

# *19. Exploiting GIS assets and navigating constraints*

*Geographic Information Systems and Science*

**SECOND EDITION**

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# Overview

- GIS/GI as business assets
- Value adding through GIS by data linkage
- Navigating the constraints:
  - ❑ Legal constraints on GIS operations
  - ❑ People with right skills, attitudes, knowledge
  - ❑ Issues about availability, pricing, quality and ownership of GI, especially common 'geographical framework'
- Risk management and GIS strategy



## *GIS and GI as Business Assets*

- The commercial sector now drives GIS:
  - Software almost all charged-for by commercial bodies
  - Much data now charged-for by commerce
  - Consultancy, etc also charged-for
  - GIS generates large revenues and costs
  - Linking data together can generate added value
- But
  - US federal government GI is free
  - Many voluntary groups do work for free or low cost
  - Some other governments expect users to pay for GI



## *Exploiting GIS assets by Value Adding\**

- 2 sets of GI, 1 combination
- 20 data sets, 190 pairs, 1 million+ combinations
- The more data linked, many more potential applications

BUT

- Can raise complex problems of GI ownership
- produces uncertainty where data collected to different standards
- Data linking procedures may partially determine results

\*First Law of GIS: You get something for nothing by bringing together GI from different sources and using it in combination



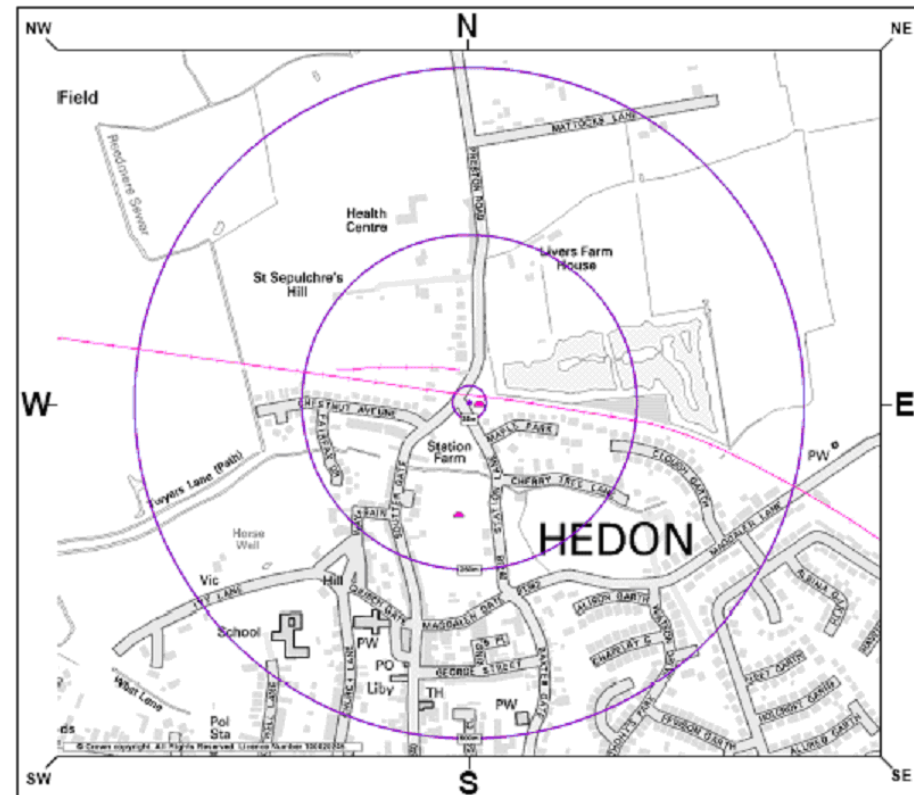
# Value Adding via GIS in Practice

Landmark – a UK commercial organisation – has brought together environmental data from many government and private sources, current and historical, all linked by geographical keys.

