Distributed Futures

An open source research programme for Smart Ledgers and new technologies

An Executive Guide To Smart Ledger Geostamping

Long Finance Webinar

Wednesday, 05 September 2018, 15:00 to 15:30 BST

(presentation starts at 15:02)

@longfinance

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Introduction

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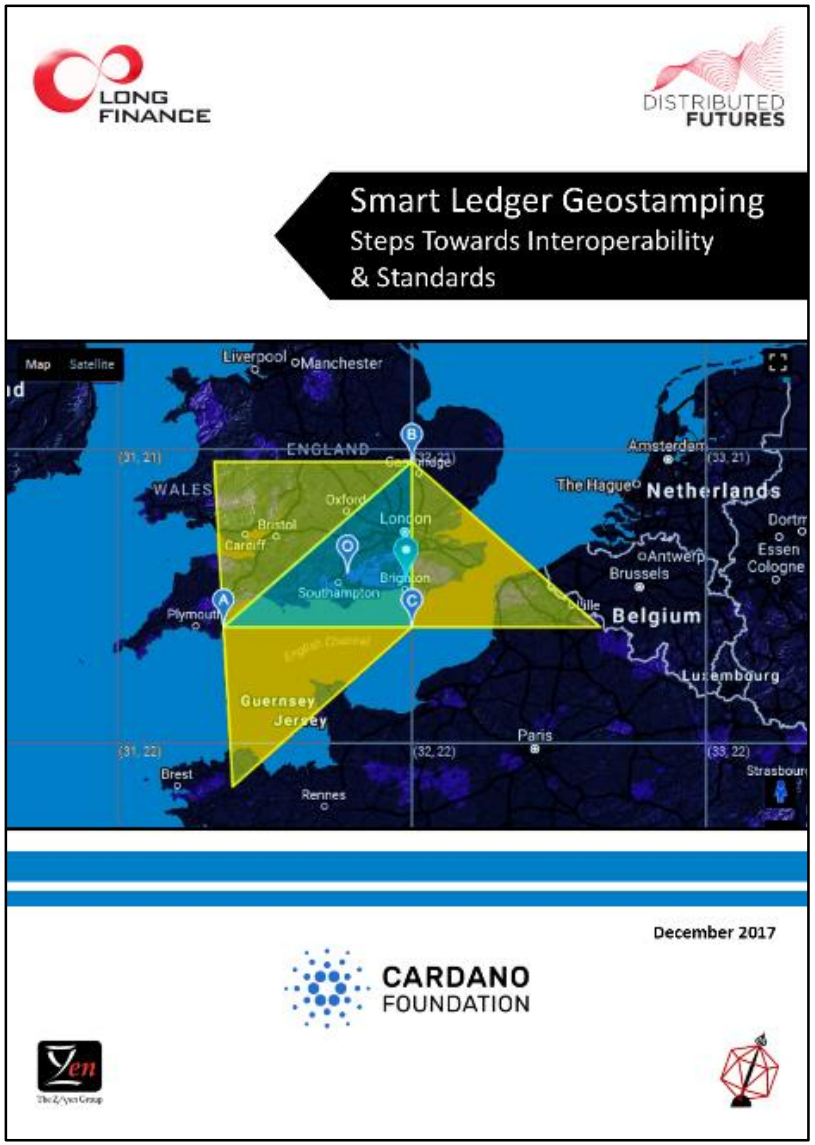
Agenda

15:00 – 15:05	Welcome & Introduction
15:05 – 15:25	Geostamping Summary
15:25 – 15:30	Concluding Remarks
15:30	Close

Report



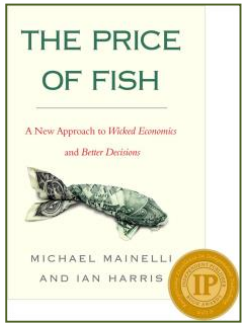
Read the report at:

https://bit.ly/2wDgFj9

Z/Yen Group

- **Special** – City of London's leading commercial think-tank
- **Services** – projects, strategy, expertise on demand, coaching, research, analytics, modern systems
- **Sectors** – technology, finance, voluntary, professional services, outsourcing

- Independent Publisher Book Awards Finance, Investment & Economics Gold Prize 2012 for ***The Price of Fish***
- British Computer Society **IT Director of the Year** 2004 for PropheZy and VizZy
- DTI **Smart Award** 2003 for PropheZy
- *Sunday Times* Book of the Week***, Clean Business Cuisine***
- £1.9M **Foresight Challenge Award** for Financial £aboratory visualising financial risk 1997



Distributed Futures Programme

We work in partnership with many stakeholders to learn together and build the vital infrastructure needed to make Smart Ledgers a success.

Our research is structured around four themes:

- Societal
- Technological
- Economic
- Political

Directed at four outcomes:

- Expanding frontiers
- Changing systems
- Delivering services
- Building communities

