

Lessons from the United Nations Capital Master Plan

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Nations Board of Auditors

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Foreword

The Board has been reporting on the United Nations' refurbishment of its New York headquarters campus (the Capital Master Plan or CMP) for the last eleven years. We have seen at first hand good practices and the tactical decisions made as issues were tackled, but also avoidable problems. This paper looks at how the United Nations coped with some of the varied challenges and provides practical insights and, with the benefit of hindsight, draws out some learning themes that should have relevance to future capital programmes.

Identifying and acting on the lessons from the once-in-a-generation CMP project, indeed from any major project, is important in itself. But it is particularly important in a context where future projects are likely and the United Nations must respond to increasing challenges around the world at a time of fiscal constraints. Delivering more with the same resource is a capability that the United Nations will need to develop going forward, with cost over-runs on major projects becoming less acceptable, and the waste of scarce costly resources even less so.

This paper, drawing on the Board's work on the CMP and wider knowledge of best practice, is offered by the Board as a contribution to the learning process. It does not cover every lesson that might be learnt. But it does highlight, in our view, some of the more important and systemic lessons that apply both at a project-specific level and at the corporate level, where it is important to have effective and well-established, organisation-wide processes, standards and capabilities for project delivery. Many of the lessons are of direct relevance to future capital projects, in particular the Strategic Heritage Plan, which is now mobilising in Geneva. Several of the lessons about corporate capability would also apply to any corporate change programme whether asset-related or not.

Based on the insights gained from our regular reviews of the project since its inception we can say with confidence that the United Nations would benefit strongly by learning the lessons in a few key areas. For example, it is vital that major projects make a successful start as experience shows it is difficult and costly to recover. The effort to get projects right at the outset is rarely wasted. Best practice is to hold any major project to a very high level of scrutiny and independent expert assurance before any decision is taken to start or to initiate each major phase during the project lifecycle. This requires from the outset effective governance and decision-making, with accountabilities and authority aligned and clearly assigned, risk and contingency transparently and explicitly at the heart of the delivery strategy, and a collaborative and integrated project team and supply chain. These are central themes in this paper.

The lessons highlighted would, if taken on board, improve the chances of success on future projects by shrinking risk and promoting learning and standard-setting, and would enable the United Nations to move towards being an organisation with a modern asset management approach and project delivery capability.

We hope the paper is of value to management, to those charged with governance, and to the representatives of member states with responsibility for oversight of the funding provided to such projects.

Amyas Morse

**Comptroller and Auditor General of the
United Kingdom Of Great Britain and Northern Ireland
Chairman, United Nations Board of Auditors**

Introduction

The renovation of the United Nations campus in New York (the Capital Master Plan or CMP) is a large and complex building refurbishment programme. The number of stakeholders, the organisation's decision processes, the iconic architecture that needed preserving, the security requirements, the need to keep the organisation running during the refurbishment and work around live operations, and the scale of the assets were all factors that influenced the way the CMP was managed.

The campus itself comprises five main buildings. Three of the buildings are operationally and physically interdependent: a three-level basement physically connecting the General Assembly, Conference Centre and Secretariat buildings, providing common utilities as well as an integrated campus-wide approach to security, cooling, heating and ventilation. The fourth and fifth buildings, the Library and Southern Annex, are more self-contained, although abutting the Secretariat building. Over time the condition of the estate had deteriorated beyond the point of reasonable repair, requiring a total overhaul rather than floor-by-floor refits. The General Assembly knew in 2000 that a complete refurbishment was needed and, after some significant false starts, approved the CMP project in its current form in 2007. The Secretary General broke the ground in 2008.

The Board, at the request of the General Assembly, provided annual reports on the CMP from 2002, reporting on differing aspects of the project during its lifecycle.¹ From 2008 onwards the reports focused predominately on the lead up to, and the delivery of, the construction phase, where the majority of the effort and expenditures occurred. This is the phase from which the majority of the lessons highlighted in this paper are drawn. The Board also increasingly commented on the weaknesses in benefits definition and realisation, including its potential as a transformative project, as well as the implications of the project for the management of United Nations' assets more widely.

¹ The reports can be found on the Board's website, available at: www.un.org/en/auditors/board/reports.shtml

This paper considers the way the United Nations has delivered the CMP and highlights lessons for consideration in planning future major programmes. It is not intended that this paper should provide a judgement on whether the CMP is a success or a failure. Nor is it intended as a toolkit of how to manage capital projects. Rather, it describes what happened during the CMP, and how the United Nations coped with those issues, and it highlights potential learning opportunities, setting this out across eight themes:

- **Theme 1** – Whole lifecycle asset management
- **Theme 2** – Getting the best possible start
- **Theme 3** – Governance, controls and assurance
- **Theme 4** – Roles within a programme lifecycle
- **Theme 5** – Commercial and procurement strategies
- **Theme 6** – Risk and contingency management
- **Theme 7** – Cost, time and outcome forecasting
- **Theme 8** – Portfolio management and organisational capability.

Theme 1: Whole lifecycle asset management

In contrast to most organisations that own large real estate portfolios, the UN did not follow a recognised whole-life asset management approach to maintaining the New York campus once it had been constructed.

Instead, it adopted a mainly reactive (run until failure) policy from the 1960s, when the campus first became operational. The UN rarely adequately invested in the fabric of the building, or in its plant and machinery other than to carry out essential maintenance and repairs. The UN did not, and still has not established, an asset management strategy for the campus incorporating a planned ongoing maintenance regime. Arguably, the need for the UN having to run such a disruptive, intense capital refurbishment plan stems from not having a well-thought-through approach to asset management. The “patch and mend” reactive maintenance policy was not sufficient to keep pace with the adverse effects of the weather, and with the wear and tear caused by occupiers. There is also a limit on the number of times plant and machinery can be repaired before it wears out and before old practices become superseded (for example, safety standards).

Over the years the fabric of the campus deteriorated and fell out of line with legislative standards, normal industry practice and its users’ needs. The ensuing \$2.4 billion refurbishment programme was not only very costly but significantly disruptive for staff required to work in temporary rented accommodation for several years in buildings dispersed around New York.

The UN did not set aside a sinking fund to cover the costs of maintenance and upgrades. The budget for facilities management activities was one element among many in the Department of Management’s budget. As such, it was inevitably at risk over the lifetime of the building from the effects of cost reduction exercises; these were mostly carried out on a ‘top down’ basis and the budgets were rarely enough to prevent a net degradation in the building from year to year.

Learning opportunities

The main corporate learning opportunities are:

- to have a physical asset management strategy that preserves the condition of the asset at a level that keeps it in a fit-for-purpose condition;
- to record comprehensively all drawings, operational manuals and maintenance and repairs records, thus providing certainty of the asset condition for future maintenance or refurbishment projects;
- to understand the relative importance of usage systems and functions;
- to fund the maintenance regime at an appropriate level, driven by the asset management plan;

- one way of organising the maintenance funding is to create a ring-fenced sinking fund. The UN may find this approach more suitable in the future as a way of protecting its assets from the effects of uninformed cost-cutting; and
- to develop in-house capability to develop an asset management strategy and associated maintenance investment plan.

Best practice considerations

As soon as a property asset is created it begins degrading. All buildings face this inexorable deterioration and the challenge is to judge the timing and quantum of the maintenance investment necessary to maintain the asset's fitness for occupancy.

For any asset owner the asset management plan is a vital tool. It sets out the lifecycle objectives for each asset, including its expected longevity, predicted use and its investment profile over time. Key to any asset management plan is having comprehensive data such as construction drawings and maintenance histories. Asset managers can reap long-term benefits for their organisation by recording all repairs or maintenance in a single source, along with the construction design plans.

