Heathrow Expansion

Capital Governance Framework

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Jacobs

Heathrow Expansion - Capital Governance Framework

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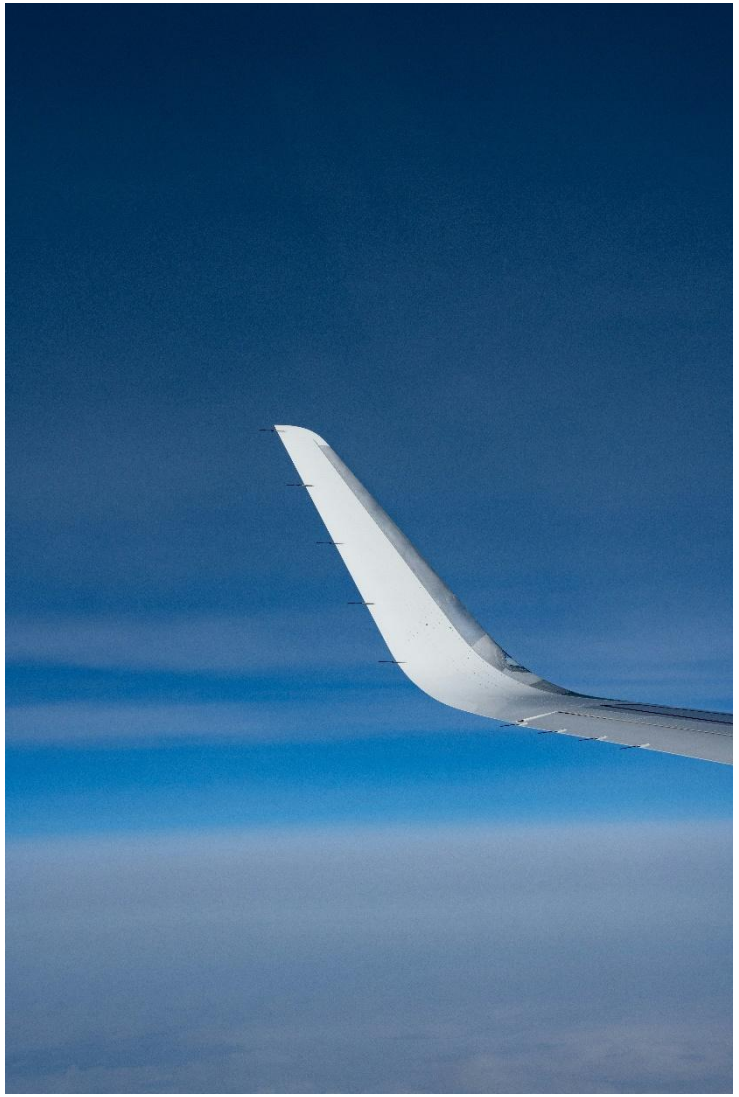


1. Executive Summary

The Study

Heathrow Airport Limited (HAL) has commissioned Jacobs to assess whether its current capital governance framework is suitable for delivering the Heathrow Expansion programme. This review responds to the UK Civil Aviation Authority's (CAA) recent working paper (CAP 3195), which outlines regulatory model options and evaluation criteria. The study examines whether HAL should continue with the Business as Usual (BAU) governance model used in the H7 period or adopt a strengthened approach that is aligned with the risks and complexity of the expansion programme.

Findings

Global Capital Governance Guidance for Mega-Projects

- General good governance principles are assurance, transparency and clearly defined roles.
- Approaches vary between countries and cultures depending on their specific market context.
- Governance structures are influenced by external factors (e.g. governmental set up and political factors).

Governance: Airport Mega-Projects

- Effectiveness of governance models is highly dependent upon the structure selected.
- Proportionate and targeted stakeholder involvement can help drive successful airport programmes.
- Regulator involvement can range from active participation through to minimal involvement.

Role of Stakeholders in Mega-Projects Governance

- Structures must be tailored to account for specific programme context and complexities.
- Independent third parties can strengthen governance by providing impartial oversight and assurance.
- Early definition of stakeholder roles and responsibilities mitigate risks through the lifecycle.

Governance: Regulated Infrastructure Mega-Projects

- Governance structure must be tailored to each mega-programme's unique context, scale and complexity.
- Effective governance should be underpinned by robust assurance, clear accountability and monitoring.
- Governance models should evolve throughout the project lifecycle as complexity and risks change.

Practices in Setting Capex Incentives

- Projects with bespoke commercial agreements can give airlines a role in setting and monitoring incentives.
- Project that are economically regulated can have capex incentives linked to performance.
- Self-funded capital projects don't typically use capex incentives due to financial risk profiles.

Application of Global Practices to Expansion

- Emphasising the benefits of providing long-term (15+ years) certainty to the developer and stakeholders.
- Flexibility to adapt scope and governance as the project evolves allows bespoke frameworks for complex projects.
- Delivery models work best when the client is highly capable and can manage complex projects internally.

Mega-Project Cases Studied


Project: HS2 Project: HARP


Project: Heathrow T2


Project: Heathrow T5


Project: Crossrail


Project: Frankfurt Airport – Terminal Programme


Project: Dublin Airport North


Project: O'Hare 21 Concept


Project: Sizewell C


Project: Western Sydney Airport

Conclusions

- Bespoke capex governance models can be successfully applied to separable elements of programmes.
- Governance frameworks should be sufficiently flexible to allow for evolution of requirements during phases.
- The effectiveness of assurance processes largely depends on how frameworks are implemented in practice.

Recommendations

- Create a bespoke governance and funding framework for Expansion.
- Introduce independent, programme-specific technical and financial assurance.
- Tailor CAA and airline involvement to project needs, with clear baseline and change-control mechanisms.

2. Terms of Reference

Heathrow Airport Limited (HAL) has engaged Jacobs to investigate capital governance arrangements that are suitable for the once in a generation Heathrow Expansion. This is in response to the UK Civil Aviation Authority (CAA) and its working paper on regulatory models (CAP 3195). The CAA Working Paper sets out a framework for assessing regulatory models for expansion, with reference to 6 key criteria, including: efficiency, deliverability and impacts on outputs and competition. It also outlines a longlist of potential governance models, using 9 stylised categories of models, with reference to case studies where these models have been applied elsewhere.

This study seeks to identify whether HAL requires a capex governance model that is different from the existing framework applied by the CAA, most recently for the H7 period. The existing capex governance arrangements are referred to as Business as Usual (BAU) governance arrangements in this study.

