

Maximising the utility of an Open Address

Anthony Beck (GeoLytics), John Daniels (UU), Paul Williams (UU), Dave Pearson (UU), Matt Beare (UU)

Abstract

how addresses are employed within United Utilities: from bespoke addressing, to the current implementation of Geoplace's Address Base. The current approach to addressing hinders effective market activities so consideration is given to how Open approaches can disrupt the addressing landscape and improve utility services

This paper was presented at the [3rd Annual Addressing Update Seminar](#) – 8th September 2016 - at the BCS London.



Figure 1:

This document has been written in [CommonMark](#): an unambiguous implementation of Markdown for scholarly writing.

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1 Maximising the utility of an Open Address

Anthony Beck (GeoLytics), John Daniels (UU), Paul Williams (UU), Dave Pearson (UU), Matt Beare (Beare Essentials)

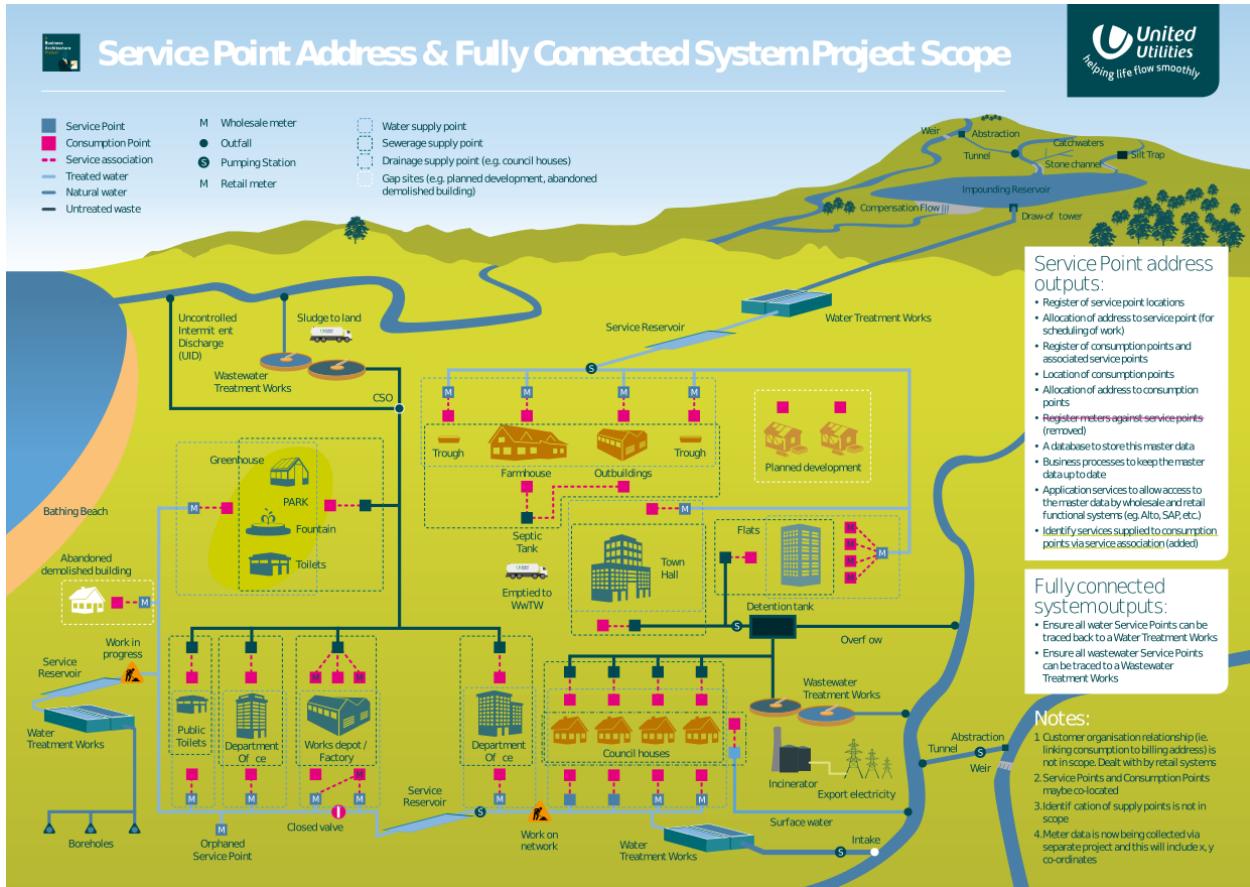


Figure 2:

Go down for licence and other metadata about this presentation

3 Addresses



Figure 6: Kaye (2012)

are part of the fabric of everyday life

4 Addresses



Figure 7:

Have economic and commercial impact

5 Addresses

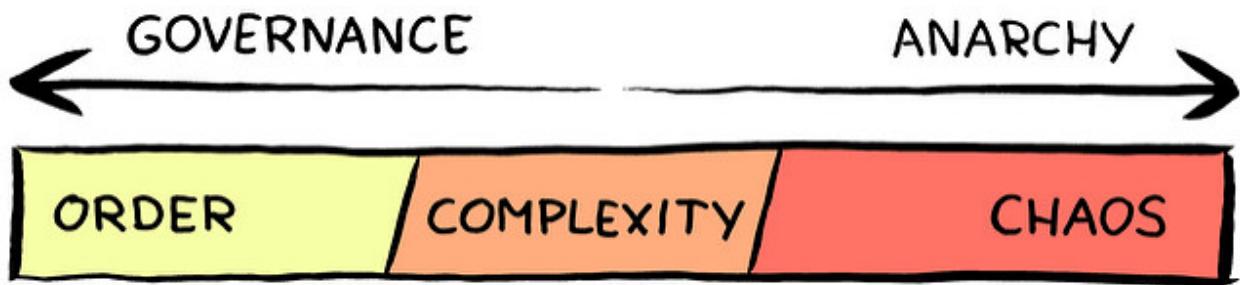


Figure 8: Appelo (2010)

Support governance and democracy

- Without an address, it is harder for individuals to register as legal residents.
- They are *not citizens* and are excluded from:
 - public services
 - formal institutions.
- This impacts on democracy.

6 Addresses

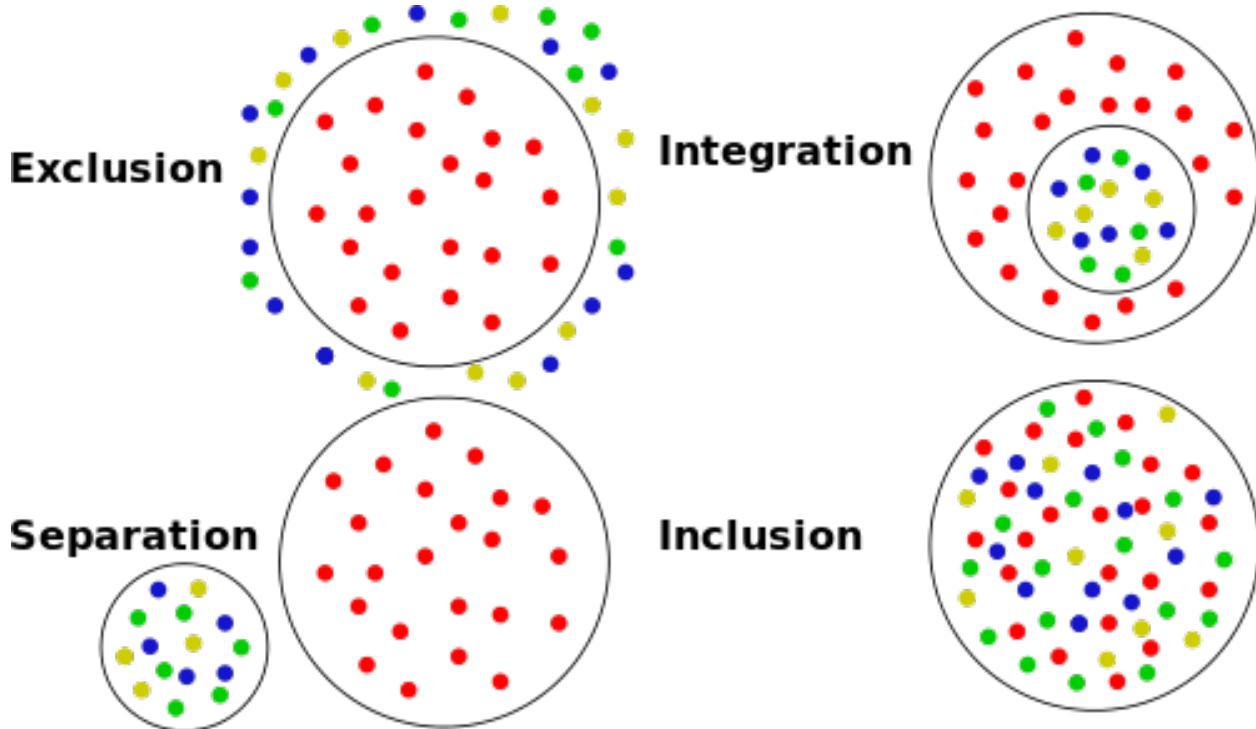


Figure 9: Beck (2015d)

Support Legal and Social integration

- Formal versus Informal
- Barring individuals and businesses from systems:
 - financial
 - legal
 - government
 -

7 Addresses

bridge gaps - provide the link between *people* and *place*

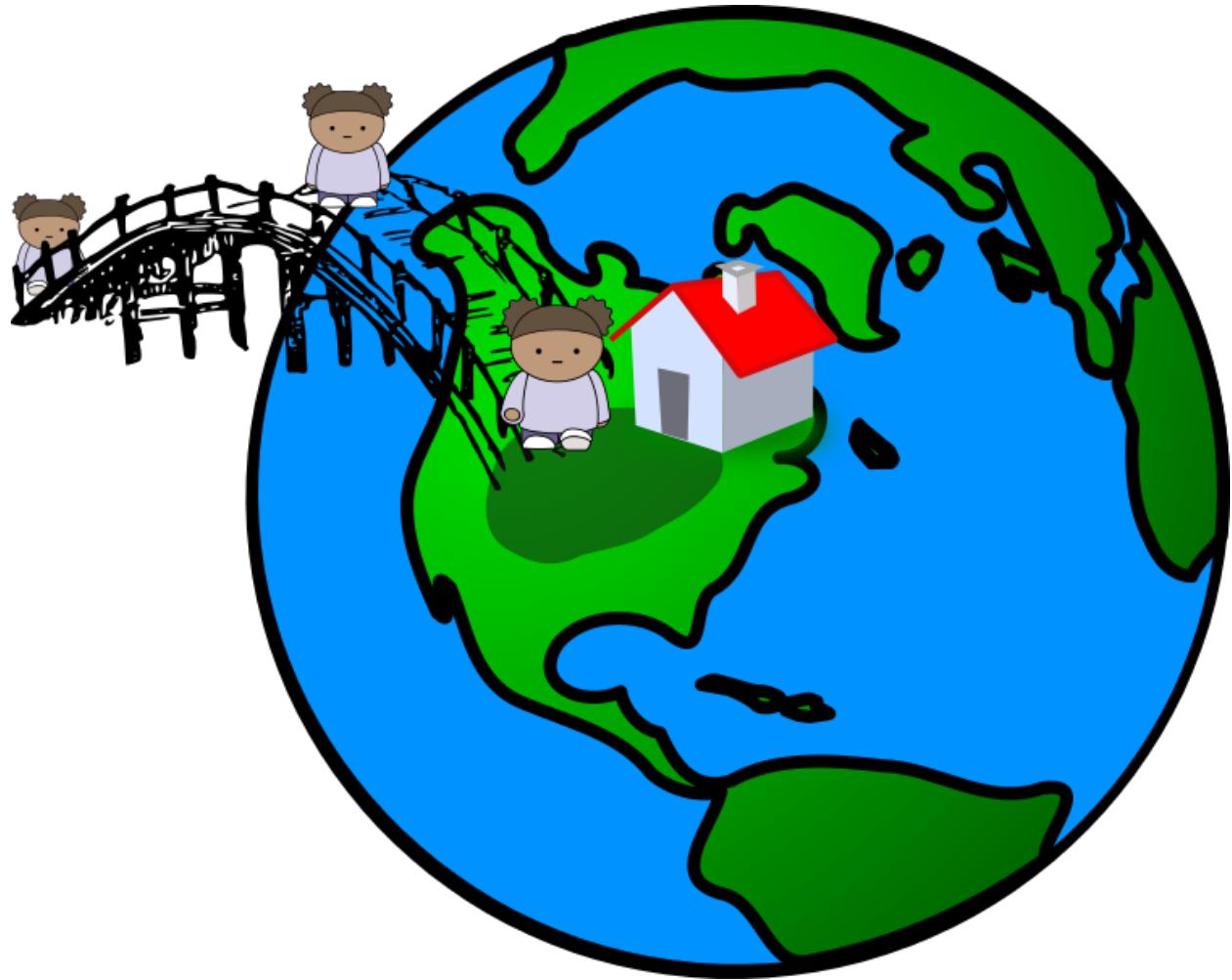


Figure 10:

8 Utility Addresses

8.1 In the beginning was the ledger

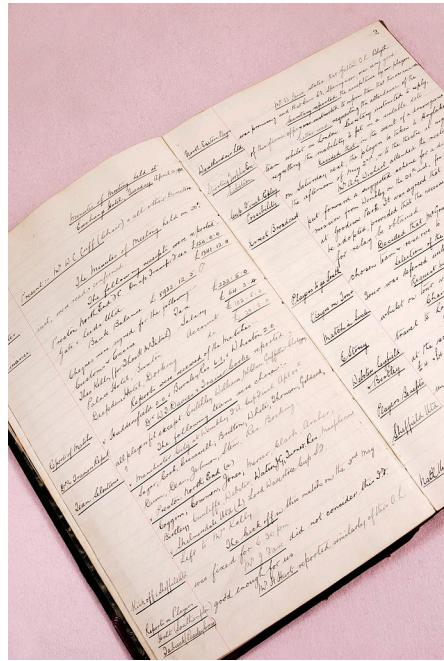


Figure 11: France (2004)

8.2 Bespoke digital addresses

- Digitisation and data entry to create a bespoke Address Database -
 - Fit for UU's operational purpose
 - Making utilities a key *owner* of address data
 - * Subject to IP against PAF matching

