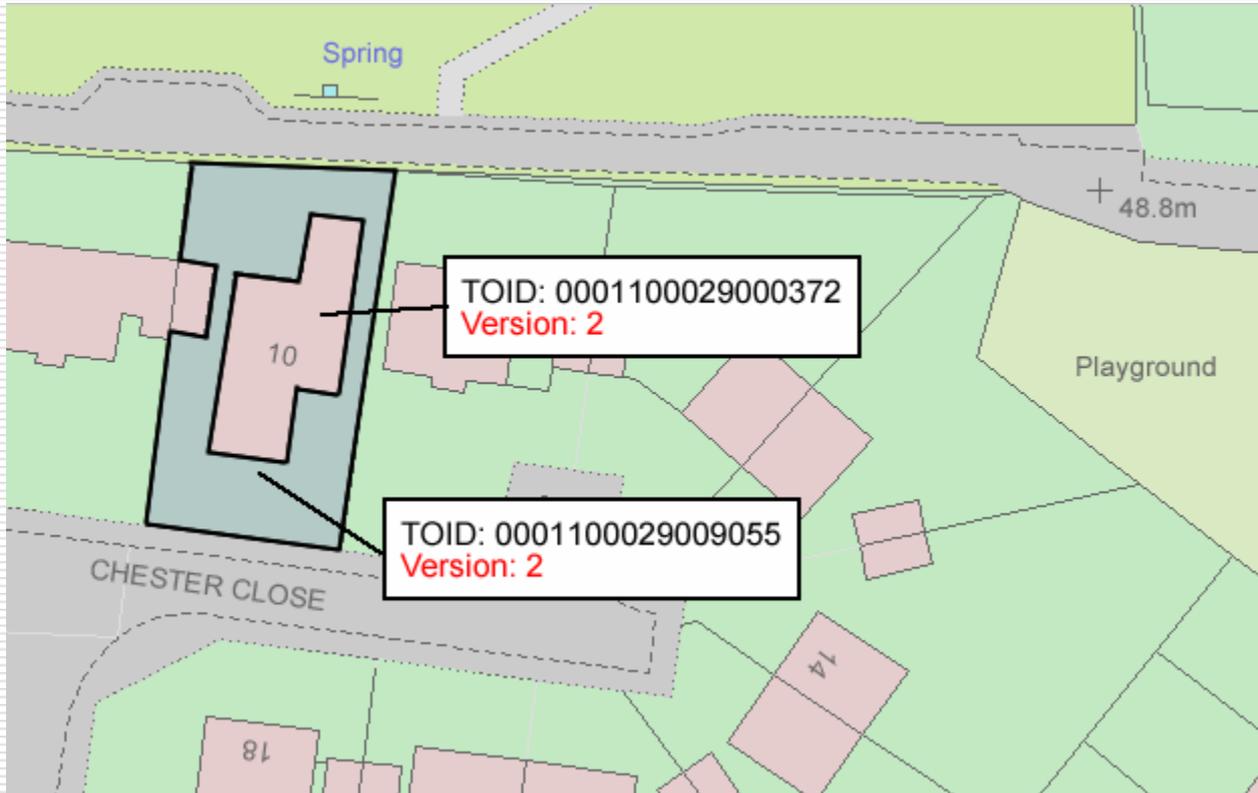
# Intelligent data ...



