

Valuing Geospatial Information : a review

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Topics

- Revenue/Value added approach
- Economic welfare analysis
- General equilibrium analysis
- Components of value

Why is it so hard to estimate

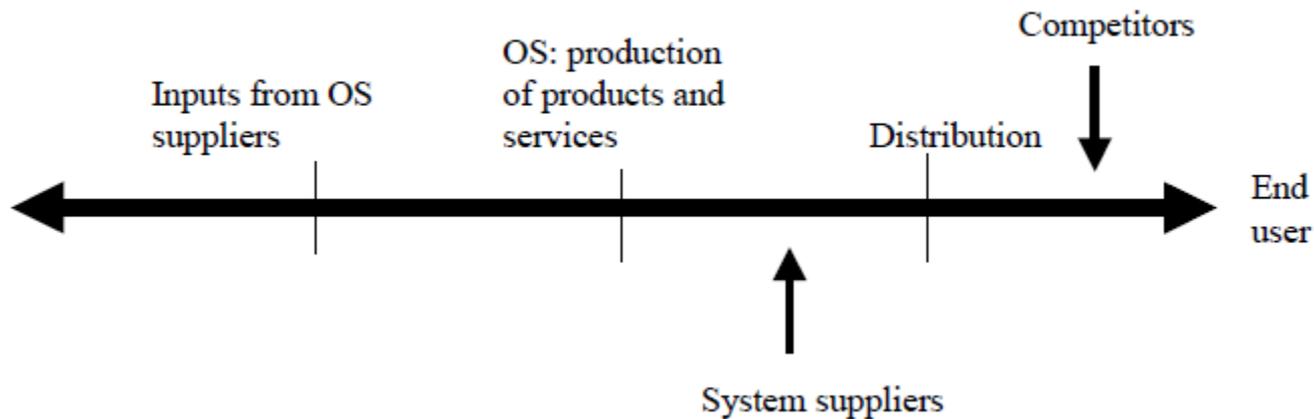
- An enabling technology
- Public good dimension
- Impacts occur across a large number of sectors
- Dynamic nature of change



The value added approach

- Economic contribution of Ordnance Survey in Great Britain – Oxera 1999
- Value added is the value of output less the cost of inputs

Figure 5.1: The production chain



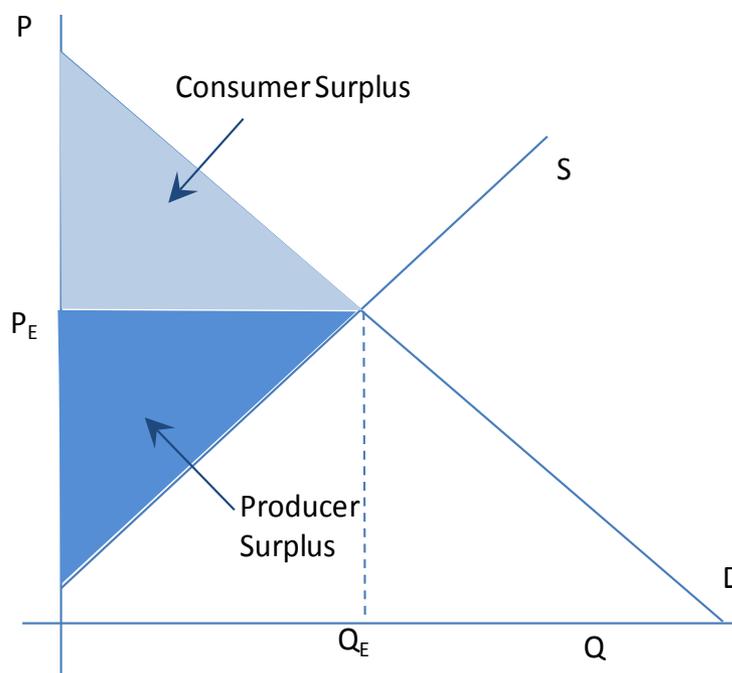
Point on production chain	GVA
OS suppliers' sales ¹	£80m
OS's own value-added ¹	
OS distributors' margin ²	£6m
OS customers ³	£79–£136 billion
Total GVA	£79–£136 billion

Revenue/value added approach

- Provides information about the size of the footprint
- Difficulties in assessing the wider impacts
- Does not take account of resource shifts nor productivity impacts
- Not as useful for assessment of net benefits geospatial information delivers to the economy