The facilities management industry describes four broad approaches to maintaining assets.² All require investment.

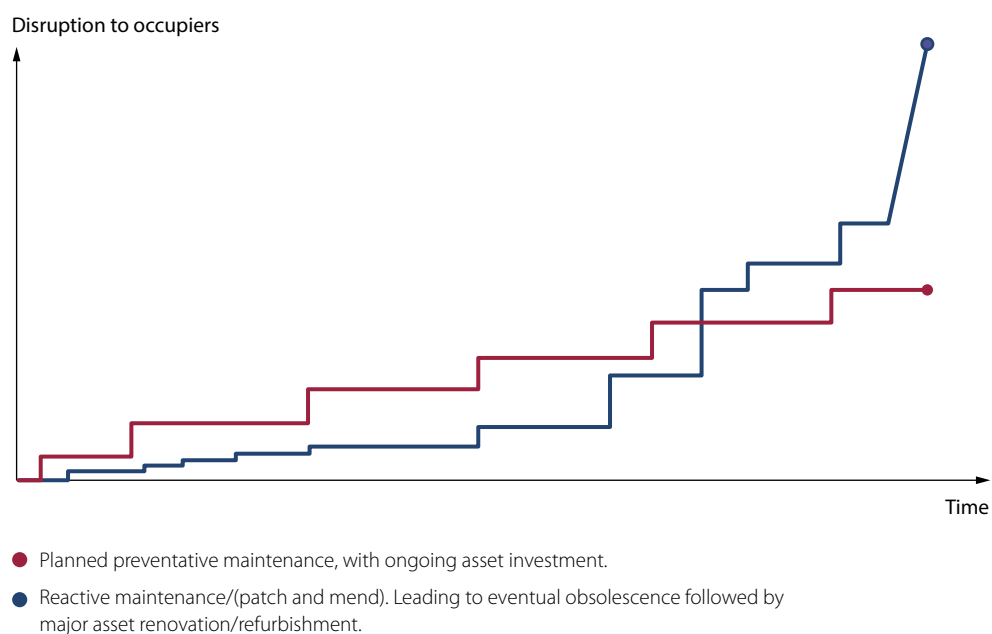
- **Run to Fail (RTF)** – the asset owner waits for plant, machinery and the building fabric to fail and then fixes it. The asset owner adopts a reactive strategy and fixes and repairs faults and defects as they arise. As time passes, the cost of keeping the asset operational increases, as does the inconvenience from the unexpected and increasingly severe interruptions.
- **Planned** – the asset owner maintains the plant, equipment and building fabric to a schedule. This involves putting a predetermined replacement and maintenance regime in place at the start. Some say this leads to a more expensive whole-life solution, as the owner replaces plant and equipment before it fails.
- **Predictive or Condition-Based Maintenance** – the owner checks on the condition of the plant and equipment for signs that it might need maintenance – using vibration testing and such like, often done via remote monitoring. This requires a sophisticated approach, delivered by highly skilled resources. Many argue that this technique produces best value.
- **Business-Focussed Maintenance** – combines all three of the above strategies. Each asset is considered on its importance to business continuity, its replacement lead times, on mitigation options (for example, whether standby generators can be hired) and on user or operational impact.

² For an overview of how the industry works see, for example, the website for the British Institute of Facilities Management, www.bifm.org.uk/bifm/about/facilities

Aside from deciding on how and when to invest in a maintenance regime, an asset owner often has opportunities to commission further capital investments. Scanning the supplier market, an asset owner can often find investment options that would reduce whole-life running costs, or simply replace outmoded plant that requires specialist labour or bespoke spare parts that have long lead times.

Over time, a reactive maintenance strategy coupled with under-investment will result in degradation of the asset, in terms of statutory compliance, reliability and all-round user experience. As time passes, the occupiers of a building that is managed in this way will experience a progressively worsening situation, with the asset degrading and the frequency and intensity of the remedial works increasing. At some point the building becomes unusable, requiring either total refurbishment or demolition and reconstruction (**Figure 1**).

Figure 1
Reactive versus planned preventative maintenance



Source: Board of Auditors

Case example

The International Criminal Court is under construction in The Hague. On completion it will follow a planned maintenance regime, with a ring-fenced 'sinking fund' to pay for the cost of the predicted maintenance effort over the asset lifetime. The aim is to avoid asset degradation and ensure funding continuity in line with whole lifecycle replacement demands.

Theme 2: Getting the best possible start

The CMP had a hesitant start, originating in the late 1990s when the need for the refurbishment programme gradually became apparent. A series of relatively broad-brush cost estimates and outline plans were met with resistance, challenge and delays; the project suffered both from a lack of sponsorship and low momentum in these early years and from the resignation of the original project director.

The CMP eventually got the go-ahead in 2007, after a change of pace that came with the newly appointed project director. What became known as the 'Accelerated Strategy' (intending to save two years off the previous strategy and take advantage of available space in the Manhattan office rental market to facilitate temporary swing space for staff) was accepted as the approved time schedule. Despite the change of pace, the CMP even then did not get off to a good start, for several reasons.

- 1 **The business case did not articulate any benefits that were particularly compelling or measurable.** The case was presented primarily as a 'fix and replace' argument, although some energy savings were identified from introducing new technology. The main prize, one of moving to a desk-sharing layout, which would have greatly increased occupancy densities and saved significant rental costs around New York and created opportunities for new and potentially more productive ways of working, was not recognised as an opportunity in the business case and was not even part of the remit.
- 2 **The Administration did not establish an external independent peer review assurance process.** An architectural advisory panel helped provide a sounding board to the CMP mainly on the heritage, artwork and aesthetic or iconic building features which was useful. But there was no source of constructive independent challenge regarding the project management arrangements, progress, costs, risks and issues. The lack of external constructive challenge was a weakness exacerbated by the absence of a corporate-wide portfolio and programme management approach – it was not even possible to organise peer review support from similar projects because the central capability did not exist.
- 3 **The governance arrangements were weak,** as described in Theme 3 below. As such, early warning signs about cost over-runs and schedule delays were not picked up and acted upon effectively by the Administration.
- 4 **There were weaknesses in the risk assessment approaches and cost forecasting techniques** (see Themes 6 and 7 below). The approach to risk management and cost forecasting for the CMP relied, too heavily in the Board's view, on the expert judgements of the highly experienced project team, combined with a formulaic approach to forecasting the contingency cost, rather than on detailed risk-based analytical forecasts. This potential risk exposure might have been identified earlier had an external assurance regime been in place from the outset.

Further, the forecast costs were incomplete. The 'Associated Costs', as they became known, covering the costs of a collection of activities necessary to support the project, had not been identified. Nor were they directly under the management or budgetary control of the CMP project team. For example, additional security guards were necessary to maintain an effective security perimeter during construction; the budgetary responsibility for this resource, however, lay with the Department of Safety and Security.

The Associated Costs (some \$140 million) went un-owned and unresolved throughout most of the life of the CMP project. The General Assembly instructed in 2009 that the CMP should absorb the costs within the existing budget but there was limited room to do this.

Overall, the CMP got off to a difficult start, a factor which was to influence its delivery at every stage.

Learning opportunities

- Deploy dedicated and experienced resources to assist major projects in their early stages.
- Make sure that the business case is robust and includes a full benefits case, a robust risk assessment and mitigation approach, a strong governance arrangement and a comprehensive cost forecast underpinning the budget.
- Establish an integrated project assurance approach, especially in the early formative stages of a project.