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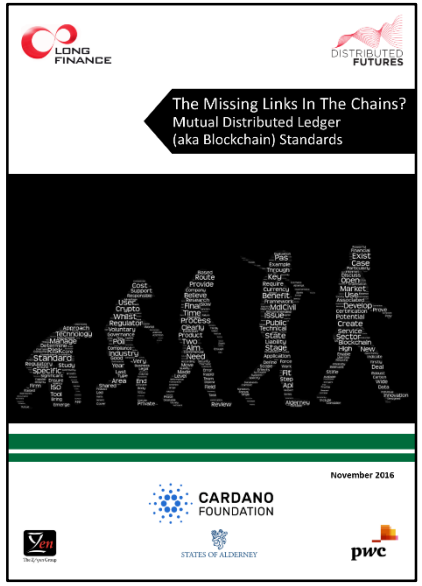
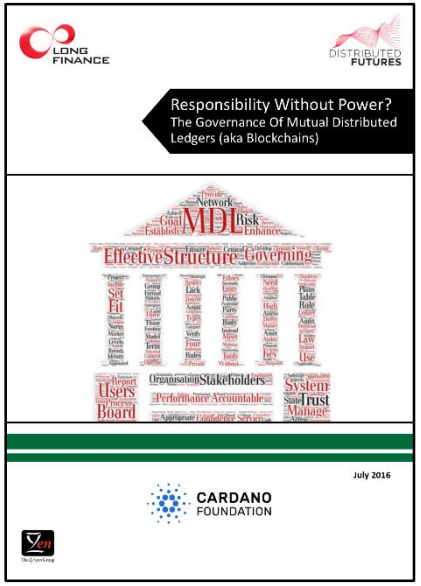
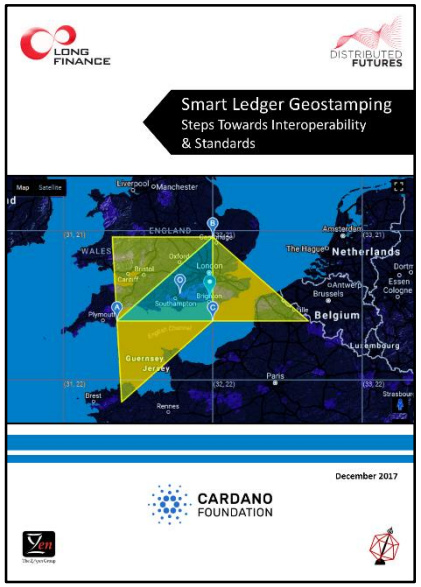
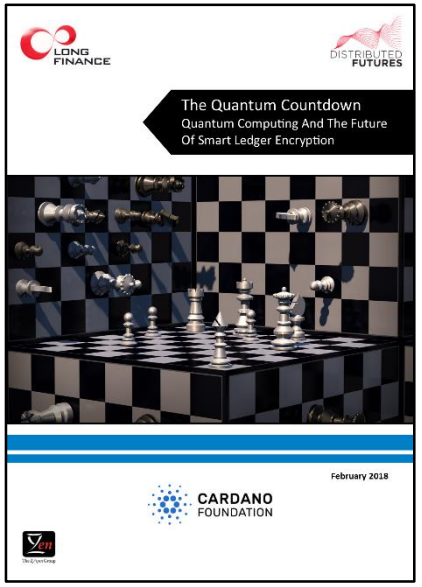
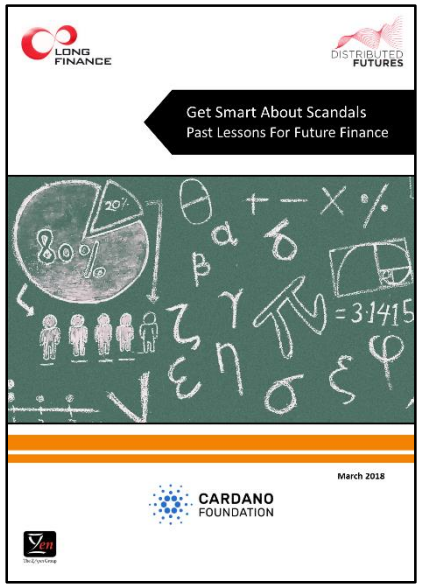
Distributed Futures Research

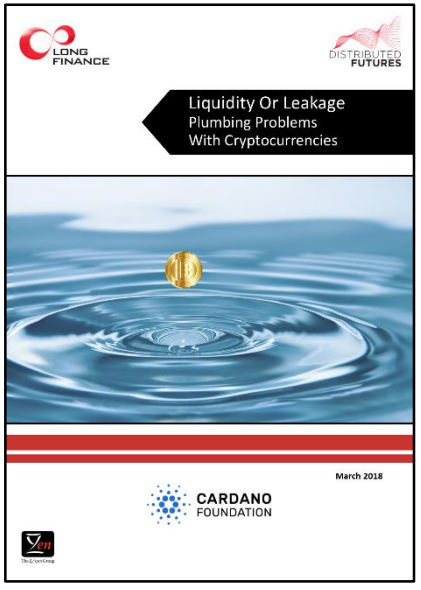


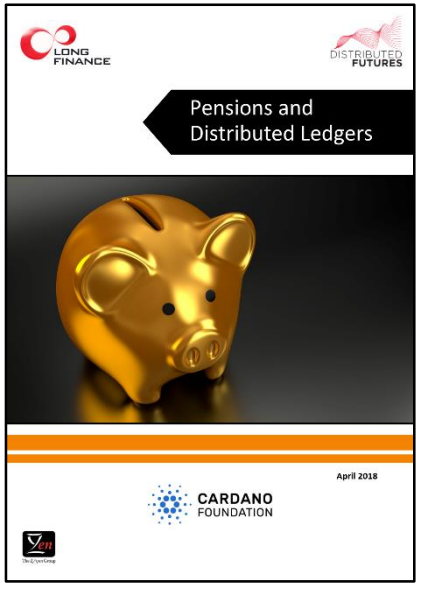












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Timeline

2017 2018 2018 2019

EXPANDING FRONTIERS

- Human Adjudication In Smart Ledgers
- Artificial Intelligence – The Risks
- Pensions & Distributed Ledgers 4
- Smart Ledger Geostamping 6
- Fractal Characteristics & Measures
- Cryptocurrency Liquidity 2
- Money Supply Rules, Algorithms & Liquidity
- Economic Impact Of Smart Ledgers On World Trade 7
- Industry Pilot – Shipping
- General Data Protection Regulation & Governance
- Green Ledgers & Sustainability Certificates – Forestry & Fish

CHANGING SYSTEMS

- Get Smart About Scandals 3
- Provability In 'Smarts'
- The Quantum Countdown 1
- Inter-Exchange Operability On A Smart Commodities Ledger
- Timestamping – Accuracy & Comparability 5
- Taxonomies & Classifications Of Smart Ledgers
- Prior Smarts – The Origins Of Smart Ledger Technology
- IP Rights On Smart Ledgers – Music
- Voting Structures On Smart Ledgers – Equities
- Cryptocurrency Energy Consumption
- WIR Revisited
- Smart Ledger Surveillance Techniques
- Cyber-Catastrophe Insurance Linked Security Pilot
- Taxation & Smart Ledgers