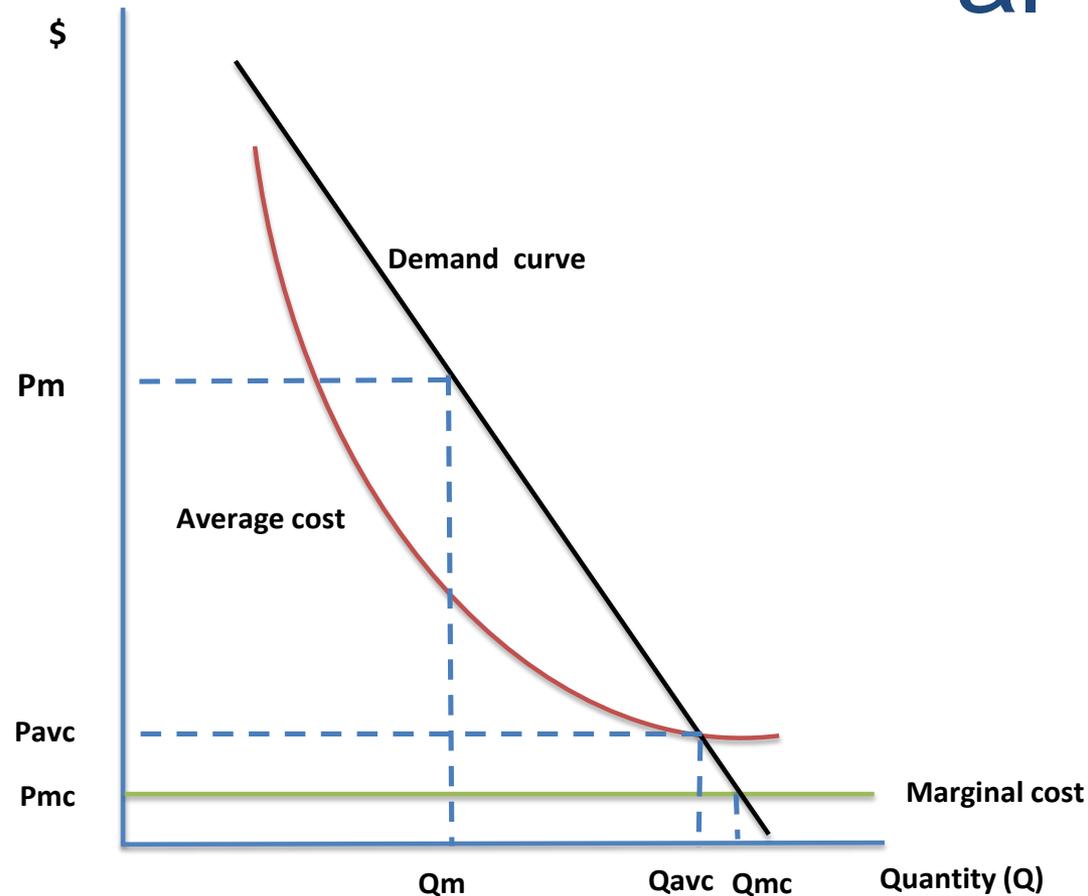
Economic welfare analysis

- Consumer and producer surplus
- Need to know what consumers are prepared to pay
 - Willingness to pay surveys
- And at what price producers are prepared to produce
 - Usually commercially sensitive



Cambridge study – Pollock et al

- Studied large scale topographic mapping and transport network products – sales worth £70 million
- Concluded that a move from average to marginal cost pricing would increase economic welfare by £156 million



ANZLIC Study

- PWC study for ANZLIC in 2010 used a similar methodology to address pricing policies
- Change in economic welfare (consumer surplus in this case) by moving from cost recovery to marginal cost pricing is shown in table below
- Report notes that this would come at a loss in revenue to the agencies concerned which has consequences for custodianship of data.