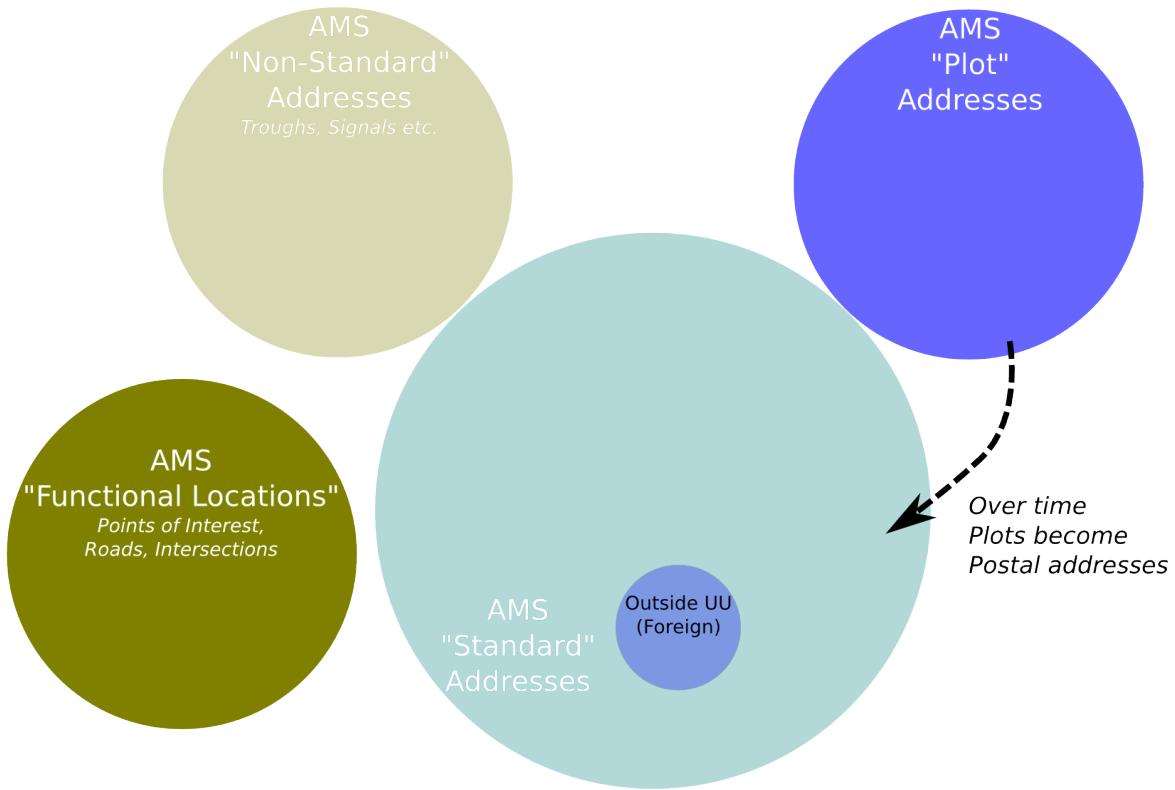


Figure 12:

8.3 Policy mandates

Open Water - A shared view of addresses requiring a new addressing paradigm - Address Base Premium?



Figure 13:

9 Utility addressing:

- Postal delivery (Billing)
 - Services and Billing to properties within the extent of the UU operational area
 - Billing to customers outside the extent of UU operational area
- Asset/Facilities Management (infrastructure)
 - Premises
 - * But utilities manage different assets to Local Authorities
 - * is an address the best way to manage a geo-located asset?
- Bill calculation
 - Cross referencing Valuation Office and other details.

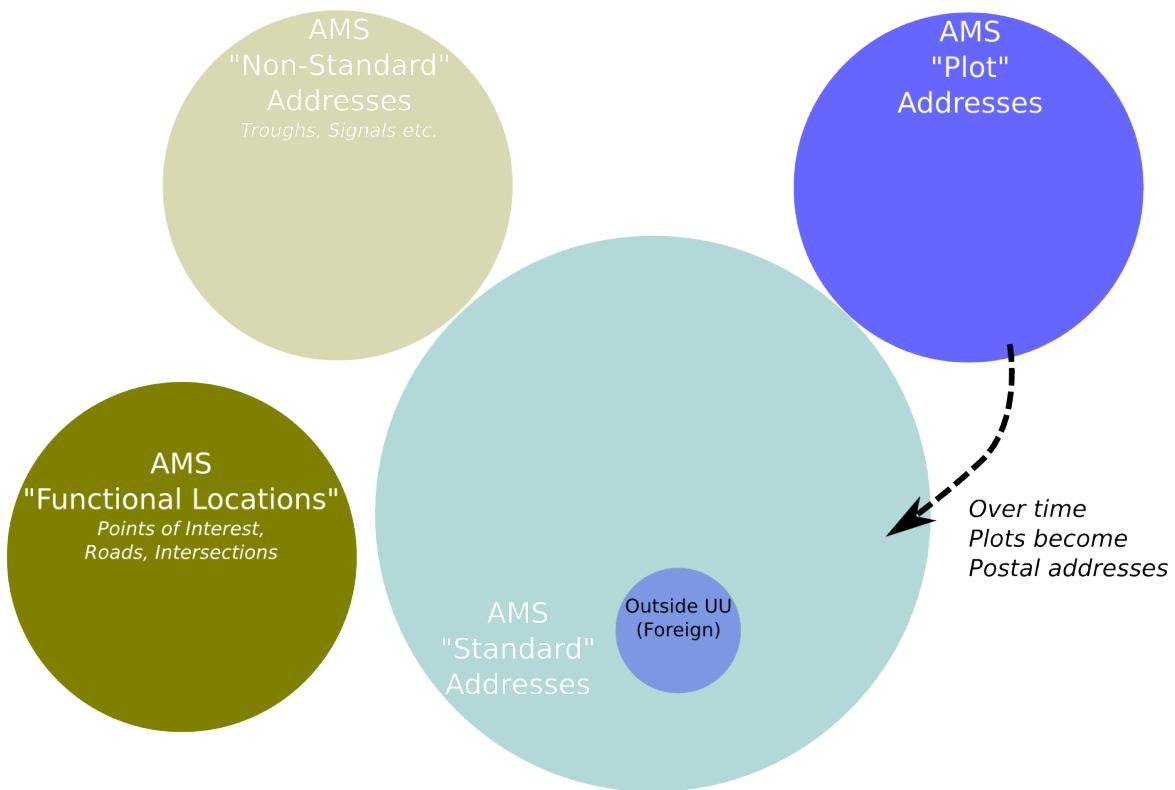


Figure 14:

....
It's not just postal addressing

....
Address credibility is critical

....
Utilities see the full life-cycle of an address - especially the birth and death

9.1 asset management

- UU manage assets and facilities

According to ABP a Waste Water facility is neither a postal address or a non-postal address.

Really? Is it having an existential crisis?

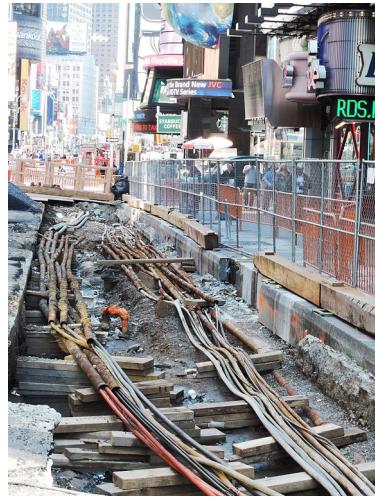


Figure 15:

9.2 A connected spatial network

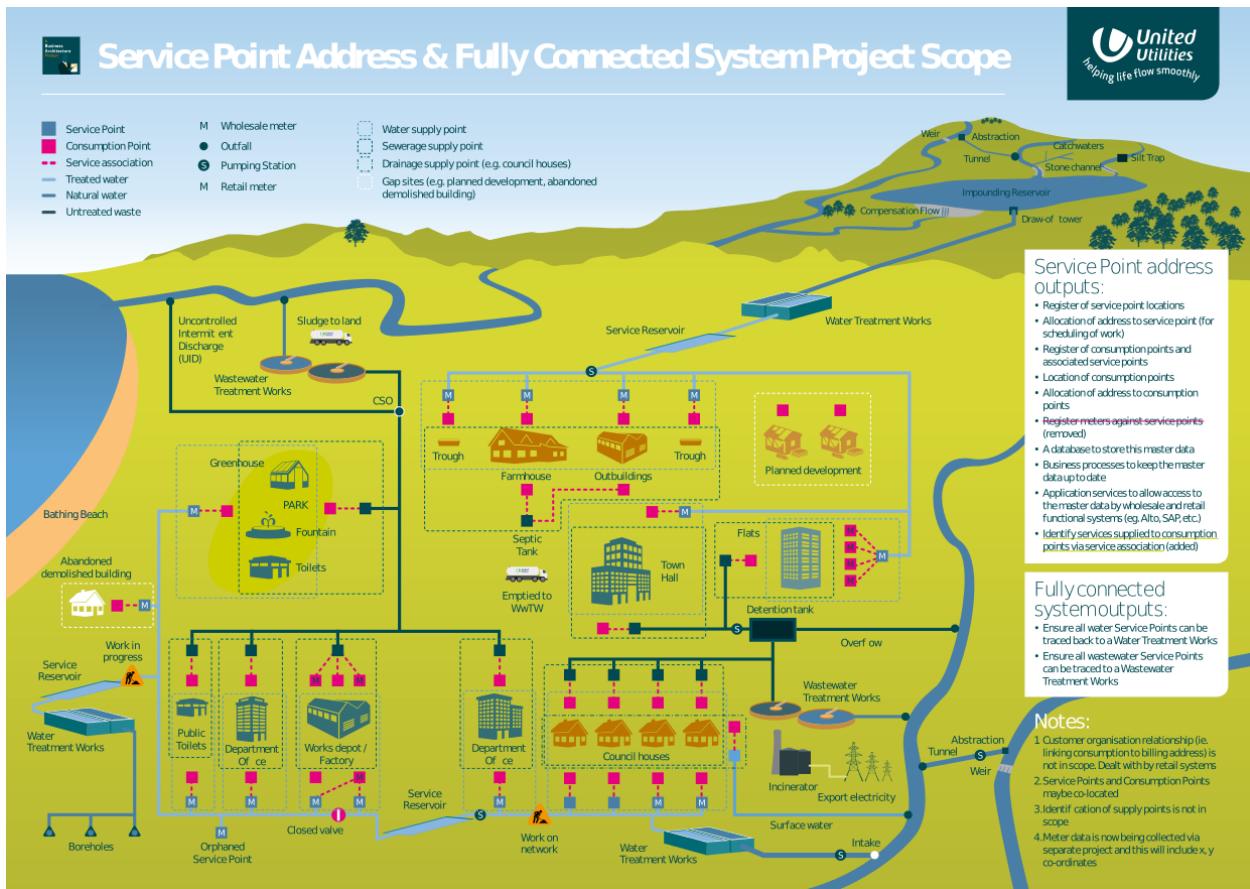


Figure 16:

9.3 Serving customers who operate somewhere

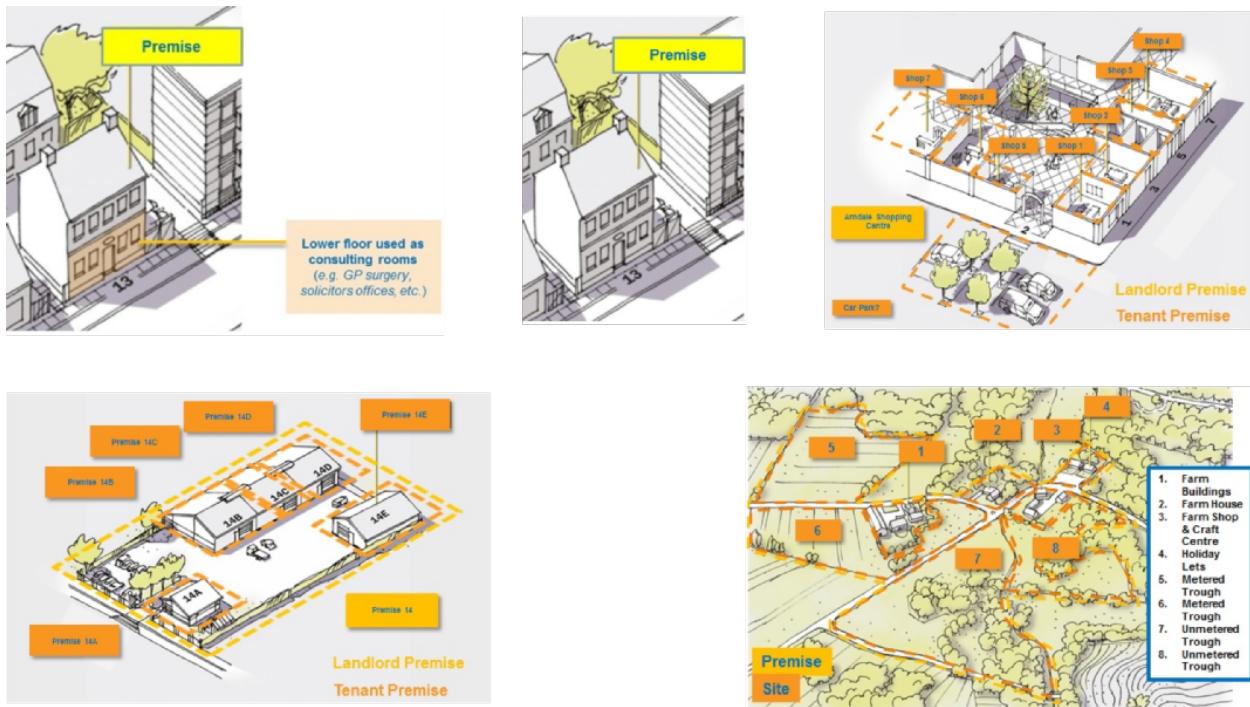


Figure 17:

- UU serve customers located in
 - Buildings
 - Factories
 - Houses
 - Fields

9.4 Serving customers who operate anywhere



Figure 18:

10 Utility addressing issues

- Addresses are a pain
 - Assets as locations
 - Services as locations
 - People at locations

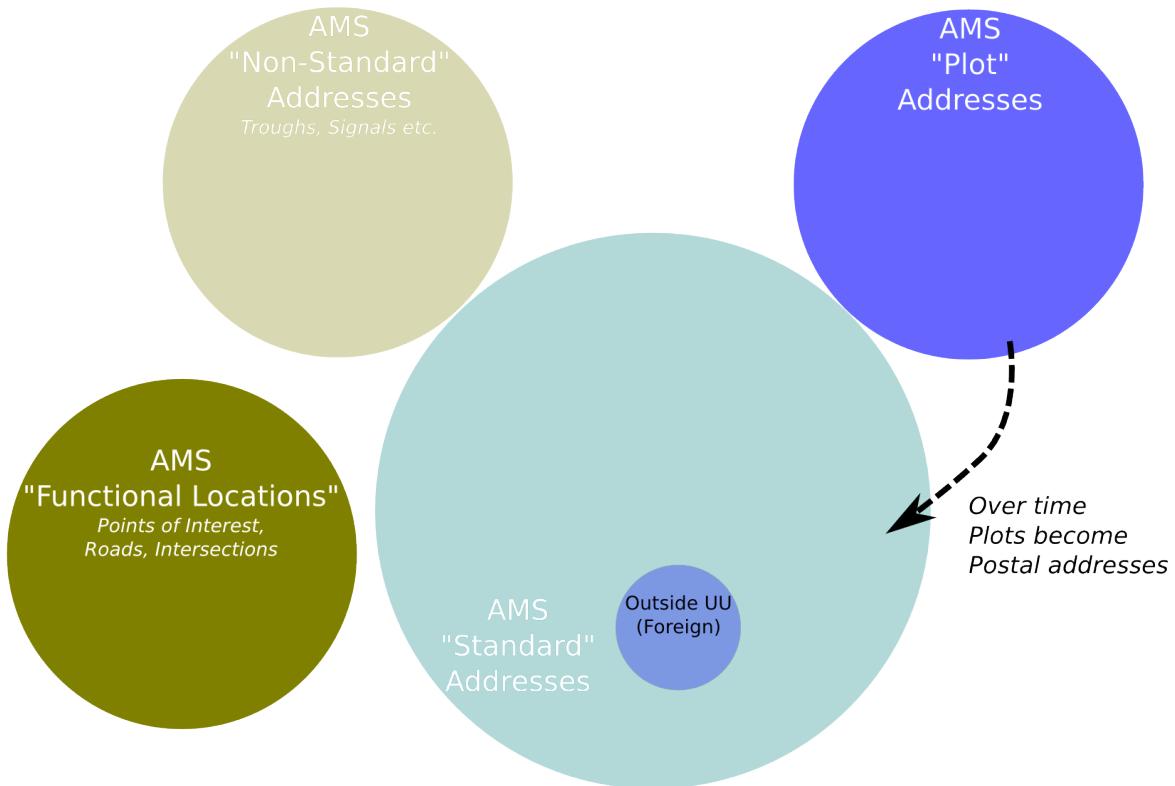


Figure 19:

11 Issues: addresses = postal address.

- Is *Postal* a constraining legacy?
- Is *address* a useful term?



Figure 20:

12 Issues: Do formal *addresses* actually help utilities?

- External addresses (ABP for example) are another product(s) to manage
 - which may not fit the real business need
 - which may not have full customer or geographic coverage



Figure 21:

13 What is an address?

13.1 Address abstraction

- Address did not spring fully formed into existence.
- They are used globally
 - but developed nationally
 - and for different reasons

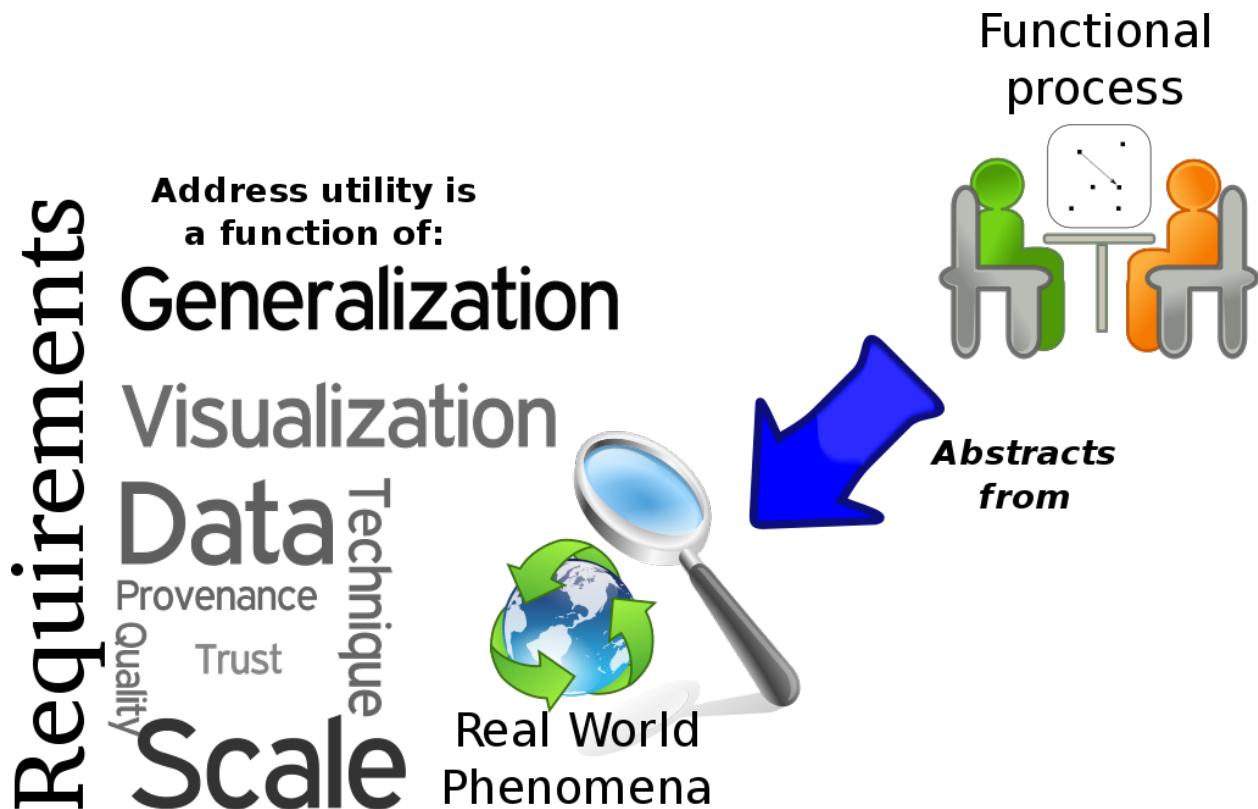


Figure 22: Beck (2016c)

13.2 Royal Mail - postal delivery

Calculating APs and DPs

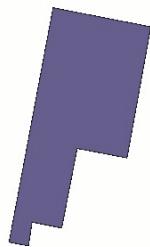
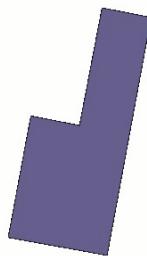


Figure 23:

In a postal system:

- a *Delivery Point* (DP) is a single mailbox or other place at which mail is delivered.
 - a single DP may be associated with multiple addresses
- An *Access Point* provides logistical detail.

The postal challenge is to solve the last 100 meters. In such a scenario the *post person* is critical.

DPS were collected by the Royal Mail for their operational activities and sold under licence as the *Postal Address File* (PAF). PAF is built around the 8-character *Unique Delivery Point Reference Number* (UDPRN). The problem with PAF is that the spatial context is not incorporated into the product. Delivery points are decoupled from their spatial context - a delivery point with a spatial context should provide the clear location of the point of delivery (a door in a house, a post-room at an office etc.).

13.3 LLPG - asset management

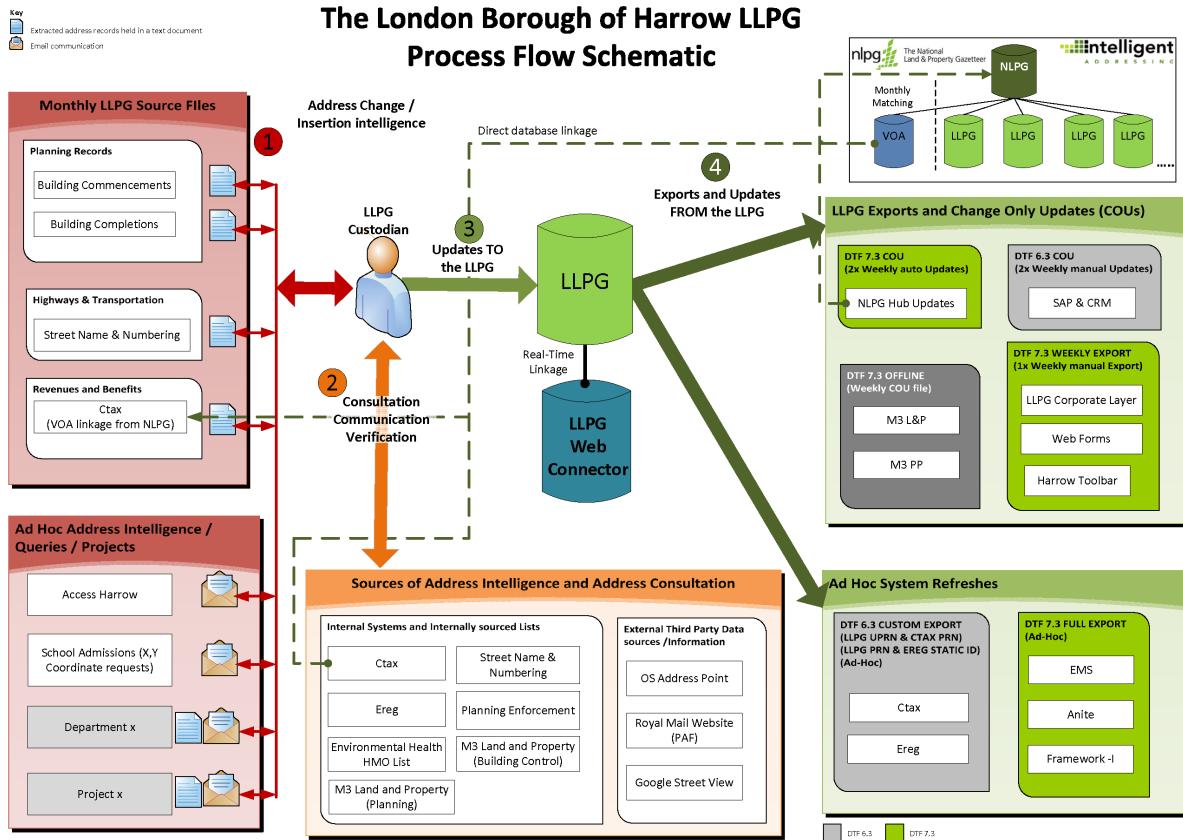


Figure 24: Borough of Harrow LLPG schematic

An LLPG (Local Land and Property Gazetteer) is a collection of address and location data created by a local authority.

It is an Asset/Facilities Management tool to support public service delivery:

- Local Authority
- Police
- Fire
- Ambulance

It incorporates:

- Non postal addresses (i.e. something that the Royal Mail wouldn't deliver post to)
- a 12-digit Unique Property Reference Number for every building and plot of land
- National Street Gazetteer

Prior to the initialization of the LLPGs, local authorities would have different address data held across different departments and the purpose of the Local Land and Property Gazetteers was to rationalize the data, so that a property or a particular plot of land is referred to as the same thing, even if they do have different names.

13.4 Addresses as assets?



Figure 25: Post box

- So what makes the following ‘non-postal’ *facilities* addresses:
 - Chimney
 - Post box - which is clearly having a letter delivered ;-)
 - Electricity sub-station
- Context is critical
 - So why is a waste-water facility not an address in ABP (when an Electricity sub-station is)?
 - * Because it is not *of interest* to a council and the Royal Mail have never been asked to deliver mail to it.

13.5 Korea: The Jibeon system - taxation

Jibeon - area based Street name and no.

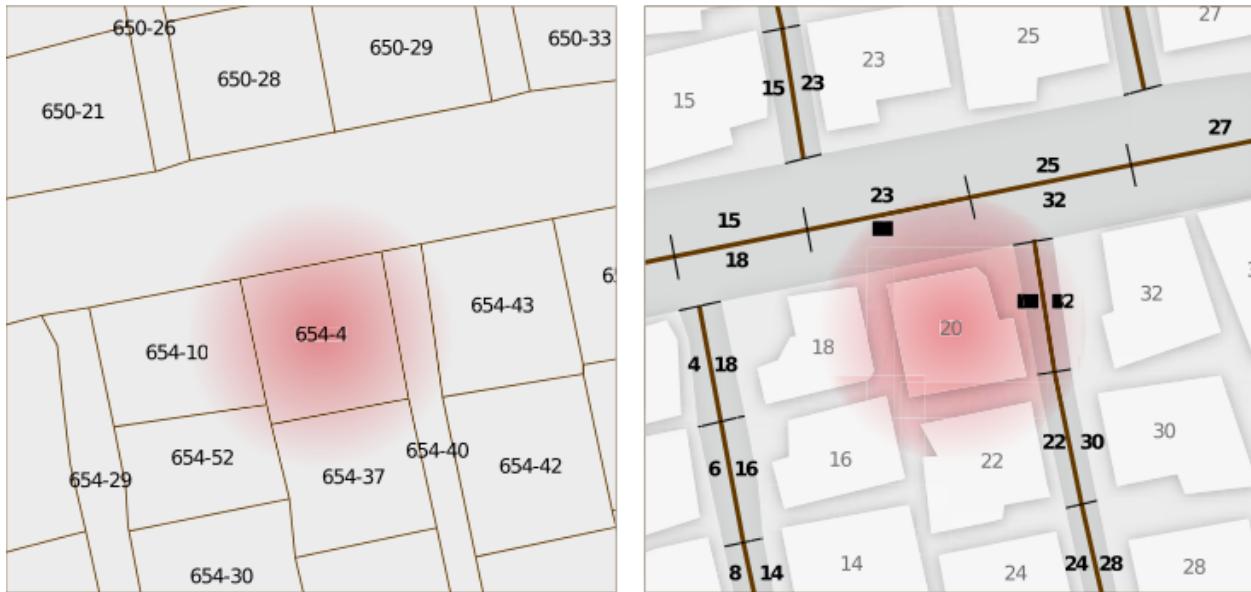


Figure 26: after (UPU (2012), p.57)

- Until recently, the Republic of Korea (Korea) has used land parcel numbers (jibeon) to identify unique locations.
 - These parcel numbers were assigned chronologically according to date of construction and without reference to the street where they were located.
 - This meant that adjacent buildings did not necessarily follow a sequential numbering system.
- This system was initially used to identify land for census purposes and to levy taxes.
- In addition, until the launch of the new addressing system, the jibeon was also used to identify locations (i.e. a physical address).