DELIVERING SYSTEMS

- Directory Services
- Smart Data Structures & InterPlanetary C#ASMs
- Architectures For Tokenless Ledgers
- Visualising Smart Ledgers
- Audit & Accounting For Smart Ledgers
- Online Simulation For Tokens & Cryptocurrencies
- Economics Of Competing Currencies
- Certificate Authenticity & Management
- Protection & Indemnity Mutuals
- Survey Of The Regulatory Landscape For Smart Ledgers

BUILDING COMMUNITIES

- Games & Fun
- Online Micro Courses
- Standards & Interoperability
- Technical Fora
- Ledger Learnings & Simulations
- Performance Benchmarking
- RegTech
- Regulatory Consultations

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Terminology Evolving

- **ledger** – a record of transactions
- **distributed** – divided among several or many, in multiple locations
- **mutual** – shared in common, or owned by a community
- **mutual distributed ledger (MDL)** - a record of transactions shared in common and stored in multiple locations
- **mutual distributed ledger technology** – a technology that provides an immutable record of transactions shared in common and stored in multiple locations
- **blockchain** - “a transaction database shared by all nodes participating in a system based on the Bitcoin protocol”
- **smart ledger** – MDL with embedded, executable code

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Smart Ledgers Hold Immense Promise

Area	Possible Applications
Financial instruments, records, models	Currency, private and public equities, certificates of deposit, bonds, derivatives, insurance policies, voting rights associated with financial instruments, commodities, derivatives, trading records, credit data, collateral management, client monies segregation, mortgage or loan records, crowd-funding, P2P lending, microfinance, (micro)charity donations, account portability, airmiles & corporate tokens, etc.
Public records	Land and property titles, vehicle registries, shipping registries, satellite registries, business license, business ownership/incorporation/dissolution records, regulatory records, criminal records, passport, birth/death certificates, voting ID, health and safety inspections, tax returns, building and other types of permits, court records, government/listed companies/civil society, accounts and annual reports, etc.
Private records	Contracts, ID, signature, will, trust, escrow, any other type of classifiable personal data (e.g. physical details, date of birth, taste) etc.
Semi-private/semi-public records	High school/university degrees and professional qualifications, grades, certifications, human resources records, medical records, accounting records, business transaction records, locational data, delivery records, genome and DNA, arbitration, genealogy trees, clinical trials, etc.
Physical keys	Key to home, hotel, office, car, locker, deposit box, mail box, Internet of Things, etc.
Intellectual property	Copyrights, licenses, patents, digital rights management of music, rights management of intellectual property such as patents or trademarks, proof of authenticity or authorship, etc.
Other records	Cultural, historical events, documentary (e.g. video, photos, audio), (big) data (weather, temperatures, traffic), SIM cards, archives, geostamping, etc.

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An Executive Guide To Smart Ledger Geostamping

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What Is Geostamping?

A geostamp is a digital record of the geographic location of a transaction or, in other words, a timestamp with a geographic location attached.

The adoption of a **limited number of consistent geocoding structures that have global applicability** could increase interoperability of Smart Ledgers.

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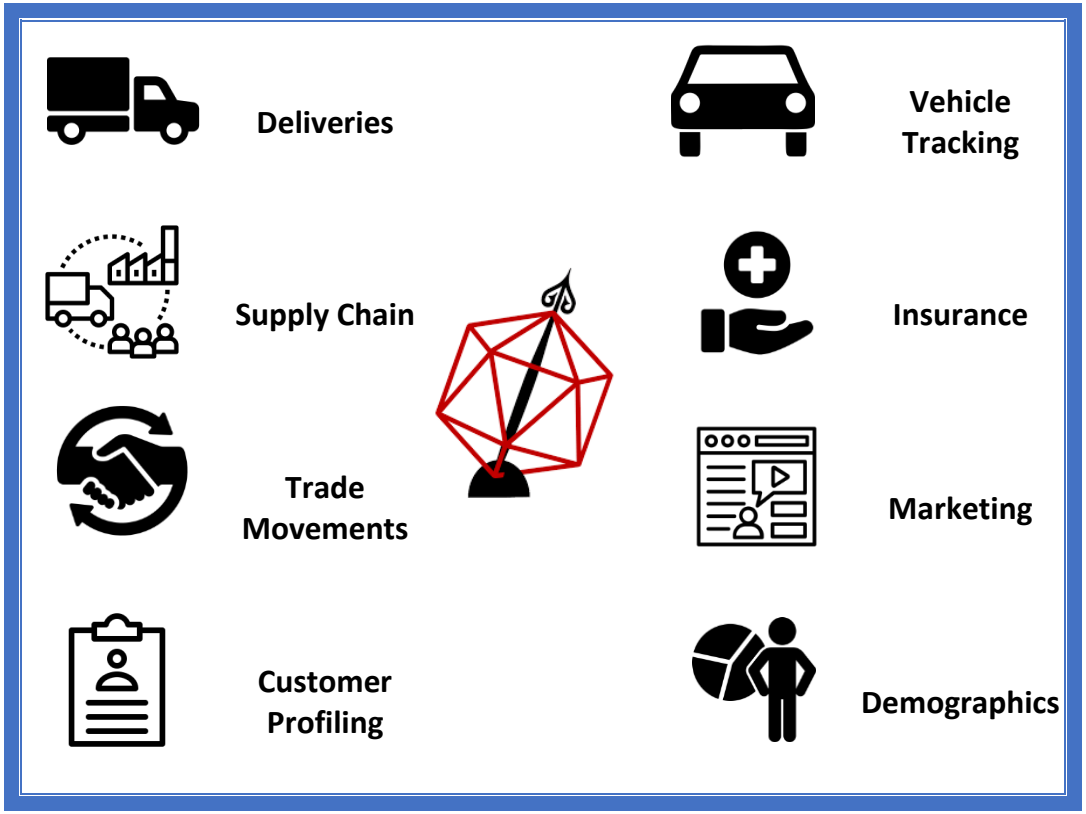
MAPS