Given the breadth of the topic, the terms of reference for this study looks at the following key themes:

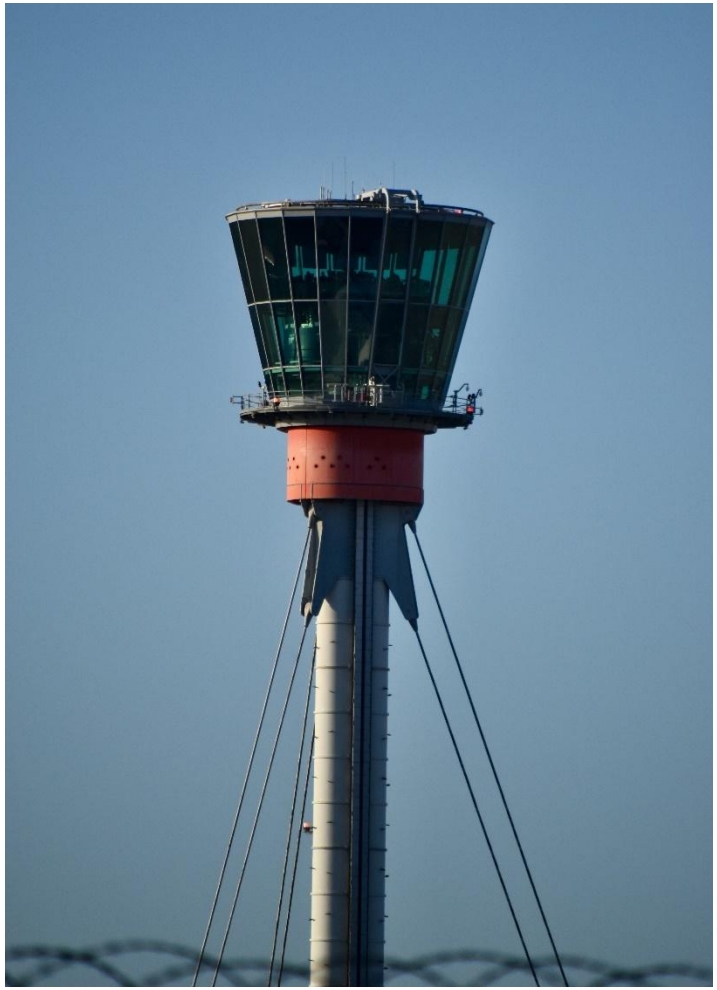
1. Appropriateness of BAU governance arrangements for Heathrow Expansion.
2. Strengthening governance arrangements based on global capital delivery practices.

To evaluate these two themes, the study assesses the following areas of capital governance frameworks:

1. Approaches to decision making with mega-project delivery.
2. Role of customer stakeholders in the mega-project lifecycle.
3. Mega-project assurance practices.
4. Capex incentive regimes on regulated mega-projects.

The analysis for this evaluation is undertaken by examining ten case studies of mega-projects that are either completed or in construction.

The approach to selecting these case studies is described in Section 4 and looks at a sample of UK mega infrastructure projects in addition to comparable international airport mega-projects.



3. Introduction

Key Takeaways:

- £33 billion in investment for Heathrow Expansion is unprecedented and unique in UK aviation for scale, cost and delivery effort.
- H7 capital governance framework is unlikely to be fit for the significantly different nature of Heathrow Expansion, requiring a different set of principles.
- Lessons from other mega-projects delivered or in delivery for regulated infrastructure and airports provide a guide to these principles regarding appropriate governance.

Heathrow's generational expansion

Heathrow Expansion is underpinned by the construction of a third runway, situated north-west of the airport together with a new terminal complex. This will add up to 276,000 flights a year for passengers and cargo. It is the most significant and complex airport expansion in the United Kingdom which involves a sequence of activities that have consequences for the existing airport precinct, the M25 motorway, adjacent communities and the overall ambitions of UK's economic growth and sustainability targets. The unprecedented complexity of delivering Heathrow Expansion ('Expansion') will require the concerted effort of HAL, the CAA and the airport community. With an estimated £33 billion (2024 prices) of capital expenditure and over a decade of delivery activities, the scale of Expansion requires a governance framework that enables success for the range of stakeholders that it impacts.

As a once in a generation airport mega-project for the UK, London and Heathrow, the capital governance framework needs to account for these unique features of Expansion. The scale and long lead times to deliver the benefits of Expansion will require efficient mechanisms to avoid incremental delays and financial risks to the mega-project.

Today's capital governance framework

The framework introduced for the H7 period (2022-2026) substantially changed the risk profile of capital delivery at Heathrow. The updated model transitioned the approach capital efficiency away from *ex-post* to *ex-ante* capex determination whilst adding in further challenges to project delivery through wide ranging delivery obligations. In practice, HAL has responded to these changes with increasing evidence of what has been efficient for capital delivery and what has added burden to enable timely progression of projects.

Expansion will need different principles whilst preserving good governance

The capital governance framework adopted for H7 is unlikely to be effective in delivering Expansion. For instance, the level of granularity required under the existing framework is burdensome for BAU delivery with external approval requirements and acceleration of activities that utilise significantly more resources earlier in the project lifecycle. Expansion as a mega-project will need to adopt a different approach but may only need incremental changes to unlock efficiencies that balance with good governance. Lessons can be learned from other mega-projects that have been recently delivered both in the UK and globally.

Lessons drawn from regulated infrastructure and airport mega-projects

Although Expansion is unprecedented in the UK, there are lessons to be learned from mega-projects that have been recently delivered or under construction. From HS2 to Sizewell C, good and poor capital governance has significant impacts on the success of a mega-project and ultimately delivering benefits to the consumer.

Similarly with the exploding growth in air travel globally, airport mega-projects have been delivered with comparable scope in comparable markets. If lessons from UK projects address the needs of the domestic capital delivery environment, airport mega-projects provide lessons in the unique environment of the aviation sector.

Optimal capital governance frameworks have consistent themes for mega-projects

Scanning the horizon of capital governance frameworks from policy level through to individual mega-project case studies, consistent themes emerge domestically and globally. Key areas of good and poor approaches address decision making, investment discipline, programme assurance, stakeholder management and the right incentives.

4. Methodology

The methodology adopted for the selection of case studies to examine takes a broad ranging approach that cuts across geography, regulated infrastructure asset classes and airport mega-projects. Six criteria are identified:

1. Scale in terms of costs
2. Comparability in terms of scope
3. Comparability in terms of timescales
4. Complexity in terms of technical delivery
5. Comparability in terms of regulatory and policy environment
6. Availability of information

An initial long list of 25 mega-projects was assessed to derive a short list of ten. The list is shown in Exhibit 1.

Cases were selected based on information publicly available as part of a desktop study or where Jacobs have experience with the case. Material included in cases is based on interpretation of information available.

Exhibit 1: Long list and short list of case studies

Item	Mega-project	Location	Sector	Shortlisted
1	Crossrail	UK	Rail	Y
2	Dublin Airport Runway	Ireland	Aviation	Y
3	Frankfurt Airport new terminal programme	Germany	Aviation	Y
4	Heathrow Terminal 2	UK	Aviation	Y
5	Heathrow Terminal 5	UK	Aviation	Y
6	High Speed 2 (HS2)	UK	Rail	Y
7	O'Hare 21 (Chicago Airport)	USA	Aviation	Y
8	Sizewell C	UK	Nuclear	Y
9	United Utilities HARP	UK	Water	Y
10	Western Sydney Airport	Australia	Aviation	Y
11	Bangkok Airport 3rd Runway	Thailand	Aviation	
12	Berlin Brandenburg Airport	Germany	Aviation	
13	California High Speed Rail	USA	Rail	
14	Delhi Airport Terminal 1	India	Aviation	
15	DFW New Runway	USA	Aviation	
16	Hinkley Point C	UK	Nuclear	
17	Hong Kong Airport 3rd Runway	Hong Kong	Aviation	
18	Lower Thames Crossing	UK	Roads	
19	Melbourne Metro Rail	Australia	Rail	
20	Navi Mumbai Airport	India	Aviation	
21	Norwich to Tilbury	UK	T&D	
22	Sabiha Gocken Airport new Runway	Türkiye	Aviation	
23	Solidarity Transport Hub (New Warsaw Airport)	Poland	Aviation	
24	Thames Tideway	UK	Water	
25	Toronto Pearson Airport programme	Canada	Aviation	

The longlist of 25 mega-projects was reduced to a shortlist of ten by assessing the projects against six equally weighted criteria.