Best practice considerations

The start of a project, when the biggest decisions are made, represents the most vulnerable time in its lifecycle. It is often when the least information is known about risks, when resources are still thin on the ground, when there is little funding support or momentum behind the early steps and when the organisation has a relatively limited understanding of the nature, scale and aims of the project. It is a time when initial ideas can become entrenched without proper challenge and review.

Building core project resources quickly

Before an organisation recognises and funds a project, the early thinking is carried out mainly by visionary people working alongside other 'day job' duties. This is an inherently risky approach because it risks missing out options and narrowing down too quickly on a costly or inappropriate solution. A key to success is in deploying experienced resources to support those early exploratory stages.

Establishing a robust business case

It is very important to establish a well-thought-through business case. Typically, this will include a statement of the drivers/needs for the project, identifying options for fulfilling them, and appraisal of those possible options, covering schedule, full costs for the total scope, risks and benefits. It will include governance structures and resourcing solutions (internal and external).

Very often an organisation will require three business cases, developed over time. The Strategic Outline Business Case will cover the main strategic options. The Outline Business Case will appraise and evaluate the front running options and consider matters such as the procurement strategy and the delivery schedule in more depth. The Full Business Case will contain robust cost estimates, and full lists of the project benefits, cash flow forecasts, risks logs and their mitigations, and a robust implementation plan. Each stage in this process provides an opportunity to revisit, develop and hone the assumptions, benefits, schedules, and most importantly the risks, their costs and mitigations.

Obtaining external assurance

In the early stages of a project there will be a high level of uncertainty and a wide range of potential solutions to explore. Obtaining external independent expert assurance about the emerging solution, before the business case develops, is a wise precaution. It gives those managing the project, and those involved in its governance processes, reassurance that all is well or early warning if it is not. It is important to note that neither the work of internal or external auditors is a substitute for an expert integrated assurance process. Numerous governments and professional project management organisations have implemented external independent assurance regimes over recent years.³

Theme 3: Governance, controls and assurance

The broad governance context

The CMP project fitted into and was delivered within the normal governance framework that applies to all UN projects, comprising the General Assembly, supported and informed by the Fifth Committee and by the Advisory Committee on Administrative and Budgetary Questions (ACABQ).

The CMP provided an annual progress report to the General Assembly and quarterly briefings to the Fifth Committee, the ACABQ and the United Nations Management Committee on the progress and cost of the project. The CMP project director also provided weekly updates on the project for the Executive Management Group chaired by the Under-Secretary-General for Management.

The CMP project was subject to regular review by the Office of Internal Oversight Services, who examined risks and controls at intervals throughout the life of the project, and an annual review by the Board of Auditors, who examined the financial statements, risks and forecasts, and other managerial issues, across the project.

3 A selection of illustrative examples of approaches to project assurance:
 Association of Project Managers, A Guide to Integrated Assurance.
 Australian government, Department of Finance and Deregulation, Assurance Review Process.
 Government of New Zealand, Major Projects Assurance Group.
 UK government Major Projects Authority.
 Government of Norway, A regime for external Quality Assurance of Major Public Projects.
 Canadian government Project Assurance Process.

Governance and the CMP

In practice, the executive control of the project, and the heart of the decision-making, lay with the Under-Secretary-General for Management and the director of the CMP. Together, they directed and prioritised the day-to-day delivery of the project design teams, cost consultants and construction suppliers working with the support of the Construction Manager.

Two advisory boards/committees provided further useful support. The Executive Management Group chaired by the project director enabled co-ordination between the various relevant groups such as the Facilities Management Service, Security, and Human Resources. This was a help to communications generally. A separate Advisory Board also helped by providing input on the aesthetic, historical context and architectural aspects of the project.

A major weakness in the governance arrangements, however, was the absence from the outset of a project board (or steering committee) to inform, advise and constructively challenge the project director in real-time. The corporate governance arrangements revolved around the annual cycle of the General Assembly and its supporting committees.

The business case, as mentioned earlier, gave a poor basis for prioritising trade-offs between cost, time and scope objectives. The weakness in the business case created a governance challenge because, lacking clarity on financial benefits or on occupancy efficiencies, the CMP project was run as a refurbishment project, with cost containment as a major objective, rather than as a benefits-yielding project.⁴

Change control

Change control was a major challenge for the CMP team. As explained in more detail in Theme 5, the contract strategy adopted by the CMP team meant that the UN held the responsibility for managing the design processes (retaining that responsibility, which was a sound decision, then meant that it became vitally important for design drawings to be issued complete and on time) and for co-ordinating the activities of the various Guaranteed Maximum Price (GMP) contractors on site. The means by which the CMP team retained control was through a change order process. A change order provides a means of instructing a contractor to do something new or different to the work specified in the existing contract. As the design developed and evolved, and in some cases ran late, it became necessary for the CMP team to issue many thousands of change orders. A backlog developed in this process, meaning that the CMP team was not as sighted as it should have been on the cost implications, and that contractors were taking a long time to be paid.

A further challenge was in managing the appetite of staff to changes to floor layouts, to proposed relocation sequences and to the emerging design drawings. The CMP team learnt from its early interactions with occupiers during the move to the temporary accommodation around New York, implementing a much clearer set of rules for subsequent engagements.

4 See Theme 2: Getting the best possible start

Independent assurance

Additionally, the UN did not have in place a policy for obtaining independent expert assurance on its projects or programmes. Other than ad-hoc external reviews, mainly to provide a second opinion on the cost forecasts, the CMP did not benefit from regular and integrated external technical, cost or project management assurance reviews. These are reviews provided by external experts (external to the project) and are not to be confused with the role played by technical experts working as part of the project team, or internal and external auditors.

With a weak benefits case, unclear accountabilities for benefits delivery and the long, time-consuming reporting cycles, the governance arrangements were a weakness all the way through the CMP project. Enormous trust, with plenty of reporting but in effect minimal corporate governance, was placed in the hands of the Under-Secretary-General for Management and the director of the CMP.

Learning opportunities

The main learning points are around the importance of distinguishing between processes that are in place for reporting purposes and processes that are in place for governance and effective decision-taking. On future projects, the UN would benefit by doing things differently in key areas:

- Streamlined, effective governance processes and effective, appropriate delegated authorities are essential for projects to achieve their desired costs, benefits, scope and time objectives. Typically, this would mean identifying:
 - a Senior Responsible Owner, SRO, accountable for the business case and benefits embedment; and
 - a project director responsible for delivering specific costs, time, scope and Benefits Outcomes.
- The SRO and project directors should be informed and advised by a project board. The role of the project board is to challenge the SRO and project director constructively and to provide support for the project as it endeavours to meet its aims. The membership of the project board would be determined by the circumstances of the project; for those with significant costs or carrying operational risk the board would include a senior member from Finance and from Facilities Management Service, together with a 'senior user' representative whose role is to coordinate, represent and communicate with users or occupiers.

- Establish independent assurance throughout the life of a project. Rather than relying on internal and external oversight as a source of objectivity and constructive challenge, the UN would benefit from establishing an integrated assurance approach. This was shown in Theme 2 to be particularly important in the early stages of a project. The aim is to support management and help them deliver strategically important and high-value programmes, not to add another layer of oversight. Adoption of a portfolio management approach spanning all the UN's capital programmes, and other major programmes, would enable a systemic assurance approach, with learning opportunities at key stages, for example:
 - project or major sub-project inception;
 - business case approval;
 - procurement decision;
 - handover/readiness for service; and
 - strategic and operational impact.

