

Infrastructure Procurement Routemap – Learning from Crossrail, examining the journey

“Understand the delivery environment you HAVE, then CREATE the one you need.” Andy Mitchell, Programme Director, Crossrail

Introduction

Crossrail is the biggest engineering project in Europe and forms a major part of the Mayor’s Transport Strategy. This case study looks retrospectively at whether the key decision-making on capability and capacity, that enabled Crossrail to achieve increased efficiency and effectiveness, is reflected in the Routemap. It follows the journey as the scheme has moved from development, to delivery, and as it begins to gear up for operational readiness.

The purpose of the case study is to inform those embarking on a similar journey so they can benefit from a greater degree of understanding and rigour in the key decisions that they must make. The case study highlights how the components of the Routemap correspond to the challenges that Crossrail faced and how they were actually dealt with (many intuitively), to illustrate the benefit of applying an objectively systematic approach. The case study describes key aspects in line with the Routemap elements of complexity assessment, sponsor capability assessment (related to investment and deliverability) and client capability and how this varies by project phase.

The benefits associated with the adoption of the Routemap principles will be discussed in the light of transferable practices that at Crossrail have led to savings against the original budget of approximately 7%.

Assessing the Complexity of the Project/Programme Delivery Environment

Prior to planning the investment and/or delivery approach it is important to understand the key issues and opportunities and the level of complexity they can create. This will help to identify any potential ‘deal-breakers’ and lead to a range of preferred options.

Box A: Assessing Complexity

Step 1: Reflect on the complexity of the project or programme;

Step 2: Agree the critical factors (and those that interact to create complexity) that comprise the degree of challenge;

Step 3: Identify the implications of the profile – how can efficiency be best achieved in the delivery environment?

The tools outlined in the first layer of the Routemap and the steps in Box A will help in raising the important questions related to the delivery environment.

Complexity Assessment Tools – in Practice

An investment review workshop was conducted with the Crossrail team to reflect on what the development and delivery phase profiles would have looked like at Crossrail at significant points in time. This was to see whether the tools would have provided useful insight had they been available at the time and to check whether there were any key issues and opportunities that they would not have identified.



Photo: Mapping Exercise using the Hexagon

Table 1 is an illustrative example of a retrospective Crossrail DECA profile (circa 2004-5). It represents a snapshot of the degree of challenge.

The profile illustrates the high degree of complexity that the programme faced at the time. Notably, the areas identified as associated with high complexity, indicated the risk attributed to ensuring the programme was a viable proposition.

There's sometimes a lot of focus on how you're going to deliver the project rather than thinking about the complexity of the environment you're in." Project Manager, Crossrail

Some of the high complexity factors were addressed intuitively, such as the need to stabilise the environment. A programme of this size and scale is likely to be deemed extremely risky by investors. The inability of the programme to attract private funding led the Crossrail team to seek public funding via Royal Assent. This allowed the development team to stabilise aspects of the delivery environment that were previously a deterrent to other investors.

Had there been a means for issue identification and complexity assessment of this form there may have been a more rapid appreciation of the extent of the complexity attributed to the *stability of the overall context*, and the required *financial investment*. This would have readily identified the unlikelihood of the programme attracting private investment (e.g. PFI as a delivery approach).

Identify any actions that have the potential to increase or decrease the degree of challenge associated with the delivery environment.

Others factors from the profile were considered at length, including level of *strategic importance* and the potential complexity of the *stakeholders* involved. The profile readily highlights the need for action to address complexity in these areas. It also calls attention to the nature and capability of the delivery entity required to manage the interfaces and dependencies.

Outcomes of Understanding Complexity

Efforts to manage complexity through the assurance of financial feasibility and clear requirements worked to achieve the required funding arrangements between 2004/5 and 2007/8. Funding was secured as 1/3 business rate supplement, 1/3 Transport for London (TfL) and 1/3 Central Government including £200 million from the City of London Corporation, £230 million from BAA and other developer contributions.