13.6 World Bank - social improvement

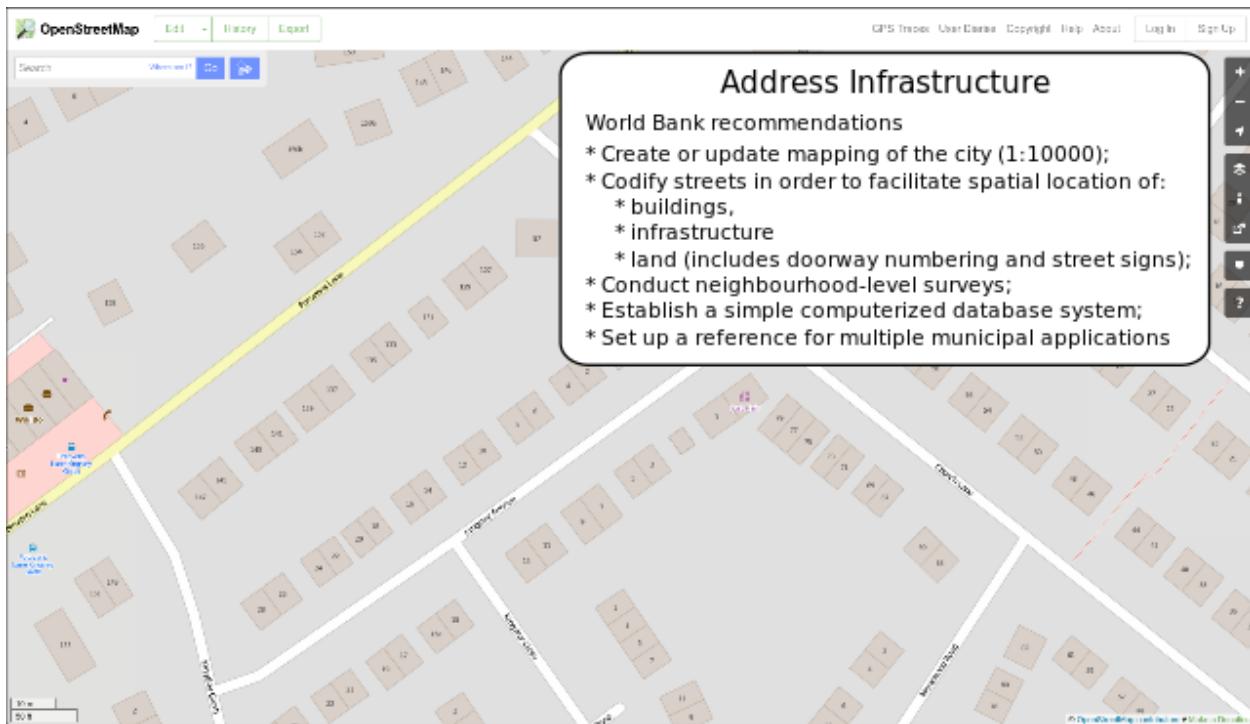


Figure 27: Beck (2015e)

The World Bank has taken a *street addressing* view-point (UPU (2012), p.57). This requires up-to-date mapping and bureaucracy (to deliver a street gazetteer and to provide the street infrastructure (furniture)). However, (UPU (2012), p.44) demonstrates that this is a cumbersome process with a number of issues, not the least:

- Urban bias
- Cost of infrastructure development
- Lack of community involvement

13.7 Denmark: An addressing commons with impact

**Standardised
Geo-Addresses**

**Provided consistency
but retained ambiguity**



Figure 28: after Lind (2008)

**Revised as a co-ordinating
spine across domains**

**as a zero-cost
accessible service**

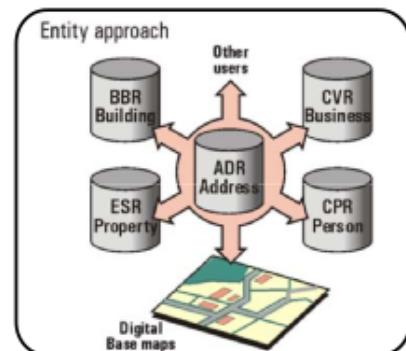
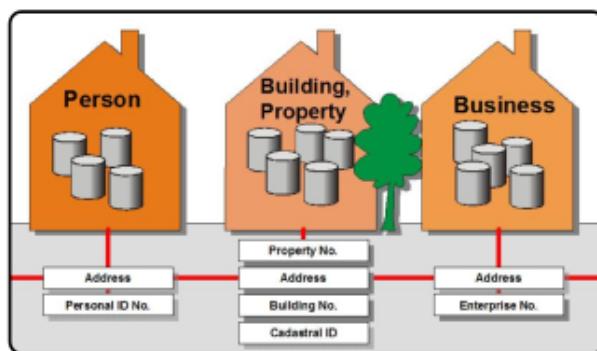


Figure 29: after Lind (2008)

13.8 Denmark: An addressing commons with impact

- Geocoded address infrastructure
- Defined the semantics of purpose
 - what is an address
- Open data
 - an address commons
- The re-use statistics are staggering:
 - 70% of deliveries are to the private sector,
 - 20% are to central government
 - 10% are to municipalities.
- Benefits:
 - Efficiencies
 - No duplication
 - Improved confidence
 - Known quality

A credible service providing a multitude of efficiencies (UPU (2012), pp.50 - 54)

14 UK Addressing

14.1 Geoplace - Formal

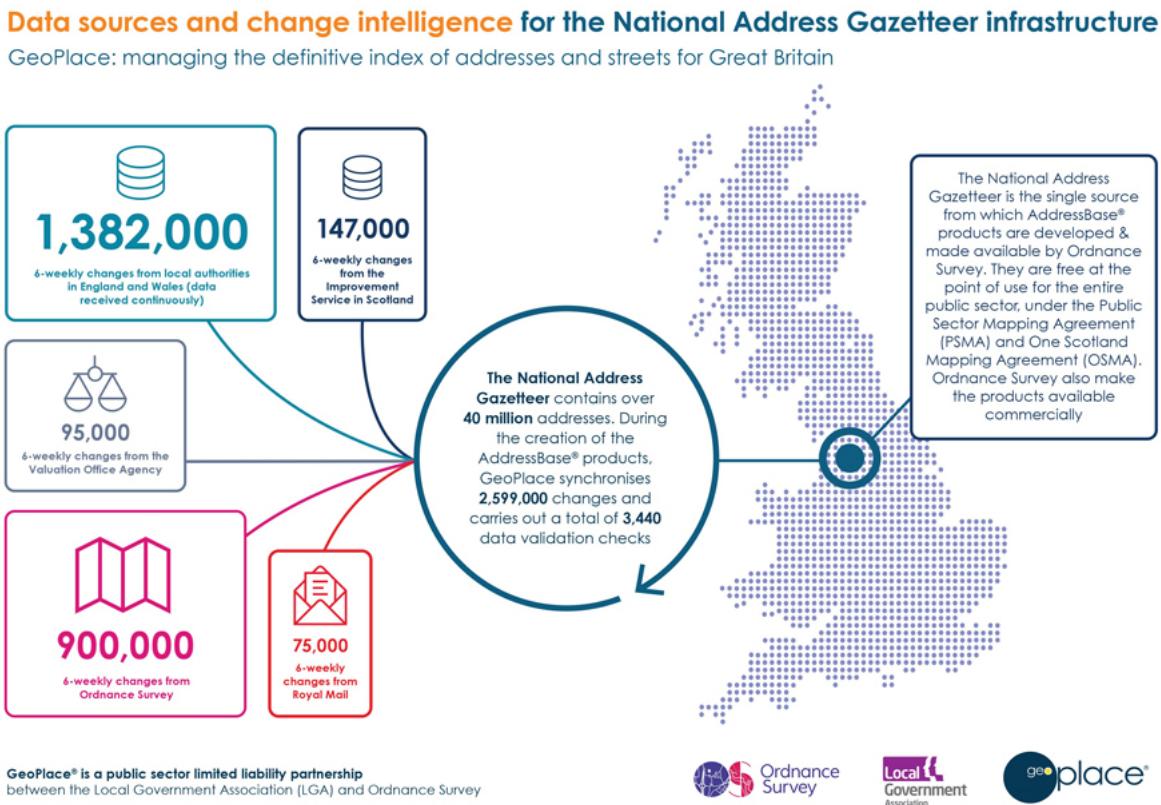


Figure 30: Geoplace graphic

- GeoPlace is a limited liability partnership owned equally by the [Local Government Association](#) and [Ordnance Survey](#).
- It has built a synchronised database containing spatial address data from
 - 348 local authorities in England and Wales (the *Local Land and Property Gazetteers* (LLPG) which cumulatively create the *National Land and Property Gazetteer* (NLPG)),
 - Royal Mail,
 - Valuation Office Agency and
 - Ordnance Survey datasets.
- The NAG Hub database is owned by GeoPlace and is the authoritative single source of government-owned national spatial address information, containing over 225 million data records relating to about 34 million address features. GeoPlace is a production organisation with no product sales or supply operations.
- The NAG is made available to public and private sector customers through Ordnance Survey's [AddressBase](#) products.

14.2 The AddressBase Family



Figure 31: Ordnance Survey

- The National Address Gazetteer Hub database is owned by GeoPlace and is claimed to be *the authoritative single source of government-owned national spatial address information*, containing over 225 million data records relating to about 34 million address features.
- Each address has its own *Unique Property Reference Number* (UPRN). The AddressBase suite have been designed to integrate into the [Ordnance Survey MasterMap](#) suite of products.

AddressBase is available at three levels of granularity (lite, plus and premium).

- AB+ merges two address datasets together (PAF and Local Authority) to provide the best available view of addresses currently defined by Local Authorities, giving many advantages over AddressBase.
- AB+ lets you link additional information to a single address, place it on a map, and carry out spatial analysis that enables improved business practices.
- Geoplac argue that further value comes from additional information in the product which includes:
 - A more detailed classification – allowing a better understanding of the type (e.g. Domestic, Commercial or Mixed) and function of a property (e.g. Bank or Restaurant)
 - Local Authority addresses not contained within PAF – giving a more complete picture of the current addresses and properties (assuming they are in scope (see below))
 - Cross reference to OS MasterMap TOIDs – allowing simple matching to OS MasterMap Address Layer 2, Integrated Transport Network or Topography Layer
 - Spatial coordinates
 - Unique Property Reference Number (UPRN) – which provides the ability to cross reference data with other organisations, and maintain data integrity.
- Premium includes the address lifecycle

AddressBase supports the UK Location Strategy concept of a ‘core reference geography’, including the key principles of the European Union INSPIRE directive, that data should only be collected once and kept where it can be maintained most effectively (see [AddressBase products user guide](#)). It’s probably worthwhile mentioning that this is not an open address layer - however, a [2014 feasibility study sponsored by the department of Business, Innovation and Skills](#) included a recommendation that AddressBase lite is made openly available.

14.3 Address lifecycle



Figure 32: addressbase products user guide (p. 9)

- This ability to maintain an overview of the lifecycle of address and property status means the AddressBase Premium has introduced new potential use cases.
- This has seen companies incorporating AddressBase Premium into their business systems to replace PAF or bespoke addressing frameworks - in theory the ability to authoritatively access the address lifecycle provides greater certainty for a number of business operations.
- At *United Utilites* (UU) AddressBase Premium is replacing a multitude of bespoke and PAF based addressing products.

14.4 Open National Address Gazetteer - *informal?*

The *Department for Business, Innovation & Skills* (BIS) on the need for an [Open National Address Gazetteer](#) commissioned a review of *open addressing* which was published January 2014.

.....

It recommended:

- the UK Government commission an ‘open’ addressing product based on a variation of the ‘freemium’ model
 - data owners elect to release a basic ('Lite') product as Open Data that leaves higher value products to be licensed

.....

AddressBase Lite was proposed with an annual release cycle. Critically this contains the UPRN which could be key for product interoperability. * This would allow the creation of a shared interoperable address spine along the lines of the Denmark model

14.5 Open NAG - '*Responses received*' April 2014

With the exception of the PAF advisory board and Royal Mail there was support for the BIS review across the respondents with some notable calls for the *Totally Open* option (particularly from those organisations who are not part of the Public Sector Mapping Agreement) and that the UPRN should be released under an open data licence (as a core reference data set that encourages product interoperability).

.....
A number of quotes have been selected below:

14.6 Addresses as an Open Core Reference

....Address data and specific locations attached to them are part of Core Reference data sets recognised by government as a key component of our National Information Infrastructure (as long argued by APPSI). The report published by BIS gives us a chance to democratise access to addressing data and meet many of the Government's avowed intentions. We urge acceptance of Option 6 (*freemium*) or 7 (*an independent open data product*).

David Rhind *Chair of the Advisory Panel on Public Sector Information*

....Freely available data are much more likely to be adopted by users and embedded in operational systems. A national register, free at the point of delivery will undoubtedly help in joining up services, increasing efficiency and reducing duplication.

Office of National Statistics

14.7 Monopoly rent exploitation

... we expressed concern that, for almost all other potential customers (non-public sector), **the prices are prohibitive**, and appear designed to protect OS's existing policy of setting high prices for a small captive market, **extracting monopoly rent**.