We believe the principal qualities of a good geostamp can be encapsulated in the ‘MAPS’ Acronym:

M	Memorability	A geocode should be compact and memorable
A	Aggregation	A coding system should be able to describe comparably a variety of area sizes and structures, both natural and human, such as forests, beaches, buildings, sports grounds, country borders, etc.
P	Proximity	Similar codes should represent similar locations, so that people exchanging codes can roughly understand the distance and relationship between them
S	Scale	Users should have control over the precision

Smart Ledger Examples of Geostamping

Smart Ledgers are mutual distributed ledgers (MDLs, aka blockchains) with embedded, executable code. Smart Ledgers are able to specify rules about the use of data within the MDL, for example, “release this ship’s location four hours after it has been recorded on the MDL”.

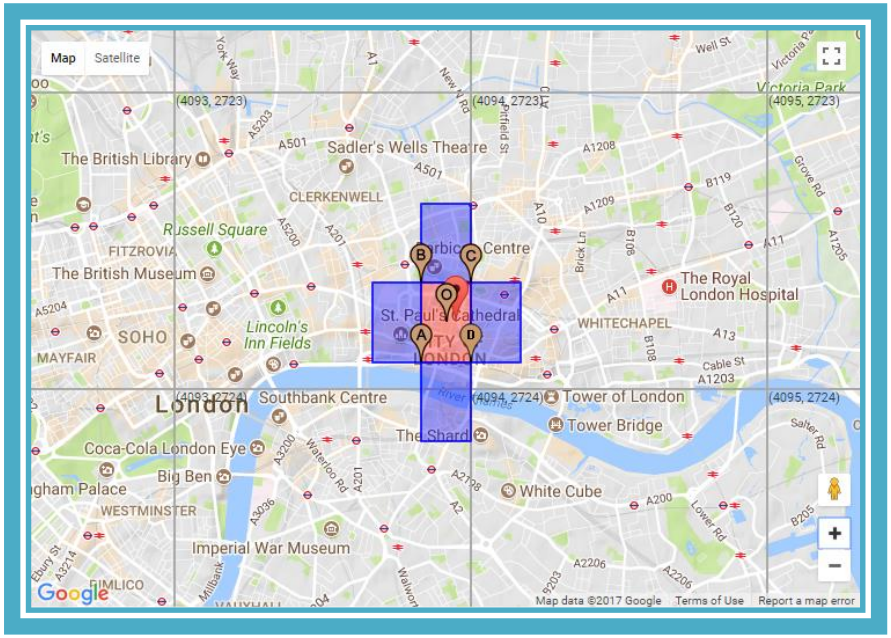


www.GeoGnomo.com

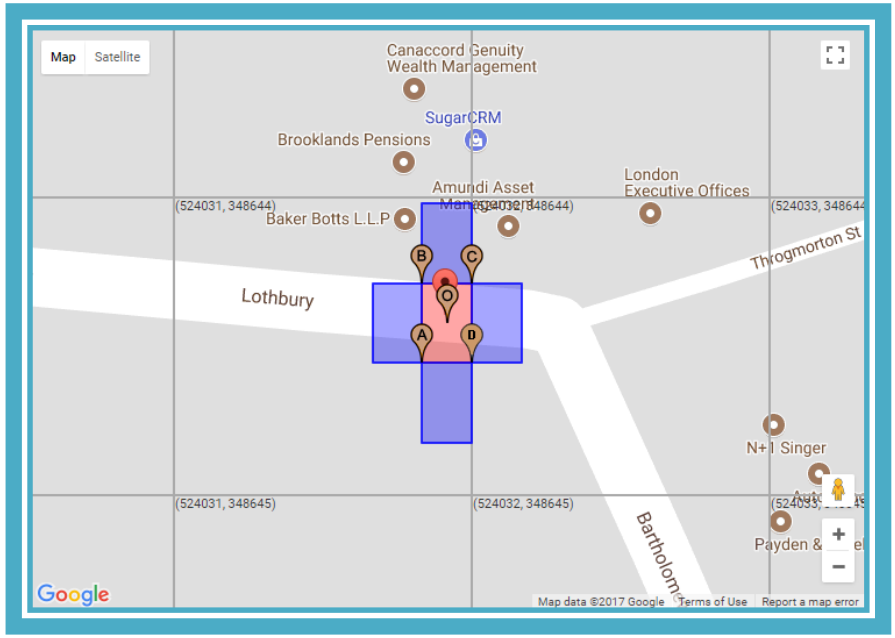
Examples of Practical Use

i) The exact destination for a parcel delivery.

M	Memorability	A geocode should be compact and memorable



GeoGnomo alphabetic code
QRS: G5V4UB-13



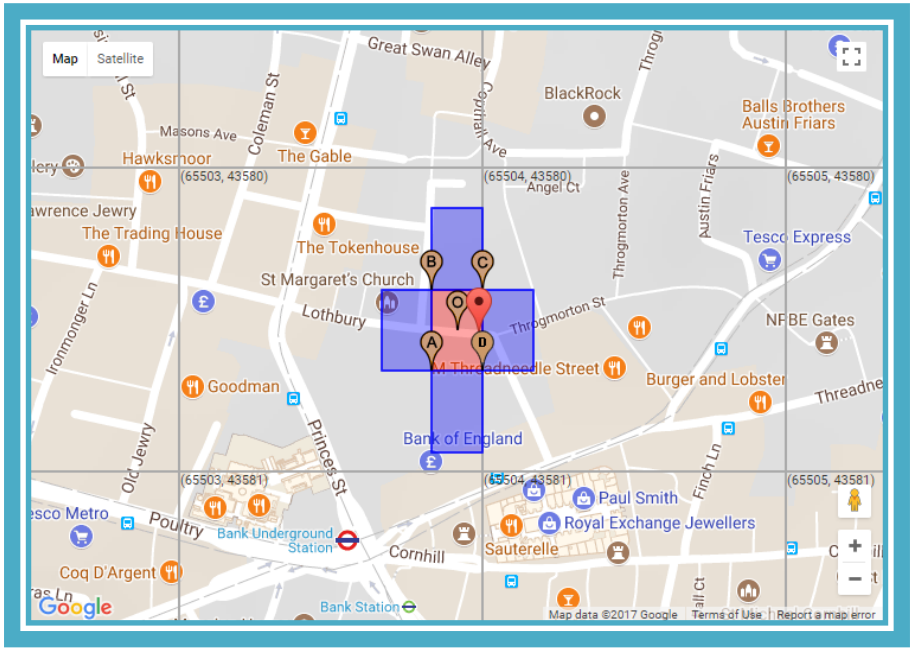
GeoGnomo alphabetic code
QRS: G5V4UW7LV-20

