
Case Studies in Location Economics

Andrew Coote
ConsultingWhere

ConsultingWhere

www.consultingwhere.com



The Value of Geospatial Information in Local Public Service Delivery



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Local Public Service Delivery

- Local Authorities
- Police
- Fire and Rescue
- Local health services



Efficiency Savings: greatest potential value

- **Channel shift** - use of transactional web mapping systems reduces the need for face to face contact.
- **Improved transport efficiency** - by wide application of route optimisation and better streetworks management.
- **Better decision making** - using geospatially-enabled local information systems to gather intelligence about a place.
- **Reduced data duplication** - using master datasets such as the NLPG as a shared data source.
- **Empowering frontline workers** - by speeding up analysis and enhancing mobile working.
- **Helping identify social deprivation** - through data integration and analysis.
- **Broader citizen engagement** in local decision making and taking part in democracy at the local level through wider access and use of geospatial information.



Channel Shift: South Tyneside

Web mapping application:

- 38,300 unique visits to online mapping in 2009
- Email alerts service > 2000 subscribers
- Estimated saving of £146,700 in 2009 based on NWEGG* estimated costs for web v phone transactions
- Unquantified savings in areas such as planning where customers able to self-serve rather than use planning officer time
- Data sharing on website with information from all the council's major systems linked by the UPRN

* Telephone £4.00 per call, web £0.17 per transaction



Route Optimisation: Daventry Borough Council

Use of GI to optimise refuse (waste) collection routes leads to savings:

- Mileage reduction of 12-13 per cent delivering savings of £25,000 p.a.
- Reduction from 18 to 16 collection rounds and to 4 days working week with cashable annual savings of £153,000 per annum
- Employee overtime will be virtually eliminated, saving approximately £28,000 p.a.
- vehicle has been rationalised to a smaller new vehicle saving £25,000
- Spare capacity to allow for vehicle washing securing savings of £17,000 p.a.



Process Efficiency: Tendring District e2e planning

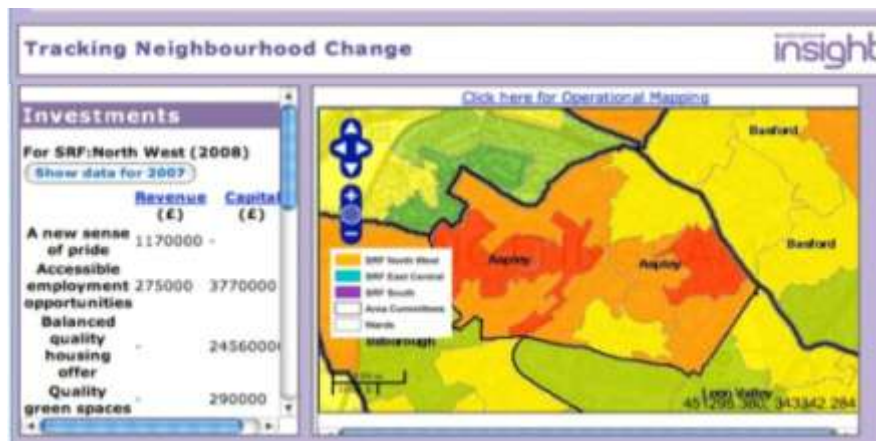
- Implementation of end to end planning systems (e2e)
 - Making the whole process of planning electronically enabled
 - Planning application received electronically
 - View applications electronically with the ability to self service - Public Access
 - Consultation of planning proposals with consultees online
 - Assessed cost and savings before and after the project was implemented
 - Savings of £ 49,500 annually mostly as a result of reduced personal visits to planning offices.
 - Savings to citizens and construction industry identified resulting from negating travel costs and reduced disputes respectively.
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Local Information Systems: Nottingham City Insight

Nottingham City Council, working with the local NHS, police, districts and the county council, created an online geo-enabled Local Information System:

- providing access to comprehensive, up-to-date information to neighbourhood level to staff both inside and outside the participating organisations and community groups
- Demonstrable savings from reductions in the time required to research and analyse evidence for decision making; saves up to £460,000 a year
- Leads to better quality decisions at a local level;
- Example: Customer profiling enabling additional benefit to be paid to most deprived families in Newark and Sherwood district.