Further Opportunities

The Crossrail Act was passed in July of 2008 and while this secured partial funding for the railway, it necessitated a reassessment of the environment to identify the new areas of complexity associated with the incorporation of the requirements and undertakings committed to in the bill process, the greater degree of stakeholder involvement, changing European railway legislation, the delivery approach and the organisational change needed to ensure Sponsor and Client bodies were capable of navigating this new delivery environment.

| Factor | Low Delivery Environment Complexity Statement | High Delivery Environment Complexity Statement | Rating Statement |
|---|---|---|------------------|
| Strategic Importance | Low priority operational level project/programme where the expected benefits are necessary but low in value terms. Externally, there is little political, media or public interest and failure would not have significant impact. | Critical to the delivery of business policy with very high expectation of benefits. High level political or public interest with strong media attention. Failure would have major impacts and consequences. | High |
| Stakeholders | Low number of stakeholders. Stakeholders are aligned with the business objectives. Stakeholders are unlikely to change. | Significant number of stakeholders with high levels of influence and differing or misaligned objectives. Stakeholders may change. | High |
| Requirements | Requirements and expected benefits are clear and linked to business policy. Key performance measurements link to goals, vision and values. | Ambiguity around requirements and how the expected benefits contribute to the realisation of the goals, vision and values. High uncertainty on project impact. | High |
| Stability of Overall Context | Requirements, governance and delivery modes are clear and unlikely to change. Confidence in planning and project/programme authorisation guaranteed. | Good chance of the scope, structure, external requirements, economic and political landscapes changing. | High |
| Financial Impact | Investment is not significant relative to other investments in terms of capital expenditure. Anticipated revenues, efficiencies or returns on investment are not fundamental to the business. | Significant financial investment revenues, efficiencies or returns on investment and /or highly involved type / source of investment anticipated. | High |
| Technology | No new technologies form part of the scope. No requirement for phased implementation or piloting. | New technology is required representing significant risks and changes in business practices. Failure to deliver successfully would have major impacts and consequences. | Low |
| Interfaces | Project/programme spans few boundaries (organisational, political, regional) and success is not dependent on relationships. Governance is not complex and enables support, decision-making and reporting. | Project/programme spans many boundaries with internal and external partners and success is dependent on relationship management. Governance is complex. | High |
| Range of disciplines and Skills | Project/programme has few specialist disciplines or skill requirements. | Large number of disciplines and skills and/or potential for strain on the supply chain capacity and capability. | Medium |
| Dependencies | Project/programme is not critical to the delivery of other projects. | Project/programme is critical to the delivery of other projects. | High |
| Execution Complexity and Extent of Change | Business as usual. | Large amount of organisational change required in organisation or business to deliver desired outcomes and benefits. | High |
| Organisational Capability | Demonstrated the capability to deliver project/programme through delivery of similar successful projects. Culture promotes 'intelligent client' attributes. | Has not demonstrated key capabilities underpinning delivery route and/or has not delivered under similar arrangements in the past. | High |
| Interconnectedness | The understanding of the relationships and alignment between policy, culture, practices, technology, people, processes and procedures has been investigated, captured and communicated. | The extent of the inter relatedness between policy, culture, practices, technology, people, processes and procedure has not been investigated, captured or communicated. | Medium |

Consider the degree of challenge. What capability and capacity does it require and what form should it take?

Assessing the Capability of the Sponsor Organisation in Practice

The degree of challenge attributed to the delivery environment in which many large infrastructure programmes exist, requires consideration of the capability of the Sponsor organisation. The level of Sponsor capability also needs to reflect the challenge presented by the programme and the delivery environment at any particular time. Certain more challenging profiles may require a more mature Sponsor organisation to maintain the business case.

The tools outlined in the second layer of the Routemap and Box B will help in raising the important questions related to sponsor capability.

Box B: Sponsor Capability

Step 1: Reflect on the level of capability of the Sponsor organisation;

Step 2: Determine whether the Sponsor capability is appropriate given the degree of challenge.

Step 3: Identify areas requiring Sponsor capability enhancement. Where can efficiency and effectiveness be improved? Discuss with the Sponsor.

Using the Sponsor Capability Matrix the level of systemic Sponsor capability for Crossrail was retrospectively assessed at key points in time. This was to see whether the matrix would have provided useful insight had it been available and to check whether there were any additional attributes that could be incorporated from the Crossrail experience. The level of sponsor capability was reflected on at two critical points: 2004/5, during initial development; and 2009, during major organisational change. This was conducted with support from the current sponsor representative. It was agreed that In 2004/5 the Sponsor demonstrated a number of the systemic attributes associated with level 1 or a 'vulnerable' system. This was primarily attributed to the lack of a clear line of sight between the business need and the objectives and the fragmented ownership of the asset.

By 2009, the Sponsor capability had been enhanced to level 2 – a governed level of capability providing policy guidance and stakeholder management support. The capability enhancement was achieved in two ways: the creation of a *Joint Sponsor Board* between the Department for Transport and TfL; and the establishment of the *Project Development Agreement (PDA)*.