Inferred links

Intelligent

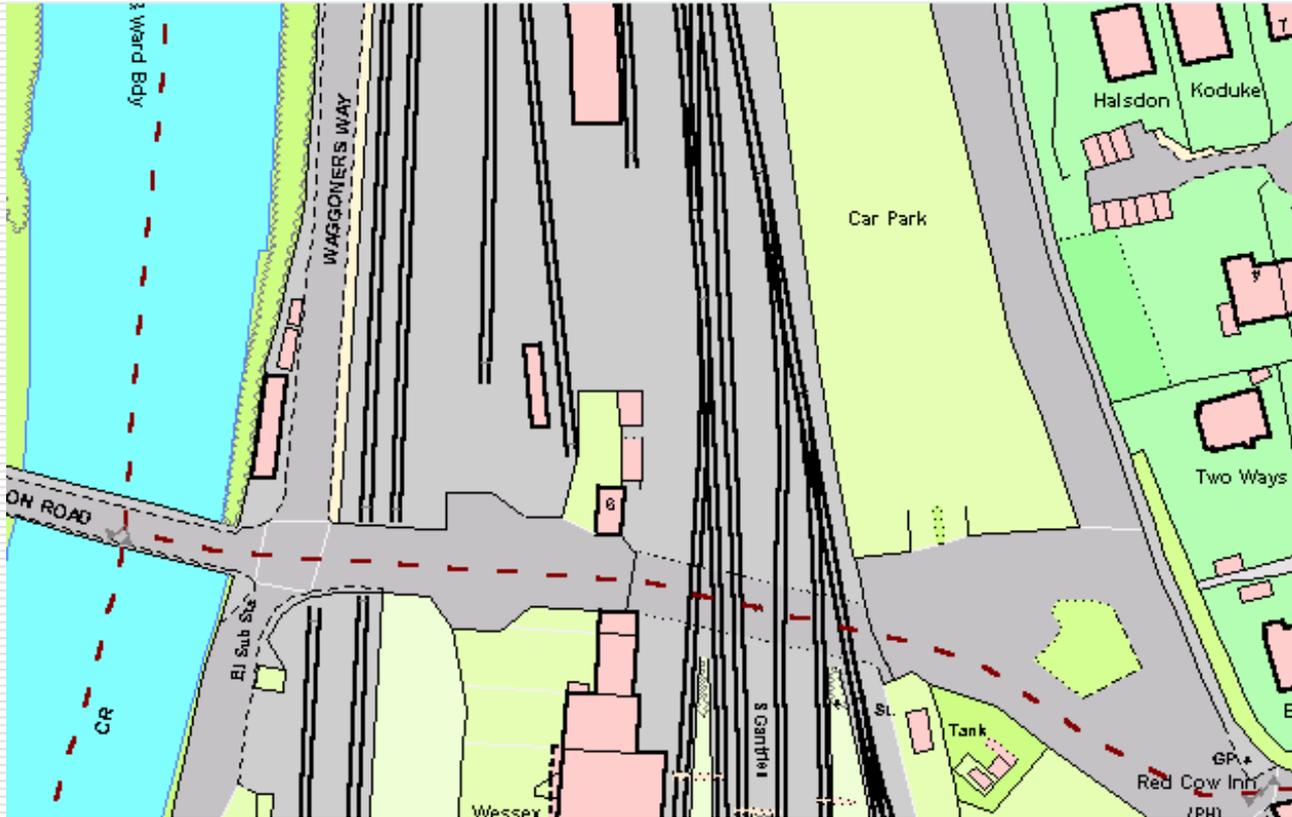
# Intelligent data ...



Topographic  
Identifiers (TOIDS)