From this, they run numerous services for business and individuals e.g. reports on potential sites of environmental contamination around a house being purchased (see two red sites opposite)



Information Map



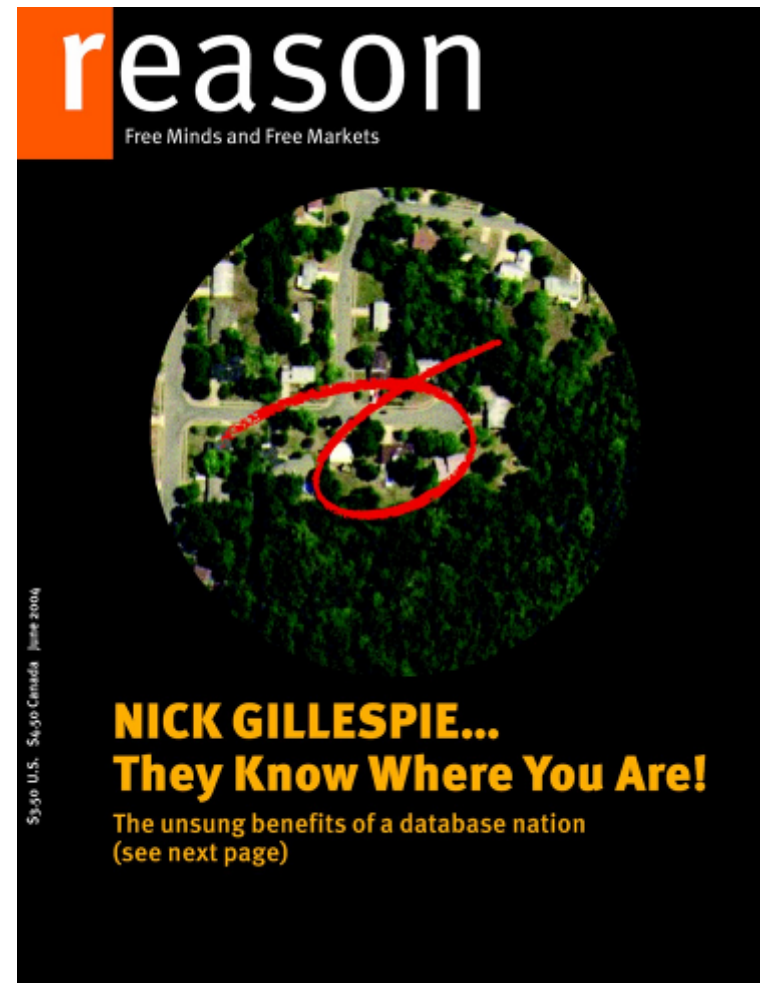


## *More Value Adding...*

Customised cover of the June 2004 issue of *Reason* magazine, with an air photo of the home of each one of the 40,000 individual postal subscribers shown on the copy they received.

This was achieved by merging their subscription address through a geo-coded address matching process with suitably geo-referenced aerial photography and generating customised, clipped digital images for the digital printing process.

It heralds 'hyper-individualized' publications but also highlights concerns about privacy





## *Navigating Constraints on GIS Success*

- Legal constraints on GIS operations
- People with right skills, attitudes, knowledge
- Issues about availability, pricing, quality and ownership of GI
  - especially common 'geographical framework'
- Risk management and GIS strategy



# *The Legal Framework*

- The law touches everything – be prepared
- There is a geography of the law – it varies. 'Commerce is global. Law, for the most part, is not' Financial Times 12/23/99
- Innovation and investment is protected through time-limited copyright or patents
  - Some governments (e.g. US federal government) do not impose copyright on information they create. Others do – and sometimes charge for the information
- Legal areas particularly important for GIS:
  - Liability
  - Intellectual Property Rights
  - Information access laws
  - Privacy