1. Scale in terms of cost

The case studies were assessed in terms of capital cost scale relative to their existing assets if applicable. This aims to ensure that the case studies selected reflect a similar order of magnitude as Heathrow Expansion relative to their existing footprint.

2. Comparability of scope

The scope of Expansion touches multiple significant activities such as detailed planning, design, consenting, phasing and construction profiles. The list of case studies was assessed regarding similar characteristics of scope.

3. Comparability of timescales

Case studies of similar timescale were assessed to provide comparability to Expansion's long delivery timescales. Mega-projects with similar delivery timescales were prioritised to understand how the governance structures were established and adapted over the life of the project.

Considering projects with comparable timescales provides insight into how the governance evolved through different delivery phases and in response to risks, gateways, and decision points.

4. Comparability of technical delivery

The case studies were assessed in terms of technical requirements, including delivery complexity and mechanisms. Assessing case studies based on their level of technical complexity aims to ensure that the risks, challenges and integration issues identified are relevant and potentially applicable to Heathrow Expansion.

This supports more accurate identification of challenges that may arise during delivery. It also enables clearer insight into mitigations that have proven effective, or ineffective, in a similar technical context.

5. Comparability of regulatory and policy environment

The regulatory and policy environment of each project was assessed to determine its comparability with Expansion.

Considering projects operating under different regulatory models helps highlight approaches that have been effective in managing approvals, compliance obligations, and policy-driven constraints. This comparison supports a better understanding of which governance and delivery practices may translate effectively across similar regulatory contexts.

6. Availability of information

The availability and quality of information influenced the selection of case studies. Projects lacking sufficient publicly available detail to gain a meaningful understanding of their context, delivery and outcomes were excluded from the short-list.

Each of the longlisted projects were considered against these criteria and the ten most suitable projects adopted into the shortlist of case studies. There may have been case studies that could be more comparable to Expansion but due to the lack of available information, they have been excluded.

5. Practices in Mega-project Capital Governance Globally

Key Takeaways:

- The core principles of good practice capital governance are assurance, transparency and clearly defined roles.
- Approaches to capital governance vary between countries depending on their specific market context.
- Governance structures on mega-projects are influenced by external factors such as governmental set up and political factors.

Approaches to effective capital project governance differs between organisations, sectors and countries. Governance is not a one-size-fits-all model but adapted to the specific context of each mega-project.

Defining best practice governance differs between project management (PM) bodies, however, it is generally agreed that the core components of effective governance include:

Structure

- Defines the process for all critical governance activities, including decision-making, risk management and oversight.

People

- Sets out the people involved, including accountabilities, defined roles and decision making authorities.

Information

- Sets out the necessary engagements for communicating with stakeholders and monitoring progress.

The nuances of best practice governance guidance between some of these different bodies are outlined to the right:

Governance Guidance from PM Bodies

- **International Project Management Association (IPMA):** Emphasises a governance framework comprising the value system, responsibilities, processes and policies that allow projects to achieve its objectives.
- **Project Management Institute (PMI):** Focuses on a structure of four critical roles within a project to establish, maintain and enforce project governance.
- **Association for Project Management:** Defines the golden rules of governance as alignment and relationships, vision and strategic roadmap, golden thread of delegation, clear allocation of roles and accountabilities and requirements.

International Key Governance Themes

UK: The National Infrastructure and Service Transformation Authority (formerly, Infrastructure and Projects Authority) states that the four pillars of effective project governance are accountability, authority, alignment and assurance.

USA: Effective project governance in the USA may rely on establishing well-structured frameworks and hierarchies that clarify decision-making and accountability.

Canada: The Canadian Institute on Governance states that the four pillars of good governance are staying on mission, delivering on mandates, building people capacity, and collaborating for outcomes.

Australia: The Australian Public Service Commission states that successful governance should include establishing clear authority and aligning project governance arrangements with wider corporate governance.

New Zealand: The core principles of project governance in New Zealand are accountability, transparency and confidentiality, as stated by the New Zealand Infrastructure Commission.

Principles of good capital governance in mega-projects typically includes accountability, assurance, transparency and defining the roles of stakeholders.

While these core principles are broadly consistent globally, there are subtleties to how countries typically structure, govern, fund and oversee projects. This is dependent on factors including the political culture, risk appetite and industrial development of the country. Key factors influencing global approaches to capital governance include:

- Regulatory and legislative environment
- Government Centralisation
- Use of independent delivery bodies
- Stakeholder influence
- Funding and commercial structure
- Assurance culture

Regulatory and legislative environment

Countries with highly regulated infrastructure sectors, such as the UK, typically have formalised governance frameworks for the delivery of projects.

These governance structures typically include mandatory assurance processes and structured stage gate reviews, for monitoring progress and ensuring outcomes are satisfactory. Markets that are less regulated may rely on a flexible, rapid implementation approach, with governance determined by governments rather than independent regulators.

Government Centralisation

Countries with a centralised government structure, such as Singapore, typically allows for faster decision-making and strong government involvement in governance. While programmes carried out in countries that have a decentralised model, such as the US, may typically involve a greater number of stakeholders. This increase in the number of stakeholders can result in more complex governance structures and challenges in coordinating multiple parties.

Use of independent bodies

Within some countries, such as the UK, it is common practice to establish arm's-length delivery bodies for the delivery of infrastructure. This approach can help to drive independence and reduce political interference from central government.

Mega-projects that followed this approach include Crossrail and HS2, which created Crossrail Ltd and HS2 Ltd as the programme delivery bodies, respectively. This approach was also implemented during the delivery of Western Sydney Airport, where the government created WSA Co. to be responsible for the delivery of the Airport programme.

Stakeholder influence

In the UK and USA, end customer stakeholders such as airlines, may have a significant role in capital governance processes. Stakeholders can be involved across the lifecycle of the programme and have a varying degree of influence on the programme depending on stipulated roles.

Example: Within the Heathrow Terminal 5 programme, key stakeholder British Airways, were influential in the planning and delivery of the project. Planned as the sole operating airline at the terminal it was critical that the airline was able to input into the programme and ensure the terminal met their operating requirements.

Additionally, the important role of stakeholders is seen in O'Hare 21 programme, where airlines have significant influence and could take control of the programme if the airport failed to deliver compliant designs in alignment with agreements.

Funding and Commercial Structures

Countries including the UK, Australia and Canada, frequently use PPPs and Regulated Asset Base (RAB) models. The funding mechanism of programmes influences governance structure by shaping the stakeholder landscape. Countries with strong public funding, such as Singapore, may implement tighter government oversight in publicly funded programmes to monitor value for money.

Assurance Culture

Markets, such as the UK, have highly developed independent assurance bodies which provide standards and guidance for project assurance. Guidance documentation, including documents from HM Treasury and NISTA reviews and Gateway processes, provide a consistent approach to programme assurance that can be applied across sectors. This supports a strong culture of assurance across the infrastructure industry. However, other countries with less mature assurance bodies may rely more heavily on internal or government led assurance reviews.