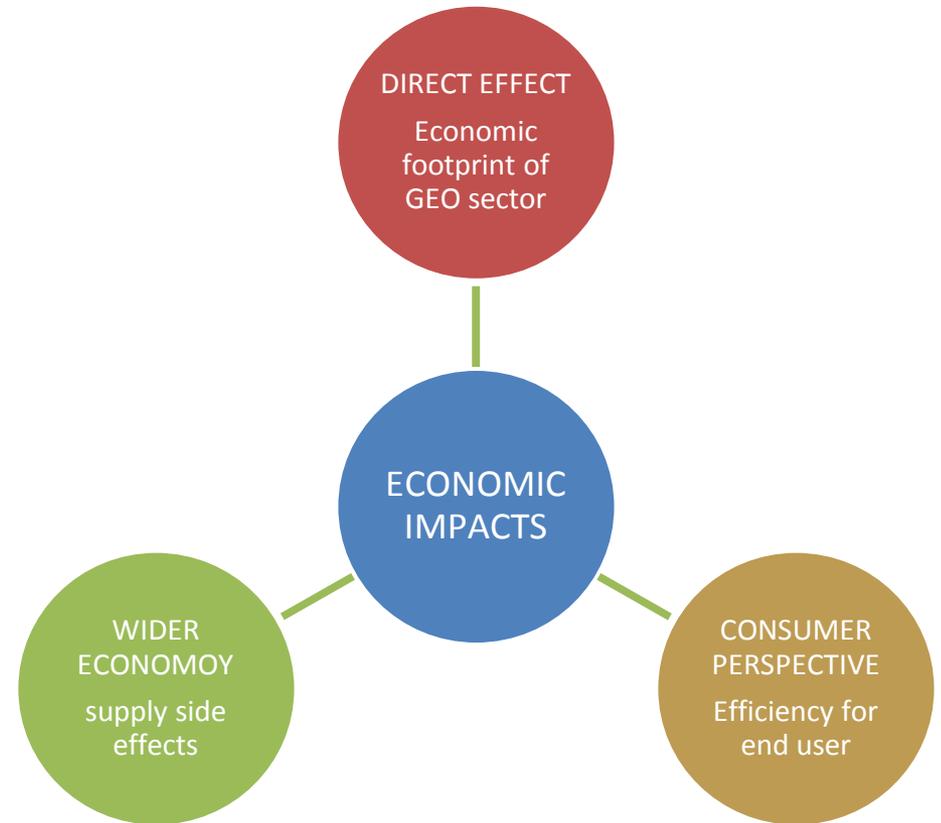
	Victorian topographic	Landgate topographic	Landgate arial photography	Geoscience Australia topographic
	\$ million	\$ million	\$ million	\$ million
Change in economic welfare	3.3	1.4	1.0	4.7

Welfare analysis

- Demand curve may not be linear and elasticities of demand are not likely to be constant
- A partial analysis that does not take into account resource transfers in the economy
 - Eg - Planning and construction gains but lawyers lose when development approvals are streamlined
- Multiplier analysis can be fraught with difficulties
 - “If I added up all the multiplier studies that come across my desk we would have an economy four times the size of the one we actually have”