Examples of Practical Use

ii) An organisation wants to know what happened within a specified location over the last year.

A	Aggregation	A coding system should be able to describe comparably a variety of area sizes and structures, both natural and human, such as forests, beaches, buildings, sports grounds, country borders, etc.

Perhaps, in a particular location, 237 aircraft flew overhead; 10,014 mobile phone numbers were recorded; 3 robberies were reported; a care worker attended six addresses.

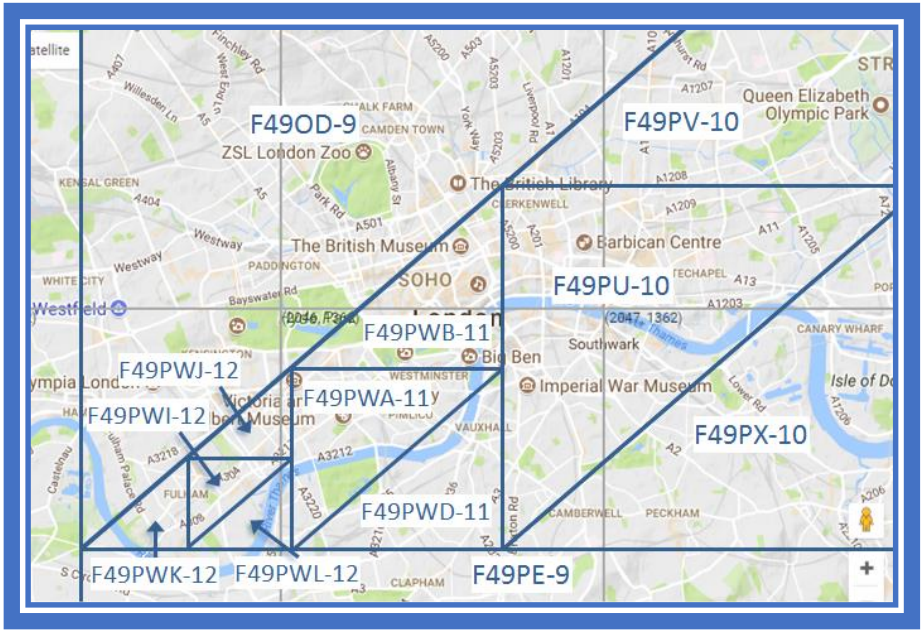


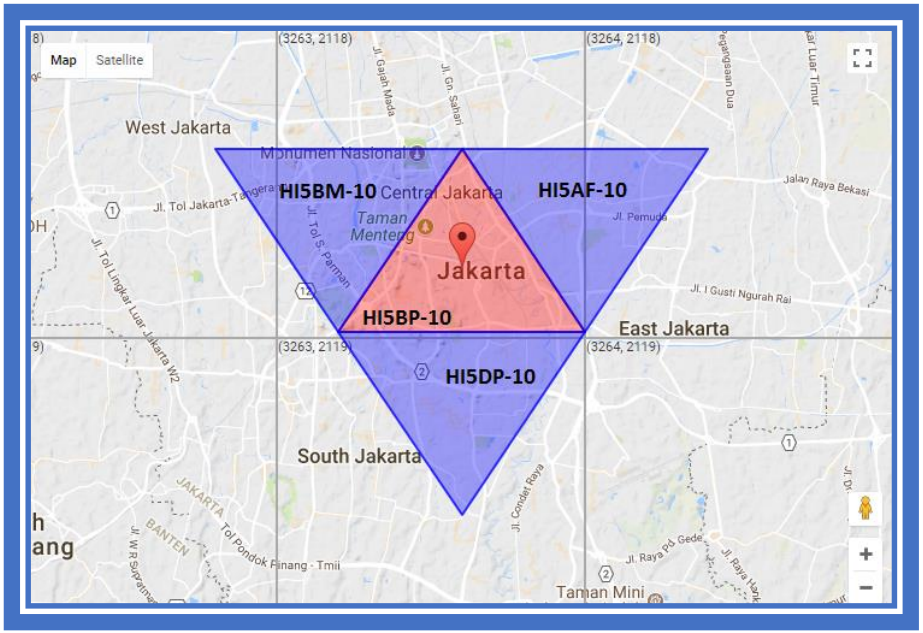
GeoGnomo alphabetic code
QRS: G5V4UW7F-17

Examples of Practical Use

iii) People exchanging codes want to understand the distance and proximity between them.

