

AGI Response to the BEIS consultation
Building our Industrial Strategy
Green Paper January 2017

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Responses to Questionnaire:

1. Does this document identify the right areas of focus: extending strengths; closing the gaps; and making the UK one of the most competitive places to start or grow a business?

No: this document has not identified the critical contribution of geographic information, when combined with other data, to further understand and communicate environmental, economic, political, social or other issues and trends. Nor does it acknowledge the crucial role of geographic information in developing policies and services to deliver the change and progress we need.

Knowing where people and things are, in context with other things, is the key to understanding how our country works and how we can improve it. It's the essence of geography. Geographic information, in its purest form, (whether this be above, below or on the ground or in the marine environment and at any time) is the data used to reference the precise location of objects and event; it reveals connections and concentrations, and is the ultimate definition of context.

In the physical world, geospatial information is pivotal to relationships, politics, migration, national security, policy-making, planning, census and trends, analysis, data ownership, data security, asset management, carbon emissions' reduction, socio-economic functions, the management of land, taxation, economics and trade, hyper-interactivity and augmented reality, efficiency of traffic flows, use of energy and so on.

In the theoretical world (where digital data is collected, stored, used to run analysis and produce useful outputs), geography is pivotal: a Geographic Information System is essential for creating trusted references and relationships between the sets of raw data that produce useful information.

With the addition of geographic insights at source, just think how data – such as that held by HMRC and Companies House – could be better used to identify and support scale-up businesses; to analyse their performance; to provide context and comparison that everyone can understand. By making geographic information and expertise more readily available, local public and private sector organisations could better identify, target and evaluate support to scale-up businesses more effectively and more consistently – and drastically reduce the cost for government in the process.

Put more simply, we cannot achieve our ambitions as a nation if we do not realise the potential of geographic information – and Geographic Information Systems – where any kind of analysis, referencing or spatial location is involved. As the Prime Minister commits us all to a Britain *'where wealth and opportunity are spread across every community in our United Kingdom, not just the most prosperous places in London and the South East'* and *'more people in all corners of the country share in the benefits of its success...'*, location-based data analysis is of critical importance to identify local needs, implement tailored action, and measure and report our success.

In Britain, we do not have an established and recognised Spatial Data Infrastructure – yet there is no part of our nation's physical infrastructure or future industrial strategy that would not benefit from establishing one. We must make greater use of geographic information, promote better adoption of Geographic Information Systems, and develop a workforce better educated in their use.

Currently, the Green Paper makes no reference to the importance and use of Geographic Information in facilitating the growth and development of Great Britain.

2. Are the ten pillars suggested the right ones to tackle low productivity and unbalanced growth? If not, which areas are missing?

The ten pillars proposed are all essential in tackling low productivity and unbalanced growth. However, their effectiveness would be enhanced by an eleventh pillar:

- **Investment in knowledge generation:** the automatic creation, sharing, curation, delivery and use of knowledge (not just data or information), thus supporting an emerging digital economy and the rise of spatially-aware and equipped politicians, businesses, innovators and citizens.

For many, 'geography' invokes little more than the science of mountains, fields, towns and maps with lines and contours. In its purest form, however, geospatial is a discipline that establishes context: it helps us understand where things are, what their physical form comprises, and how they are connected to each other – their spatial relativity – be they physical or digital.

Implementation of the EU INSPIRE directive <http://inspire.ec.europa.eu/> has already improved access to, sharing of and implementation of geographic information across government and other public bodies at local regional, national and international levels. However, the understanding, implementation, standards, and technology on which INSPIRE was based are all now dated. Progress demands reaction.

There is growing recognition (particularly well articulated by Australia and New Zealand in their white paper 'Towards a Spatial Knowledge Infrastructure' <http://www.crcsi.com.au/spatial-knowledge-infrastructure-white-paper/>) that as a nation we would benefit by moving from the fabric of a Spatial Data Infrastructure mandated by INSPIRE to a Spatial Knowledge Infrastructure.

As the clear voice of the geospatial industry in Britain, the AGI is well aware that the transition will require innovation and new practices in government, the private and public sector. However many of the key protagonists in the geospatial industry are working towards this ambition already and we are supporting them by promoting the value of using location in every aspect of work and all walks of life.

The innovation must harness the potential of emerging technologies. It must have far-reaching scope to meet the future demands of users. There will be converging themes, moving the focus of government away from the supply of data towards a diverse and more collaborative information-management environment, which works in partnership with many data providers: using more and more automated data sharing capabilities, developing rich open-analytics capabilities, and progressively moving to the provision of a knowledge-focussed environment for customised and real-time decision-making.