Best practice considerations

In most large, complex organisations projects, programmes and portfolios of activity are normally subject to robust stakeholder management, governance and controls, supported by a combination of internal and external assurance processes. The aim is to ensure clear accountability and responsibility for delivery and at the same time establish effective controls and limits to mitigate and manage risk without overly constraining progress.

A well-governed project typically features:

- a detailed Full Business Case, articulating the benefits, costs, scope and proposed approach;
- clearly defined project management roles and accountability;
- a project board – properly constituted and effective;
- appropriate mechanisms for change control;
- timely project reporting arrangements supporting an efficient transparent decision process; and
- effective integrated assurance over the whole life of the project.

The Full Business Case is an essential element of the governance framework, as described above in Theme 2.

An organisation usually identifies two key roles for the successful delivery of a project:

- **The Senior Responsible Owner (SRO)** develops, presents and owns the business case and is accountable for its benefits, defined in terms of outcomes (such as financial savings, increased capabilities or improved services). The SRO adopts a facilitative role with the organisation's senior management and stakeholders, becoming an advocate and champion for the project at the highest levels.
- **The Project Director** owns the delivery of the project, defined in terms of costs, scope, timescales and benefits. The project director adopts a strong delivery focus, making sure that the designers, suppliers and operators are coordinated and working consistently towards delivery of the four objectives.

Normally, the SRO has the support of a project board. The SRO remains at all times fully accountable for the delivery of the programme's benefits, scope, costs and schedule and a properly empowered board can be a strong source of guidance, constructive challenge and support.

Effective change control is essential. Changes are a common feature of major projects and programmes. Keeping them under control from the moment they are suggested, then instructed and later quantified and reported is an essential discipline, adhering to delegated powers vested in the SRO and project director.

Timely, accurate, transparent and clear progress and cost reporting are essential features on any major project. Reports should be written to inform and promote effective decision-making by the project director, by the SRO supported by the project board, and by more senior members of the organisation depending on the levels of delegated authority, and ultimately those responsible for governing or funding the organisation. Project reports should also include forecasts of the costs of future risks which, when they materialise, will subsequently reveal themselves as change orders.

As noted in Theme 2 above, independent integrated assurance is a valuable tool in the governance process. Typically, an assurance review is carried out at key stages in the life of the project, for example at the outset to validate the need and the strategic approach; after drafting the business plan and before proceeding with procurement; during delivery and before handover; soon after handover, confirming contractual completeness; and finally a few years after handover, to assess the operational and strategic success.

Case example

The London 2012 Olympic Games programme is an exemplar in transparent open access reporting. The 2012 team made project information available 'live time' in a data room to the governing body, the client sponsor, the government and external audit organisations. Making the project information available in this way greatly improved transparency, knowledge and insight as the London 2012 Games progressed. All of the best practice from the London 2012 Games can be found at <http://learninglegacy.independent.gov.uk/>

Theme 4: Roles within a programme lifecycle

The UN invested in a relatively small project team to run the CMP project, around 20–30 people. Recognising that the UN did not have an organisation-wide cadre of resource with similar experience at its disposal to draw upon, the UN supported the core UN CMP team with external resources:

- An external cost consultancy company was appointed to provide risk management and cost management support. The cost consultancy was responsible for reporting actual and forecast costs – not only the core costs of each construction package, but also the costs of all change orders and of any claims made for additional payment due to disruption.
- A construction company was appointed to lead and manage all of the construction activities. The construction company was already familiar with the New York construction market and used its expertise, knowledge, authority and reputation to manage costs and to drive progress with the suppliers.

The responsibility for delivery of the whole CMP project rested with this small core team of people. Within the team, roles were established to suit the nature of the project, for example:

- engaging with the users about floor layouts and space allocations;
- managing the design team, particularly to ensure design coherency and timely delivery;
- managing construction;
- managing progress on each of the main buildings across the campus;
- finance and funding management;
- procurement;
- legal;
- reporting; and
- commissioning.

In practice, this approach worked reasonably well, although the small core team had little flexibility to grow or shrink in line with the workload, due to the inertia of the UN's recruitment and redeployment processes. Instead, the team was able to cope with peaks and troughs by drawing on resources from the cost consultancy and the construction company to help with the various phases.

With hindsight, however, there were some challenges that the team struggled to address. For example, the effort put into the initial user consultation process was not sufficiently intense to create genuine engagement or authoritative direction when required and the early migrations into the temporary swing space proved difficult.

Design management was a constant challenge for the CMP team. Significant percentages of the buildings across the campus were occupied by staff during the time when the initial design was being carried out. As such, the designers had to rely on assumptions supported by limited data about the true nature of the underlying structures. Only when the buildings were fully vacated could full information be derived. This inevitable delay put pressure on the design process, as did the challenge of coordinating the design across the various packages of work.

There was considerable advantage in retaining most of the responsibility for design management, but it also exposed the CMP to a high level of risk, as described in Theme 5 below. In hindsight, the CMP underestimated the challenge that would come from the design coordination process and from ensuring that the emerging design kept pace with the need for information from the construction process. Consequently, contract packages went out to competition in the construction market with designs less developed than they should have been, exposing the UN to risk from subsequent changes.

Another area where, with hindsight, matters should have proceeded differently was in the engagement with the Facilities Management Service (FMS). As already discussed, the UN does not have an over-arching approach to asset management.⁵ Early interactions with FMS informed the specification for the refurbished building, but with hindsight that level of engagement was too light. FMS should have been engaged more deeply at the outset and more purposefully throughout the life of the CMP. At a practical level, this resulted in a weakness in the readiness for handover, with FMS struggling to manage the assets or support them with appropriate supply chain contracts. At a strategic level, it meant there was little fit between the immediate post-completion support activities and the absent long-term asset management plan.

A strong positive feature of the CMP project was the way the management from the core project team, the construction company and the external cost consultant were co-located. This enabled rapid communications and issue resolution. It created a feeling of common purpose and single-mindedness, which was a great help in delivering the CMP project. The external designers, however, did not co-locate in this manner, which was a drawback. Ideally, all the main elements of the project team, irrespective of their corporate identities, should co-locate.

5 See Theme 8: Portfolio management and organisational capability.

Learning opportunities

The main lesson learnt on the CMP project is in recognising how the roles of the project team inevitably have to vary as time passes on a project and that a high degree of flexibility will be required in terms of ensuring an appropriate resourcing strategy. In particular, it is important to:

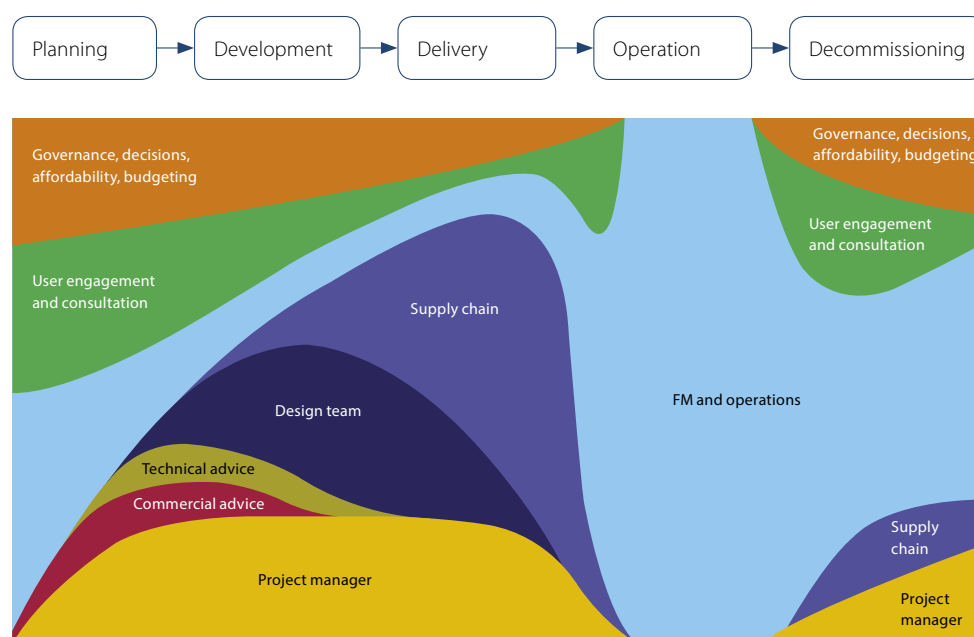
- establish an integrated and, as far as possible, co-located team;
- create an effective user consultation process. The key to success lies in establishing an effective project board, which will include a 'senior user' with a strong consultative and communications remit;
- manage the design teams robustly, so as to ensure effective design coordination between contract packages and timely delivery of design drawings and specifications; and
- ensure that the Facilities Management solutions are embedded from the outset, firstly to ensure compatibility with the long-term asset management plan and secondly to ensure that the handover process is robustly supported.

Best practice considerations

The level of activity and focus of those contributing to a project varies enormously with time as projects move through the various phases from start to finish, as indicated in **Figure 2**.

Figure 2

Relative roles during a project's life



Source: Concerto partners

In the early stages the initial concepts are often managed and developed by a small core team, carrying out consultations with the occupiers, users and maintenance groups about the project's scope and requirements. As time passes the project team, led by the project director, will grow and strengthen in line with the increasing workload required to prove the initial design concepts and prepare full business cases.

Once the organisation has approved the business case, the number of people working on the project usually swells significantly. Designers and constructors come on board through formal procurement channels, while the degree of interaction with the users abates as the majority of the effort switches to delivery. Towards the end of construction the size of the site workforce begins to diminish and the users or occupiers become more engaged again, especially those teams responsible for maintaining the asset.

Following what is normally a long operational period, the asset may eventually have to be demolished and cleared away or replaced, in which case further engagement activities start up again with the formation of a project team and the procurement of suppliers to carry out the necessary demolition works.

To be at best practice in this area means being ahead of the game in terms of resourcing, and having the right people in place ahead of time, being able to cope with the ebbs and flows of the demands of the project as it moves through its different phases. This therefore requires good planning and anticipation and it requires a flexible resourcing model through which the project team can access the right sort of resources at the right times.

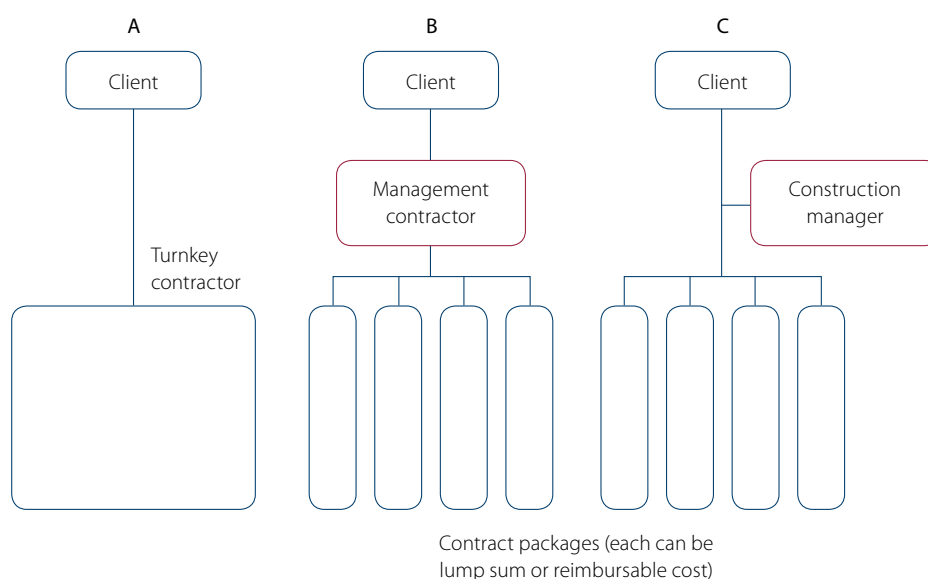
Theme 5: Commercial and procurement strategies

The CMP team recognised very early on that the full scope of the whole campus renovation project was not predictable at the outset. It was impossible to know what the whole design solution would be at that stage, because the condition of the assets could not be determined without stripping away the existing fit-out and inspecting the whole structure in an unencumbered condition. This insight proved right as in due course substantial volumes of asbestos were removed from the campus buildings, which demanded both care and time, and structural reinforcement was required in some areas, which could not have been foreseen. Higher standards of structural security emerged during the project lifetime too – imposing a major upheaval in terms of the design solution and schedule progression. The success of the whole project was destined to depend on the CMP team having flexibility in its contractual mechanisms to cope with substantial levels of change as time passed.

As such, this ruled out a lump sum/fixed price/turnkey solution because the level of uncertainty was too high; to attempt such a solution would have required the UN to agree to a significant risk premium in the contract price – assuming that a contractor could be found in the construction market in the first place willing to take on that level of risk and participate in such a deal.

After careful consideration the CMP project team elected to appoint a lead contractor organisation to work under a direct contract with the UN to procure and manage smaller contract packages, following Option B shown in **Figure 3**. The lead contractor received a management fee for its services in addition to direct cost reimbursement.

Figure 3
Contrast strategy options



Source: Board of Auditors

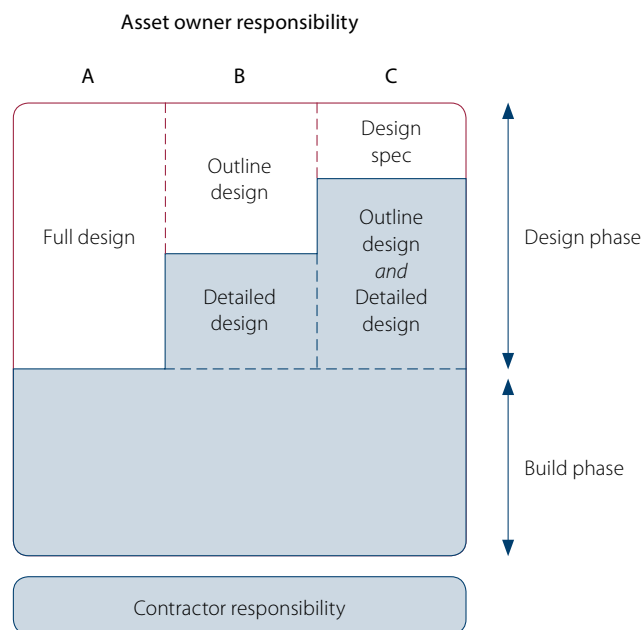
This package management approach created flexibility for the UN as the CMP team could make progress on a more local basis without knowing what the full solution was. For example, work could start on reconfiguring the basements as an early package of work, without knowing what all the design answers were in the three buildings above.

The CMP team, supported by its lead contractor, ran competitions in the global construction market to identify other contractors who could deliver defined packages of work under Guaranteed Maximum Price contracts. When tendering for such work the bidders provided:

- firm prices for work that could be fully defined; and
- schedules of cost rates for other work that was thought necessary but which could not be fully defined at that stage. The schedules of cost rates were subsequently used to calculate the costs when the design solution or specification later emerged.