## *Exploiting GI: the Big Questions*

- Can GI be treated as (intellectual) property? YES
- Can 'geographical facts' be protected? USUALLY NOT IN USA
- Should government GI be protected? LAWS VARY
- How to prove theft of GI? SEE PAGE 429
- Who owns GI when new stuff added? ALL CONTRIBUTORS
- How to price GI?
  - BY PERCEIVED VALUE, NOT COST
  - EXPLOIT ECONOMIES OF SCALE AND SCOPE
  - DIFFERENTIATE PRODUCTS (& PRICE) FOR DIFFERENT MARKETS
  - SEIZE FIRST MOVER ADVANTAGE
  - USE PROMOTIONS, ETC



# *GIS/GI Skills and Education*

- People much more expensive than hard/software
- Many GIS folk see themselves as skilled technicians
- Many global similarities in technical GIS education/training
- Over 2000 universities involved + private sector providers + schools
- Growth of interest in professional accreditation, CPD





# *What we need in GIS education*

- Not just technical skills but also:
  - The principles of Geographic Science
  - Entrepreneurial skill development and leadership
  - Understanding organizations
  - Finance, investment criteria and risk management
  - Human resources policies and practice
  - Legal constraints to local operations
  - Understanding cultural differences between disciplines
  - Awareness of international differences in culture, legal practice and policy priorities
  - Formal management training, including staff development and presentational, analytic, and team skills



# *Availability of GI*

- GI the 'rocket fuel'. See below for different types
- Availability varies hugely by country and by theme
- Quality difficult to measure and regulate
  - Brand image of supplier important guarantee?

	<b>Geographic framework</b>	<b>Area coverage</b>	<b>Human individual</b>
<b>Government</b>	National topographic maps, datums	e.g. geology, house plots, etc	Admin. data. Often confidential
<b>Private sector</b>	Imagery + local maps	e.g. classified imagery	Geo-demographics

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## *Example of geographic framework*

- Ordnance Survey MasterMap opposite
    - Includes topography, street addresses, all road links and imagery, all held as many database objects
  - Use of the same framework by all users reduces errors and misfits – but destroys competition
- © 2005 Ordnance Survey