Improved Data Sharing

- **Blackpool Council:** The LLPG has eliminated the need to maintain 7 of the council's key datasets; saving the council **£750k** since data was consolidated.
- **Plymouth City Council:** Consolidation of address datasets is saving an estimated **£150k** per annum by eliminating the duplication of work.
- **Huntingdonshire:** As a result of linking 19 business systems to the LLPG, the Council estimate that it saves **£247 k** per annum



The accumulated Net Present Value over the period 2010 to 2015 for completing sharing the LLPG across LA Property systems alone is £15 - £24 million



South Yorkshire Police

Police incident analysis:

- Basic exercise previously took a qualified analyst average 40 minutes to complete, can now complete in less than 2 mins saving £13.50 per case;
- Full demographic analysis: Previously took a qualified analysts 4 hours to complete, can now do this in less than 2 minutes saving £80.00 per case;

Demonstrated savings of in excess of £600,000 per annum could be made across the force area in time savings alone.

- Uncosted:- example using the mapping of CCTV cameras staff can target the cameras they know may have captured the offence. This reduces the time a potential witness (owner of CCTV) maybe inconvenienced as the enquiry is targeted.



Emergency Planning – Dudley MBC

- Local authorities have the responsibility under the Civil Contingencies Act 2004 for the coordination of emergency planning;
- Immediate availability of over 450 datasets in control room - crucially including locations of vulnerable people;
- Ability to respond to “ad hoc” queries in near real time;
- Improved communication with the public through map information;

The assessment of the emergency planning team was that contributes to a significant reduction in the likelihood of serious injury and loss of life.



Welsh Assembly Government

- Extension of project currently in progress to model value of geospatial to local public service provision in Wales;
- New case studies:
 - Education department: route optimisation
 - Welsh Data Unit
 - Data sharing
- Due for completion end March



Commercial Sector



Utilities

- Mobile mapping at Scottish Power
 - Field Quotations for new or modified connections averaged 1700 per month. Being able to estimate in the field rather than this being a largely office based activity saved:
 - £50,000 pa on reduced fuel plus reductions of 150 tonnes of CO2 emissions;
 - £30,000 pa in administration costs from reduced staff time, printing and postage
 - In addition, the project produced the following additional uncosted benefits:
 - Improved customer satisfaction from improved turnaround for quotations;
 - Increased job satisfaction for estimators;
 - Less disputes about the job specification.



Building Information Modelling

- BIM is a suite of technologies and processes that integrate to form the 'system' at the heart of which is a component-based 3D representation of each building element.
- Sample data concludes that reductions of 8-18% on design fees from concept to technical design from BIM
- Tenders -There are identifiable savings made on the co-ordination of trade contractors consistent with saving 8-10% of construction cost
- Construction: savings of 8% by delivery of unambiguous information to all subcontractors. 4D programme integration allows better face to face coordination, productivity and meeting health and safety requirements
- Other benefits include earlier certainty on costs and more predictable planning
- Geospatial is key to integration of information sources



Financial Services

CNP Fraud - Card Not Present.

This applies to all internet transactions and the elaborate security built into the card itself does not apply.