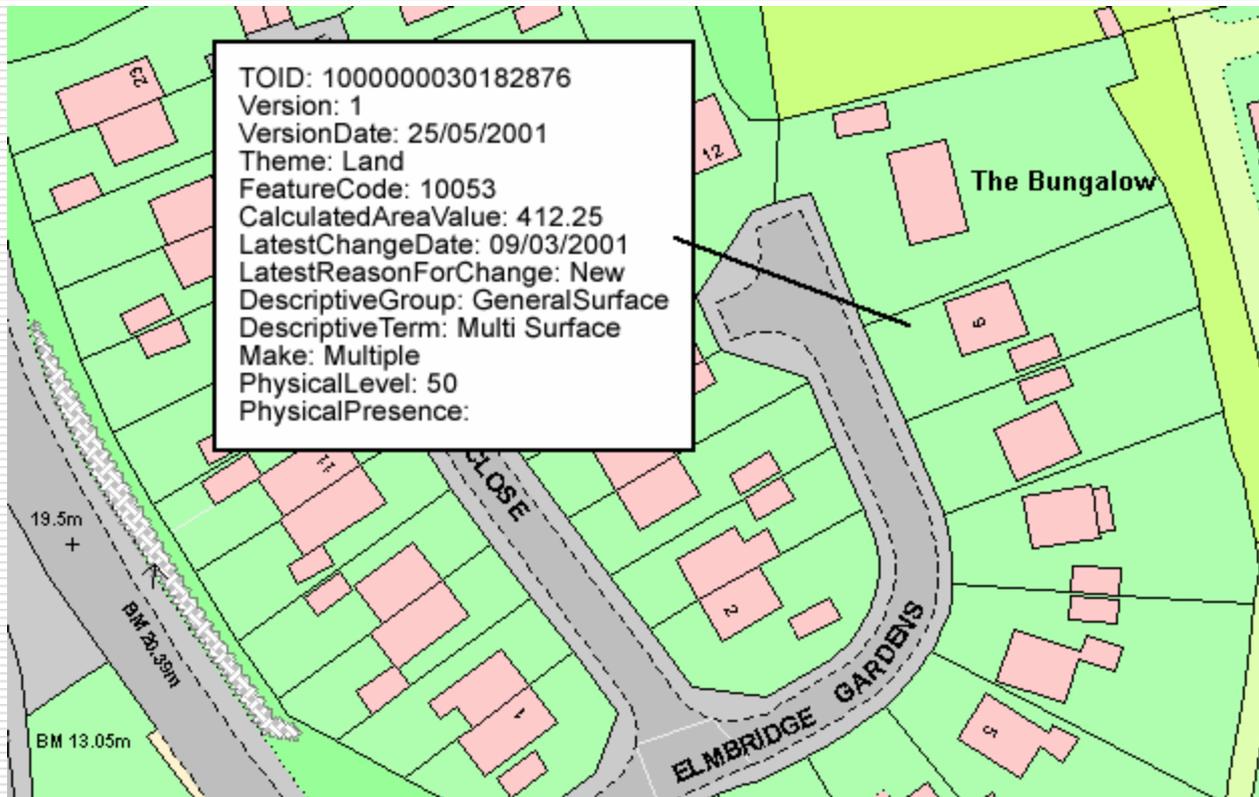
Intelligent  
Intelligent

# Themes



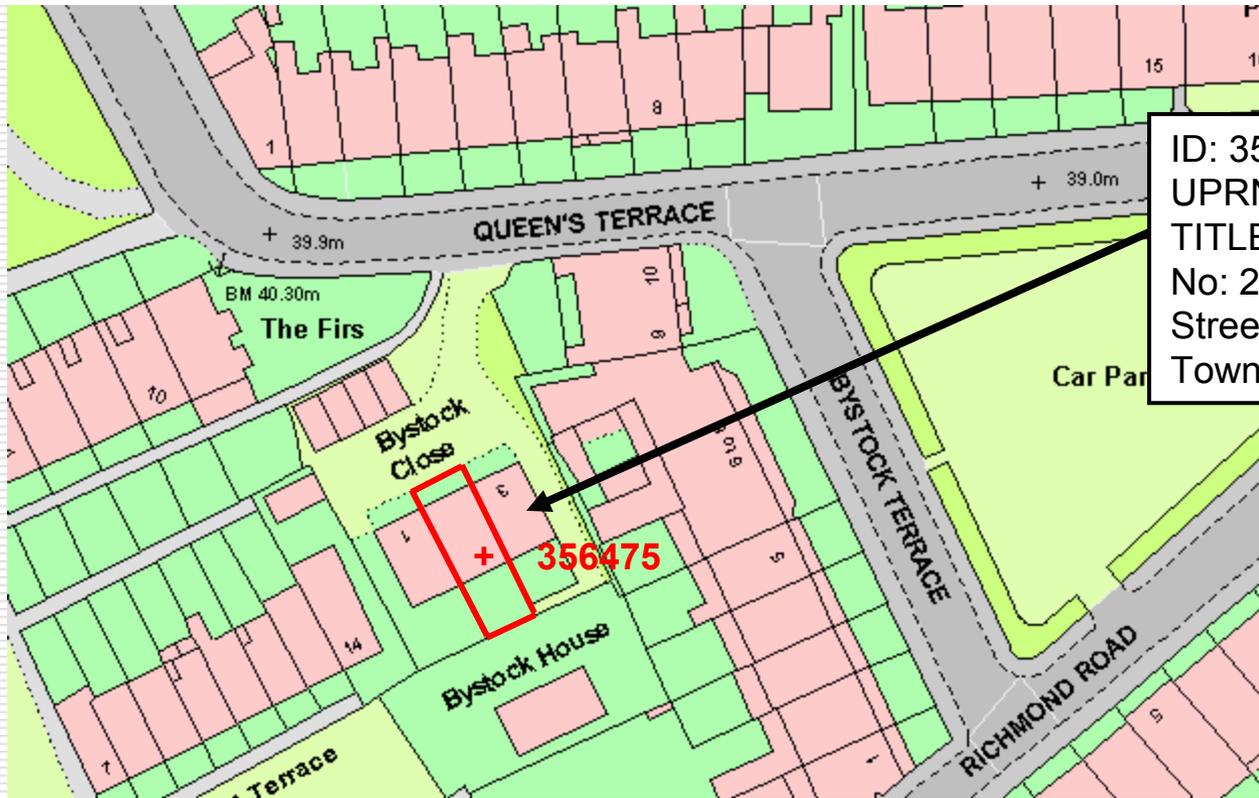
- Land
- Buildings
- Roads, tracks and paths
- Rail
- Structures
- Water
- Admin. Boundaries
- Terrain and height
- Heritage and antiquities