With the use of the Sponsor Capability Matrix, systemic attributes in conflict with the Sponsor responsibilities could have been readily identified and developed into a clear action plan for improvement.

“Stability of the overall context - what’s good with Crossrail is the PDA, which sets out what it is we’ve got to do, how we meet the requirements of the Act.”

Commercial Manager, Crossrail

Outcomes of Sponsor Capability Enhancement

The Joint Sponsor board removed the fragmented nature of the Sponsor interface and clarified the accountability and authority with respect to the overall business case. This allowed the projects to be managed as a programme with reference to the overall strategy. Helping to support this, the PDA aligned the objectives and clearly articulated the requirements across the Sponsor-Client interface. As a result of the level of sophistication found in the Client-Sponsor relationship, Crossrail was able to deliver savings of £1.1 billion. This was done through Project Assure (£350M), an aggressive value management exercise. The outcomes from this formed a key component of the client’s submission to the Sponsor in support of the UK Government’s Comprehensive Spending Review that saw another £750M in savings.

Understanding the Capability of the Client and the Required Delivery Entity – Planning for Change

The alignment of capability and challenge is extremely important when considering the existing capability of the client organisation and deciding the nature of the delivery entity. The capability of the client body may be the key factor in deciding the most appropriate delivery mechanism, so it is important to adequately consider what defines an ‘intelligent client’ and the implications of this.

Recognise the capability transition at an early stage – differing skills, structures and processes are required at different phases.

The delivery of a major infrastructure such as Crossrail and the London Olympics, has demonstrated the need for a ‘delivery entity’ with capability that can:

- Support the sponsor and client organisations as the nature of the programme changes over time;
- Manage the programme interfaces;
- Maintain the key message related to benefits realisation; and
- Ensure the crucial elements underpinning programme success continue to progress during organisational change.

By recognising these requirements along with those associated with the task, the degree of challenge and the delivery approach, a robust profile of the programme management capability needed will emerge. This capability needs to exist within or alongside the client organisation throughout the programme lifecycle.

The tools outlined in the third layer of the Routemap, the transitioning diagram and Box C will help to answer the important questions relating to the delivery entity.

Client Capability Transitioning and Assessment Tools

For intelligent clienting, the Client organisation needs to be able to articulate the capability requirements beyond the individual attributes. This includes flexibility in the scope and scale required to meet the degree of challenge presented by the environment at various points in time. This is achieved by making smart decisions regarding the selection of the delivery approach and how the balance of responsibility will change over the life of the programme. Value is gained through learning from and incorporating people and practices from similar investments.

Once the nature of the client organisation has been determined, ensure there are clear governance structures to reinforce who is doing what and that this is translated to the contractual relationships. In planning for transitioning, early involvement of the main actors in the next phase is an important step in assessing the readiness to move forward. In doing so, the degree of integration appropriate to the task – and what constitutes ‘appropriate’ for each phase can be determined. This includes the level of challenge the market can realistically organise to meet. Entering the next phase without sufficient preparation can result in a strain on capacity.

Lastly, in the face of organisational change, robust programme management ensures that what is important keeps progressing. Whether success is dependent on time, cost, quality or benefits, it is imperative to maintain the crucial programme elements. Part of this is ensuring that they are represented in the strategic and programme risks and their criticality reflected in the incentivisation mechanisms.

Box C: Transitioning

Step 1: Determine what the client needs to be. Plan for the capability transitions in terms of composition, scope and scale of the client organisation and delivery entity. Is this appropriate to the degree of challenge?

Step 2: Consider the transitioning relationships and the key capability requirements.

Step 3: Develop a clear way forward. Who should be engaged?

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One-on-one interviews with key programme and procurement personnel were conducted to capture specific examples of how Crossrail considered the transitioning requirements and whether the Routemap adequately described the critical considerations. As the client organisation, Crossrail, recognised that the complexity of the delivery environment and the need to gear up quickly required robust programme management capability. The deployment of the programme partner (Transcend) in conjunction with a programme delivery partner (Bechtel) ensured that there was a programme management function with sufficient reach back supporting the client independent of those focused on delivery.

As delivery progressed it was felt that in order to increase the capability level of the client and reduce some inefficiencies and duplication, the programme partner and delivery partner should become part an integrate part of the client organisation. This also required a change in the resourcing strategy, bringing resourcing responsibility into the client organisation while still providing access to DP staff for short term, critical assignments.