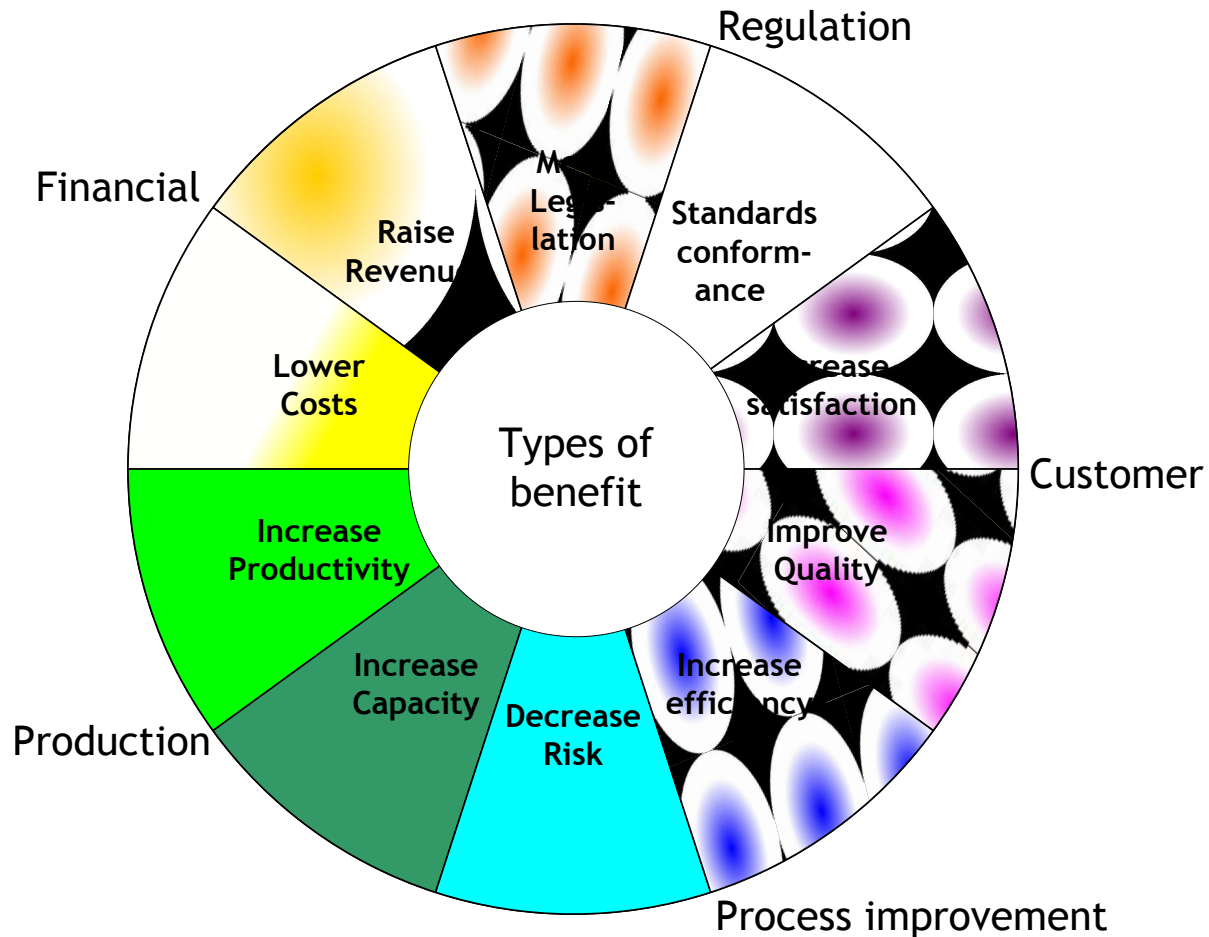
Location-based analysis includes:

1. Does “ship to” address match up with IP address?
2. Domain Type - does extension match location
3. User profile - tracking of previous IP addresses used by customer as well as physical address. Unusual patterns raise “red flag”.
4. Connection velocity - when information is travelling over the web - there is a known profile of transmission to receipt lag.
5. Travel velocity - can movement between location of transactions be realistically achieved?

Value to industry worldwide maybe £10 - 100 m per annum



Benefits categorisation



OS OpenData Project

- Aim is to establish the value to the economy of applications facilitated by the initiative;
 - Key sectors: transport, financial services, retail, agriculture and food, social networking, third sector;
 - Will test the “counter-factual”;
 - Look at International adoption curves for free data;

 - Feasibility stage over next two months;
 - May be too early to draw robust conclusions
 - Full study in FY 2011-12;
 - Your help appreciated in identifying candidate case studies
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Thank you



Backup Information



Benefits – quantifiable examples

- Conform with legislation
 - Infraction fines for non-compliance with INSPIRE
 - Regulator grants for pro-active action - utilities vegetation management
- Standards conformance
 - Reduced data duplication from sharing standard databases (e.g. NLPG, see GIV study)
- Increased customer satisfaction
 - Less complaints (CRM measures costs to resolve)
 - Reduced citizen time interacting with officials *