# Object attributes ...



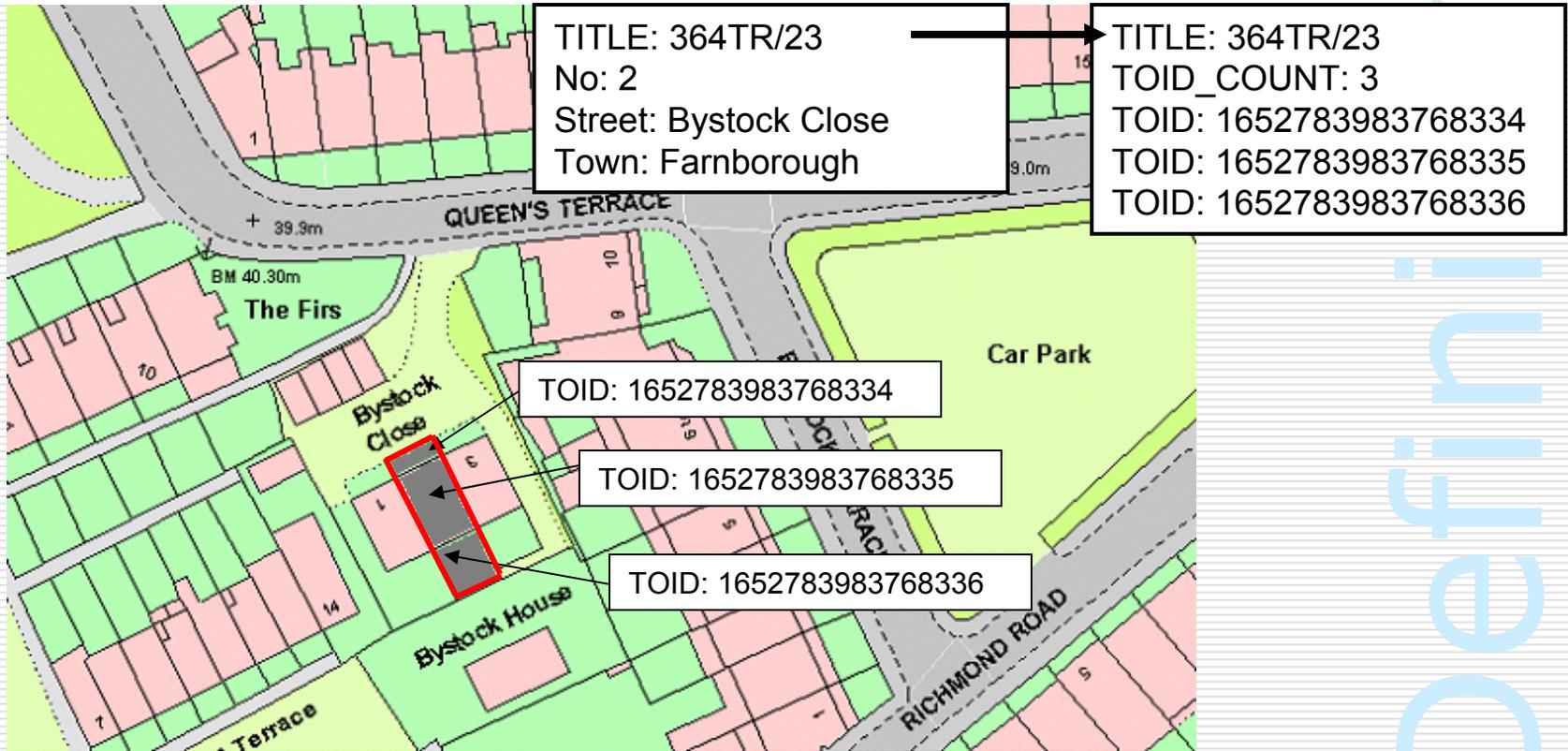
Definitive

# Data Association



ID: 356475  
UPRN: 26635528  
TITLE: 364TR/23  
No: 2  
Street: Bystock Close  
Town: Farnborough

# Data Association



# Basic Spatial Units

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- Building
  - Property parcel
  - Elementary Street Unit
    - (comprises 2 sides – left / right)
  - Block
    - Area of land bounded by streets or other identifiable linear features such as railways / rivers / canals / coastline / cliffs
-

# Basic geographical references

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## □ Direct

- Map reference
- GPS derived co-ordinates

## □ Indirect

- UPRN (Universal Property Reference Number)
- Building ID
- Street name
- Address
- Postcode
- Area code

□ e.g. any Standard name or code such as a ward code or FIPS code in the United States

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# An axiom

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No geographical object is permanent. All geographical objects are subject to one or more of the following processes:

- Creation
  - Destruction
  - Fusion
  - Fission
  - Movement
-

# Joined-up-geography

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- A set of basic spatial units that comprise the geography must be defined
  - Those units must be referenced using a consistent set of identifiers
  - A logical relationship between the units should exist which, in turn, ensures consistency in the use of the identifiers
  - The process of creating the geography must be regulated (self regulation is possible) to ensure consistency, non-duplication and timeliness
  - A single definitive reference source should be available for each of the units and identifiers in the system – this should be available for free query using web services
-

# How close are we to having a joined up geography?

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- In the UK 6 types of agencies are involved:
    - Local Government
    - Electoral commissions
    - Postal Authority
    - National Mapping Agency
    - Statistical Agency
    - Land Registries
-

Which of these has a primary responsibility for geographical referencing?

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NONE

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Which of these create geographical references?

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ALL

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# How joined up are the references?

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- Theoretically a common set of references for addresses and administrative / statistical / electoral areas are used by all the bodies involved
  - In practice ???????
  - Gridlink – common geocoding used by ONS Royal Mail and OS has helped
  - Discussions on the address base continue
  - However there is a long way to go to achieve the objectives outlined above.
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# The address fiasco

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- A stand-off has existed for a number of years between Local Government, Royal Mail and Ordnance Survey over the 'ownership of addresses'
  - A maintained and affordable national address master file is essential to deliver many elements of e-government
  - Each of these three protagonists is concerned with control of addresses to secure income
  - What should be a discussion about technical standards and dissemination has become a war over intellectual property rights
  - This is due to government's unwillingness to fund the spatial data infrastructure required to support e-government
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# Regulators