6. Capital Governance in Airport Mega-projects

Key Takeaways:

- Airports adopt a variety of capital governance models from regulator facilitated to commercially agreed frameworks.
- Airline involvement in airport mega-projects ranges from significant presence to having a more consultative role.
- Stakeholder governance is an important element of achieving collective positive outcomes and needs to be considered as a central element of consultation in Expansion.

Capital governance in airport mega-projects typically follows three types of structures:

- Strong regulator actively involved in project planning and delivery and with a remit to approve/reject projects or modify scope (e.g. UK CAA, Ireland IAA).
- Government involvement in an oversight capacity only (e.g. Frankfurt, Western Sydney Airport).
- Negotiated outcomes between airports and airlines under commercial deals, with more limited government oversight (such as enforcement of competition law).

While this serves as a broad simplification, it provides a framework to understand the different types of governance arrangements used by airports globally in the delivery of mega-projects.

Active involvement of a strong regulator

Some programmes, such as Heathrow Terminal 2 (T2) and Terminal 5 (T5), and Dublin's north runway are governed under the BAU regulatory frameworks from a government-appointed regulator such as the UK CAA or IAA.

They use a Regulated Asset Base (RAB) approach where the airports include their mega-project within their overall capital plan for a price control period submission. The regulator in turn solicits comments from stakeholders, makes adjustments to the capital plan, and issues a determination as to the level of funding the airport shall receive from airlines to fund the approved capital works.

Differences exist between the specific models used in each of the three referend examples. These include:

- Heathrow Terminal 2's incorporation of airline approvals into the airport's internal project governance gateway process.
- Heathrow's extensive collaboration with British Airways during the development and delivery of Terminal 5 as the sole airline tenant.
- Heathrow's use of the T5 Agreement, a relational contract between the former BAA and tier 1 suppliers, which implemented a devolved governance model empowering suppliers to accelerate decision-making and provided incentives rewarding successful delivery at a programme-wide level.
- Ireland's approach of determining project scope and cost through BAU governance approach.

This model ensures projects are reviewed by an independent body before delivery to ensure it is suitably scoped and represents an efficient level of capex. It allows airlines and other stakeholders to formally engage in the delivery process. Limitations of this model impose a rigid and inflexible regulatory framework onto large and complex (and often dynamic) capital programmes that is unsuitable. It may not provide an efficient means of modifying project cost or scope to respond to changing conditions.

Example: Under the determination process in place at the time of Heathrow Terminal 2's development, CAA's BAU approach meant they only considered an airport's capital projects in their price cap determinations on fixed five-yearly intervals *(Economic Regulation of Heathrow and Gatwick Airports 2008 -2013)*. This means that the airport's major capital project would have had to be fully scoped and developed in time for the CAA's cutoff for submissions (which may be challenging given the careful planning required for any mega-project).
If a project was at risk of *not* being fully scoped and planned in time to meet the CAA's determination process, an airport may have felt compelled to consider delaying the project to the next regulatory period or accelerate planning work to meet the CAA's submission deadlines (potentially risking unfavourable project outcomes).

Government involvement in an oversight capacity only

Observation: Mega-projects such as Frankfurt Terminal 3 and Western Sydney Airport, are delivered under light-touch regulatory oversight where the airport has independence to develop infrastructure as they see fit, with the government providing oversight and monitoring only (and not holding an explicit decision-making role as with the first approach discussed above).

Example: Frankfurt Terminal 3 is being delivered by Fraport, a part state-owned company. Frankfurt Terminal 3 is being delivered by Fraport, a part state-owned company. The Terminal 3 project was proposed between Fraport and the city of Frankfurt in the late 1990s, leading a two-year mediation process which set out the desired outcomes, benefits and success criteria for the project.

The Fraport Executive Board (which included government representatives as members) held responsibility for the overall risk management of the programme.

A Supervisory Board monitored the efficiency of internal controls and risk management frameworks in alignment with German corporate governance laws. Regular inspections of the terminal and oversight from the government were carried out during the development to assess progress against the defined scope and grant permission for projects to continue to the next stage.

The Terminal 3 programme is regarded as a success and due to be completed on time and within its budget.

Example: Western Sydney Airport (WSA) is being developed in a similar manner by an arms-length government-owned company. Government involvement is limited to their representation on WSA's board of directors as the company's sole shareholder. This gives WSA considerable discretion in its operational and commercial decisions.

WSA are required to submit quarterly progress reports to their shareholders (i.e. the Government) providing an update on activities undertaken for the previous quarter, including financial performance and programme delivery. Additionally, WSA Co are required to provide Shareholders with an early warning of any potential risks or issues arising from the project.

This approach provided the Government with an overview of the progress of the programme and how it compared with the pre-defined scope, while giving WSA autonomy to deliver the programme free of political interference.

Delivery of the WSA project is still ongoing but is expected to complete on time and on budget despite being the first greenfield airport developed in an Australian capital city in nearly 50 years.

The operational independence afforded by this model allowed Fraport and WSA to focus on project delivery and operational readiness. They benefitted from the increased efficiency and reduced complexity in making key decisions, and experienced fewer delays resulting from managing complex, rigid and inflexible regulatory frameworks and assurance processes. In turn they allowed Fraport and WSA to focus on delivery and operational readiness.

Projects negotiated and delivered between airports and airlines under commercial deals

Observation: Other projects may be delivered under a radically different capital governance models where the project's scope, cost and governance and assurance structures are negotiated and agreed between each airline and airport in bespoke commercial agreements.

Example: At Chicago O'Hare, the ongoing expansion programme known as O'Hare 21 is being delivered under a Use and Lease Agreement.

No economic regulator is involved in the determination of this agreement or its terms. Instead, most elements of the project and its future operations (including operational processes, charges and ongoing governance) were negotiated between O'Hare Airport and the airlines under a 15-year commercial agreement. Regulatory involvement was generally limited to oversight from municipalities and the FAA as the civil aviation regulator.

Under the Use and Lease Agreement, airlines play a critical role in the project's governance. They sit on the programme board (known as the Executive Working Group) and have clear contractual rights to approve and reject scope and cost changes above a predetermined threshold.

Under the agreement, the airport has a duty to prove to the airlines that designs meet the agreed scope and cost at key gateways. The agreed governance framework provides remedies to the airlines if the airport fails in this duty, ranging from requiring the airport to re-design a submission, through to potentially challenging the Airport for control of the programme.

An advantage of this model is that the programme governance and assurance framework can be co-designed between the airport and airlines and tailored to the specific requirements of each sub-project. In addition, the 15-year duration of this agreement provides a degree of long-term certainty to participants.

However, this model in some scenarios can generate a substantial amount of design iteration to develop a workable design that delivers each scope item within the agreed budget. In addition, the successful day-to-day management of the programme requires a robust dispute resolution mechanism to quickly and efficiently resolve disagreements over interpretation of scope items within the contract (for example, resolving disagreements over what constitutes a "substantial" scope change, or precisely how to measure the width of a pier). As a result, an adversarial relationship between the airport and airlines can sometimes develop if a programme is underperforming.

Observation: Australian capital city airports adopt a broadly similar structure. They operate under a Regulatory Asset Base model as with UK airports, only under a dual-till structure with the absence of a defined economic regulator.

