

Transportation and Roads Projects: Improving Processes and Management

By Albert Hamilton

The performance of any type of project, which includes infrastructure projects, is measured using two standards, namely project success and project management success.

Project success is the result of comparing what has been delivered against the over-riding purpose of initiating the project in the first instance. Project management success is the result of human effort expended in managing the process and is measured against the traditional 'iron triangle' metrics of time, cost and quality.

Government, the institutions and most of the popular press, would have us believe that a nation's roads are:

- designed for accurate traffic forecasts
- sited in the correct locations
- created to meet the strategic needs of the nation
- conceived with the necessary level of citizen involvement
- neither over or under designed
- procured using the right approach and a contract that will provide the tax payer with value for money
- effectively and efficiently managed.

Much of the arguments put forward on traffic forecasting methods, meeting society's needs for travel, the application of private finance, value for money and how projects should be managed are essentially spurious. In general, there has been no rational debate on how these idealised models are appropriate and hold completely for all circumstances.

Essentially, what seems to happen is that a decision is made on political grounds that a particular concept and approach will be used for a particular project and everything undertaken thereafter is made to justify the decision (1).

Through skilful propaganda and creating a critical mass of 'fellow believers' it is often the case that many people pontificate on matters that they know little, if anything, about. But if the message that you wish to have spread about is done skilfully and there are enough gullible people wishing not to question what they are told, the propaganda becomes like a snowball rolling downhill – it becomes bigger and bigger and it gathers pace.

Within the Republic of Ireland there is enough anecdotal and other evidence now available to indicate that project success under the third National Development Plan (2000 - 2006) has been, at best, mixed and project management success has a considerable way to go before it could be seen as 'best practice'. Citizens of the Republic have the right to demand that this time around considerable improvement is achieved.



Strategic and Planning Issues

Roads projects generally start with a forecast of traffic flows and are completed when the project is opened for the travelling public to use. Although with the wide range of procurement options now being considered, in some cases a completed road remains a project for as long as 30 years after opening because it was let under some sort of PPP arrangement.

The largest and most recent study (2) undertaken of transportation infrastructure projects looked at a sample of 210 projects (183 were roads projects) in 14 nations worth US\$59bn. This showed that forecasters generally do a poor job in estimating demand; road

projects are over forecast on average by about 20%. There is also statistically significant evidence to show there is average cost over-spends on roads of 20.4%.

When over forecasting the traffic that a road will carry is combined with habitual project cost predictions that are deliberately kept low, the result is a cost benefit analysis that is totally misleading. The outcome is substantial financial risks, which are typically ignored or downplayed by planners and decision makers to the detriment of social and economic welfare.

The cure is transparency, accountability and new forecasting methods. The challenge is to change the governance structures for forecasting and project development.

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There have been spectacular over-runs (3), namely: 92.4% on the €33m Cavan Bypass, 98.6% on the €43m Nenagh Bypass, 117% on the €244m Drogheda Bypass and 306% on the €44m Youghal Bypass, just to mention a few.

tematic knowledge exists about the costs, benefits and risks involved. When a project under performs, this is often explained away as an isolated instance of some unfortunate circumstance. It typically is not seen as a particular result of the general malaise of under performance in infrastructure projects, which includes roads and their associated structures. The challenging question is whether under performance is the exception or 'the rule'.

Strategic planning takes a project from being identified as a societal need to being fully conceptualised up to when the project proper enters the procurement phase and the implementation phase. Getting the strategic planning right at the front end of roads projects is crucial to successful delivery at completion.

There has been criticism by the Economic and Social Research Institute of the Irish Government's failure to carry out cost-benefit analysis of major projects. This type of analysis is a crucial methodology used in differentiating between options to satisfy the same need and between projects to determine priorities.

The UK's Highways Agency relies on a cost/benefit analysis, which they call COBA, which is specific to road schemes and gives economic value to the non-tangible benefits that schemes are designed to deliver, such as reduced journey times, reduced vehicle operating costs and reduction in accidents. Each of the schemes must successfully pass a COBA analysis as part of the admission criteria to the National Road Programme. Project proposals that include schemes with higher COBA ratios are more attractive as they deliver greater benefits for money spent.

Roads Under The Third NDP

In the Global Competitive Report 2000 from the World Economic Forum, the Republic of Ireland was placed fifth out of 59 countries on overall economic competitiveness but were placed at 37th for road infrastructure.

According to the NRA the Republic of Ireland has a total road network extending to about 95,000km. Of this length, only 5,500km (six per cent) is classified as national road. The rest is termed regional and local. It is estimated that the six per cent national road network carries 48% of the traffic volumes and is the source of 40% of fatal collisions.

In 2005 the number of vehicles was about 2.2 million and the percentage change from 1998 was 41%. The number of licence holders in 2005 was 2.35 million and over the same period the percentage change was 21%. Although road accidents is not a focus of this article, it is worth mentioning that in 2005 it was recorded that the Republic, at 10 deaths per 100,000 population, was one of the highest in Europe, if not the highest. It does raise the issue of the travelling public's adaptation to the newly improved and expanding infrastructure. When the causes are examined it seems that attitudes will have to change because the vast majority (92%) of accidents are caused by driver behaviour.

It has been recorded that road fatalities in 2004 cost the State nearly €853m and serious injuries cost just over €911m.

The opposition parties recently stated in the Dail that more than €4bn of taxpayers' money has been squandered on cost overruns on the roads programme. They also stated that research by the Comptroller and Auditor General has revealed that the bulk of the cost overruns were a result of poor planning of projects from the outset.

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Certainly the indications are that planning, or estimating, or execution, or control, or management, and it could well be 'all of the above', are significant factors in contributing to many project outcomes being classified as failures.