The CMP team faced early on a key decision about how to organise and manage the design process for delivery of the project. Traditionally, there are three broad options, which are shown in **Figure 4** below. Option A means that the client team has responsibility for developing the full design, whereas at the other end of the scale under option C the client merely produces a design specification and then the contractor completes the design. There are benefits and disadvantages either way with any of the three routes shown in Figure 4 – towards option A the client has the advantage of retaining full control of the design, but loses the opportunity for contractors to innovate and take responsibility for design coordination. Towards option C the reverse opposite occurs – minimal ability for the client to influence the design but maximum contractor innovation and design coordination responsibilities.

Figure 4
Different ways of organising design responsibilities



Source: Concerto partners

After careful consideration, the CMP team chose a solution closer to Option A in the diagram above, namely to keep control of the design and to retain responsibility for design management. Teams of designers worked under the direction of the CMP team, supported by the external cost consultancy, which also took on a design project management role as the CMP project progressed.

This was highly advantageous, given that the design had to evolve and adapt at regular intervals as new information emerged about the condition of the asset. The approach carried significant responsibilities, however, as the CMP team had to ensure that the designs were properly coordinated between the packages, producing an integrated solution that joined up properly. It meant that the CMP team was responsible for ensuring that information was released on time, thus avoiding claims for delay or disruption. In reality, however, the CMP struggled to keep pace with the demands of the construction process and on several occasions packages were procured based on incomplete design information. This in turn created risks and meant that numerous (over 3,000 to date) change orders were required to clarify design details or to coordinate design information at package interfaces.

In selecting a GMP contract packaging approach led by a main contractor and in choosing to take full responsibility for the design, the CMP project positioned itself at the 'maximum control with maximum responsibility' end of the scale. Given the circumstances, with the high degree of change anticipated on the project, the two choices still make good sense in hindsight. It was, however, a contract strategy that left the UN exposed to the vast majority of risks arising on the project, from late design completion, inaccurate design and coordination between the package contractors. Where the CMP faced difficulties was in the execution of those strategies – with design management being a particular challenge. The design management process failed to keep pace with the construction schedule, and for that the CMP did carry the risk and in due course felt the consequences in terms of schedule delays and cost over-runs.

It will never be known whether setting a different contract strategy at the outset would have produced a different outcome, either in terms of preventing the delays which set in or in terms of preventing the cost-overruns, which became inevitable as the work progressed.

What was evident, however, was that the CMP team did face substantial logistical and coordination challenges in keeping the design on track. The construction process, once started, needed feeding with design information at the right rate in order to prevent delays setting in. A substantial backlog of change orders developed, meaning that the cost position was uncertain.

In hindsight, while the contract strategy was probably correctly configured to suit the phased delivery solution, the core team was inadequately resourced to maintain full oversight and timely control of the process.

Learning opportunities

There are substantial learning opportunities associated with the way the CMP team selected and then organised the contract strategy on the delivery of this major refurbishment contract.

- The choice of a 'packaged' contract strategy enabled work to progress when substantial parts of the scope were unclear or could not be determined at the time. This choice created a significant time advantage by allowing work to start in some areas before the full scope became known but it inevitably created risk for the UN as the total cost of the whole campus-wide refurbishment will not be known until the last contract package has been agreed. It also meant that the CMP team was responsible for the risks of poor coordination between packages.
- The contract strategy created a necessity for design management of the highest order. If the UN wishes to follow a similar contract strategy in the future, ie one based on multiple GMP contracts whose scope only crystallises as time passes, then the project team's design management capability must be excellent.

Best practice considerations

Selection of a commercial policy and strategy is one of the most important decisions an asset owner can make. This covers an organisation's funding arrangements for the project and its appetite to risk, to risk mitigation and incentivisation, and broadly how to go about keeping the project under control in order to deliver its stated benefits.

After that comes the procurement policy and strategy (how to shape the market and go about buying the required contract services). Within this overall process, a vital decision for the asset owner to make is the responsibility for management of the design.

It is important to consider each of these decisions explicitly, document them and obtain sign-off from the project board. The key decisions include:

The commercial policy and commercial strategy, including:

- funding;
- whole lifecycle cost management approach;
- risk management, mitigation and incentivisation; and
- lump sum v target cost v reimbursable commercial regimes.

The procurement policy and procurement strategy, including:

- market engagement; and
- contract packaging/bundling.

The design policy and the design strategy, including:

- the balance between client-retained and contractor-delivered design;
- market engagement approach and shaping; and
- design contract packaging/bundling.

Theme 6: Risk and contingency management

The concept of contingency cost forecasting and management is not one that sits comfortably in the United Nations, where the normal practice is to award contracts with low levels of contingency. On a project such as the CMP, with a wide range of uncertainty and facing significant scope, timing and technical risks from the outset, these established contingency working practices can quickly become a constraint that affects progress and pushes up cost unexpectedly. The UN's normal operating procedures do not support the concept of risk-based contingency management, nor of project-wide contingency management.

The CMP team therefore followed a simplistic approach to risk and contingency management both in the pre-tender phases and during the life of each GMP contract.

- Pre-tender, the budget for each GMP package included a blanket 20% contingency cost allowance.
- Once each GMP contract had been awarded the contingency allowance was set at 10% of the tender price.

This formulaic approach had an advantage of simplicity, but the fundamental disadvantage of masking the true forecast costs of the risks.

The few risk assessments that the CMP carried out did not drive the contingency cost calculations, rather they were self-contained and separate exercises. In the first few years of the CMP project these risk assessments were conducted at a detailed level once a year, with interim updates taking place every six months. Over time, the risk assessments were updated more often.

The Board of Auditors commented on this unsatisfactory position regularly as part of its annual audits of the CMP programme. The concerns were threefold:

- the simplistic application of contingency allowances bore no relationship to the potential levels of risk in each package;
- there was no formal programme-wide mechanism available to the CMP management team to retain contingency sums for programme-wide risks. There was no formal method to hold a contingency reserve above the GMP level, either managing surplus contingency or for reallocating it towards newly emerging risks; and
- the reporting of contingency lacked transparency. The levels of contingency, either used or remaining, were not separately reported, nor the reasons for its use.

In short, this resulted in the true position regarding risks and the potential for cost rises being unclear – certainly from an outside governance perspective as the cost forecast became increasingly hard to understand.

One of the risks that a long-running project will usually face is that of construction price inflation. Most projects make an explicit allowance for this risk in the financial cost forecasts. The CMP project correctly recognised this risk at the outset, reporting the quantum of the ‘escalation’ allowance as it was called. As the project progressed, however, the escalation allowance was included with the remaining contingency allowance. The provision was eventually used, but without a clear justification being provided for the level at which it had been set, or for its use. It essentially was absorbed into the contingency as a whole.

The CMP’s whole approach to contingency management, inflation provisions and risk provisions was unclear to member states throughout the life of the project.

Learning opportunities

The UN now has an opportunity to adopt a more systematic approach to risk management and contingency management. There would be benefits from:

- assessing risks and calculating their probable weighted cost impacts each month;
- basing the forecast contingency sum required for the remainder of the project on the quantified regular risk assessment and being aware that the forecast can rise or fall as time passes and risks reduce or increase, or new risks arise;
- explicitly stating the risk of price inflation, and the underlying assumptions, in the project budget, and reporting on this separately to donors, with the potential to return this funding to donors if not needed;
- modifying the corporate governance policy to enable contingency sums to be held at;
 - contract level under the direct delegated authority of the project director; and
 - project-wide level under the control of the SRO endorsed by the project board.