In combination with new semantic web technologies, a Spatial Knowledge Infrastructure would assist in connecting, integrating and analysing data. As a consequence, new knowledge-based activities would emerge such as smarter transportation networks; responsive and resilient cities; and intelligent infrastructure planning. The common thread for these knowledge-based solutions is the delivery of data and information in real-time using Machine to Machine (also known as M2M) communications and on-the-fly predictive analytics – all of which depend on spatial location.

Support for the development and greater integration of this knowledge would deliver enormous benefit to Britain. Much could be achieved by, first, recognising the importance of the geospatial industry's potential to contribute, and second, by ear-marking investment from the Industrial Strategy Challenge Fund.

3. Are the right central government and local institutions in place to deliver an effective industrial strategy? If not, how should they be reformed? Are the types of measures to strengthen local institutions set out here and below the right ones?

We have no response to this question at this time.

4. Are there important lessons we can learn from the industrial policies of other countries which are not reflected in these ten pillars?

Yes. Many other countries are taking a stronger, more overt approach to the development and implementation of a Spatial Data Infrastructure and a more-integrated approach to the use of geographic information in their policy-making, infrastructure development and service delivery.

For example:

- The Dutch implementation of 'Key Registers' such as address, unique property reference etc. has brought many benefits including improved effectiveness and increased efficiency.
http://www.eurogeographics.org/sites/default/files/Daniel_SDMQ2015-27.pdf
- Georgia's implementation of 'block chain' technology in their land register has also improved
<https://www.forbes.com/sites/laurashin/2017/02/07/the-first-government-to-secure-land-titles-on-the-bitcoin-blockchain-expands-project/#6a581f254dcd>

World-renowned experts in the discipline have said: "As funding sources diminish, it's critical to make correct decisions the first time. Geographic Information Systems give economic developers a framework for decision making, which helps to minimize risk and maximize value."

Source: <http://www.esri.com/industries/economic-dev>

5. What should be the priority areas for science, research and innovation investment?

We have no response to this question at this time.

6. Which challenge areas should the Industrial Challenge Strategy Fund focus on to drive maximum economic impact?

The Industrial Strategy Challenge Fund should show greater support for and make significant investment in the data revolution. This is a broad statement, but examples of use cases in which the stated ambition would benefit from greater understanding of and inclusion of geospatial expertise include:

- the digital economy; the 'Smart' landscape and Internet of Things; 5G – sensor technology; Digital Built Britain; artificial intelligence; robotics ... and the many other technologies that could significantly improve efficiency and productivity;
- the supporting education platforms and initiatives that can nurture a new set of skills and a collaborative, cross-discipline approach to unlock the potential of a better built Britain; and,
- a UK Spatial Knowledge Infrastructure
<http://www.crcsi.com.au/spatial-knowledge-infrastructure-white-paper/>

7. What else can the UK do to create an environment supporting the commercialisation of ideas?

We have no response to this question at this time.

8. How can we best support the next generation of research leaders and entrepreneurs?

The AGI is the voice of an entire industry, so we do feel able and equipped to comment on the potential for our discipline to have a significant positive impact in the support of the next generation of research leaders and entrepreneurs.

Every day we create 2.5 quintillion bytes of data – an amount that is hard to quantify by comparison or description. However, 90% of all data available to us today was created in the last two years. Is that a data revolution or a data deluge? There is an urgent need to widen the capacity and increase the capability for new skills to analyse that data – efficiently, consistently, and effectively.

<http://www.agi.org.uk/about/resources/category/100-foresight?download=160:agi-foresight-2020>

As a society then, we would all benefit from encouraging individuals and commerce to focus on the value that Big Data and the Internet of Things can bring to the design of common frameworks, rather than the technology itself. We would benefit from having a national Centre of Excellence for the Internet of Things, which could bring a diverse set of skills together for the right ecosystem. And we would benefit by nominating experts and leaders to develop industry standards and identify best practice for the many disparate Big Data and Internet of Things pilots and demonstrators that are starting to surface ... and to ensure that quality and trust are integral to each initiative, before mainstream scale up is attempted.

9. How can we best support research and innovation strengths in local areas?

We have no response to this question at this time.

10. What more can we do to improve basic skills? How can we make a success of the new transition year? Should we change the way that those resitting basic qualifications study, to focus more on basic skills excellence?