Best Practice for the Next NDP

A crucial question requiring a Government response is 'Were the experiences and the lessons learned from the third NDP used when developing the fourth NDP?' The answer that we may get could be disappointing when trying to satisfy citizens who will want to see 'best practice' being used.

It would be understating the situation for the public sector by saying that reform is needed. What is needed is transformation of the governance process if there is to be substantial improvement in project delivery performance. Here are some suggested actions that are urgently needed.

Workflow

A major concern of the construction industry is the inability of the public sector to provide the market with sufficient early warning and confidence about future opportunities and the certainty of associated funding.

Project Management

The level of management maturity within most public sector organisations is low or very low. Every organisation engaged in construction projects should establish 'intelligent' project management practices as a corporate requirement. This can be best achieved by establishing a Project Management Office in each organisation.

Early Stage Development

A much more rigorous approach to forecasting, conceptualisation of scheme options and creating the business case for projects will result in infrastructure assets that address the wider economic, social, and environmental needs. Not enough detailed effort is being expended in the early stages to ensure that what will be delivered is what was predetermined as being required to satisfy the social need. Also, similar human effort must be spent on establishing time, cost and quality targets that have restricted variances.

Procurement Strategies

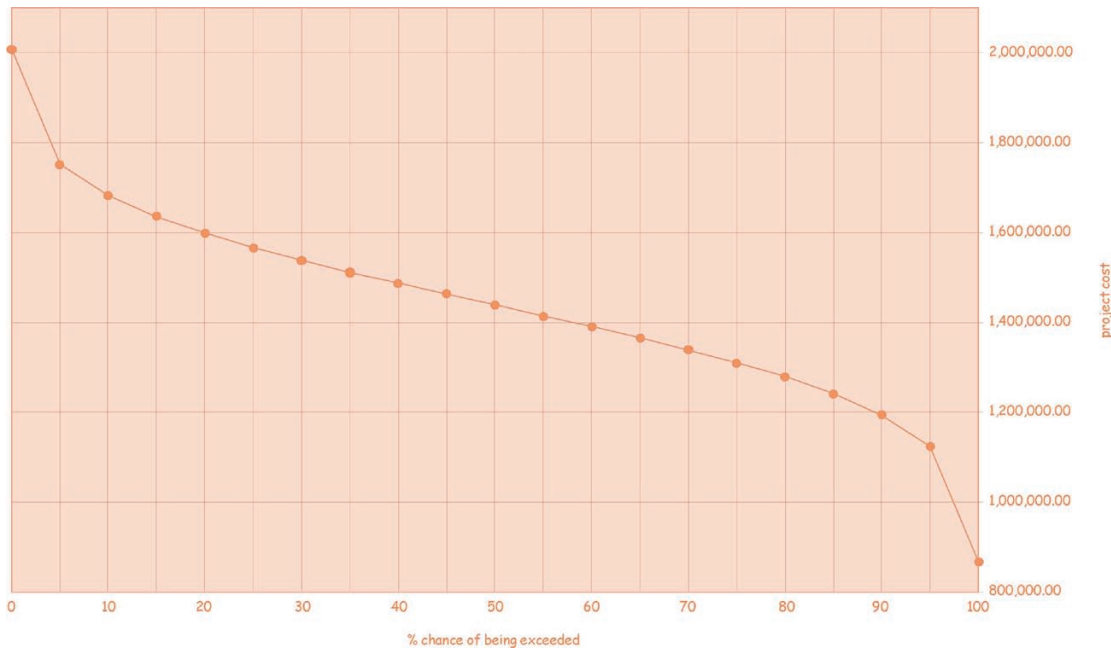
The public sector has great commercial leverage in driving the industry towards 'best practice'. Poor maturity in risk management, life cycle costing, performance incentives in contracts, contracts that use sharing of value savings, etc are the sort of requirements needed to transform the procurement process.

Collaborative Working

There is a crucial need to create the concept of an integrated team on each project to capture the entire supply chain of forecasters, designers, procurers, contractors, suppliers, sub-contractors, etc, working collaboratively from as early a stage as possible.

Performance Evaluations

It is generally the case that few, if any, public sector organisations engage in project post-mortems and lessons learned. It is absolutely essential that the public sector know, and make known to the Republic's citizens, that a project has delivered the intended benefits and that what has been learned from one project is



Graphic shows the result of a risk analysis of potential construction cost overspend on a bridge across the River Liffey in Dublin city.

being passed on and used on subsequent projects.

There is also the case for a completely independent unit carrying out these evaluations, as a public sector organisation carrying out its own evaluations could be said to be biased.

Summary

The ESRI are of the view that the first three NDPs have made an essential contribution to the transformation of the Irish economy and society over the past

15 years. Without the past levels of investment the nation's infrastructure would have affected the economy greatly and the environment would have been under more serious pressure than it is currently.

However, we have to accept that these achievements have been in spite of a governance approach that did not ensure appropriate management methods were used. Such derogation of responsibility has regrettably resulted in much waste of resources including project funding. Much, much more could have been achieved had the funds been used effectively and efficiently.

The public sector as an influential body within the Irish economy does not appear to acknowledge that over the last 15 years there have been monumental failures and the sad thing is these failures haven't stopped. They continue to this day.

The public sector has not taken seriously the significant improvements that a formal methodology for the management of projects produces in the form of successful outcomes. The public sector must be brave and drive the industry towards partnering with those in the supply chain. It must also promote innovation through contract incentives, ensure that the means of procurement fit the project and establish project management methodologies that will be part of a cultural change programme for continuous improvement.

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