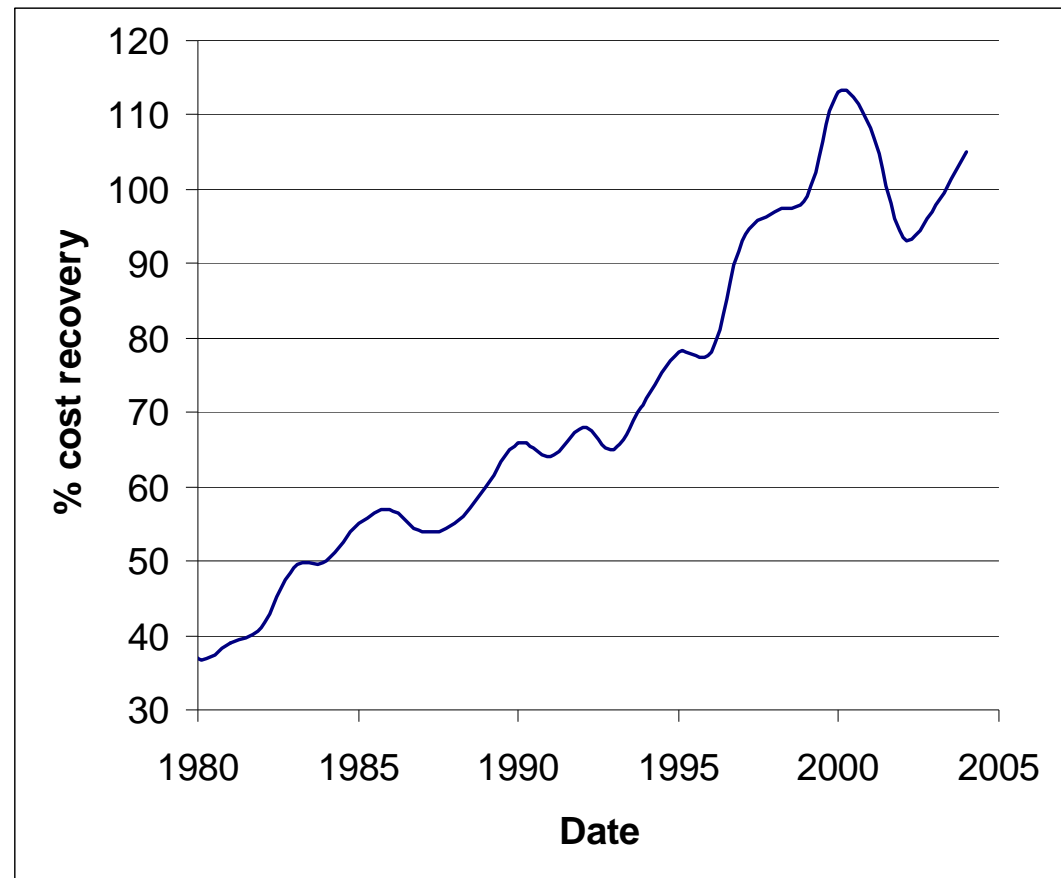




# *Paying for Government Framework Data: the British case*

**The topographic 'framework' of Britain is available in huge detail – paper maps at 1:1250 and 1:2500 scale were digitised, the resulting data being up-dated continuously.**

**Government required users to pay to support maintenance – this is how it evolved**





## *Advantages of Free or Charged Use of government GI*

- Charging measures real need, offers users influence over what is produced, avoids cross-subsidy – hence 'fair'
- Free use leads to maximum use, giving tangible and intangible benefits

Note: it's much more complicated than this – see pages 437-441



# *Policy Changes Over Time: an example*

1. Strict adherence to copyright protection of UK government mapping in early nineteenth century (below)
2. Charging based only on cost of paper, ink c 1920
3. Copyright defence and higher user charging introduced in 1960s

## TRIGONOMETRICAL SURVEY OF GREAT BRITAIN

It having been represented to the Master-General and Principal Officers of His Majesty's Ordnance, that certain mapsellers and others have, through inadvertence or otherwise, copied, reduced, or incorporated into other works and published, parts of the "Trigonometrical Survey of Great Britain," a work executed under the immediate orders of the said Master-General and Board, the said Master-General and Board have thought proper to direct, that public notice be given to all mapsellers and others, cautioning them against copying, reducing, or incorporating into other works and publishing, all or any

part of the said "Trigonometrical Survey," or of the Ordnance maps which may have been or may be engraven therefrom.

"Every offender after this notice given, will be "proceeded against according to the provisions of "the Act of Parliament made for the protection "of property of this kind."

By order of the Board,  
R.H.Crew, Secretary

Office of Ordnance, 24th February 1817





# *The essential GIS Strategy*

- Rarely have one for GIS alone – often one part of overall business strategy
- Defines:
  - ❑ The current situation, agreed by all key players
  - ❑ Statement of organization's strengths, weaknesses, opportunities and threats. Provides view of constraints
  - ❑ How existing activities fit with organization's strategic vision
  - ❑ Statement of changes needed and relationship to constraints and risks to be managed
  - ❑ 'buy in' from key players and monitoring tools
  - ❑ Need implementation plan as well!
- Rarely stays stable for long – so review periodically