Instead, the airport goes through a similar capital planning price calculation process as Heathrow may, only the inputs, calculations and outcomes are negotiated and settled between airports and airlines in private commercial discussions. Under this model, regulators only play a role insofar as airports and airlines are subject to Australian competition law. Similarly, the governance framework for capital works is negotiated and agreed between the airport and airlines on a project-by-project basis.

Airline stakeholder involvement

Observation: Airline stakeholder involvement in capital governance ranges from heavy day-to-day involvement.

Airports such as Chicago or Australian capital city airports adopt bespoke commercial agreements with airlines for each project which leads to close collaboration between the airline and the airport, and strong airline involvement in the governance of the project.

By contrast, UK and Irish airports following the CAA and IAA processes tend to only involve airline within the governance process insofar as they are consulted by the CAA as part of the regulatory settlement process

Some airports like Frankfurt and Western Sydney have limited airline involvement in capital governance and manage the delivery and oversight of their capital projects internally.

Regional trends in airport capital governance frameworks

Observation: Some broad patterns emerge when comparing the different capital governance frameworks between airports around the world.

Example: Few, if any, airports outside of the UK or Ireland adopt the CAA/IAA's process of five-yearly funding settlements managed by an economic regulator.

By contrast, many airports in Australia and the USA deliver their projects under bespoke commercial agreements negotiated between the airport and airlines. This affords greater flexibility for parties to co-design a governance framework that works for their specific environment. However, it can require both parties to have strong project governance and delivery expertise.

Some airports deliver their projects with no stakeholder involvement within the governance processes. These do not appear to be concentrated on any geography.

7. Capital Governance in Regulated Infrastructure Mega-Projects

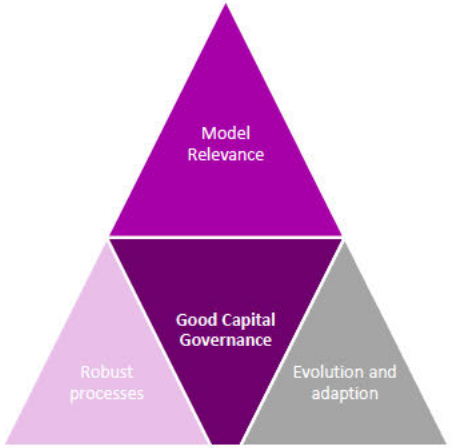
Key Takeaways:

- Governance structure should be tailored to each mega-project's unique context, scale and complexity.
- Effective governance should be underpinned by robust assurance processes, clear accountability, transparency and monitoring.
- Evolution and review of governance models should occur throughout the project lifecycle to respond to changing complexities and risks.

Best practice approach to capital governance in regulated infrastructure mega-projects is nuanced and dependent on the specific risks and operating context of each project. However, good capital governance is typically underpinned by:

- Implementation of governance models relevant to the programme.
- Robust assurance, accountability, transparency and performance monitoring processes.
- Ability to adapt and evolve the governance structure throughout the programme lifecycle.

Exhibit 2: Good governance pillars



Bespoke governance models

Observation: The scale, complexity, and risk profile of mega-projects means that each project typically requires a bespoke capital governance model, tailored to the sector and nature of the project in which it operates and the unique challenges it faces. Unlike smaller capital projects, mega-projects may struggle to be effectively managed using standard governance frameworks, which often lack the rigour, flexibility, and the specialist capability required for multi-year, multi-stakeholder delivery. Experience across global infrastructure programmes has highlighted that applying routine governance structures can lead to inefficiencies, slow decision-making, and inadequate oversight.

A tailored governance model, supported by well-defined roles and responsibilities, clear escalation pathways, and sector-specific assurance mechanisms, is imperative to support disciplined decision-making and maintain alignment across stakeholders.

Example: HAL demonstrates that brownfield mega-projects, T2 and T5, can be successfully delivered under an adapted version of BAU regulatory models, with adjustments to account for the additional complexity of the projects, such as through enhanced triggers, revenue and cashflow adjustments. Mega-projects from other sectors, such as HS2 in rail, demonstrates that standard approaches to governance can have negative impacts when applied to mega-projects.

The delivery, governance framework, and the wider stakeholder environment in which HS2 operates has followed a relatively traditional approach. This has negatively impacted the programme's progression and the robust development of controls. Due to the unprecedented scale and complexity of the HS2 programme, development of a tailored capital governance framework needed recognition in early development.

The 'Stewart Review', an independent assessment of how the DfT governs major projects, conducted at the request of the Secretary of State for Transport, found that "A bespoke approach is required to deliver a programme of the size and complexity of HS2."

Robust assurance for accountability, transparency and performance monitoring

Observation: Effective governance structures in mega-projects are underpinned by establishing clear accountability and well-defined roles for relevant parties. This is fundamental to effective capital governance in regulated infrastructure mega-projects. Typically, these programmes include multiple stakeholders, often across government agencies, regulators, operators, delivery partners and the community, each with distinct interests and responsibilities. Without clarity on accountability for strategic direction, funding, assurance or delivery, mega-projects are at increased risk to delays, cost escalations, rectifications and non-compliance. Mega-projects require the development of clear roles and accountability guidelines that are used to help ensure stakeholders understand their remit, authority and obligations throughout the project lifecycle.

Example: The development of defined roles and documented accountability of stakeholders supports the progression of a programme, however without clear enforcement of this information, the project will not benefit. Within HS2, the Department for Transport in consultation with HS2 Limited produce a Framework Document setting out the governance framework. The framework covers responsibilities, and the roles of the parties involved, including day-to-day working practices. Although the governance structure adopted by HS2 was agreed and well defined, the Stewart Review found that the structure was "too complicated, multi-layered, [blurred] accountabilities and perhaps most importantly doesn't recognise the role of Government as the Financial Shareholder."

Observation: Effective governance requires establishing and agreeing the baseline components of a programme, including scope, costs and schedule, between stakeholders at the outset of the project. Defined decision points such as milestones and stage gates allow for oversight and ongoing monitoring of programme performance against pre-agreed criteria.

Example: The HS2 Development Agreement defines the core programme for the delivery of the project, setting out the obligations of HS2 Ltd and mechanisms for reporting to the Secretary of State (SoS) for Transport.

The Agreement set out the level of reporting that must be upheld by HS2 Ltd, specifying the level of engagement required to the SoS.

This performance monitoring approach is implemented in other regulated mega-projects, namely Sizewell C, which adopts a stage-gated governance with clear decision gates for financing, consenting, procurement and commissioning.

Adaption and evolution

Observation: Best-practice in governance of mega-projects supports evolution of the framework throughout the project lifecycle, as the programme moves through its key phases. This flexibility ensures that decision-making remains aligned with shifting priorities, emerging risks, and increasing levels of complexity. Early phases typically benefit from a leaner governance structure focused on strategic approvals, funding decisions, and establishing the programme baseline. As the programme progresses into design, construction, commissioning, and operational readiness, the governance model must mature accordingly, introducing more robust oversight, tighter performance monitoring, deeper stakeholder engagement, and integrated risk and assurance mechanisms.