Keith Dugmore *Director, DUG*

14.8 The benefit of current credible addresses

The problem of out-of-date addresses is a very significant commercial cost for the whole of the UK and is also arguably underplayed in the report.

Individual Respondent 3

14.9 Licences

Whatever licence the data is available under, **it must permit the data to be combined with other open data and then re-published.** ... The [Open Government Licence](#) fulfils this criteria, but it should be noted that the [OS OpenData Licence](#) (enforced by OS on its OS OpenData products, and via the PSMA) does not. The use of the latter would represent a significant restriction on down-stream data use, and so should be avoided.

Individual Respondent 6

15 Taking Stock

15.1 Addresses are heterogeneous



Figure 33: Beck (2015a)

In terms of:

- What they mean
- What they are used for
- Who uses them
- How they are accessed

15.2 Assets can have addresses

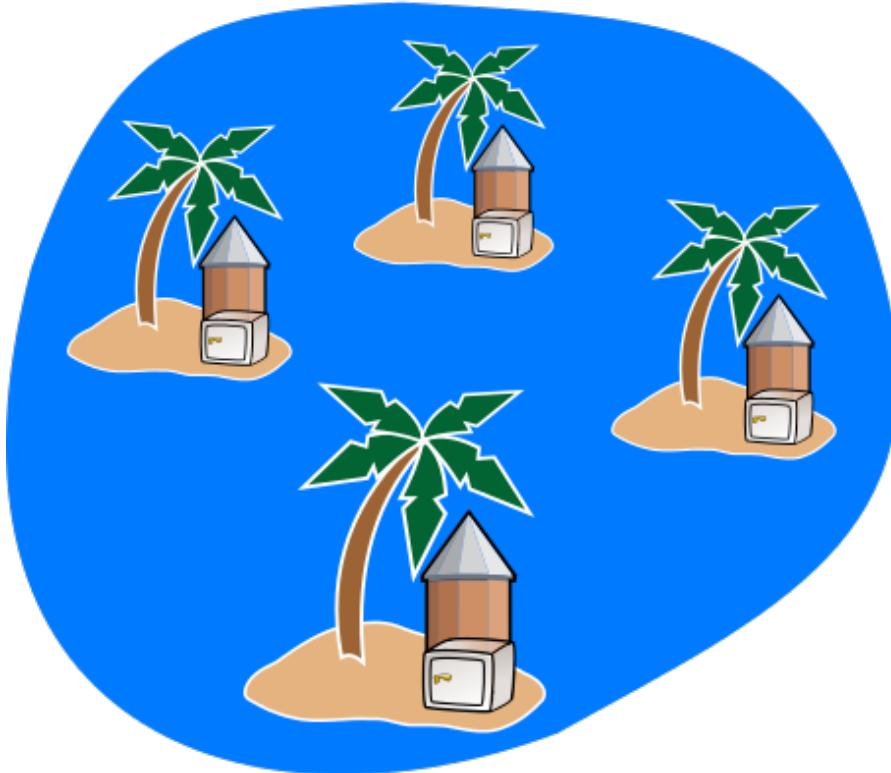
So - anything can have an address (the *Internet of Things*)



Figure 34: Post box

15.3 National data silos

Islands of data Disconnected data silos



Different:
*Standards
Quality
Databases
Semantics*

Figure 35: Beck (2015b)

They have been created to solve national issues.

No unifying semantics

Islands of incompatibility

Licence clause incompatibility

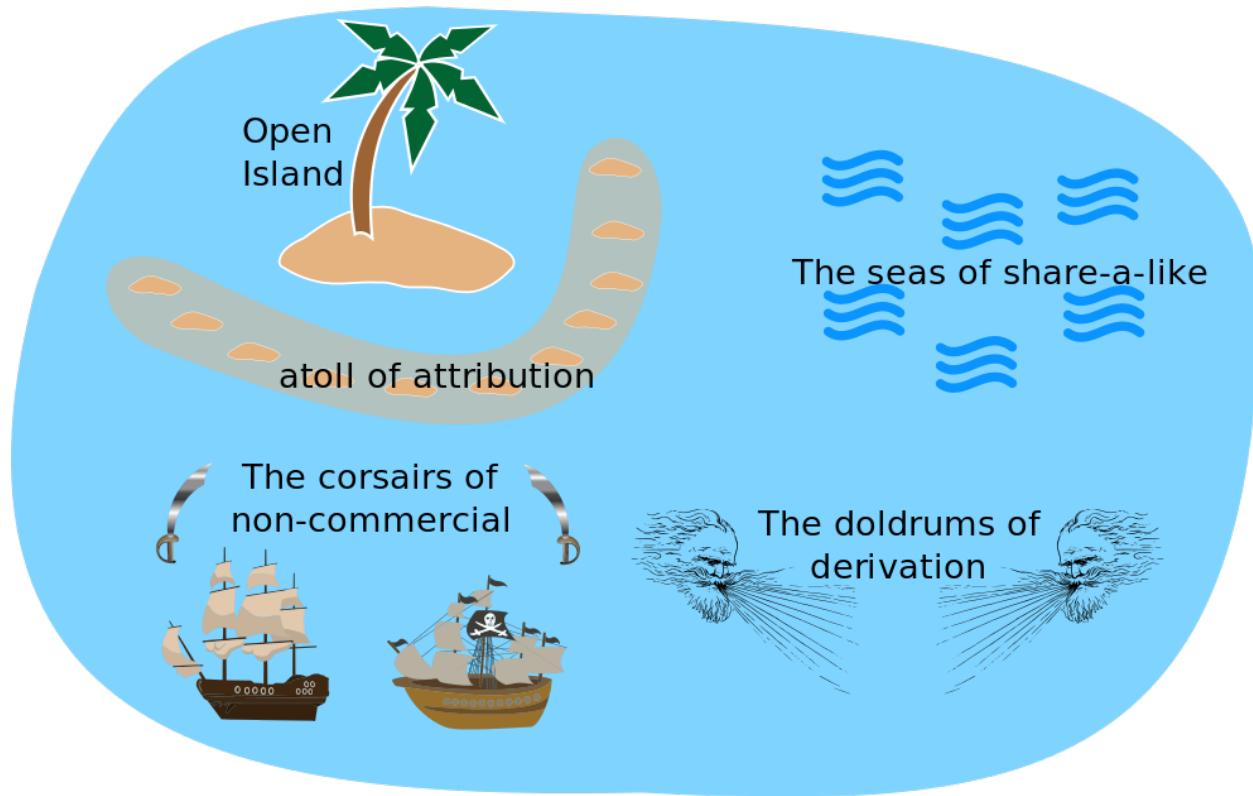


Figure 36: Beck (2016b)

15.5 Addresses are bureaucratic and costly

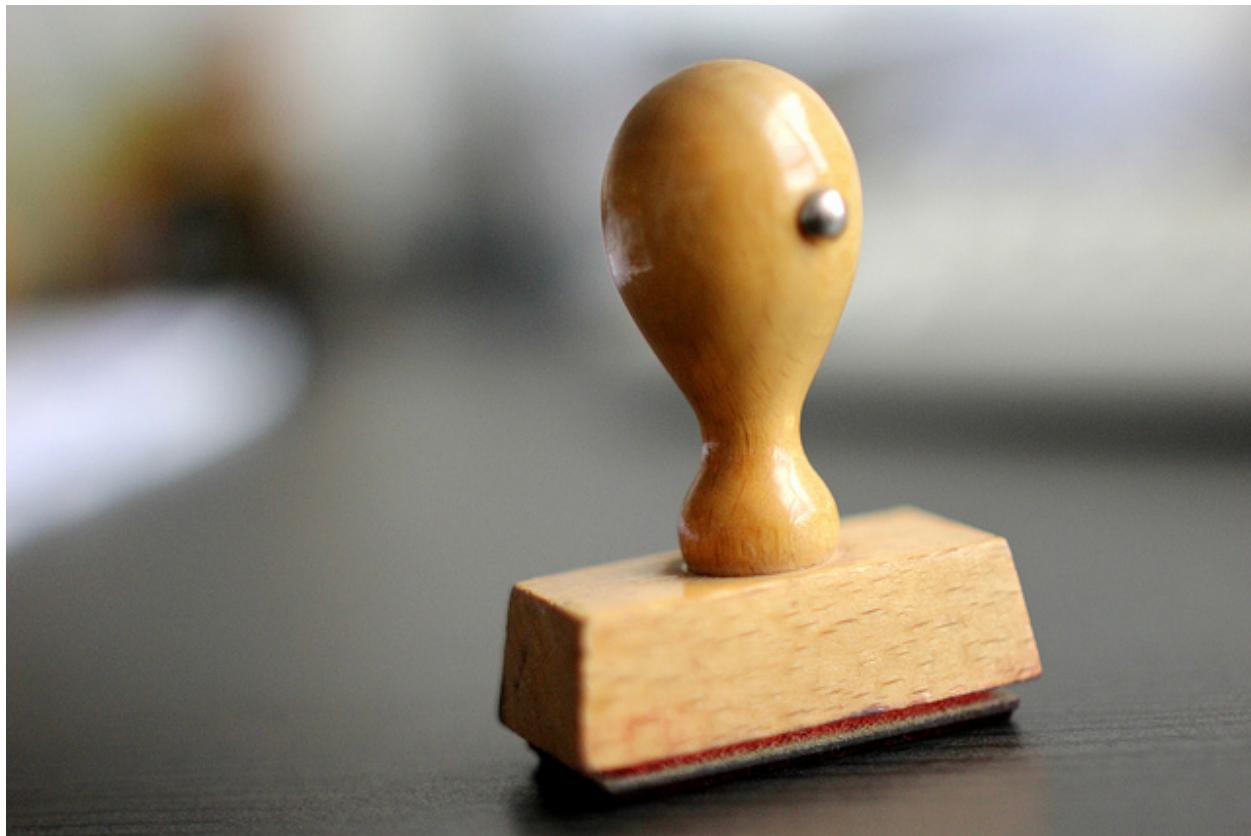


Figure 37: Schnettelker (2013)

Severely protracted when formal/informal issues are encountered.

15.6 Addresses can be opaque

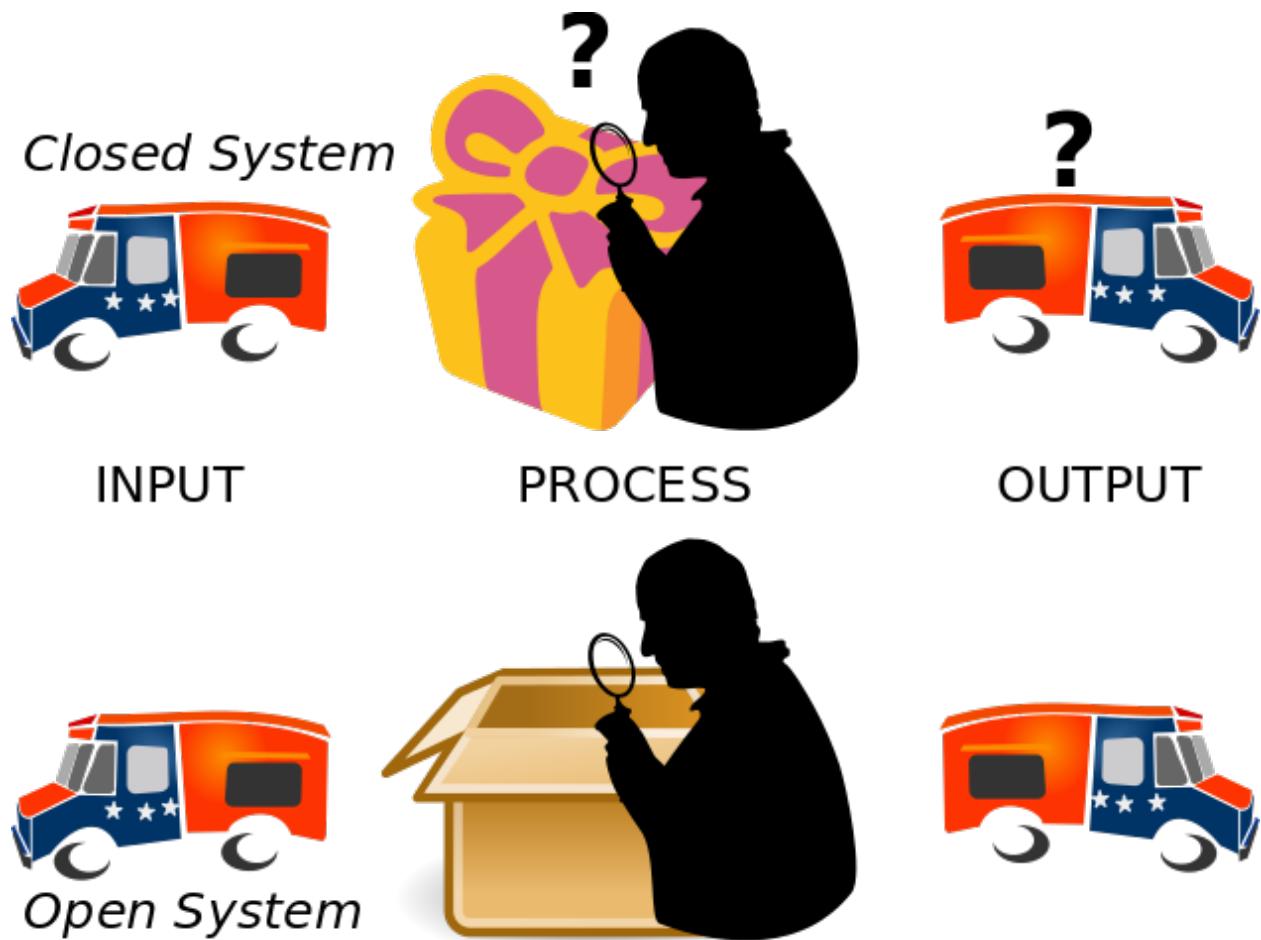


Figure 38: Beck (2015c)

transparent and reproducible?

15.7 Addresses are of global significance



Figure 39: Gray (2011)

15.8 Addresses are ripe for disruption



Figure 40: Rain (2007)

16 Address Disruption

16.1 Formal versus informal



Figure 41: Beck (2016a)

16.2 Technology

Streets are so last century.....