# *Iterative Nature of Coping with Risks*

## Types of risk:

**Business risks (e.g. poor GIS products, out-of-date technology)**

**Event risk (e.g. reputation, legal, or disaster or policy shift-induced risks)**

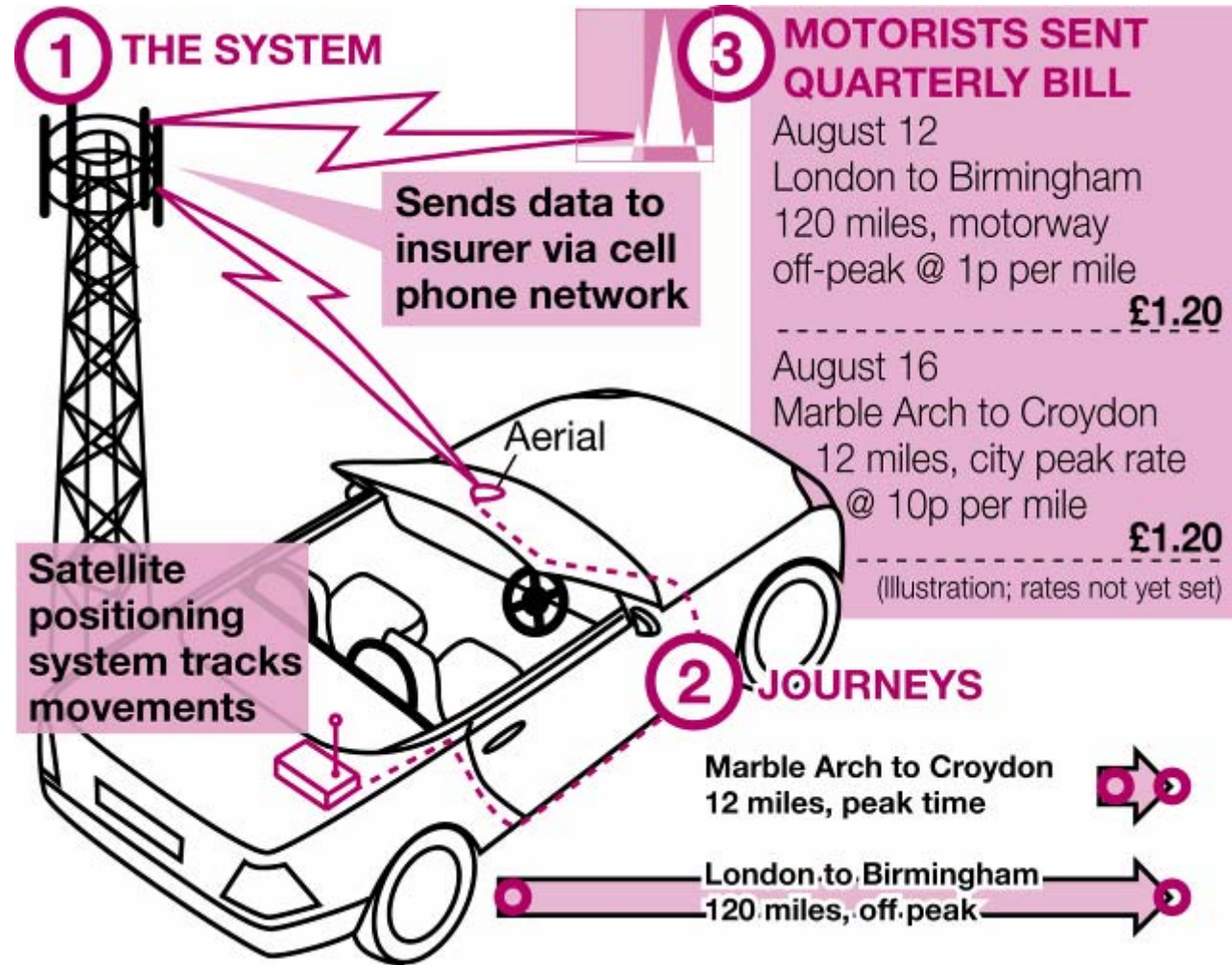
**Financial risk (e.g. currency, cash flow, credit, fraud risks)**





*GIS can make risk a business asset...*

**Real-time charging for auto insurance being trialed, taking account of congestion, time of day, distance travelled – as proxies for risk**





## *Summary*

- Technical skills necessary for many GIS roles but rarely sufficient for success in GIS/GI 'business'
- Understanding the operating 'business' environment crucial to success
- Awareness – at least – of some legal and human resource issues very helpful
- Role of governments in data supply varies greatly
- Business has to vary operations to suit national or local geographic conditions – GIS core software used internationally but everything else needs to be tailored