Example: This approach was adopted within Crossrail as the project progressed from delivery through to preparation for operational readiness. The key objective of this governance transition was to simplify the decision-making process at the executive layer and Board, ensuring that decision making was aligned to the critical final phases of the project. This approach ultimately allowed the programme to streamline governance and deliver the project successfully. Alternatively, HS2 has been criticised for failing to evolve its governance structure as the project moved from design to construction. A key recommendation made to HS2 going forward is to adapt its governance structure and adopt a new approach, including the creation of a shareholder board, a new programme board with independent members and a specialist sub-board.

8. Capital Governance and the Role of Stakeholders

Key Takeaways:

- No one-size-fits-all approach to stakeholder involvement, governance structures need be tailored to account for specific programme context and complexities.
- The presence of independent third parties can strengthen governance by providing impartial oversight and assurance.
- Stakeholders require clarity on their roles and responsibilities to act according to their remit.
- The level and depth of stakeholder involvement should be proportionate to their expertise, knowledge and sophistication on the programme.

Effective capital governance can be improved by the targeted involvement of stakeholders at specific stages of the project lifecycle, though not at the cost of timely and efficient delivery. Stakeholders can play a wide range of roles on projects, from providing oversight and formal approvals through sponsorship or governance boards, to representing the needs and expectations of end customers. Their level of involvement varies; some stakeholders will maintain a light-touch approach, remaining informed but not directly influencing decisions, while others act as key decision-makers with the authority to endorse, challenge, or halt decisions if they do not align with programme progress. Stakeholder relationships may involve public-to-private organisations, government-to-government entities, or partnerships between private-sector bodies. The nature of these relationships, and the governance mechanisms that underpin them, depend on the organisations involved, their relative influence, and the extent of their interest in the programme's outcomes. Well defined governance structures are therefore critical to ensuring clarity, accountability, and effective decision-making across the programme lifecycle.

Although the role of stakeholders within capital programmes will vary depending on the specifics of the programme, typical mega-projects will include stakeholders of the following roles:

Delivery Body

Typically established companies responsible for the delivery of a programme.

Project sponsor

Provide strategic direction for the programme and ensuring alignment with objectives, making the case for investment, securing funding, specifying project requirements and/or ensuring project outcomes are realised. Additionally, providing monitoring of progress against predefined criteria.

Customer

Intermediate or end customers, such as airlines or TOCs, may provide strategic influence and approval for programmes through a series of gateways. This can ensure that programmes are progressing against the predefined scope and criteria. This approach can help to ensure that the end product is sufficient to meet the needs of users.

Regulatory bodies

Specific bodies that are designed to provide oversight and approval for the programme, typically across areas such as economics, safety and environment.

Suppliers

Suppliers support delivery of a programme but typically have minimal influence on the strategic objectives of the project.

Delivery body

Observation: Many organisations establish a separate delivery body for mega-projects, such as the approach used for HS2 and Crossrail. This approach can offer significant advantages to the programme governance. Creating dedicated organisations with their own corporate governance, leadership and capabilities can provide programmes with clear operational focus and reduce bureaucracy. This separation can also drive accountability and enable more agile decision-making.

Example: Within Crossrail, the delivery body CRL was established and supported by the Project Development Agreement. The independence and autonomy delegated to CRL by sponsors provided an effective solution to support the realisation of project outcomes. Crossrail's Project Development Agreement stipulates the scope, roles, funding rules and reporting requirements to be adhered to by the delivery body, CRL. This allowed Crossrail's stakeholders to cede autonomy gradually over three years, with CRL's board proving its competence over four review points. CRL praised this approach and said that it provided the project executive team the freedom to focus on delivery and ultimately supported the successful delivery of the project.

Project sponsor

Observation: The number of sponsors within a capital programme can vary significantly depending on project size, scale, complexity, and the industry in which it operates. Mega-projects often have two or more sponsors, reflecting the breadth of strategic outcomes of the project and the diverse interests involved. These sponsors typically share responsibility for setting the programme's objectives, securing and providing funding, and ensuring alignment with organisational or government priorities. Establishing a multi-sponsor structure can be advantageous, as it brings broader strategic oversight, distributes decision-making authority, and strengthens governance, particularly where a programme spans multiple agencies.

Example: Establishing a dedicated sponsor board provides a structured, high-level governance mechanism that can strengthen decision making, oversight and alignment. Programmes such as Crossrail, have a dedicated Sponsor Board, consisting of TfL and DfT. The board was accountable for making the case for investment, securing funding, specifying the project's requirements, and ensuring that the project benefits and outcomes were realised. The interests of the sponsors were brought together under a joint sponsors Agreement, setting out the overall management, ownership and governance of the project, while clearly defining the role and responsibilities of each sponsor. This approach helped to control programme scope and allowed wider stakeholders, such as central government and environmental bodies to maintain oversight of delivery and influence project objectives and outcomes. This approach was praised for ensuring tight management of the programme, delivering on time and within budget.

Alternatively, HS2 had one programme sponsor, The Secretary of State for the Department of Transport, which took on the role of funder, shareholder and sponsor. This binary nature of the relationship between HS2 Ltd and DfT was considered a disadvantage compared to other programmes with more than one sponsor, such as Crossrail or Sizewell C. Additional sponsors can introduce independent representation within the stakeholder dynamic, this is shown to be beneficial in dispute resolution and problem solving between bodies.

Customer

Observation: Customers, such as TOCs or airlines, can play a critical and often influential role in mega-projects. As end users and commercial partners, they can provide essential operational, financial and customer experience perspectives that shape programme requirements.

Within airport capital programmes, airlines are an important stakeholder and can hold varying levels of influence over programme direction and decision-making depending on the delivery model. In environments without a formal economic regulator such as Chicago O'Hare, airlines hold a large degree of influence over the programme delivery. Their involvement can help ensure that progress remains aligned with the agreed scope, budget, and delivery timelines.

Conversely, such a level of airline involvement in programme governance may be less suitable in jurisdictions with an economic regulator (such as the UK), as these bodies would likely be performing this function already, for example through Constructive Engagement.

As well as the role of an economic regulator, the level of airline involvement should also consider their areas of expertise, the type of project and its phase, and not come at the cost of timely and efficient delivery.

Example: Chicago O'Hare 21 adopted a substantially different governance framework to the model generally used within the UK. Rather than establishing a framework which involved an economic regulator, O'Hare 21 is being delivered under a bespoke commercial agreement negotiated between the Airport and airlines. This approach gives airlines a significant role and influence within the programme's governance structure.

The airport was responsible for presenting designs to airlines to gain their approval that the scope and budget aligned with the predetermined agreements. If the Airport failed to prove this, the airlines had a range of remedies ranging from requiring re-design of a submission through to taking greater control of the programme. This gave the airlines significant influence over the progression of the programme.

This approach can benefit the delivery of the programme as key design submissions can be reviewed and agreed between participants. However, in some cases this approach can result in an adversarial relationship between stakeholders, and slow down decision making.

Projects using this model should consider including a robust dispute resolution mechanism chaired by an independent third-party so disagreements can be resolved quickly and efficiently.

Regulatory bodies

Regulatory bodies can play a key role in the development of mega-projects by ensuring that progression and investment comply with legal, safety, environmental and industry specific standards. The involvement of regulators can provide confidence to wider stakeholders that the programme is being delivered responsibly, transparently and in alignment with statutory requirements. In capital mega-projects regulators may be responsible for assessing financial, technical and operational aspects of the project, to ensure investments are efficient, cost-effective and provide value for money.