There is a real danger that enthusiasm for one subject, or group of subjects, will deliver an ecosystem that suffers from being 'too specialised'. Education should foster inter-disciplinary approaches that encourage collaborative working across disciplines and domains.

We see the need for Industry, Universities, Schools and Colleges to work together in a seamless and coordinated assault on the growing digital skills gap. Our experience in the geospatial industry shows us that the challenge is not unique to our own discipline: the education system will be in danger of acting as a decelerator to progress, if a cross-discipline approach does not underpin future generations' skillsets. The transition to a digital, knowledge based economy will stall unless this is seen as a priority with STEM subjects forming the core of all curricula content. This will require a generous and spirited effort towards collaboration across institutions and across industry sectors in possibly an unprecedented way.

There is also an immediate need to improve workplace Geographic Information skills accreditation so that it covers standards, data management, data sources and the creation of business cases that can support investment decisions and risk assessment work.

11. Do you agree with the different elements of the vision for the new technical education system set out here? Are there further lessons from other countries' systems?

We have no response to this question at this time.

12. How can we make the application process for further education colleges and apprenticeships clearer and simpler, drawing lessons from the higher education sector?

We have no response to this question at this time.

13. What skills shortages do we have or expect to have, in particular sectors or local areas, and how can we link the skills needs of industry to skills provision by educational institutions in local areas?

We have no response to this question at this time.

14. How can we enable and encourage people to retrain and up skill throughout their working lives, particularly in places where industries are changing or declining? Are there particular sectors where this could be appropriate?

Over the long term our nation's infrastructure, economy and society in general would benefit if government and industry recognised the importance of and invested in individuals who are following a process of Continuous Professional Development.

Geographers are relatively well supported in this vein, in the Royal Geographical Society's Chartered Geographer scheme and the AGI's Continuous Professional Development record. Other disciplines would benefit from a longer term commitment to self-improvement and education, and a cross-discipline or collaborative approach to sharing best practice.

15. Are there further actions we could take to support private investment in infrastructure?

We have no response to this question at this time.

16. How can local infrastructure needs be incorporated within national UK infrastructure policy most effectively?

We have no response to this question at this time.

17. What further actions can we take to improve the performance of infrastructure towards international benchmarks? How can government work with industry to ensure we have the skills and supply chain needed to deliver strategic infrastructure in the UK?

On page 56, the Green Paper recognises the importance of data infrastructure thus:

- *'As well as physical and digital infrastructure, we need to make sure that we also have in place an effective data infrastructure. This means the right elements for an economy in which open data drives growth, efficiency and innovation. This includes secure services that allow individuals and organisations to prove who they are online – for example, the GOV.UK VERIFY service, which gives people safer, simpler and faster access to government services like filing their tax or checking the information on their driving licence'.*

While we understand and support the benefits represented by open data, it is imperative to recognise that all data, not just open data, *'drives growth, efficiency and innovation'*.

In addition, it is widely acknowledged that we are on the threshold of being technically able to move from the fabric of the Spatial Data Infrastructure mandated by INSPIRE to a Spatial Knowledge Infrastructure.

In the future, data will move away from being delivered as products to being published in a much more 'raw' format, dynamically linked to metadata, rules and associated processes. Data will be created, curated and evolve as the result of a range of dynamic processes. The role that geographic information plays in ensuring consistency and improving confidence in those processes should not be underestimated.

It is true, the main focus of the 'Upgrading Infrastructure' pillar does take the National Infrastructure Commission's aims and objectives into consideration. However, without more recognition of and greater support for geography as a contributing discipline, strategic infrastructure will not be as effective as it might have been; efficiencies in data exchange will be overlooked; costs will be higher; and the disparate elements of our national infrastructure will not be as cohesive as they otherwise have the potential to be.

The Association for Geographic Information is a forward-thinking organisation with a reputation for connecting innovators in our field with individuals in other disciplines: technology, physical infrastructure, Big Data, analytics, business development, policy making all of these elements benefit from wider adoption and better use of geographic information. We are ideally positioned to help government to better capitalise on investments made to date, and to advise on ways in which geography as a discipline can make a significant contribution to improving the nation's infrastructure.

<http://www.agi.org.uk/>

18. What are the most important causes of lower rates of fixed capital investment in the UK compared to other countries, and how can they be addressed?

We have no response to this question at this time.

19. What are the most important factors that constrain quoted companies and fund managers from making longer term investment decisions, and how can we best address these factors?