Combining approaches – Oxera 2013

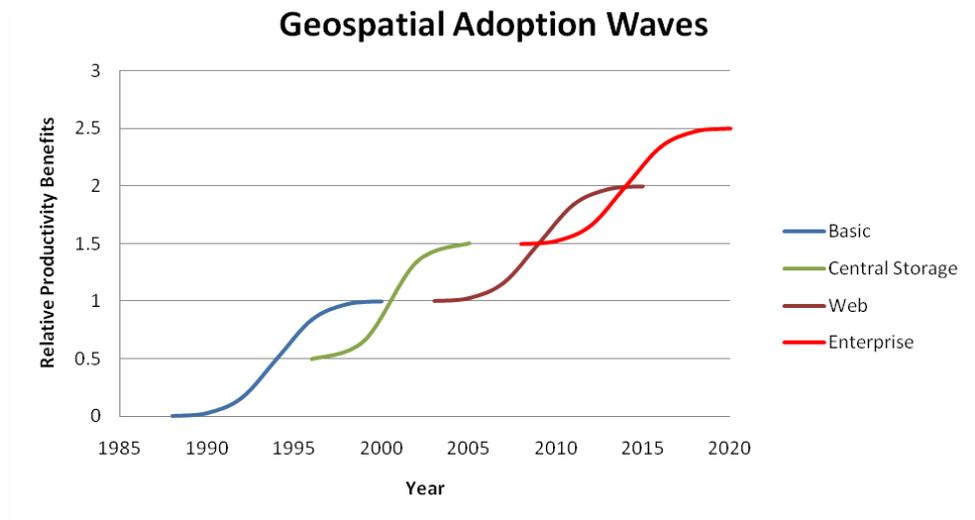
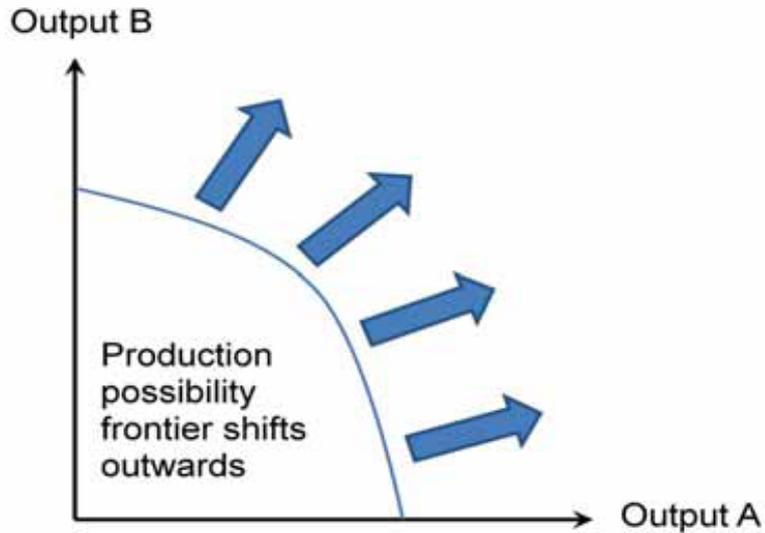
- Direct effects
 - Gross value added \$113 billion
 - Net \$40 billion
- Wider economy
 - \$10 billion cost savings
- Consumer savings
 - Fuel savings \$22 billion
 - Education \$22 billion



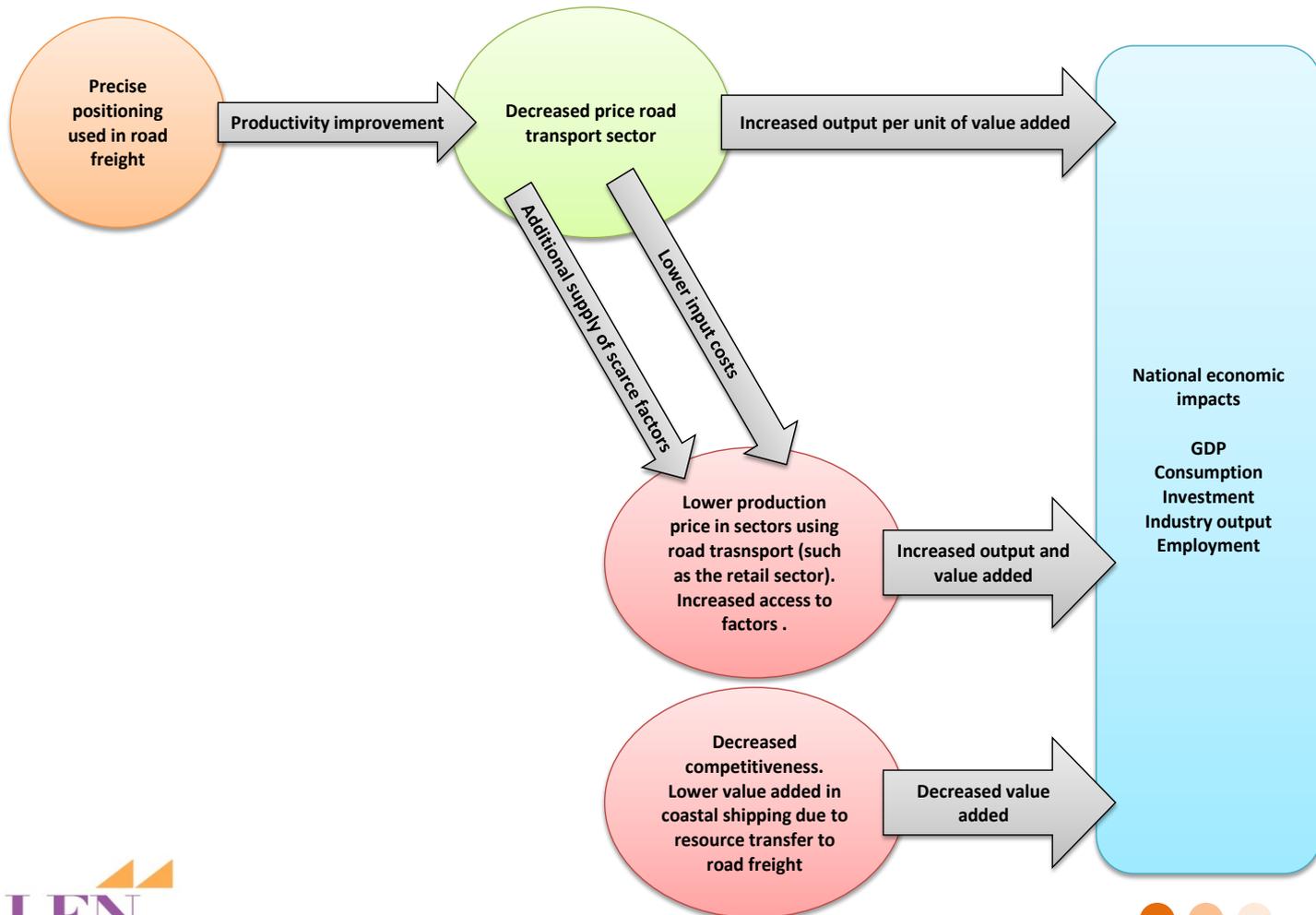
Productivity estimates and CGE modelling