* *Work time £17.50 and leisure £5.68 per hour (DfT / Treasury Green book)*



Benefits – quantifiable examples

- Improved quality
 - Increase in crime conviction rates by police officers having information available on mobile devices
- Increased efficiency
 - Reduction in number of processes from shared services (e.g. Total Place trials)
 - Optimised routes reducing numbers of bin collection runs (see Daventry example in GIV study)
- Risk reduction
 - Re-insurance of assets to reduce hazard clustering
 - Less Local Land Charges compensation claims



Benefits – quantifiable examples

- Increased capacity
 - Cloud computing releasing processing capacity
- Increased productivity
 - Channel shift reducing distraction of planning officers dealing with personal callers (see Tendring DC in GIV)
- Lower costs
 - Reduced office space requirements for equipment or staff
- Raising revenue
 - Faster insurance quotes using better address gazetteer leading to more business (e.g. RSA)



Economic Modelling: Results

- Output of local government increased by over **£230 million** in 2009 as a result of the productivity benefits associated with the use of geospatial applications
- Average annualised cost to benefit cost ratio of using geospatial information in local government is around 1:2.5 over 5 years.
- Gross Domestic Products (GDP) for England and Wales was over **£320 million** higher in 2009 than it would otherwise have been without the adoption of geospatial information

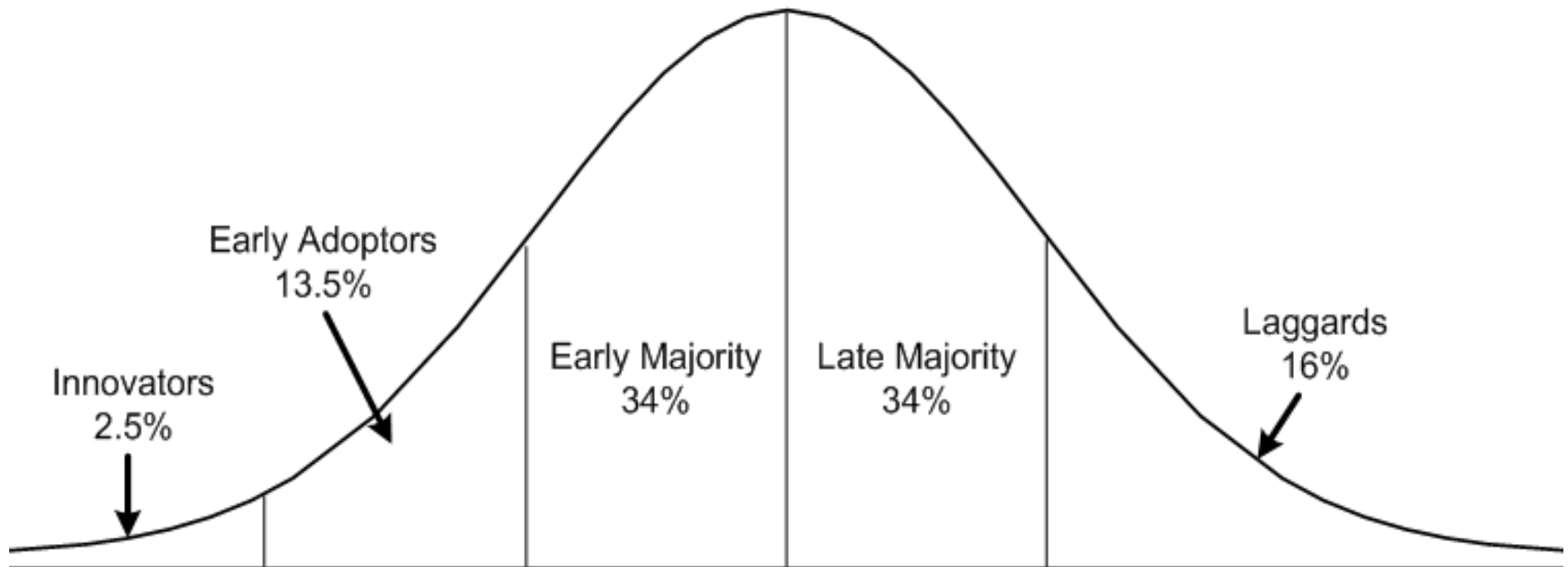


Economic Modelling results (2)

- Projecting forward to 2015, GDP for England and Wales could be over **£560 million** higher than it would otherwise have been without the adoption of geospatial information applications.
- Better policies and action to deliver the ideal scenario, could improve GDP to an estimated **£600m** by 2014-5
- government revenue from taxation was over **£44 million** higher than it would otherwise have been. Revenues are projected to increase to **£89 million** by 2015
- Accumulated Net Present Value representing the added value of sharing the National Land and Property Gazetteer, a key local government dataset, is between **£15 and £24 million** over 5 years.