P	Proximity	Similar codes should represent similar locations, so that people exchanging codes can roughly understand the distance and relationship between them



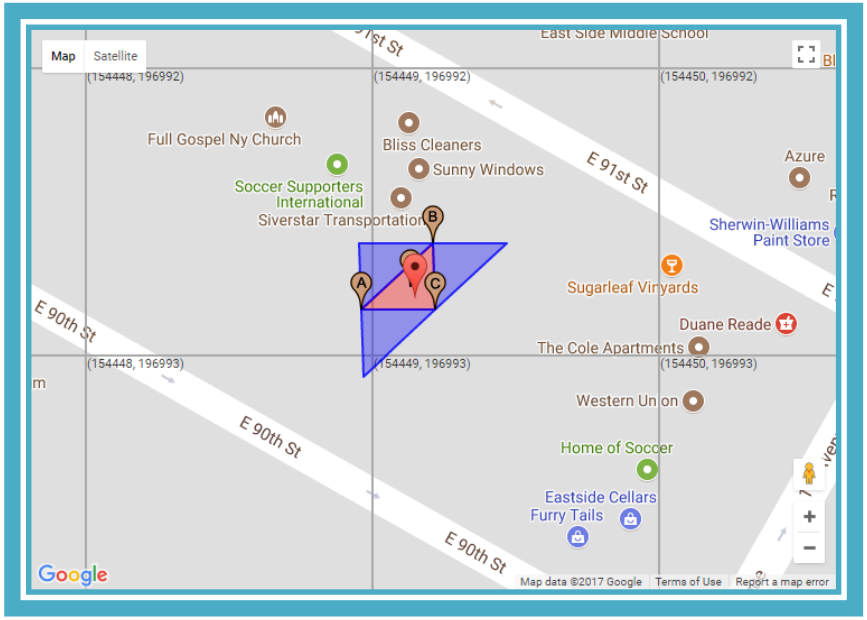


Examples of Practical Use

iv) Allowing the size of the areas to vary enables adaptation as to why the geostamping is being used.

S	Scale	Users should have control over the precision

We can use small area geocodes to keep track of the location of a computer and larger area geocodes to keep track of the area of land that a farmer owns.



GeoGnomo alphabetic code
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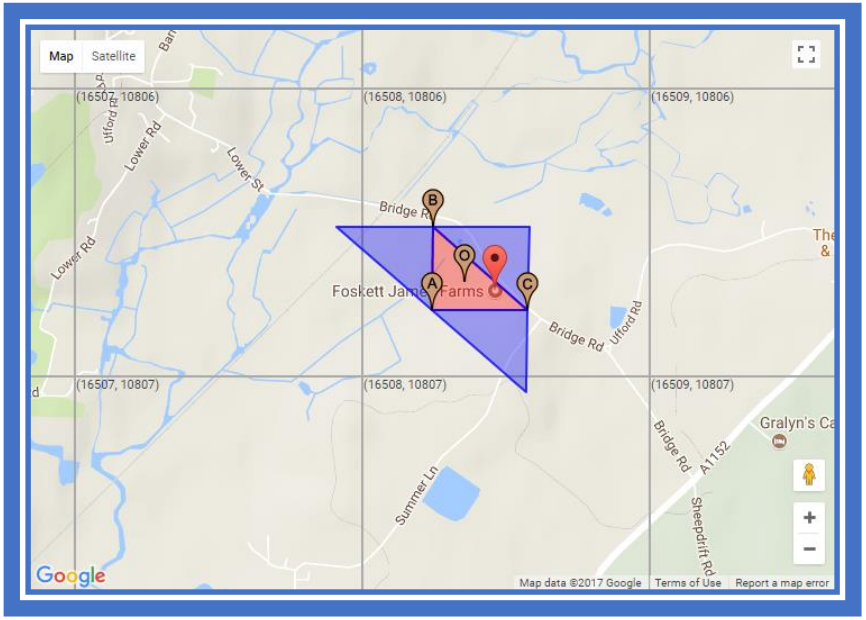

GeoGnomo alphabetic code
QTS: B52XFND-15

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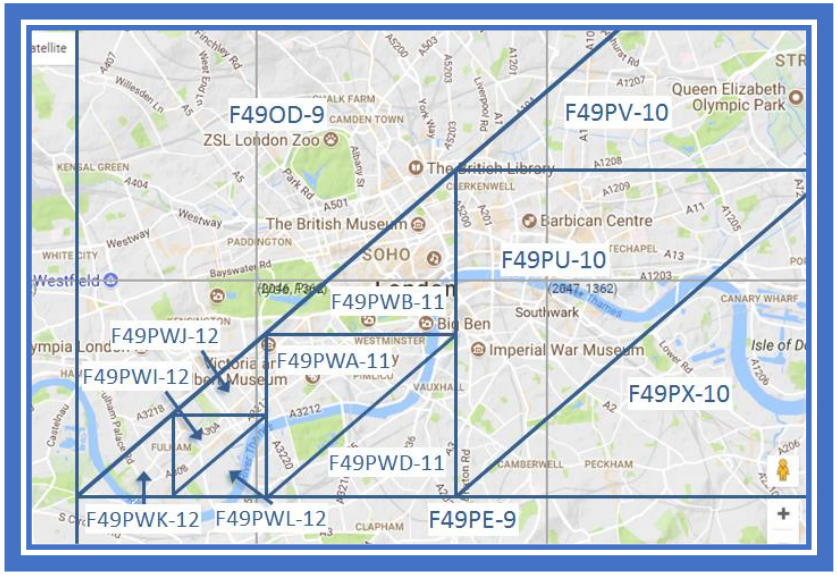
Geostamping Formats

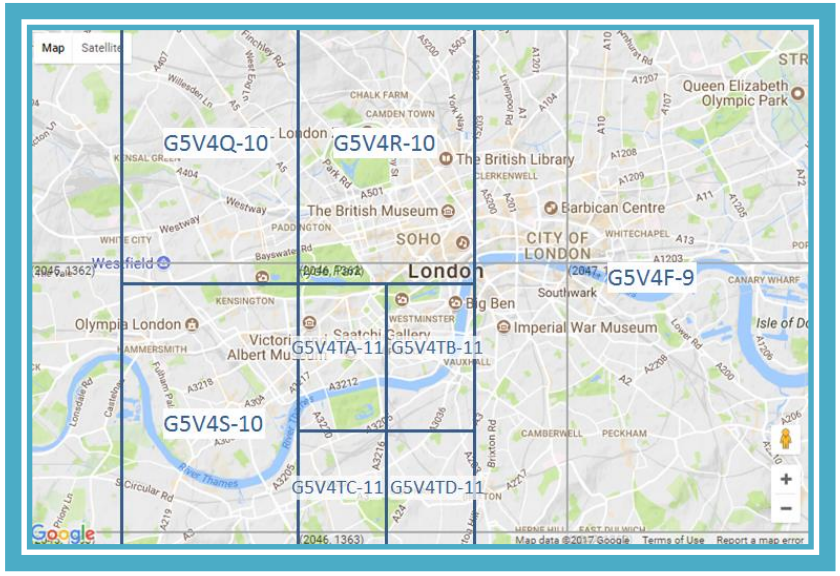
GeoGnomo has developed three methods for geocoding, two use rectangular areas, one triangular areas.

