



MAIN IMAGE: Thames Estuary -
The Thames Barrier. Photo Credit:
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ARE TOUGH TIMES THE RIGHT TIME FOR INVESTMENT?

IF SO, THIS RECESSION COULD PROVE A TURNING POINT IN THE CONSTRUCTION AND INFRASTRUCTURE INDUSTRIES SAYS TRACEY STONE OF AUTODESK

It was easy to imagine, just a couple of short years ago, that the UK construction industry was heading for a time of milk and honey. The prospect of the 2012 games, combined with a whole series of huge regeneration projects such as the Thames Gateway, promised an abundance of work – and profit – for any commercial organisation selected. In turn, we thought, this would lead to a bonanza of funding for the local authorities involved too.

That was then. Now, of course, we're all more realistic. Thankfully, preparations for the games are gathering momentum, but many related schemes are in stop-go mode, despite the UK government's plans to bring forward infrastructure projects worth around £3 billion and requests for contractors working on programmes such as the widening of the M25 and Cross Rail to accelerate their work.

Inevitably though, this means the spotlight of scrutiny will shine even brighter on every large regeneration scheme and the dealings of all those involved. Of course, even before the downturn, the industry was already chastened by the time and cost overrun on large, high profile projects. But now, more than ever, businesses need to proceed with eyes fixed firmly on both the calendar and the calculator.

If the government is providing help, it will demand greater transparency. Or, if the government – and therefore also the tax payer – is the client, firms may feel they have a moral obligation to use the most efficient working practices and methods available to them.

Loss leader

But, there must be a reason why so many mega-projects overrun their implementation budget by substantial amounts. Nobody under-budgets for the sake of it. But, when projects are global, and competition is tough, there could be a tendency to under rather than over-estimate for fear of losing out because of pricing.

However, under-budgeting is not always a conscious strategy. Many firms rely only on the experience of their project managers to cost a complex project accurately.

Take, for example, something as apparently simple as the movement of quantities of earth. Cut and fill quantities are often a real "guesstimate" based on anything from intricate calculations to gut feeling. Yet, earthworks are often one of the most expensive parts of a project.

On the other hand, if the cost of every potential over-calculation or mistake were included, the quote just wouldn't be viable.

In reality, costs can begin to escalate before this, at the policy-making and planning stage. Outdated paper maps, the lack of any central data repository and duplication of effort all rack up the overheads. Even when information has been digitised, the mismatch of different types of data and file format can cause long delays, imprecision and full-blown errors.

So how can architects, engineers, planners and policymakers all work together more efficiently and rapidly without compromising standards and quality?

Strategic investment

When we look back, we may see this recession as a turning point. When the entire construction industry was buoyant, it was difficult to convince anyone of the need to revise working practices. Although the Latham Report in 1994 and the Egan Report four years later both emphasised the need for change, only small steps have been taken by anyone other than a few pioneering exceptions.

Yet with all the talk about austerity and the need to manage costs carefully, it is tempting for businesses and local authorities to batten down the hatches and cut overheads to the bone. However, they can only be part of this revolution if they are prepared to make a few strategic investments in the latest GIS and CAD tools.

Part of the problem is that many IT managers see GIS and especially CAD as niche applications and focus their budgets on what they know better – mainstream, enterprise systems. However, there are several factors driving change here.

First is the growing importance of geospatial data in our digital era. For the past decade commentators have been discussing the fact that around 80 per cent of IT applications could benefit from spatial enabling. Geographic information can no longer be locked away in a complex, inaccessible system but is needed by almost everyone in an organisation, from call centre operatives to those responsible for strategic planning.

Second is the integration of technologies and disciplines due to the need not only to build roads, bridges or houses, but to “make places” – to create new, sustainable communities. In other words, homes, for example, need to be designed in the context of roads, open spaces, schools and hospitals. Technology-wise this means GIS needs to integrate with CAD.

But until recently, this has created a technical stumbling block and consequently cost councils and other GIS-users substantial amounts of time and money. It is expensive to manage multiple types of software, convert data and synchronise systems.

At a series of recent Autodesk seminars where we spoke to over 100 GIS and CAD users, over half cited the gulf between GIS and CAD as one of the major issues in their working lives. It would seem that the divide has caused much loss of productivity, inaccuracy and repetition and as such is a significant barrier to progress.



Underpinning these drivers of change is the emergence of new applications which enable the convergence of geospatial, CAD and visualisation technologies to create a single 3D model backed by a central spatial database. This can be used to hold valuable nuggets about a scheme or development depicted by the central model – from practical information on materials and measurements to socio-economic statistic and transportation and utility data.

Advances in analysis and simulation technology mean that this single model can be used by city planners to assess the impact of changes to the skyline, for example, or if one building blocks the light of another. Utilities can use it to locate and manage assets and ensure underground pipes don't clash. It can measure the performance of a building over time – all before one brick is laid on site.

Currently, developers are experimenting by adding gaming technology to the mix. This will enable them to assess the movement of people through a community after a terrorist attack or, more prosaically, analyse traffic movement. Where are the bottlenecks? How can the flow be improved?

In fact, Autodesk has been working with a number of cities across the globe, including Salzburg in Austria, Incheon in Korea and Vancouver in Canada to create complete digital cities, mapping the inside and outside of buildings plus both overground and underground facilities.

Nobody can deny the efficiency of testing and analysing the performance of a design on screen rather than in real life – albeit an historic city such as Salzburg or a regenerated development scheme full of new builds.

In the case of the latter, the analysis could take the form of testing for energy efficiency or experimenting with different building materials so that sustainability becomes an integral part of the design rather than an afterthought. Similar CAD tools enable users to calculate very precisely how much earth needs to be moved to build a section of road or underground car park and to balance this cut and fill to minimise environmental impact.

The true potential of digital cities is still being discovered. Imagine, for example, if the 2012 athletes' village could be modelled and displayed on computer screens at strategic points around the finished site during the games. By touching the screen they could find out exactly where they were and 'fly through' their route to the relevant stadium or other venue. What a way to save time and overcome language barriers.

If the planned regeneration schemes do eventually go ahead – let's ensure that investments in these new developments are not made in vain. Not only would a new way of working help project teams do more with less, collaborate more efficiently, be more productive and ensure less waste and error on site, it may also lead to better urban planning and design and more people-friendly communities. This is one legacy for the 2012 Olympics for which we would all be grateful.

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