We have no response to this question at this time.

20. Given public sector investment already accounts for a large share of equity deals in some regions, how can we best catalyse uptake of equity capital outside the South East?

We have no response to this question at this time.

21. How can we drive the adoption of new funding opportunities like crowdfunding across the country?

We have no response to this question at this time.

22. What are the barriers faced by those businesses that have the potential to scale-up and achieve greater growth, and how can we address these barriers? Where are the outstanding examples of business networks for fast growing firms which we could learn from or spread?

We have no response to this question at this time.

23. Are there further steps that the Government can take to support innovation through public procurement?

We have no response to this question at this time.

24. What further steps can be taken to use public procurement to drive the industrial strategy in areas where government is the main client, such as healthcare and defence? Do we have the right institutions and policies in place in these sectors to exploit government's purchasing power to drive economic growth?

We have no response to this question at this time.

25. What can the Government do to improve our support for firms wanting to start exporting? What can the Government do to improve support for firms in increasing their exports?

We have no response to this question at this time.

26. What can we learn from other countries to improve our support for inward investment and how we measure its success? Should we put more emphasis on measuring the impact of Foreign Direct Investment (FDI) on growth?

We have no response to this question at this time.

27. What are the most important steps the Government should take to limit energy costs over the long-term?

We have no response to this question at this time.

28. How can we move towards a position in which energy is supplied by competitive markets without the requirement for on-going subsidy?

We have no response to this question at this time.

29. How can the Government, business and researchers work together to develop the competitive opportunities from innovation in energy and our existing industrial strengths?

We have no response to this question at this time.

30. How can the Government support businesses in realising cost savings through greater resource and energy efficiency?

We have no response to this question at this time.

31. How can the Government and industry help sectors come together to identify the opportunities for a 'sector deal' to address – especially where industries are fragmented or not well defined?

We have no response to this question at this time.

32. How can the Government ensure that 'sector deals' promote competition and incorporate the interests of new entrants?

We have no response to this question at this time.

33. How can the Government and industry collaborate to enable growth in new sectors of the future that emerge around new technologies and new business models?

We have no response to this question at this time.

34. Do you agree the principles set out above are the right ones? If not what is missing?

We have no response to this question at this time.

35. What are the most important new approaches to raising skill levels in areas where they are lower? Where could investments in connectivity or innovation do most to help encourage growth across the country?

We have no response to this question at this time.

36. Recognising the need for local initiative and leadership, how should we best work with local areas to create and strengthen key local institutions?

We have no response to this question at this time.

37. What are the most important institutions which we need to upgrade or support to back growth in particular areas?

We have no response to this question at this time.

38. Are there institutions missing in certain areas which we could help create or strengthen to support local growth?

We have no response to this question at this time.

Responses to Administration Questions:

Are you happy to be contacted if we have any questions about your response?

Yes.

Are you happy for your response to be published?

Yes.

Postcode

SW7 2AR

Are you answering on behalf of:

The Association for Geographic Information

About us:

The Association for Geographic Information (AGI) is the clear voice of the geospatial industry in Britain: promoting the value of using location in every aspect of work and all walks of life, capitalising on the potential benefits of GI for citizens, good governance, and commerce.

- Knowing where people and things are, in context, is the key to understanding how the world works – and how we can all work together to improve it.

Geospatial resources offer immense value to businesses, individuals and academics, as well as public and private sector organisations and government at local and national levels.

We are a forward-thinking organisation with a reputation for connecting innovators in our field with individuals in other disciplines: technology, Big Data, analytics, business development, policy-making, software – all of these things benefit from wider adoption and better use of geospatial information.

Our members get to access advice on data and standards; to share their ideas, find resources, and network with like-minded and inspiring individuals.

We help businesses and individuals tap into other fields of expertise to glean valuable geospatial insights. What's more, we are a vendor-neutral but progress-positive community: we represent everyone who is working with or would like to work with the UK geospatial industry equally, no matter what their organisation's size or ambition.

The AGI helps bring location to life.

- **We influence:** our work promotes the value and benefits of using location in work, business, and every walk of life.
- **We inform:** we help to bridge the gap between our own discipline and others through networking, events and collaboration; CPD; accreditations for courses; and holistic advocacy of GI in as many mediums and fields as possible.
- **We act:** we represent everyone who is working with or would like to work with geospatial data; we are the clear voice of the geospatial industry in Britain; and the AGI is also encouraging a new breed of geographers – connecting emerging talent with established enthusiasm.