Method	Memorability	Aggregation	Proximity	Scale
Latitude/Longitude Coordinates	Poor	Average	Very Good	Poor
Variable Rectangular System (VRS)	Average	Good	Average	Very Good
Quaternary Rectangular System (QRS)	Good	Average	Good	Good
Quaternary Triangular System (QTS)	Good	Average	Good	Good

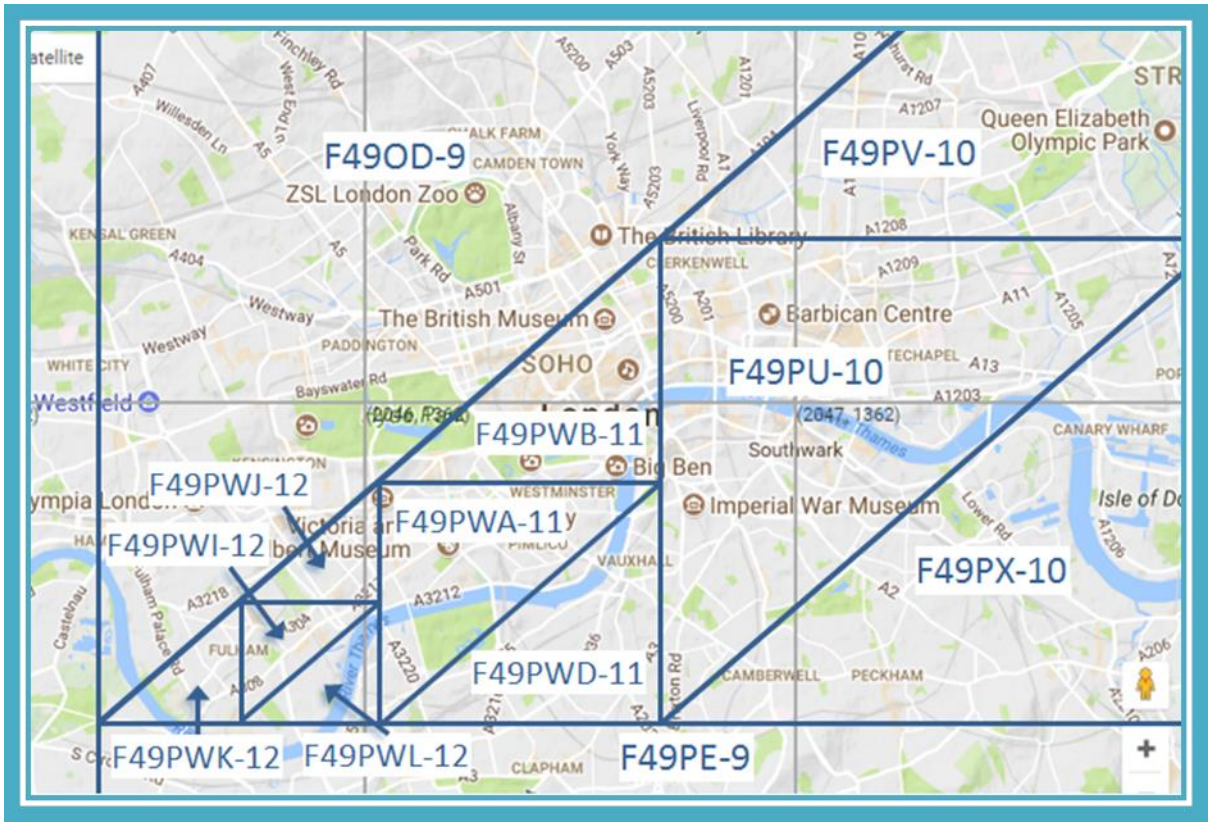
Drill Down

Geostamping is typically constructed from letters and numbers and can be accessed at different levels, depending on the detail required.

