

LSE Growth Commission

Infrastructure and Energy

1. What aspects of infrastructure and energy are particularly important for productivity and growth?

Connectivity and power are essential elements in any economy – they are necessary if not sufficient to create a developed economy. As the economy has changed and global balances have changed, it is necessary also to realign the infrastructure. This is independent of issues of climate change, though these obviously play a role.

Over the last thirty years, for example, London has succeeded in replacing around 1 million manufacturing jobs with over 1 million service sector jobs. The geography of these is quite different, with the manufacturing centres being around the north and south circular roads and along the radial routes. Many of these industries arose in the 1930s with the introduction of such products as vacuum cleaners, TVs and radios. Workers in these factories generally travelled short distances and used buses.

The new geography is much more centrally focused, and has been made possible by the existence of a transport system which could deliver this change of employment patterns. A legacy system going back to Victorian times of both overground and underground railways had sufficient spare capacity (just). We are only now having to reinvest in major new capacity to support continued expansion of the city centre employment locations.

It is the infrastructure and energy which make possible the continued expansion of trade which are of the most significance as they create the potential for added value, economies of scale and the exploitation of comparative advantage.

For example, without Crossrail, 35,000 people will be crowded out of access to central London jobs by 2035 – by 2060 it is more likely to be 70,000. This represents a loss of additional output to the UK economy rising £80bn, simply on the basis of the higher productivity which is generated across all activities in a dense location.

It is notable that this recession has not obviously reduced overcrowding on London's transport system and the resilience of access to Canary Wharf is a particular issue. Activity requires more and better access to power for computing and communications as business becomes more international. Liveability also requires improved standards of public realm and good power, water and sewage. Flood risk must be contained to ensure that residential expansion is possible.

2. How does the UK compare internationally in terms of infrastructure and energy? How has this position been changing over time?

The latest World Economic Forum rankings put the UK 34th in terms of infrastructure. This does not help when the economy itself needs to restructure in the face of changing opportunities. The UK trades around one third of its output so that the global economy is of crucial importance, as much to the suppliers to international business as to the trading businesses themselves.

Changing economy changes needs

3. Does the UK suffer from (public and/or private) underinvestment in infrastructure and energy? If so, in what kind of infrastructure? In what sectors?

Planning for infrastructure is a long term activity. It therefore requires the willingness to develop strategic vision and pursue it with flexibility. Some of the longest lived major companies in the world are the oil companies. This is what they try to do – and they consider the financial aspects of their investment decisions as part of the plan. The UK has found it difficult to take a long term strategic approach to investment which has meant that underinvestment in areas which require some form of government support has been relatively hard.

For example, when North Sea oil development became viable, oil companies were willing to take risky investment decisions. Government is disinclined to take risk.

An example of a strategic approach is however, the establishment of the motorway network, which was envisaged as a whole and developed over time – with changes as attitudes and the economy changed. Sao Paulo is currently taking a similar approach to its redevelopment – in the context of an overall vision developing physical infrastructure and commercial and residential development quarter by quarter and over periods in which the investment programme can be self sustaining.

In France, there is a similar approach to optioneering within a vision. In all of these countries and places, there is a focus on improving financial return which is entirely lacking from the mindset of planners and regulators in the UK.

4. Assuming affirmative response to previous question, what are the challenges that are holding back growth-enhancing investments in UK infrastructure and energy?

Whether evaluating transport investment with welfare based tools, or assessing an ‘approved’ cost of capital with a regulated asset base, we have allowed economic models to get in the way of reality.

This means that costs and benefits are assessed by different standards and with insufficient attention paid to payback, as distinct from benefit cost ratios. Private investment needs to get a payback which can cover interest and principal and over which the investor has some control. Where the returns are under the control of the public sector (fares, charges, prices) then a lender must have faith that the monies will be sufficient and robust to that regulation. This is a difficult judgement and made more difficult every time the rules are changed.

In the case of TIFs, there is a further judgement that tax revenues will flow through to a project to make this payback. Creating this ring fence at a sufficient scale and size to cover the costs is still untested – we are currently working this through for Nine Elms. Equally risk management is still untested as are the propositions around additionality.

The Treasury will only be prepared to hypothecate taxes which they view as additional to those they might otherwise collect without the investment. This is quite a stringent view of how the economy works and depends on strong economic modelling assumptions of the kind that are extremely hard to test – another example of how economists have imposed a particular view of reality.

Another implication of the 'modelled' approach that we take to infrastructure is that the real economic benefits are seen as the add on and the less real are taken to be the basic benefit. In the case of a transport investment, for example, it is time savings, valued by some limited techniques, which is the core method of thinking about rail and road infrastructure.

The weakness of this approach is self evident:

- It relies on forecasts of economic activity and population and assumes this growth will happen anyway
- It relies on assumptions of the value of time which are in turn dependent on survey evidence

The larger and longer term an investment the less likely it is that growth will be independent of the investment. The value of time (even if measured correctly) will only be a good measure of welfare and economic benefits if the stringent and highly unrealistic assumptions of perfect competition apply.

Nonetheless this approach is used in generating the cost benefit ratios which are a key public sector decision rule.