Best practice considerations

Modern best practice is for programmes and projects to be driven by their risk management processes, with the risk register and associated mitigating actions frequently updated and a clear link maintained between the **contents of the risk register** and **the expected costs should those risks arise**. Those expected costs, usually termed the contingency costs, comprise subcategories that often include:

- a cost allowance for the effects of inflation (which can be a material factor on a long-running project), separately justified and reported based on robust data;
- an allowance for the costs of foreseeable risks; and
- an allowance for the risks of unforeseeable risks.

The contingency cost allowance must be fundamentally linked to managing risk, with no assumption that it will all be used, an understanding that any unused contingency can be returned to funders, but at the same time available for use should a well-justified reason arise (a key task for a steering committee or project board would be to examine any justification put forward for use of the contingency). Accepting these principles drives a different way of managing and governing the contingency funding, rather than allowing it to be solely controlled and used by those directly managing the project. For example, GMP package-level contingency monies should be held and managed by those best able to manage risks on each GMP (ie the UN project manager), programme-wide contingency monies should be held by the programme director, with some pre-defined risks held at Programme Board level. In this way, with total transparency of risks at all levels, the mitigation responsibilities are placed with those best able to take informed action.

Risk management and mitigation accompanied by benefit maximisation should be at the centre of a project's management philosophy. All processes and priorities on a project should be directed to mitigating risk and maximising benefits. Modern risk management processes revolve around the project team assessing the risks and their impacts in terms of costs, benefits, schedule and scope or performance outcomes on a regular basis (usually monthly) from both a pre-mitigation and post-mitigation perspective.

The project team then calculates the likely impact of those combined risks based on the individual probability of their occurrence. The calculation method adopted can vary from simple tabular summation of the weighted probabilities through to sophisticated risk-modelling techniques using dedicated software. Pragmatic asset owners, supported by experienced project directors, often adopt the first approach rather than the second.

Having computed the net probable cost impact of all the known risks and having made an assessment of the cost of future as yet unknown risks, for example by benchmarking or by trend analysis, the project team will then reforecast the contingency cost allowance and use this information to update the project total forecast.

Theme 7: Cost, time and outcome forecasting

The Board of Auditors reviewed as part of its annual audit the CMP's approach to forecasting the total costs of the project, finding combinations of good practice and significant flaws.

What the CMP did well was to break the total scope of the job into smaller packages, procuring each one separately and reporting the costs accordingly. Each contract package procurement exercise was preceded by an independent cost forecast from the cost consultant, together with a higher-level cost estimate from the construction manager. The contractor's bids, when they were opened as part of the bidding process, were compared against these independent numbers. Anomalies were queried and clarifications issued. At the end of that process the CMP team, informed by the construction manager and by the cost consultant, had a good understanding of the tendered cost structures. This informed the forecast total cost for each GMP contract package. That part of the cost forecasting process matched good practice and was robust.

The weakness with the cost forecasting process was that, as described in Theme 6, the UN has a formulaic approach to forecasting the costs of risks, applying a 20% contingency cost allowance before a contract is awarded and a 10% allowance after award. Such a cost forecasting approach was flawed in that it was not based on the true estimated costs of the risks. The Board commented regularly on this forecasting weakness but the CMP team did not adopt a more comprehensive cost forecasting technique.

As a consequence of that approach, the total cost forecast would tend to remain relatively stable for long periods, with the 10% contingency sum being utilised as a source of funding for numerous change orders associated with design development and design coordination. Cost stability prevailed until a major risk materialised, at which point the cost forecast would be re-examined and a new figure reported to the General assembly. In this way, the CMP's cost forecasts inevitably understated the true position and the life of the CMP project was punctuated by apparently unpredictable cost shocks.

A more informed approach to forecasting risks and to relating the costs of those risks to the total cost forecast would have given earlier warning to stakeholders about the true cost position and would have provided earlier opportunities to make trade-offs between the scope, time and cost objectives.

Learning opportunities

The formulaic approach to contingency management did not serve the UN well on the CMP project. The learning point is that contingency should be estimated from the ground up, based on an appreciation of risks and their probable cost impacts plus an allowance for unknown risks or costs derived from trend analysis or benchmarking.

The monthly cost forecasts should be genuine estimates of the total final cost of the project, based on all known information about the procured contracts, about future procurements, about change orders that have been agreed, about those that are known about but not yet agreed, and lastly about the forecast cost allowance for risks.

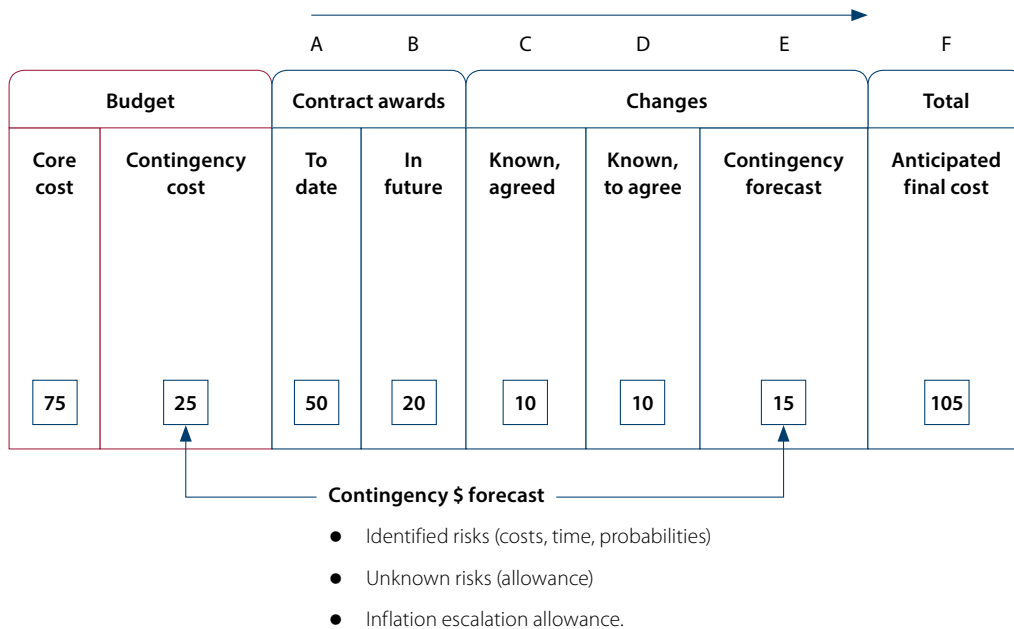
Best practice considerations

Most asset owners follow a common path when forecasting a project's costs. Typically, the anticipated final cost is arrived at by working from left to right across the table shown in **Figure 5**.

The anticipated final cost (shown in column F) is the sum of the costs of:

- A** The contracts awarded to date.
- B** The contracts expected to be awarded in the future.
- C** The change orders instructed and agreed to date.
- D** The changes orders instructed to date, awaiting confirmation of the scope or cost records.
- E** A contingency cost forecast for future risks.

Figure 5
Approach to cost forecasting



Source: Board of Auditors

A and **C** represent costs that are certain – they are agreed and are part of the contract payment mechanism.

B and **D** represent costs that are less certain – typically, some information is available but the cost forecast will involve assumptions as well.

E is the least certain cost. It is usually derived from a risk analysis as described in Theme 6, supported by a cost estimate for remaining unknown risks, which can be derived by benchmarking, by trend analysis of the changes to date or by judgement.

Figure 5 contains an illustrative example – showing how the budget of \$100 is forecast to be exceeded by \$5 due to the forecast costs of future risks.