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- The issue of an NSDI for Britain could be resolved if government was advised by and had the services of independent regulators
  - These might include
    - National Mapping Agency
      - But undermined because of the need to recover costs and can't regulate itself
    - A ministry e.g. ODPM
      - It is the major user of geographic information in government so it looks like special pleading
    - HMSO
      - Regulates the free access to government information and is poorly placed to regulate trading funds or secure resources
    - E-envoys office
      - Well placed and doing a good job on technical standards but unable to secure funding and is a time limited office of government
  - But a single regulatory body would be better – perhaps a Geographic Commission
-

# Office of the e-Envoy

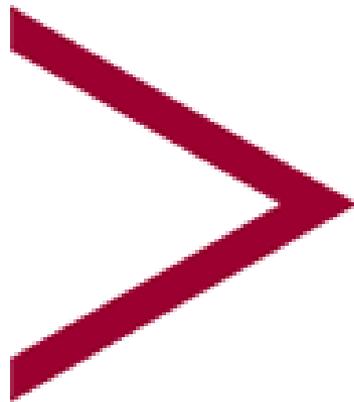
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The Office of the e-Envoy (OeE) is leading the drive to get the UK online, to ensure that the country, its citizens and its businesses derive maximum benefit from the knowledge economy. To support this aim, the Office has four core objectives:

- to make the UK the best place in the world for e-commerce
- to ensure that everyone who wants to can access the internet by 2005
- to deliver electronically, and in a customer-focused way, all government services by 2005
- to co-ordinate the UK government's e-agenda across different departments

# E-envoy key areas of work

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Internet  
access

Digital TV

UK online  
campaign

Metadata

e-Economy  
Overview

Information  
assurance

e-Democracy

Government  
Gateway

Interoper-  
ability

# Things you need to know about the E-Gov Act of 2002

Provision	Description	Details
Office of Electronic Government	Creates presidential-appointed administrator to lead office within Office of Management and Budget.	Leads CIO Council on behalf of OMB's deputy director for management.
E-Government Fund	Authorizes \$345 million during four years, administered by the General Services Administration.	Funding contingent on congressional appropriations.
Section 508	Reiterates Web accessibility law.	Could be enforced as part of budget process.
Web guidelines	Requires e-gov administrator to set basic standards for federal Web sites.	Agencies must develop a process for deciding which information goes online.
Privacy requirements	Requires privacy impact assessments for new systems.	Allows agencies to withhold information considered sensitive but unclassified.
Information technology workforce development	Calls for governmentwide effort to identify training priorities.	Includes public/private staff exchange program.
Share-in-savings	Supports contracts that pay vendors based on lowering costs of operations.	Limits agencies to five such contracts from 2003 to 2005.
Cooperative purchasing	Allows state and local governments to buy IT through GSA schedule.	Higher volume potentially could drive down prices for feds.
Geographic information system standards	Calls for development of common protocols for geographic information.	Authorization provided for necessary funding.
Information security	Includes Federal Information Security Management Act.	Select National Institute of Standards and Technology guidelines could turn into mandates.

# Conclusions

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- ❑ e-government involves GIS because the relationship between government and citizen is frequently geographically based
  - ❑ e-government places a greater reliance on the robustness of information – geographic information has considerable scope for error
  - ❑ e-government requires an e-geography i.e. a National Spatial Data Infrastructure
  - ❑ Attempts to fund an NSDI by cost recovery in the UK have been good at improving mapping but poor at making it widely available and maximising its usage
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# Relevant web links

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- ❑ <http://www.e-envoy.gov.uk>
  - ❑ <http://www.govtalk.gov.uk>
  - ❑ <http://www.neighbourhood.gov.uk>
  - ❑ <http://www.nlis.org.uk>
  - ❑ <http://www.nlpg.org.uk>
  - ❑ <http://www.ordnancesurvey.gov.uk>
  - ❑ <http://www.planningportal.gov.uk>
  - ❑ <http://www.socialexclusionunit.gov.uk>
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# That's it!

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