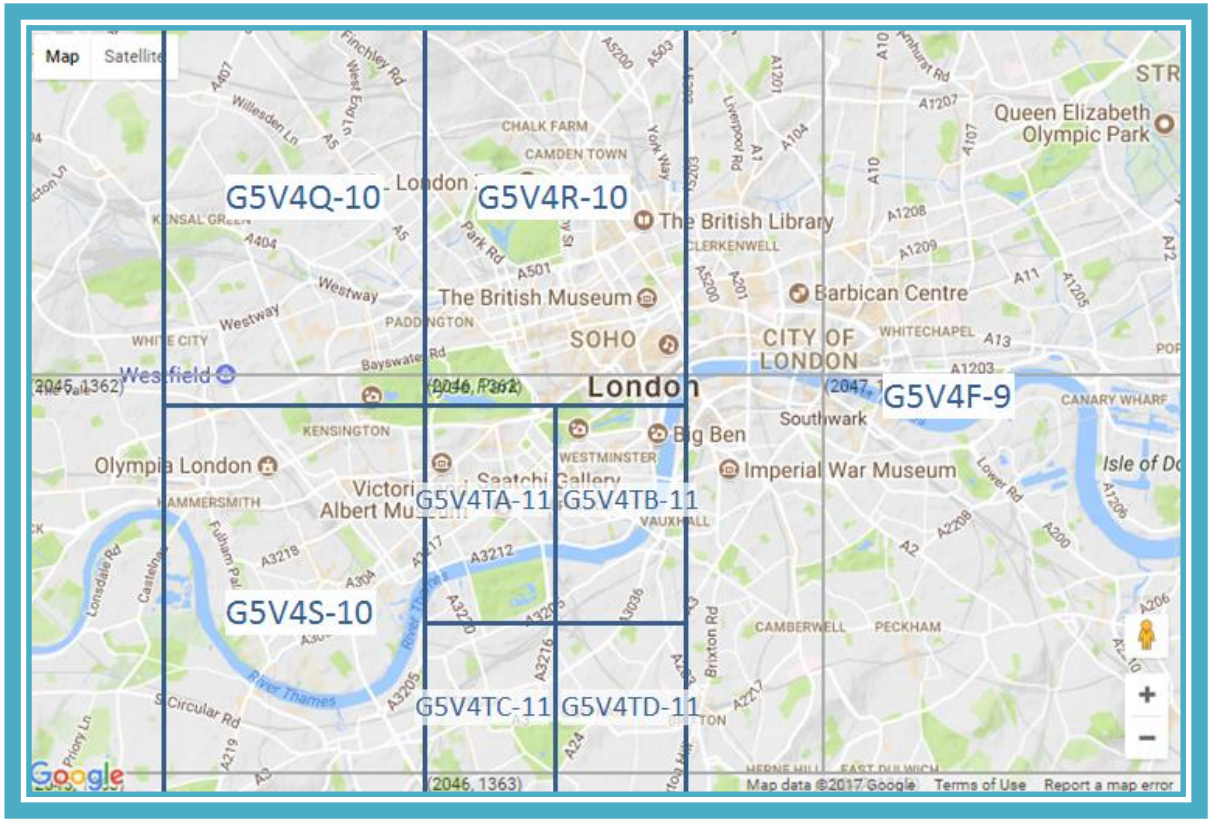




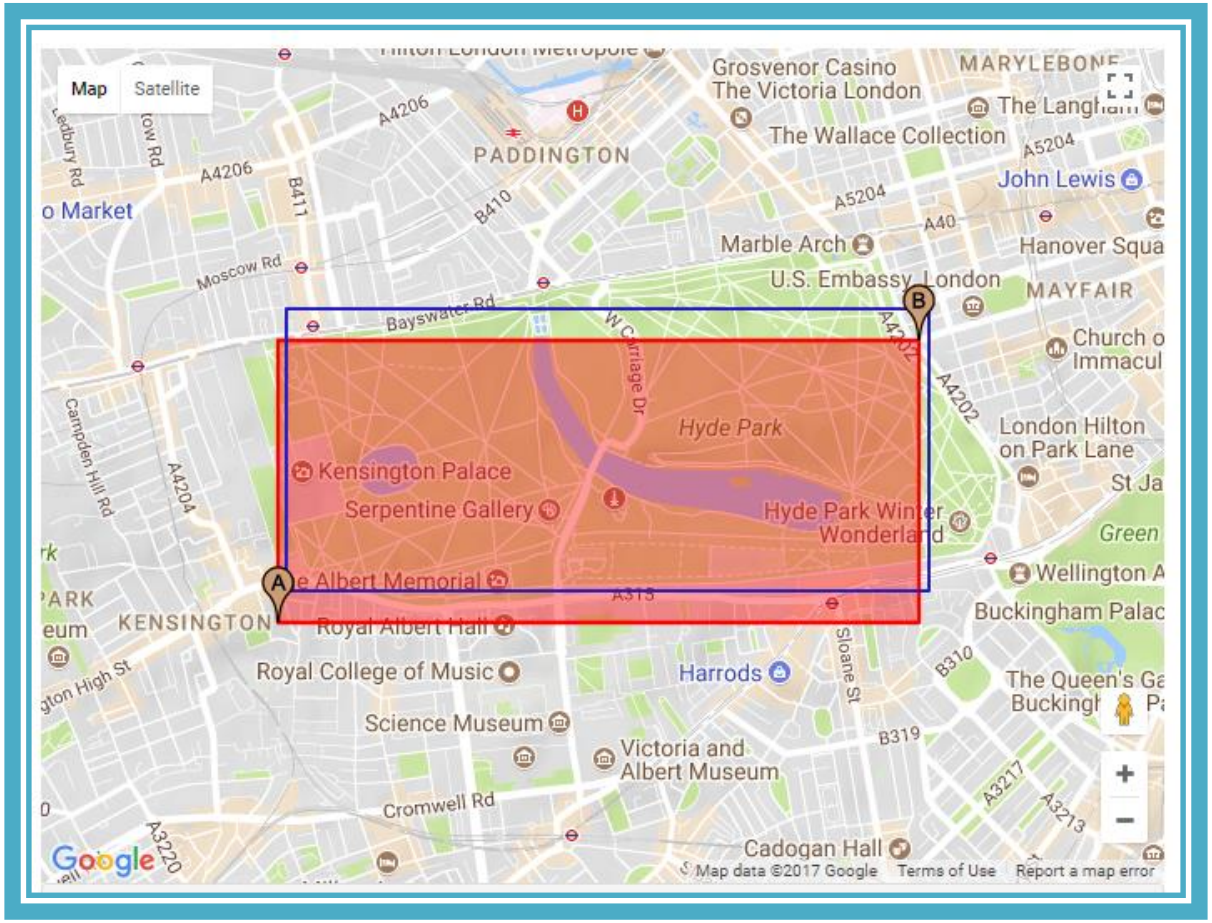
Method 1: Quarternary Triangular System (QTS)



Method 2: Quaternary Rectangular System (QRS)



Method 3: Variable Rectangular System (VRS)



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Future Research Directions For GeoGnomo

- Other Shapes?
- Words?
- Altitude?

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An Executive Guide To Smart Ledger Geostamping

Questions

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When Would We Know Our Commerce Is Working?

"Get a big picture grip on the details."
Chao Kli Ning

Thank you!

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