This philosophy, and approach to forecasting the final costs is commonly accepted practice across most projects, although the presentation and format may vary from one asset owner to another.

Theme 8: Portfolio management and organisational capability

When the CMP was conceived the UN, despite having an extensive real estate portfolio, did not have a portfolio-wide management approach to planning or managing its global asset base. The practice at that time, in the late 90s, was for projects to emerge individually, to have their business cases assessed as one-offs and, after approval, to make progress on their own. This is an important point: working in isolation meant that the CMP could not benefit from or be supported by an already-established capability group or centre of excellence. There were also few existing standards and policies to draw from. Nor was there a cadre of project and programme managers potentially available for deployment onto the CMP project. The CMP was therefore delivered very much as a discrete project, not part of a coherent planned global portfolio of activity, and it was not supported by organisation-wide estates management processes or resources, or any framework for the delivery of major projects.

The UN's response to this capability and capacity shortfall was to search the construction management market for suitably skilled and experienced people, recruiting them to lead the CMP on fixed-term contracts, supported where possible by internal administrative staff already employed by the UN. This approach had the advantage of enabling the UN to pick the best people for the senior roles from the market. It carried a major disadvantage, however, because the recruitment lead time was typically 12 months. The CMP lost momentum in its early stages when there was a change of project director and after that it was not easy to adjust upwards or downwards its resource profile when the workload and required capability demands changed. There was a risk of poor continuity throughout the project; there was no 'Plan B' that would have coped with senior staff losses and there was inadequate corporate strength in depth.

Another disadvantage arising from the one-off approach taken by the UN was that there were no corporate occupancy standards in place for the quality of the fit-out, occupancy densities, standard office and floor layouts/specifications and so on. The CMP had to solve all of these challenges from scratch. The CMP in fact made a lot of progress, considering those circumstances, in standardising the physical solutions (there are now far fewer office variants for senior staff and limited desk size choices for other staff) but, working without corporate guidance or structures, the CMP never managed to bring the UN anywhere close to international occupancy standards of space allocation, desk-sharing, home working and mobile working.⁶ Had it done so, higher occupancy densities would have considerably reduced the requirement for temporary and long-term rental space elsewhere in New York. Achieving this would have entailed a wider change management remit, beyond the immediate scope and objectives of the CMP.

⁶ For example, in the UN the space allocation per person is above 250 square feet, whereas in the UK government it is between 120 to 150 square feet (with an established target of 80 to 100 square feet that departments are working towards).

Learning opportunities

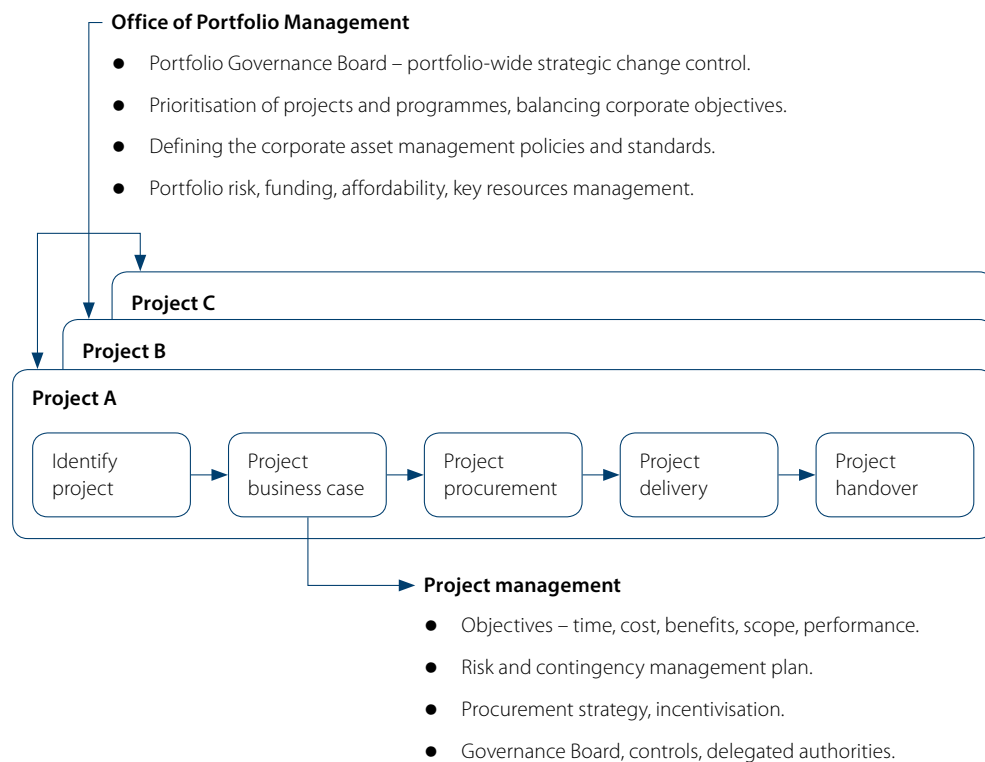
There is a strong need for a corporate UN integrated portfolio management approach to asset management, with a central unit responsible for:

- Portfolio planning.
- Policies and standards.
- Business plan coordination, presentation and prioritisation.
- Resource deployment onto key projects at project director-level and Project Management Office-level.
- Sharing and promoting best practice.
- Providing portfolio-wide estates and project management systems.

Figure 6 overleaf shows how an Office of Portfolio Management (OPM) could work in the UN. It would interpret the UN's wider corporate strategy and would understand the operating environment and affordability constraints across the whole landscape. The OPM would be responsible for managing the competing tensions and priorities between projects and programmes across the whole of the UN whatever the nature of the work, ranging from real estate projects to IT projects to business change programmes.

The OPM would ensure consistent policies and standards are in place across the UN. It would develop and implement new standards for asset management and other business areas where there is no current capability. In areas where consistent policies and standards already exist, which may be the case, for example in ICT, the OPM would only have to fulfil the portfolio prioritisation role.

Figure 6
Adopting a portfolio planning approach



Source: Board of Auditors

Best practice considerations

Many organisations with large real estate portfolios establish a capability to coordinate and manage project, programme and portfolio activities across the entire estate. This enables the organisation to develop a cadre of talent that can deploy from one project to another, to adopt a consistent approach when delivering projects and programmes and, crucially, to define and maintain estate-wide standards for quality, brand identity, occupancy densities, maintenance investment and capital programme delivery. Typically, a portfolio asset management director will be responsible for:

- 1 setting policies and standards that apply across the whole estate;
- 2 leading and being accountable for integrated portfolio planning, budgeting and priority setting;
- 3 portfolio-wide resource management (for example, deployment of scarce resources);
- 4 learning, capability-building and best practice promotion;
- 5 establishing and maintaining organisation-wide asset management information systems and asset registers;
- 6 procuring services such as facilities support, communications networks, IT and construction delivery;
- 7 programme and project management of major investment in new or existing assets; and
- 8 acquisitions and disposals activity.

Depending on the physical spread of the estate, the central unit may choose to delegate or devolve certain activities to country-specific teams. The first six activities in the list above are often the direct responsibility of the centralised function, with project and programme management delivery, depending on project workload, often devolved to the relevant countries.

Case example

A national Foreign Ministry has properties in many countries around the world.

It has implemented a global portfolio management approach. Its rolling ten year portfolio plan is informed by asset condition surveys, by government policy changes and by user requirements.

The ministry's Estates and Security Division prioritises and organises work across the global asset base and is responsible for policies, standards, and budget and resource prioritisation. Projects and programmes, once approved by the corporate centre, are either delivered locally or by the central estates team.