Figure 42: Beck (2015e)

- Ubiquitous GPS/GNSS
- Structured crowdsourced geo-enabled content (wikipedia, OSM)

16.3 Interoperability

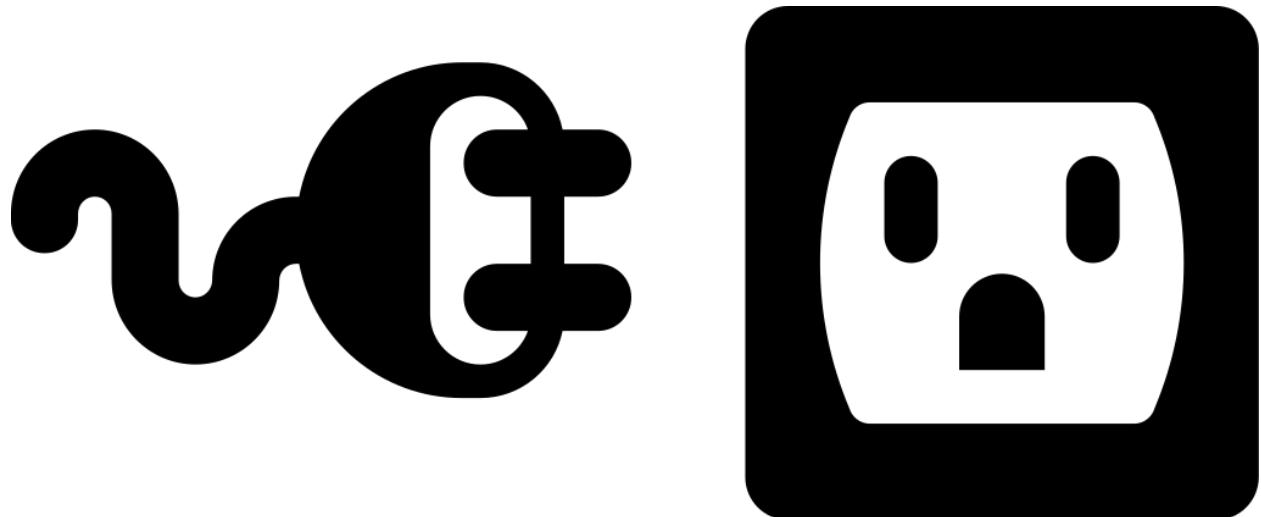


Figure 43:

- Will the semantic web provide address interoperability?
- between addressing systems
- to incorporate additional data
 - VOA
 - ETC

16.4 Globalisation

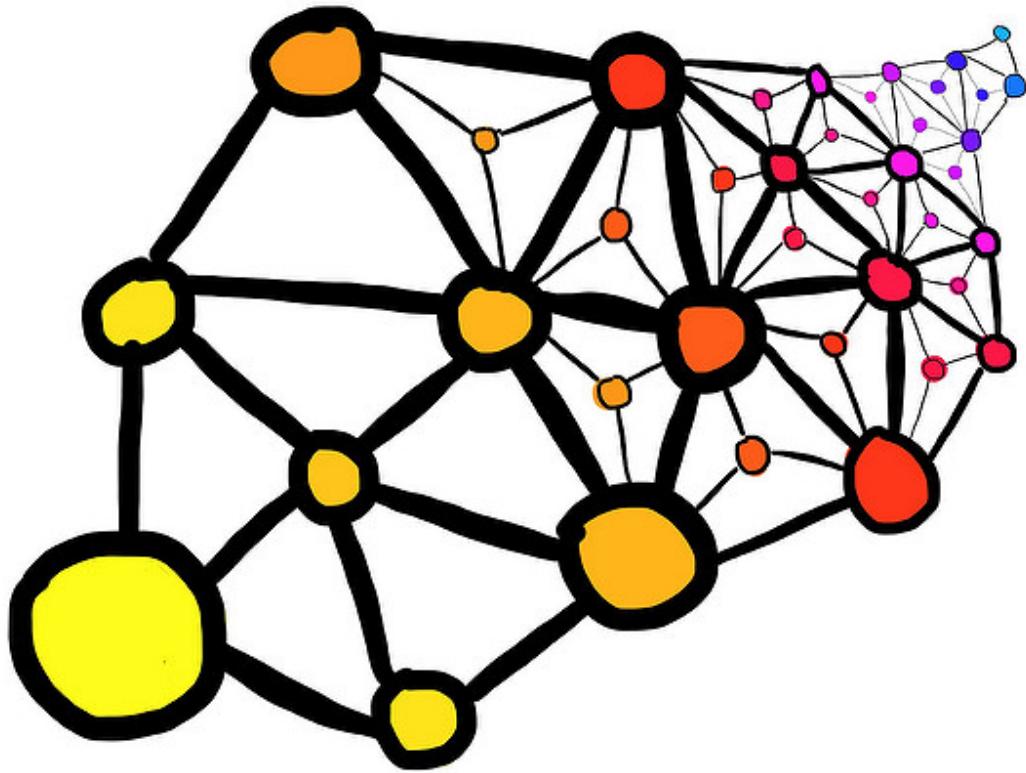


Figure 44: van Staveren (2013)

- Addressing is a **core reference geography**
- Global brands will demand (or invoke) consistent global addressing
- How will licences impact on this?

17 A new global address paradigm?

- [Amazon drone delivery in the UK requires](#)
 - A new view over addressing complements streets and buildings but is geo-coded at source
 - and supports accurate delivery throughout the delivery chain using a global referencing system.

Is there a universal approach which allows all avenues to be satisfied?

The screenshot shows a news article from The Guardian's website. The header includes links for 'sign in', 'become a supporter', 'subscribe', 'search', 'jobs', 'dating', 'more', 'UK edition', and a 'browse all sections' menu. The main title of the article is 'Amazon.com' followed by 'Amazon to test drone delivery in partnership with UK government'. Below the title is a sub-headline: 'The company will run tests to explore the viability of drones carrying deliveries weighing five pounds or less - which make up 90% of Amazon's sales'. The author is listed as 'Nicky Woolf in San Francisco and Samuel Gibbs in London'. The date is 'Tuesday 26 July 2016 00.00 BST'. There are social sharing icons for Facebook, Twitter, LinkedIn, and Google+. The article has 1,731 shares and 624 comments. A large image of an Amazon Prime Air drone is displayed, showing it flying against a blue sky with clouds. The caption below the image reads: 'Amazon Prime Air drone. Photograph: Amazon'. To the right of the main article, there is a 'Most popular' sidebar featuring three other news items with small thumbnail images and brief descriptions: 'Clegg, Osborne casually cut welfare for poorest to boost Tory popularity', 'Amy Schumer throws sexist heckler out of Stockholm show', and 'Top baby names: is yours on the up or on the way out?'. At the bottom right of the sidebar, there is a link to 'Caroline Lucas and Jonathan Bartley voted'.

Figure 45:

17.1 How might this look?

..
Requirements for a Global Address Framework
..

17.2 WGS84 algorithmic address minting



Figure 46: Addison (2009)

A global addressing framework needs to be transparent and reproducible.

A global addressing framework should be based on a spatial reference system.

A global addressing framework needs to be lightweight and cheap so it can be implemented in a timely manner.

17.3 Small footprint



Figure 47: Terwolbeck (2012)

Ubiquitous access across platforms.

No dependency on internet access.

17.4 Short/memorable

XKCD PRESENTS:
SOME NEW

SCIENCE MNEMONICS

ORDER OF OPERATIONS

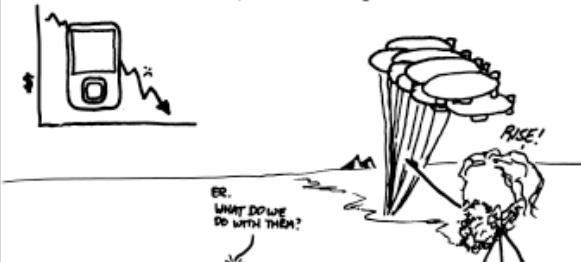
PARENTHESSES, EXPONENTS, DIVISION &
MULTIPLICATION, ADDITION & SUBTRACTION
TRADITIONAL: PLEASE EXCUSE MY DEAR AUNT SALLY



PLEASE EMAIL MY DAD A SHARK
OR: PEOPLE EXPECT MORE DRUGS AND SEX

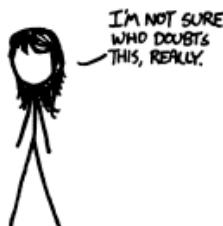
SI PREFIXES

KILO, MEGA, GIGA, TERA, PETA, EXA, ZETTA, YOTTA
MILLI, MICRO, NANO, PICO, FEMTO, ATTO, ZEPTO, YOCOTO
TRADITIONAL: [I NEVER LEARNED ONE]



TAXONOMY

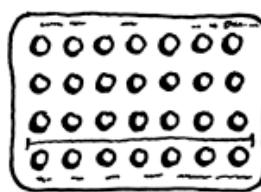
KINGDOM, PHYLUM, CLASS,
ORDER, FAMILY, GENUS, SPECIES
TRADITIONAL: KING PHILIP CAME OVER FOR GOOD SEX



KATY PERRY CLAIMS ORGASMS
FEEL GOOD SOMETIMES
OR: KERNEL PANICS CRASH OUR FAMILY GAME SYSTEM.

GEOLOGIC PERIODS

(PRECAMBRIAN) CAMBRIAN ORDOVICIAN SILURIAN
DEVONIAN CARBONIFEROUS PERMIAN TRIASSIC
JURASSIC CRETACEOUS PALEOGENE NEogene
TRADITIONAL: [I NEVER LEARNED ONE]



POLYCYSTIC OVARIAN SYNDROME DOES CAUSE PROBLEMS
THAT JUDICIOUS CONTRACEPTIVES PARTIALLY NEGATE.

RESISTOR COLOR CODES

BLACK BROWN, RED, ORANGE, YELLOW,
GREEN, BLUE, VIOLET, GRAY, WHITE
TRADITIONAL: [NONE I CARE FOR]



"BIG BROTHER REPTILIAN OVERLORDS," YELLED
GLENN, "BRAINWASHING VIA GROUND WATER!!"
OR: BE BOLD, RESPECT OTHERS; YOU'LL GRADUALLY
BECOME VERSATILE, GREAT WIKIPEDIANS!

PLANETS

MERCURY VENUS EARTH MARS
JUPITER SATURN URANUS NEPTUNE
TRADITIONAL: MY VERY EXCELLENT MOTHER
JUST SERVED US NACHOS



MARY'S "VIRGIN" EXPLANATION MADE
JOSEPH SUSPECT UPSTAIRS NEIGHBOR

Figure 48: Munroe ()
74

17.5 Self checking



Figure 49: Levine (2014)

Improving validity and credibility of downstream business processes.

17.6 Unlimited spatial recording

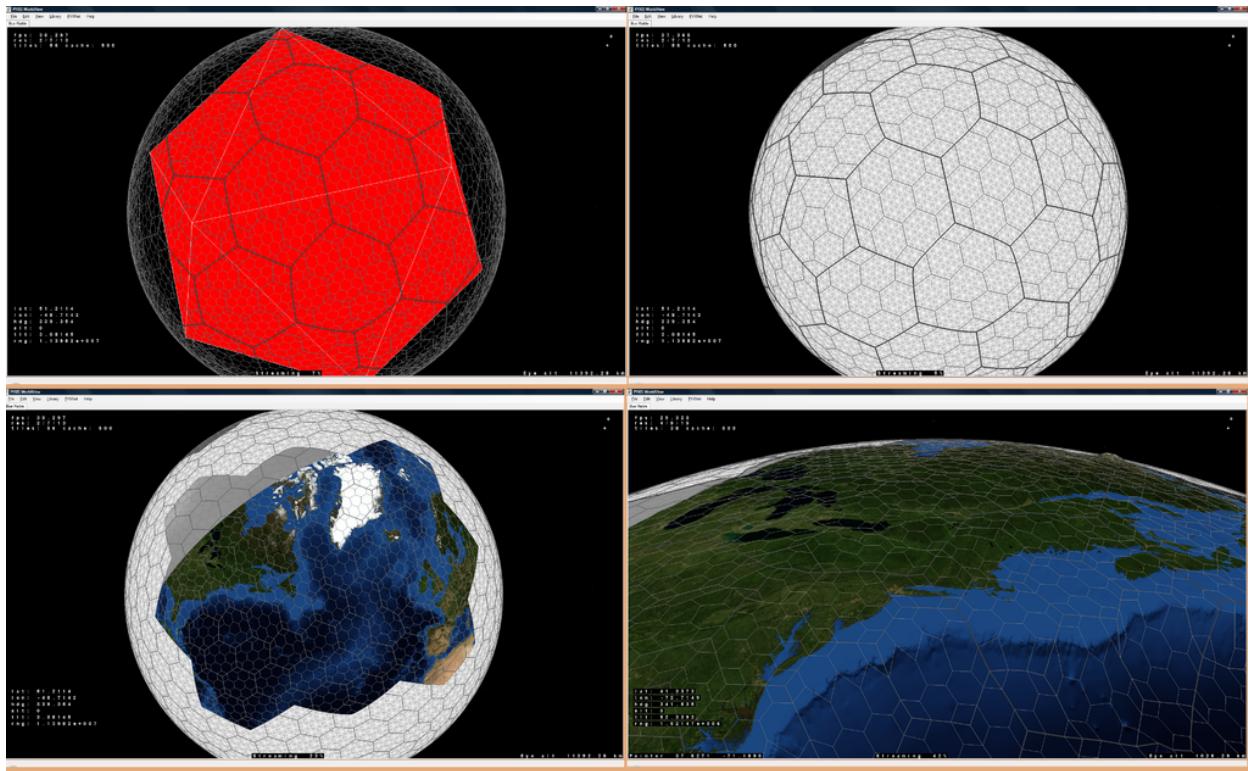


Figure 50: Petersen (2007)

- What are the spatial requirements for the range of addressing options?
 - Manila has a population density of 42,857 people per square km.
 - Map Kibera and OSM has revolutionised service delivery in Kibera (Kenya).
 - * Address Kibera could do the same thing for citizenship.

A global addressing framework should meet the needs of the rural, urban, formal and informal communities equally.