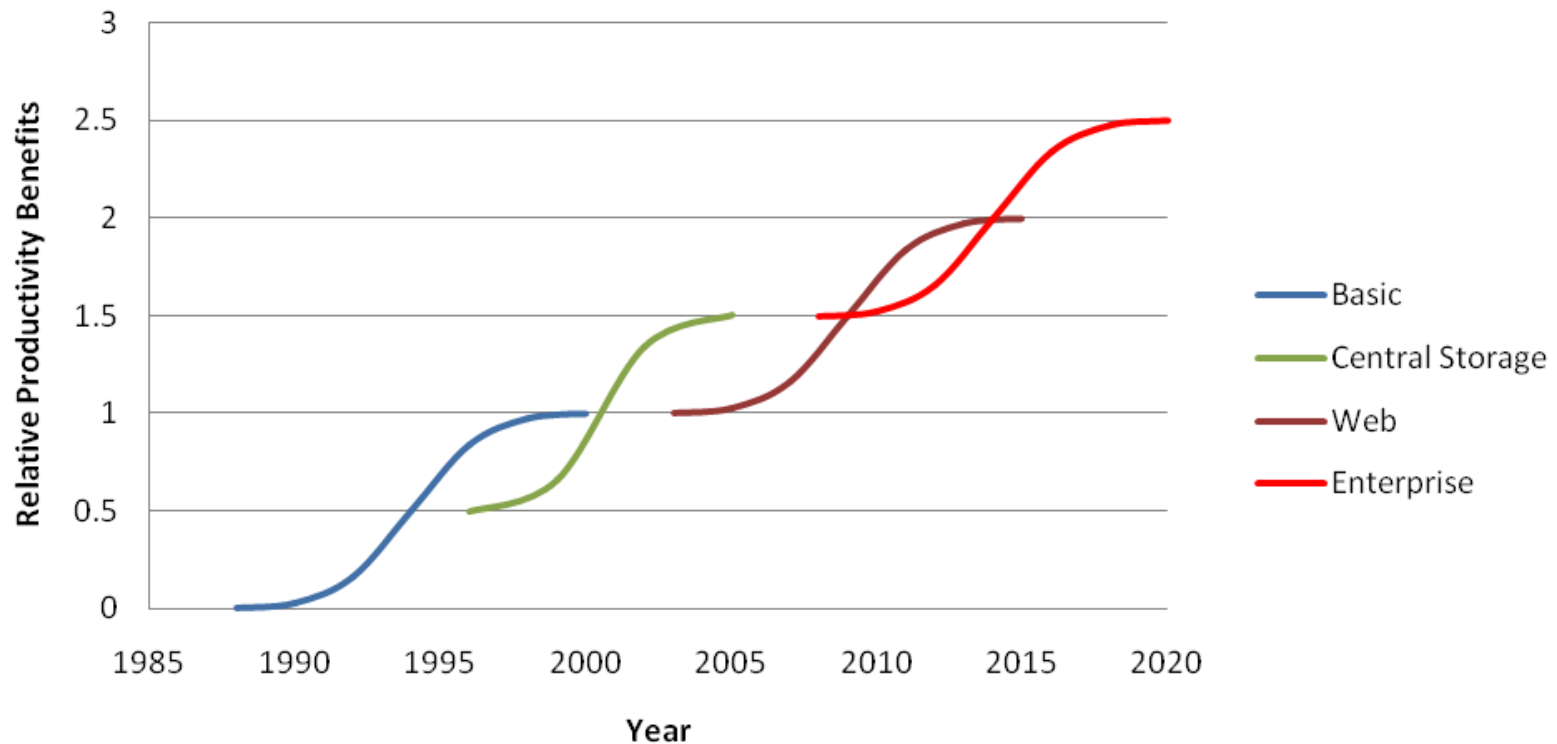


Technology diffusion – Rogers



Adoption curves over time – accumulating productivity

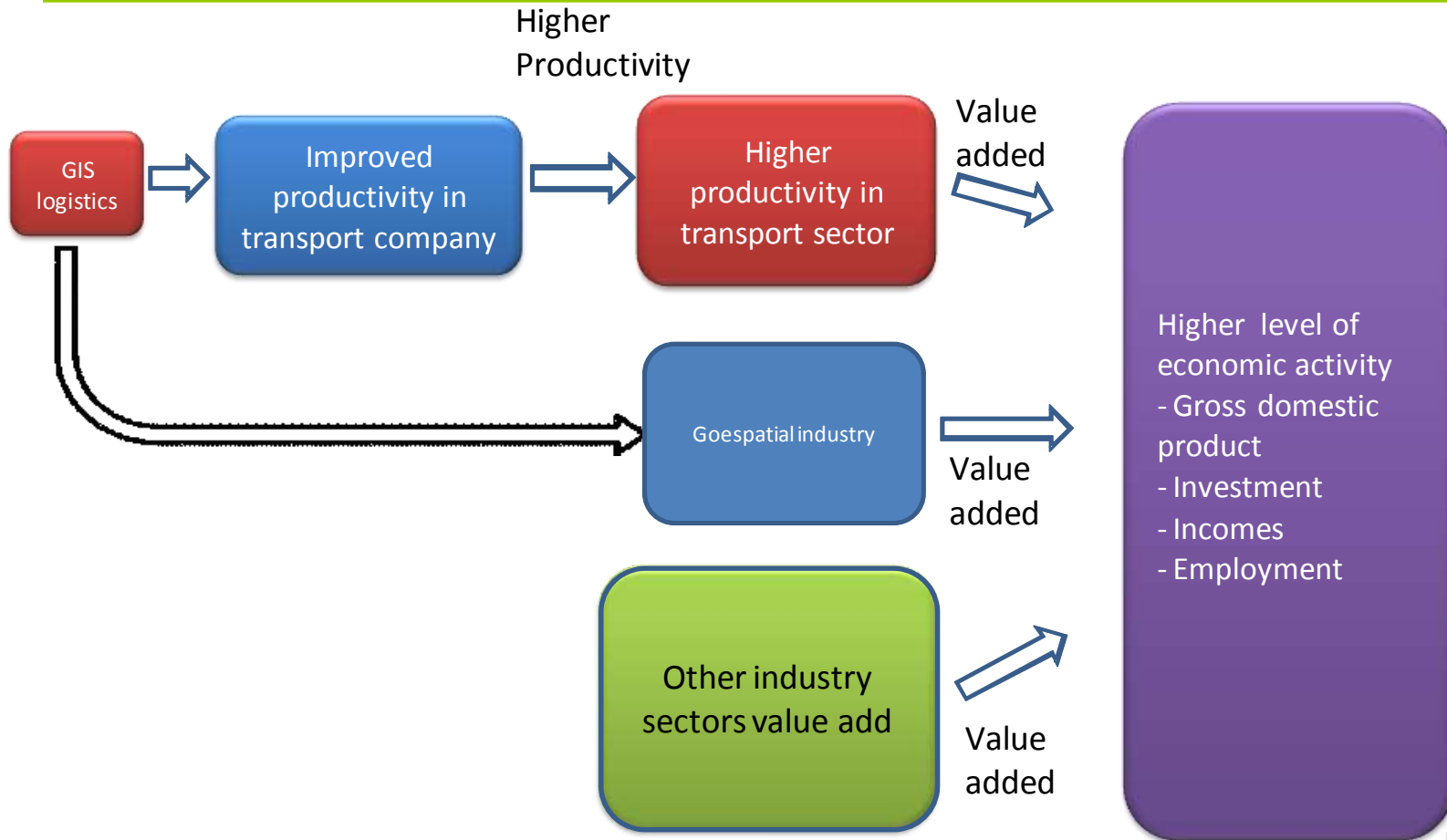
Geospatial Adoption Waves



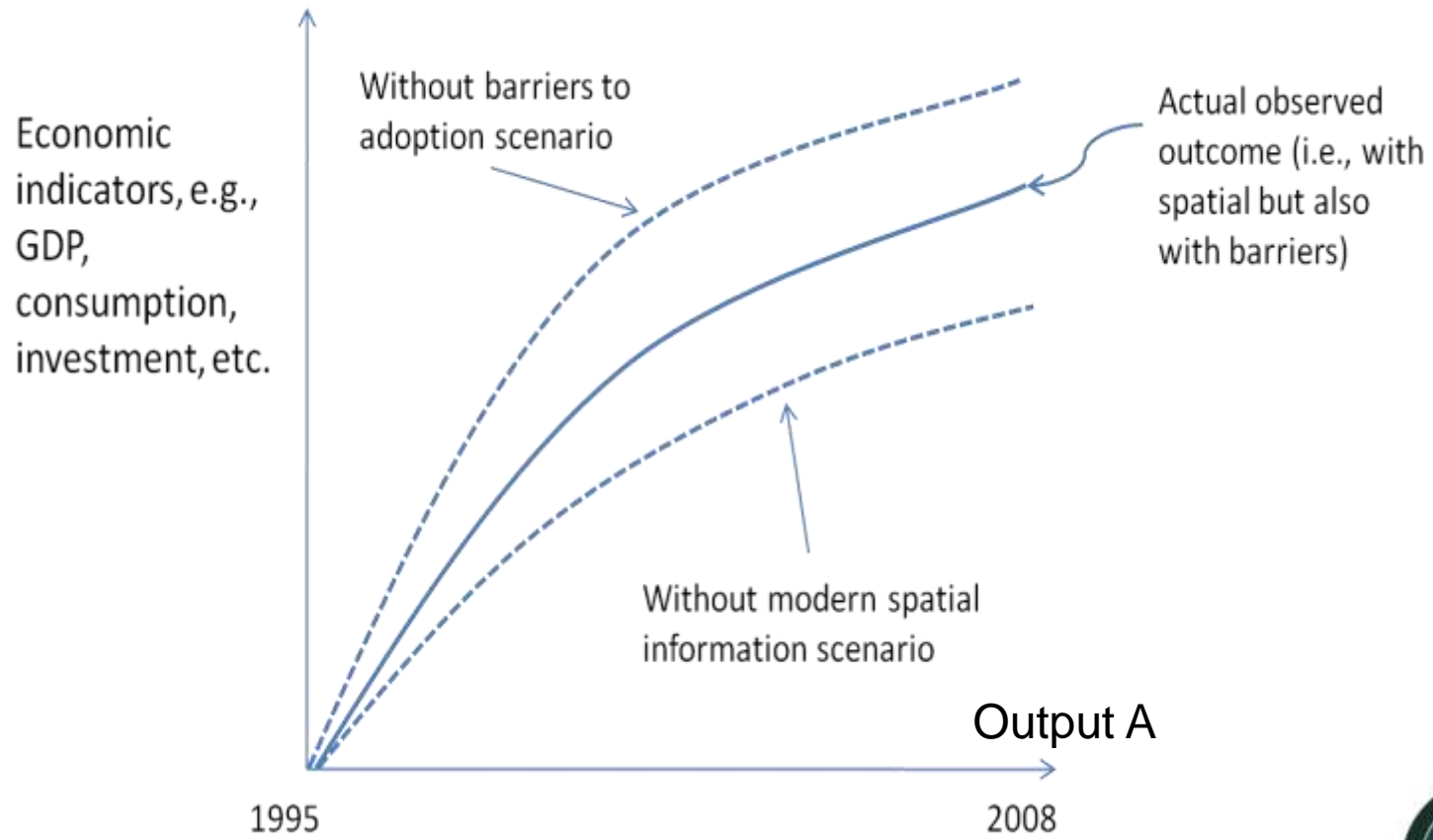
Geospatial adoption curves in UK
local government



Impact on economy



General equilibrium modelling



The value of earth observation from space

- Direct and indirect economic value
 - Direct and indirect economic value of contemplated large scale applications
 - Direct and indirect economic impact of an unplanned denial of service
 - Read NASA's "a day without space"
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