Example: Regulators can provide oversight and assurance of programmes at milestones to validate the costs and schedules; in many cases regulatory approval is required at these milestones before a programme is able to progress to the next stage. This approach is demonstrated in the Dublin Airport North Runway programme, where success criteria was identified in the form of triggers and milestones by the IAA in consultation with the DAA and airlines at the beginning of the programme. These milestones were then assessed throughout the programme to monitor progress, ensuring users would only pay for the project once benefits could be realised. This approach encouraged the delivery body to meet these predefined milestones through efficient delivery of the project.

Additionally, within the Frankfurt Airport Terminal 3 programme, the terminal building was subject to inspections at milestones, before a project stage could be complete. This approach prevented the programme from progressing to subsequent stages until approval had been granted, giving stakeholders significant influence on programme progress.

Suppliers

Suppliers are external stakeholders who play a vital role in the delivery of capital programmes by providing the materials, services, and equipment essential for successful completion. While individual suppliers may have limited influence over strategic decision-making, their impact on programme progress can be significant, particularly where delivery schedules, quality standards, or specialised capabilities are critical. Effective governance frameworks should clearly define how suppliers are engaged, managed, and monitored to ensure performance expectations are met, contractual risks are controlled, and potential delays are minimised. Proactive supplier management is therefore crucial to maintaining programme momentum and safeguarding overall delivery outcomes.

Example: Establishing a bespoke contractual arrangement for the management of suppliers, such as the T5 Agreement, can benefit programmes.

The Terminal 5 programme was delivered through the T5 Agreement, a relational contract between the BAA and tier 1 suppliers. The Agreement involved a bespoke approach to management of suppliers, in which BAA held project delivery risk, creating incentives for suppliers which rewarded successful performance. This approach gave BAA greater control over the financial implications of risk and tighter control of the overall budget. The T5 Agreement underpinned the successful delivery of the terminal, on time and within budget.

The individual stakeholders involved in mega-projects will depend on the project context and its sector. However, examples of stakeholders in UK infrastructure mega-projects include:

Exhibit 3: Examples of UK Infrastructure Stakeholders

9. Practices in Setting Capex Incentives

Key Takeaways:

- Airports operating with a formal economic regulator tend to have regulator-defined capex incentives such as financial penalties or recovery triggers.
- Projects delivered under bi/multilateral commercial agreements can give stakeholders a role in approving or rejecting cost changes to encourage capex discipline.
- Airports self-funding their capital projects may not incorporate capex incentives as they are already holding financial risk for the project.
- Incentive schemes need to be appropriate to the regulatory structure and funding source for each capital project.

Approaches used to set and enforce capex incentives for airport mega-projects typically fall into three categories:

- Regulator set and enforced incentives.
- Bespoke commercially negotiated incentive scheme.
- Limited incentive scheme – airport holds most of the financial risk.

While this serves as a broad simplification, it provides a framework to understand the different types of incentive arrangements used by airports globally.

Regulator set and enforced incentives

Observation: Capital projects at UK airports and Ireland tend to adopt incentives that are set by an external economic regulator during the price control period determination process.

Example: For Heathrow Terminal 2 and Terminal 5, the CAA set a price cap that allowed Heathrow to pre-fund capital works. To prevent the airport from gaining a financial advantage by delaying works (and thereby collecting money from airlines for work not done), the regulator set several "triggers" for each project.

These triggers were tied to construction milestones such as completion of demolitions and site preparation, weather sealing of a building, commencement of operational readiness activities and so forth.

Each trigger had a deadline date that was determined by the CAA. If the trigger activity had not been completed by the CAA's deadline, Heathrow would have to pay a predefined monthly financial rebate to the airlines until the trigger activity was complete. Under the process, only the CAA had the authority to declare a trigger as having been achieved. The intent of this system was to provide clear incentives for Heathrow to deliver Terminal 2 and Terminal 5 in a timely manner.

A lesson learned from this approach was that setting triggers too early may not be appropriate for large and complex programmes such as these, as they can reduce flexibility earlier in the projects' planning stages.

The funding of capital projects through the business-as-usual price settlement process meant that the CAA only allowed Heathrow to recover money from airlines for a given project based on an efficient level of capex (rather than the level of capex requested by the airport).

In addition, overspend could generally only be recovered from airlines within the next regulatory period. This provided further incentives for Heathrow to spend their approved capex in an efficient manner.

Heathrow Terminal 5 adopted the "T5 Agreement" with their first-party supply chain. This was based upon an open book commercial arrangement between Heathrow and its key suppliers, with fair profit for good performance and incentives for exceptional performance to incentivise collaboration, innovation and efficiency throughout the entire supply chain.

Observation: Ireland's regulator, the IAA, approves and funds capital projects in a broadly similar manner to that of the CAA, with the exception that projects are not pre-funded as with the CAA.

Example: As part of the price cap determination process, the IAA set a project tigger that in effect meant Dublin Airport could only proceed with the project once they had exceeded 25 million passengers in the preceding 12 months. This trigger was determined by the IAA based on expert advice and following a consultation period. Its intent was to incentivise Dublin Airport to pursue reasonable non-capital options to increase passenger capacity at the airport, delaying expenditure on the new runway until necessary. Furthermore, the IAA calculated an efficient level of capex for the Dublin north runway project and listed the runway project as a separate line.

item within their passenger price charge cap determination to provide transparency to stakeholders.

This meant that the regulator was able to establish a milestone system in which charges were levied to airlines by the airport in tranches once construction milestones had been achieved. For example, the recoverable cost of the main construction works was determined by the IAA to be €0.50 per passenger. The IAA set a milestone so that the airport could only begin charging this €0.50 to airlines once the IAA had determined main construction works were complete.

This meant that airlines were only charged for work completed. It ensured users would only pay for the project once benefits could be realised and encouraged the efficient delivery of the project as only a known, fixed payment would be available to the airport after project completion.

Observation: UK transport authorities have implemented a system of "Earned Autonomy". Under this framework, a project's arms-length delivery body is commissioned with limited operational autonomy. The parent Department progressively hands over specific powers to the delivery body as the project achieved pre-defined milestones. In turn these powers can be withdraw from the body if specific contingency thresholds are exceeded. These powers can also be withdrawn from the body if specific contingency thresholds are exceeded.

Example: Crossrail was delivered by Crossrail Ltd (CRL), a 50/50 joint venture company between the Department for Transport (DfT) and Transport for London (TfL).

DfT and TfL implemented an earned autonomy process whereby CRL had a lower degree of autonomy and were subject to stronger assurance and oversight processes during the project's planning phases, when the ability to influence and change the project's requirements and scope were at their greatest, and CRL was still maturing as an organisation.

Responsibilities and decision-making authority were progressively transferred to CRL as the project progressed through the lifecycle and the organisation "earned" increasing levels of autonomy.

These transfers were granted over a three-year period following structured external reviews and aligned to clear milestones defined within the Project Agreement. An example of the key rights granted to CRL at these milestones include gaining the authority to independently issue tender notices and award contracts, rather than through the Department's procurement processes.

Likewise, clear three trigger points were set linked to the forecasted outturn cost and the extent to which CRL and TfL's contingency reserves were expected to be called upon. These triggers would lead to TfL and ultimately DfT taking greater oversight and ultimately control over the project.