More recently, some variations on this theme have been permitted – a bit like the addition of further epicycles to Ptolemaic astronomy rather than accepting that the earth goes round the sun. These variations permit additions to benefits if it can be shown that:

- Investment increases activity in highly productive centres, increasing the output of the UK as a whole
- Investment improves land use and regenerates locations which are the subject of policy.

Both of these add further degrees of arcane analysis and are difficult, if not impossible, to prove. It is undoubtedly true that increasing activity in productive centres by relieving constraints on transport systems, such as Crossrail does, increases the output of the UK economy as a whole. Indeed it is possible to show that the taxes on such activity are sufficient to pay back the investment, while the fares are capable of covering the interest charges. In this context, it would seem that the whole paraphernalia of traditional cost benefit analysis is unnecessary – the investment will pay for itself.

In the case of the second effect, this has been defined in the guidance in such a way as to provide an almost impossible test, especially for any investment on a large scale. Requirements include the need to provide a model of how transport interacts with land use – known as LUTI models. Such models are even larger black boxes than the transport models, but like them the scale of investment that is made in them by both researchers and clients mean that there is a tendency for faith to replace judgement. These models are opaque and almost impossible to calibrate to real data. Relying on them for any policy decision is entirely irresponsible.

The case for the Thames Gateway Bridge had to rest on proving the potential for the bridge to create economic activity. Models in social science do not meet the standards of proof of engineering models and this proved a serious difficulty.

If we are to be able to invest in transport infrastructure it is essential to find a better way to rank investments and especially to create a more transparent method which can both be better understood and challenged. Public sector priority setting is a key element in the investment process, whether there is public sector funding or not. Even where there is a private sector

funding, planning processes will still require analysis to meet the standards set by transport policy makers.

The tests that assessments need to meet are:

- Transparent in process and assumptions
- Clear about the split between financial and non-financial benefits
- Clear about the purpose of investment and what form of benefits are expected
- Clear about who controls the benefits

One way it has been proposed to do this is to create a future asset base valuation (RAB) on which an agreed rate of return can be made. Unfortunately this will fail the transparency test. The way in which a future asset base is estimated has a lot of similarities with the existing process of modelling. Again it relies on forecasts and an assessment of benefits in the same framework as before.

The easiest way to create transparency is to start with an analysis as if a project is a private sector investment. Benefits would clearly be financial and it would be clear to what extent these could actually be captured by the investors. This would also create a framework for analysing the extent to which private investors would have an interest in investing – if returns can only be captured by institutions under the control of the public sector, this will clearly limit private sector funding.

Subsequent to this initial analysis, which can be provided in a form in which it will be possible for third parties to understand and challenge the analysis, it is then perfectly possible to consider external effects which might make the investment either more or less attractive, such as:

Negatives:

- It reduces the value of other activity (cannibalisation)
- There are environmental negative
- There are distributional negatives

Positives:

- There are growth impacts
- There are environmental benefits
- There are distributional benefits

It would need to be obvious that these were not captured in a monetary analysis before they could be accepted – but if they were this would be a clear signal for government investment.

It must be accepted that such an approach to investment appraisal for transport would go against the development of large scale models and associated guidance which has been built up over thirty years or more. There is much vested interest associated with the current system and intellectual capital that has been built up around understanding and presenting this complex analysis.

However, it is clear that this system militates against principles of good governance, even if the analysis could be done perfectly. It lacks transparency of both process and analysis. Moreover, the embedded assumptions in the analysis are risky and lack calibration to the real world. And finally, it is absolutely obvious that there is insufficient investment in infrastructure. The current decision making process has therefore failed at a very basic level.

A simpler system must have a better chance of getting a sensible set of decisions which can generate the infrastructure we need.

5. What can be done (if anything) to improve things? (i) by government, (ii) by firms, (iii) by other stakeholders?

There are various proposals for multiplications of institutions to improve infrastructure investment, including the preparation of national infrastructure plans, the establishment of an Infrastructure Bank and the Infrastructure Planning Commission (now absorbed into the Planning Inspectorate).

It is certainly the case that planning remains a major headache, although the National Policy Statements are still in their infancy. The development of the nuclear plant policy however shows a good direction of travel. This could mark a major step forward in the ability to take long term planning decisions.

European rail companies estimate that the costs of building rail in the UK is about three times that on the continent. In part this is differing safety standards, but it also results from the costs of delay on engineering and management.

A willingness to create a long term vision and act on it in a flexible way requires a willingness to create proper financial vehicles which can control costs and manage revenues, whether from charges or from taxes.

At a recent conference on High Speed 2, the speaker from France stressed finance, profitability and return on investment. The UK speakers did not mention any of these concepts. Instead they talked about systems, general economic benefits and management. This was noteworthy from a French system which is nonetheless heavily subsidised.

The stress on model based benefits and evaluation tends to lead to larger projects and a focus on cost benefit ratios, rather than a focus on deliverability and revenues. The best becomes the enemy of the good. Large projects obscure the identification of benefits and who could pay.

Bridget Rosewell
Volterra Partners
June 2012