17.7 Open and interoperable

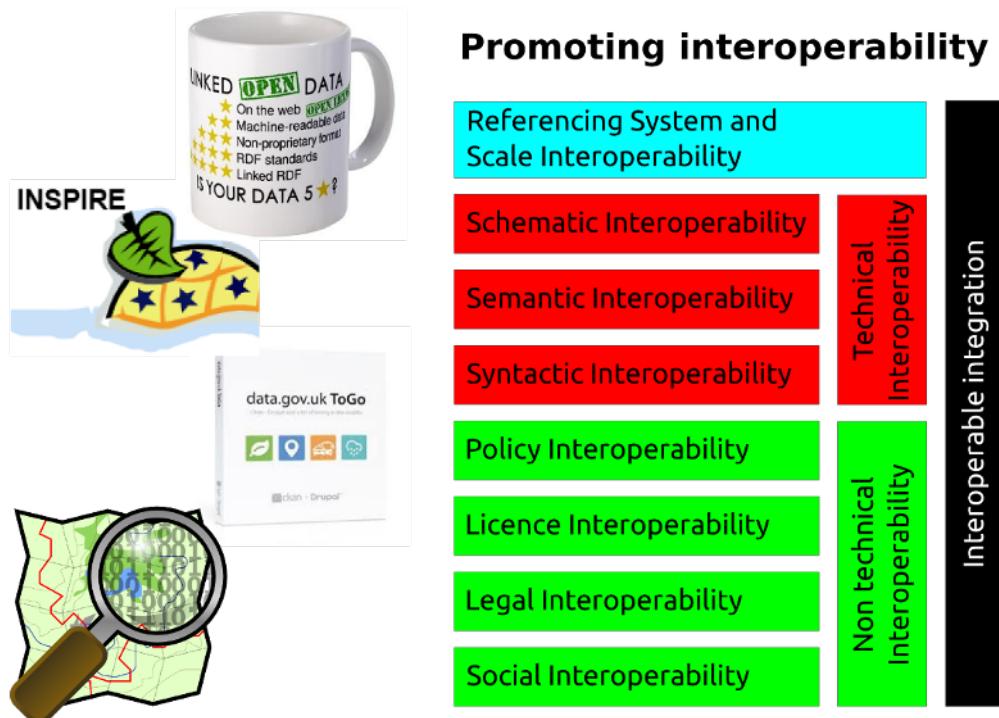


Figure 51:

17.8 Open and interoperable

the lack of a consistent and transparent legal and policy framework for sharing spatial data continues to be an additional roadblock.

Pomfret & Ramage (2010)

A global addressing framework should be open or available with as few barriers as possible.

17.9 Indoor use and 3D

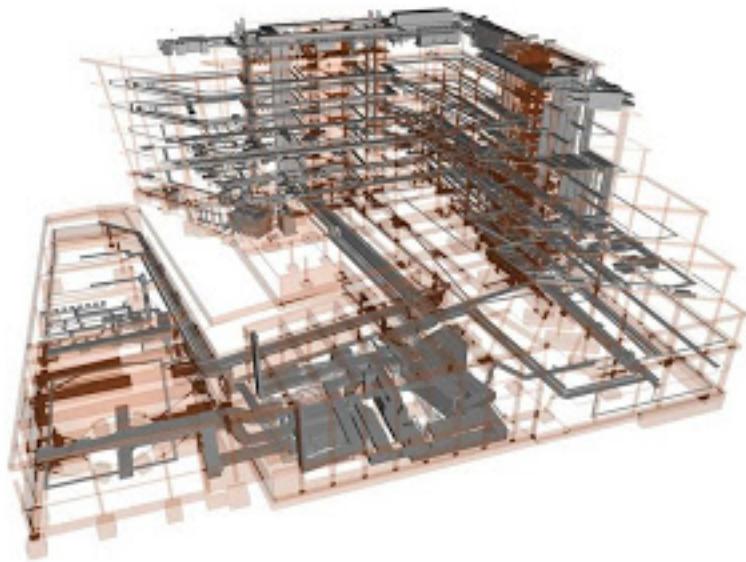


Figure 52: Arup (2013)

Incorporating wifi-triangulation - *individual room* addressing and navigation.

Seamless integration with BIM and CityGML.

Addressing isn't only about buildings - think about the Internet of Things

17.10 Inherent geo-statistical aggregation (spatially scalable)

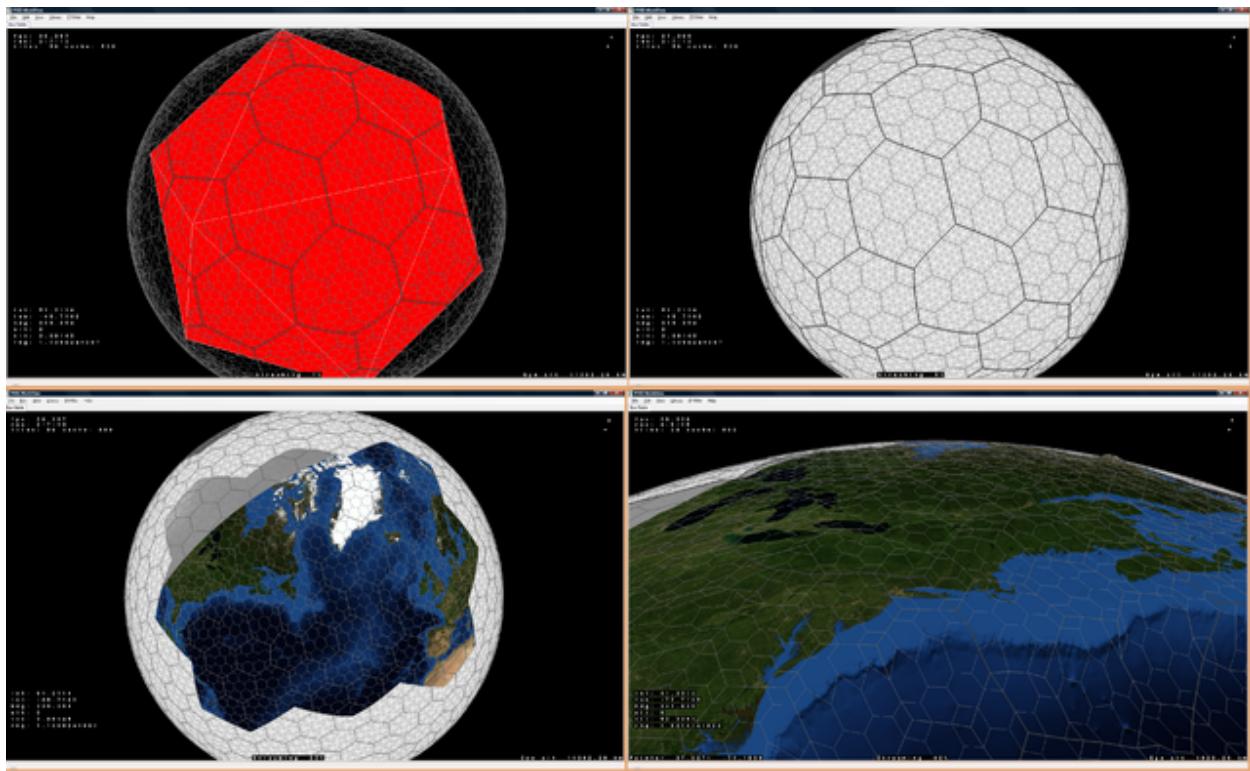


Figure 53: Petersen (2007)

GIS free multi-scale analysis and reporting during disaster scenarios.

18 Utility address concepts

- A means of communicating location to third parties in a way **they** understand.
 - Delivery
 - Contract engineer
 - Incident reporting
- Hence, addresses are all about sharing
 - We need to *buy into* disambiguating stakeholder semantics
 - * Democratise the infrastructure
 - * Democratise re-use
- Everything is mediated by a human in the information exchange
 - Everyone has their own semantics
 - Formal and vernacular geographies

18.1 Addresses mediate space

In business systems addresses are bridge a between technology stacks and social systems.

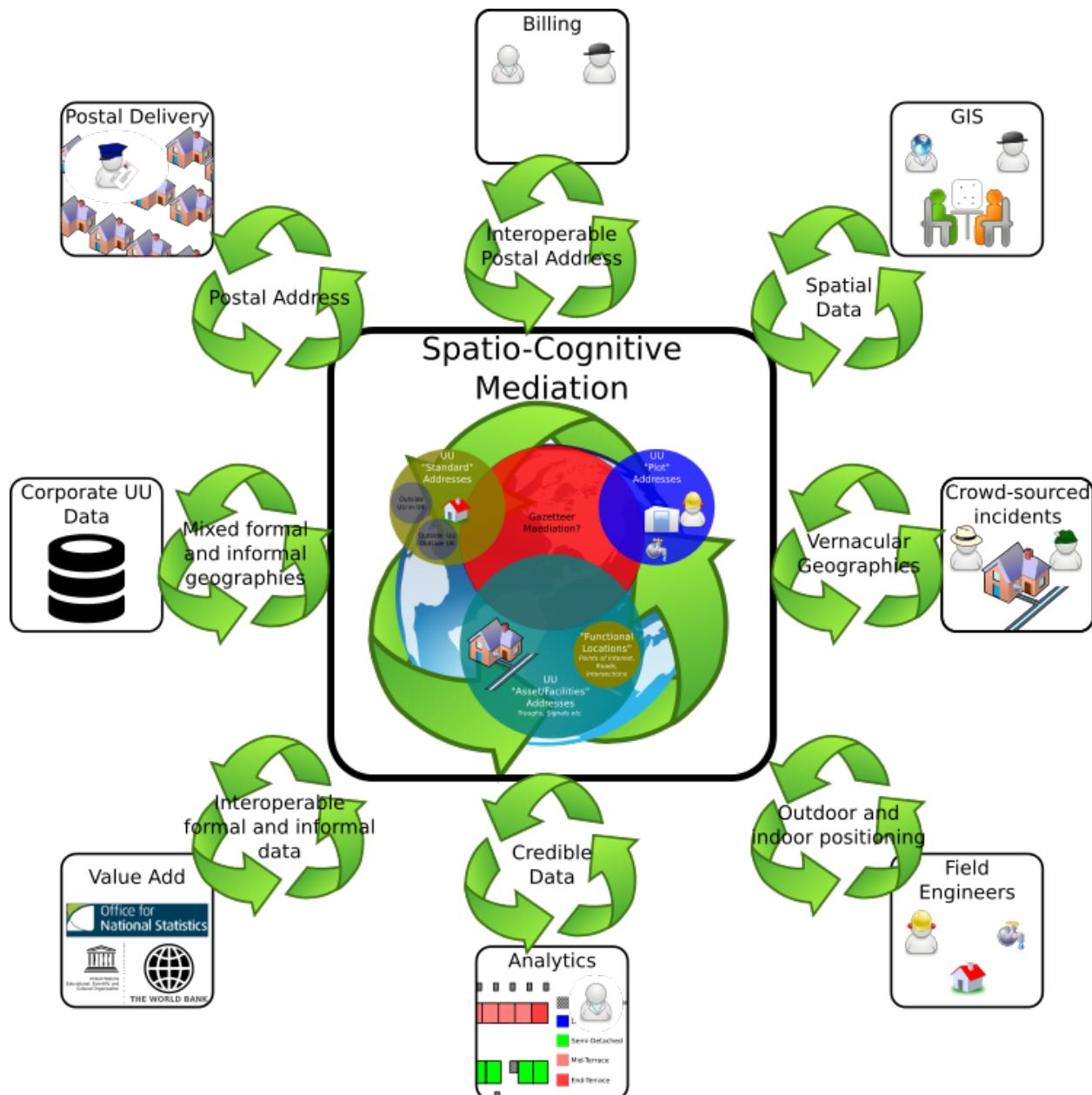


Figure 54:

18.2 Addresses mediate space

In business systems addresses are bridge a between technology stacks and social systems.

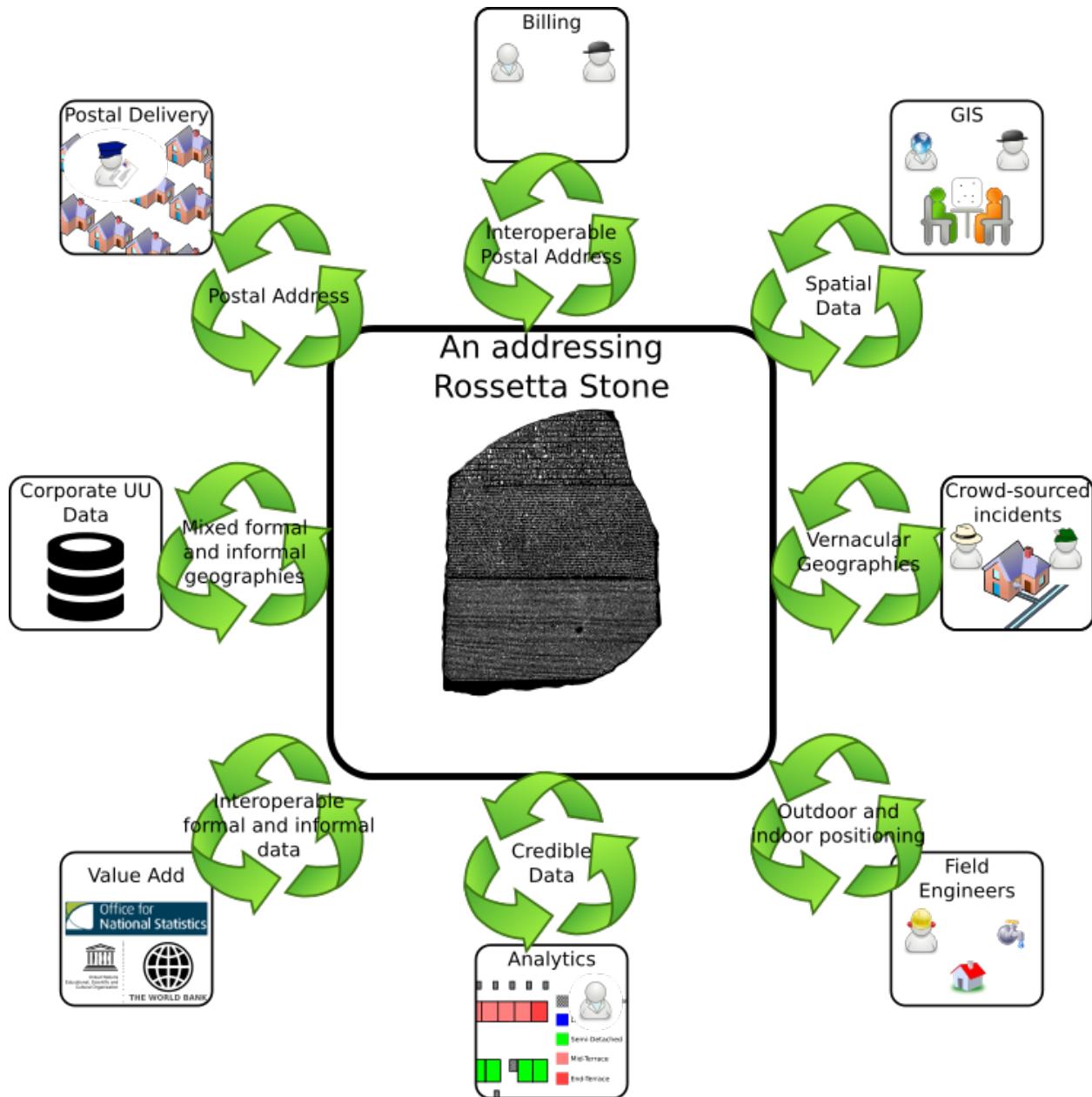


Figure 55:

- Challenges
 - find an unambiguous way to encode these different address types across the enterprise (and/or as part of an open initiative)
 - find ways to dynamically transform these address so that each end-user community get the most appropriate address be they:
 - * formal addresses

- * vernacular (informal) addresses
- * Postal address
- * Asset location

- Most people in the UK think of an address as a *postal address*
 - This is a mindset we should be trying to break
 - A delivery address is only one facet to an address
- What do addresses enable
 - Services
 - * Postal services
 - * Utility services
 - * etc
 - Routing
 - * Vehicle navigation
 - * People navigation
 - Asset/Infrastructure management
 - Information integration
 - * Lifecycle
 - * Geodemographics
- Hence, addressing information covers a range of requirements:
 - Semantic
 - GIS
 - Database
- Challenges
 - find an unambiguous way to encode these different address types across the enterprise (and/or as part of an open initiative)
 - find ways to dynamically transform these address so that each end-user community get the most appropriate address be they:
 - * formal addresses
 - * vernacular (informal) addresses
 - * Postal address
 - * Asset location

In terms of assets two things spring to mind -

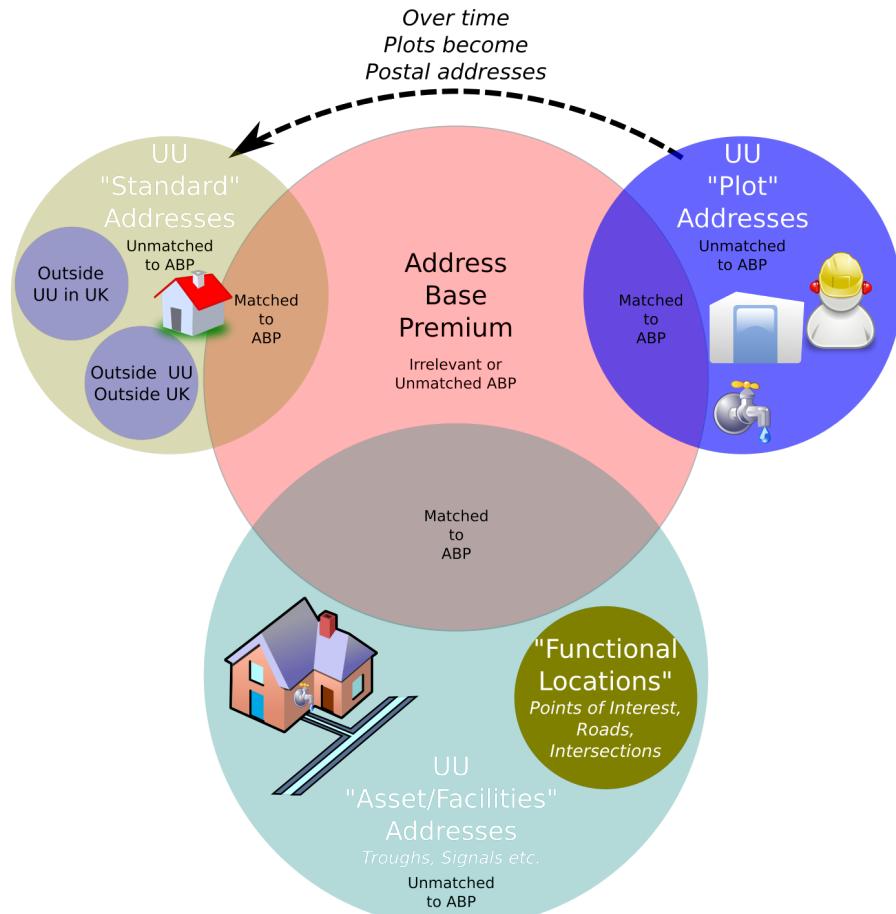
1. we no longer need streets and buildings to provide an address.
 - GNSS already does this globally.
 - The challenge is to translate GNSS into something appropriate for other services
2. The Access point/Delivery point metaphor used by Royal Mail may be important for traction
 - solving the last 100m problem (or location of local drone delivery depot)

The screenshot shows a news article from theguardian.com. The header includes links for 'sign in', 'become a supporter', 'subscribe', 'search', 'jobs', 'dating', 'more', and 'UK edition'. The main navigation bar has links for 'home', 'UK', 'world', 'politics', 'sport', 'football', 'opinion', 'culture', 'business', 'lifestyle', 'fashion', 'environment', 'tech', and 'travel'. Below this, a secondary navigation bar shows 'home > tech'. The article title is 'Amazon to test drone delivery in partnership with UK government' by 'Amazon.com'. It was written by 'Nicky Woolf in San Francisco and Samuel Gibbs in London' on 'Tuesday 26 July 2016 00.00 BST'. The article text states: 'The company will run tests to explore the viability of drones carrying deliveries weighing five pounds or less - which make up 90% of Amazon's sales'. A large image of an Amazon Prime Air drone is shown in flight. The sidebar on the right is titled 'Most popular' and lists three articles with small thumbnail images: 'Clegg: Osborne casually cut welfare for poorest to boost Tory popularity', 'Amy Schumer throws sexist heckler out of Stockholm show', and 'Top baby names: is yours on the up or on the way out?'. At the bottom left, there are social sharing icons for Facebook, Twitter, Email, LinkedIn, and Google+, showing 1,731 shares and 624 comments. A 'Save for later' button is also present.

Figure 56:

19 Current utility addressing?

19.1 A shared view over addressing?



As Denmark have demonstrated: there should be no such thing as *unmatched* in a national address gazetteer

Figure 57:

19.2 A shared view over addressing?

Not really....

- ABP isn't a silver bullet
 - Subset of required 'formal - delivery' addresses
 - Mis-match in terms of assets
 - * Why does a sewage works not have an address when a post-box does?
 - Not plug and play
 - Lag in the system - the lifecycle feedback does not have credibility for time critical applications.
 - The co-ordinating spine is not freely available (under a permissive licence)
 - Inset areas - an agglomoration of 'addresses'
 - VOA link is a cludge



Figure 58:

19.3 Addresses should mediate systems

- Bridge the gap between a building focussed 2d view of the world and the 3d world in which we inhabit.
- Harmonise the edge cases relationships between UPRNs and VOAs

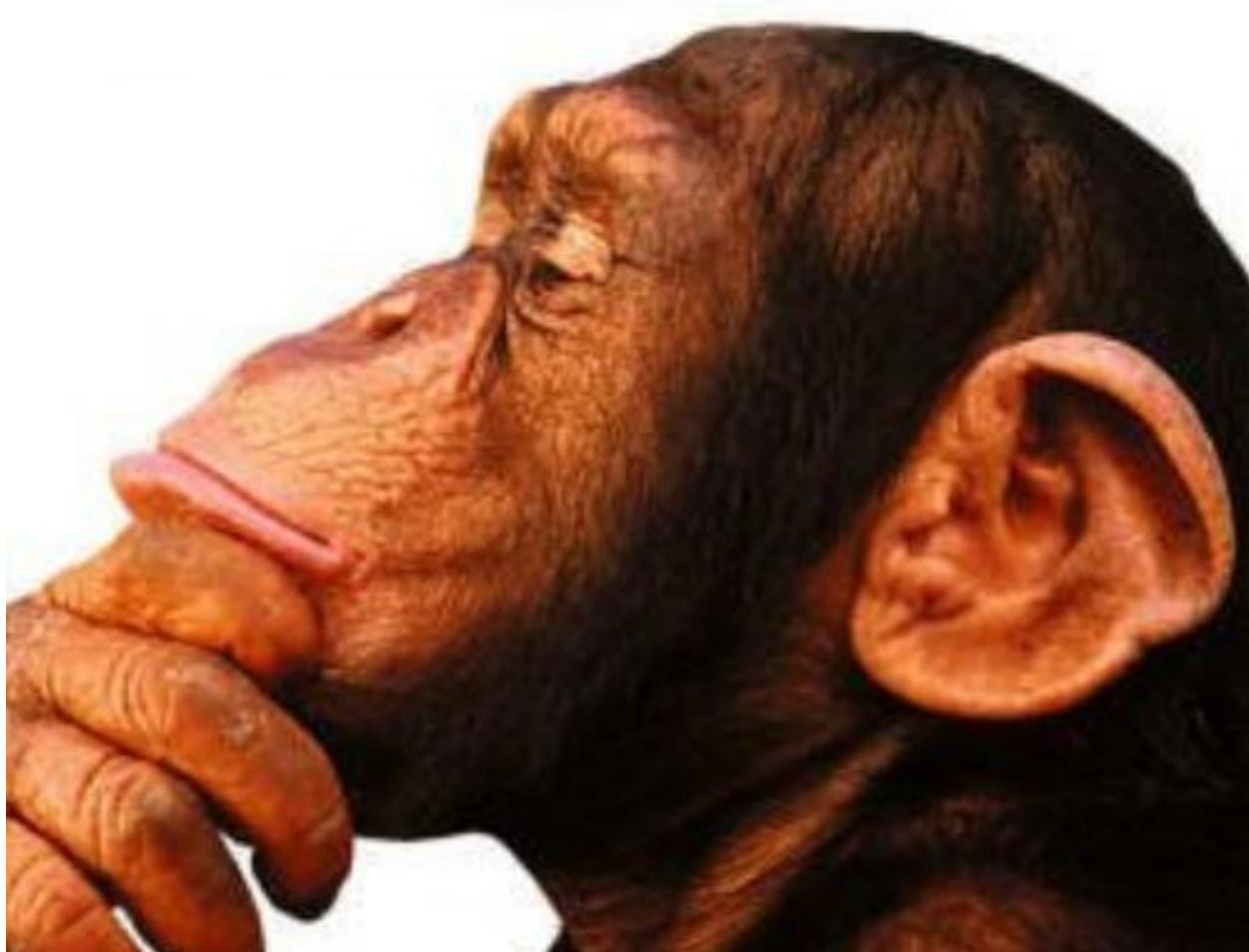


Figure 59:

19.4 Issues about ABP

- Users over a barrel
 - Needed to buy ABP as AL2 was being removed
- Data model change
 - a hostage to someone else's data model
- Lifecycle benefit not being realised (at least not for utilities)
 - Altough utilities have a significant value add
- Update frequency
- Different view of property hierarchy
- 2d and 3d metaphors against VOA
 - a better 2.5 view of the world would be appreciated.
- Licences do not encourage re-use and innovation

19.5 This begs the question

Why should utilities replace a functional bespoke address system with an address framework (ABP) that does not meet all their business requirements?

This creates a paradox when products like AddressBase are stipulated in Government policy documents (such as OpenWater)

How can this gap be bridged? Can *open addresses* help?

Addresses need to be fit-for-purpose for the end user

20 Future Addressing

20.1 What do Utilities need from an Open Address infrastructure

Ant Beck will talk about how addresses are employed within United Utilities: from bespoke addressing, to the current implementation of Geoplace's Address Base.

The current approach to addressing hinders effective market activities so consideration is given to how Open approaches can disrupt the addressing landscape and improve utility services.

- Should this simply emulate Address Base Premium?
 - No
- Like Denmark should it exploit technological developments to be:
 - More robust
 - Improve use case
 - More flexible

21 Future Addressing

21.1 What do Utilities need from an Open Address infrastructure

- Should it embrace technological development to make operational activities more efficient
 - Use disruptive technologies to facilitate geo-coded addressing of assets in a flexible and credible manner
- How can such an infrastructure interoperate with other formal and informal sources to provide benefits
- What licence would a service be under.
 - OS licence? **-No - it is restrictive**
 - The point is to encourage:
 - * adoption
 - * engagement
 - * re-use

We would like to see an *open address infrastructure* in the UK **provide a platform for 21st Century addressing**

It should **not simply aim to emulate ABP** - there are other use cases

21.2 What can Utilities bring to Open Addresses

- A credible publisher of addressing updates under open licences providing:
 - additional content
 - improved lifecycle information
 - expanded use cases
 - improving confidence and credibility
- Critical lifecycle data updates
 - potentially faster than local government (lag is critical to some users).

21.3 What can Open Addresses bring to Utilities

- Fill the gap of formal and informal addresses
 - But share a common reference Spine
 - * UPRN?
 - * But what about the 3d world
- Add value
 - Link to different geoaddressing paradigm
 - * W3W
 - * GeoHash
 - * etc.
 - Linked data?
 - Property life-cycle?
 - Spatially consistent
 - Crowd enhanced
- Service innovation
 - enhanced business intelligence from shared knowledge
 - geo-demographics protecting the disenfranchised
 - * who are our sensitive customers - what are their needs?

22 Final thoughts

Utilities have the potential to be:

- Key consumers of open addressing data
- Key providers of open addressing content

United Utilities would like to help frame this debate and be part of any solution.

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