- Economy wide approach
 - Estimate direct impacts and use general equilibrium model to translate into economy wide impacts
 - Takes into account resource transfers within the economy as a result of change
- Direct impacts
 - changes in productivity of labour or capital or multifactor
 - changes in resource availability
 - changes in income or trade

Productivity and adoption – sector wide impacts



Translates into national economy



Published studies

Year	Organisation	Issue	Results (GDP)
2008	ACIL Tasman	Value of spatial information in Australia	\$6 billion-\$12 billion in 2006-07 7% higher if barriers removed
2009	ACIL Tasman/SKM/Ecological Consultants	Value of Spatial information in New Zealand	\$NZ1.2 billion \$NZ 1.6 million with barriers removed
2010	Consultingwhere /ACIL Tasman	Value of geospatial information for local government in England and Wales	£320 million higher in 2007-08 as a result of geospatial information
2008	Allen Consulting	Value of enhanced positioning	Total value in mining, agriculture and construction \$ 0.8billion-\$1.9 billion
2011	ACIL Tasman/ Lester Fanks/Consultingwhere	Value of improved SDI in Tasmania	\$1.5 million to the state in 2010
2013	ACIL Tasman	Value of augmented positioning	Underway

Local Government (UK) Results

- Output of local government has increased by **\$400million** in 2009 as a result of the accumulated productivity benefits of using geospatial application
- Gross Domestic Products (GDP) for England and Wales was over **\$480 million** higher in 2009
- Projecting forward to 2015, GDP for England and Wales will be an estimated **\$840 million** higher with right policy framework
- Average annualised cost to benefit ratio of using geospatial information and services in local government is on average **1:2.5 over 5 years.**



CGE

- Takes account of resource shifts in the economy including trade effects
- Counterfactual requires careful thought
- Depends on good evidence for productivity impacts and assessment of levels of adoption
- Reflects the current structure of the economy
- Does not capture intangibles

Components of value

TOTAL ECONOMIC VALUE

USE VALUES

NON-USE VALUES

DIRECT USE VALUE

ECOLOGICAL FUNCTION VALUE

OPTION VALUE

EXISTENCE VALUE

BEQUEST VALUE

Outputs

Benefits

Benefits

Benefits

Benefits

- petroleum and minerals
- transport
- communications
- property and construction
- agriculture
- Fishing
- forestry
- tourism
- public administration

- flood control
- climate
- sustainable water resources
- sustainable natural resource management
- Biosecurity
- biodiversity

- protection from fires, floods and natural disasters
- improved management of climate change
- Insurance
- defence

- satisfaction that resource is there
- preservation of environment and conservation values
- national security
- Long baseline for historical analysis

- altruistic
- preserving national assets for the next generation

Thank you