In doing so, it was recognised that this would improve the management of both the internal and external interfaces through the complete alignment of the Client, Programme Partner and Delivery Partner objectives. Along with this, Crossrail moved from separate tunnelling and stations packages to geographical delineation in order to better handle the risk posed by the interfaces between the two. Understanding how the challenge drives the capability and functional requirements, the degree of integration and where value can be lost was fundamental to these gains made by the Crossrail team. Had there been a systematic process originally adopted for transition planning at Crossrail, the organisational change would not have been reactive and further gains attributed to continuity of performance may have been achieved. Learning from this, Crossrail is planning for the next transition 2 years in advance to ensure the client organisation has adequate time to evolve into the most efficient organisation without compromising current capability needs. Fundamental to this is early operator involvement.

“Most programmes end up with the interfaces by accident, expending resources and risks to try and overcome them. Determine them now.” Procurement Director, Crossrail

Further examples of good transitioning planning have been adopted within Crossrail’s procurement team.

Without the Routemap as a systematic process, Crossrail intuitively recognised the need for procurement capability enhancement and adopted the lessons from the 2012 London Olympics. Key to this was the migration of the procurement team to contract management. This ensured both efficiency in size and shape as

well as effectiveness by making sure the capability is placed where it is most needed. The transitioning of successful processes and teams from projects with similar delivery environments can lead to significant value. Lastly, it is important to consider the cost and value drivers, in order to protect what is critical to programme success.

As Crossrail moved from design to tunnelling, and now to the upcoming railway integration, the understanding of what was and is 'mission critical' has always been clearly communicated. The message is driven on an annual basis throughout the organisation.

PROTECT and keep the crucial programme elements MOVING, even in the face of organisational change.

For example, in 2010 it was 'protecting the design', in 2011 it was 'pulling back £1.1 billion in value' and in 2012 it was '13km x 13 periods'.

Notwithstanding the importance of high level, clear statements of intent it is important to maintain full visibility of a wider range of programme critical indicators, such as, would be incorporated in a dash board of controls - performance, staff turnover and absence, and the cost associated with re-work.

Crossrail uses performance league tables in a 'dashboard', monitoring supply chain performance including compliance and responsible procurement.

Outcomes of Client Capability Transitioning

The full integration of the client function, including resourcing responsibility, and the removal of existing duplication of effort resulted in further significant efficiency savings. Planning for an organisational transition not only ensures adequate consideration of the most effective and efficient composition, but prevents reactive mid-phase organisational change that can impact decision-making. In a programme the scale of Crossrail, the cost of delay could be as much as £5 million/day in direct and indirect costs. Recognising the importance of early involvement, led to the incorporation of OCI into the procurement policy and contracting arrangements.

Through this process the Crossrail civil designs were jointly validated and improved by client, designer and contractor following the award of construction contracts. Whilst significant benefits were realised, undertaking such an exercise earlier may have delivered further benefits still.

Benefits of the Routemap – Shortcuts for the Journey

Through examination of the Routemap principles in light of Crossrail's journey so far, lessons or 'shortcuts' to assist other major investments have been identified within the case study.

These include:

- The need to firmly establish the key principles, systems, roles and tasks before the detail of delivery and procurement;
- The need to determine the interfaces prior to transitioning – what is the impact on risk and complexity and how procurement be used to maximise benefit (eg. common procurement);
- Insufficient planning for organisational change can result in a loss of client identity, the blurring of governance and accountability and the need to redefine the relationship with partners;
- The need to assess the functional requirements against the partnering and systemic relationships. Efficiency can be lost through duplication of effort, conflicting culture and not knowing ‘when to step in’; and
- The need to protect not only the key programme elements but the capability required to manage them during organisational change.

Conclusions

Crossrail saved in excess of £1.1 billion, approximately 7% of the original budget, using principles that are reflected in the Routemap (a mature sponsor-client relationship, client capability transitioning and OCI). It is reasonable to assert that the adoption of an objectively systematic approach, as advocated in the Routemap, would enable other major investments to achieve at least similar levels of savings. Therefore, from examination of the Routemap principles at key stages in the Crossrail programme, the IUK Procurement Routemap as an approach has been demonstrated as good practice and a very applicable and appropriate tool.

More generally, the capability of sponsors and clients is often found not to be at this level. There are a number of NAO reports that identify the need for attention to be paid to sponsor and client capability as historically, project and programme outcomes are not being met. As a form of rapid appraisal, the Routemap will identify critical aspects requiring in-depth review and how to systematically take steps to increase both effectiveness and efficiency this should lead to savings in excess of those accrued at Crossrail.

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