For example, If the forecasted outturn cost exceeded the P50 cost estimate, CRL were required to submit a remediation plan to TfL. If the forecasted outturn meant CRL were expecting to exhaust their contingency, TfL had the right to step in and replace CRL's Directors and Senior Executives. If following this TfL's contingency reserves were *then* expected to be exhausted, TfL could hand the project to DfT.

This created a two-way system of incentives where CRL, while an arms-length delivery body, had to *earn* its operational autonomy from their parent bodies under a structured process. Likewise, this autonomy could be lost through an equally transparent and robust process if it was not expected to deliver the project in line with the agreed budget.

Bespoke commercially negotiated incentive schemes

Observation: Some airport capital projects may be delivered with capex incentive schemes that are negotiated and agreed between each airline and airport in bespoke commercial agreements.

Example: At Chicago O'Hare, the ongoing expansion programme known as O'Hare 21 is being delivered under a Use and Lease Agreement negotiated between the airport and airlines. The incentive scheme is specified within the agreement and can be tailored to each project.

The agreement establishes two bodies overseeing capex incentives: an Executive Working Group that oversees the programme and is majority-staffed by the airlines, and a Majority in Interest (MII) mechanism, which is essentially authorisation from airlines party to the agreement that together pay at least 70% of all passenger service charges.

Under the agreement, if the estimated cost of the 30%, 60% or 90% design for any sub-project exceeds the agreed budget by less than 50%, the airlines may provide recommendations to the airport to reduce capex. These recommendations may be ignored at this stage. These recommendations may be ignored by the airport at this stage.

However, if the design for a sub-project exceeds the budget by more than 50%, the airport must revise the design at their own expense unless the MII (that is, 70% of all airlines by revenue) provides authorisation for the airport to proceed to the next stage of design despite the forecasted overspend.
If any construction tender is returned to the airport exceeding the agreed budget by more than 10%, the MII must provide authorisation to proceed.

If the airport continues to produce designs or tenders that that do not comply with the agreed project budget, the airlines may be able to use their majority position on the programme board to challenge the airport for greater control of the programme.

This creates a clear incentive for the Airport to develop a scheme that aligns to the capex budget agreed between the airlines and Airport, as the cost of undertaking any re-design work is borne by the Airport.

The primary advantage of this incentive model is that the programme capex incentive structure can be co-designed by the participants and tailored to the specific requirements of each sub-project.

A disadvantage of this model is that it can lead to a substantial amount of design iteration to arrive at 30%, 60% and 90% design submissions that comply with the agreed budget and scope.

Another disadvantage of this model is that disputes can develop relating to cost estimation methodologies (given the importance of designs meeting the capex budget) if not adequately specified within the Agreement.

Australian capital city airports adopt a broadly similar structure where airports negotiate and agree capex incentives with airlines in private commercial discussions which also establishes the airport's forthcoming capital plan and the rates and charges payable by the airline. Under this model, capex incentive structures can be negotiated and agreed between the airport and airlines on a project-by-project basis.

No incentive scheme, Airport holds financial risk
Some airports privately fund their own capital projects, holding greater financial risk of their capital projects and therefore may operate without a structured incentive scheme.

Example: Frankfurt Terminal 3 was largely funded by the operator Fraport AG (with some funding provided by the European Investment Bank), making it one of Europe's largest privately funded infrastructure projects. Due to the funding model of the programme, no capital incentives were offered. Similarly, no capital incentives were provided to Western Sydney Airport for the successful delivery of the project as the airport bore the entire financial risk for the delivery of the project.

10. Application of Global Practices to Heathrow Expansion

Key Takeaways:

- Successful global practices in mega-project governance emphasise the benefits of providing long-term certainty to the developer and stakeholders.
- They can accommodate evolution to the project's governance framework as the project develops and allows airports and stakeholders to play a role in defining a structure that meets their requirements and the needs of the specific project.

The applicability of different global practices in capital governance can be considered against three broad characteristics of a successful governance framework. These include:

- Providing **long-term certainty** to the developer and stakeholders.
- **Flexibility** to allow for changes to the framework during different phases of the project.
- **Bespoke** governance framework that recognises scale, complexity and programme-specific risks.

Providing long-term certainty

Observation: Some projects, such the Dublin Airport North Runway, are delivered under a BAU governance framework. The approach adopted by this project provided long-term certainty to the Airport and stakeholders by making determinations on project scope and cost, and development trigger six years in advance of the trigger being met. The project remained on the approved capital plan and rolled forward until such time as the IAA determined the trigger will be met in the forthcoming year.

This compares to the BAU approach at Heathrow where projects are generally considered within the price control process only if works will commence during that period, with less scope for such trigger and roll-forward mechanisms.

Example: The approach adopted at Dublin allowed complex planning work to be conducted at its own pace and the project introduced into the regulatory process as and when ready. It also meant that the airport, airlines, investors, and other stakeholders had long-term visibility and certainty over the level of expenditure that was expected to be incurred, and when it would be incurred.

By comparison, under light-touch delivery mechanisms, such as the one adopted at Chicago for O'Hare 21, project terms and durations can be negotiated between the Airport and airlines in private commercial discussions. This means that these projects can be delivered under agreements that are as long or as short-term as required. In the case of Chicago, a complex long-term mega-project, the project agreement adopted a 15-year term. This struck a balance between providing long-term certainty to parties while leaving opportunity for a new agreement to be negotiated following completion of the project and initial operational years.

By comparison, the BAU approach at Heathrow sees works generally funded and governed under fixed 5-year regulatory periods, irrespective of the wider programme's duration. This means that large projects may have to seek funding across multiple regulatory periods, providing less certainty to project parties.

Observation: Some airports self-fund and deliver projects. These may see the role of government limited to an oversight function, and airlines limited to a consulted stakeholder. These include projects such as Frankfurt Terminal 3 and Western Sydney Airport.

Under this delivery approach, the airport may calibrate each project's funding and investment horizon to the project's needs, and the broader organisation's and investors' objectives.

Flexibility to allow for changes to the framework during different phases

Observation: Projects such as Dublin Airport North Runway incorporate unique features into their BAU regulatory process to incorporate a degree of flexibility into the economic regulator's processes.

Example: The regulator overseeing this project, IAA, adopted a trigger system as part of their determination. Under this system, the scope and expected capital expenditure for the runway project was defined by the airport early and a determination by the regulator made. A trigger was set so that the project remained within capital plan as a triggered project until a 25 million passengers per year threshold was reached (the point at which the regulator's independent experts determined runway construction needed to commence).

This meant that the Airport could progress the project through the regulatory determination process when planning work was sufficiently progressed. It allowed the Airport to retain flexibility to delay or accelerate planning works as needed as there was a diminished requirement for project planning to align to submission deadlines for a specific settlement period.

Observation: By comparison, the Heathrow Terminal 2 case study noted that such system did not exist under the CAA's BAU process. The airport identified that the project must commence during Q5 to meet the targeted completion date. The structure of the CAA's processes meant that the project had to be incorporated into the Q5 capital plan regardless of the maturity of the Terminal 2 design. Unlike Dublin, no such process existed to prepare the project early, gain approval under a preceding regulatory period, and leave the project dormant in the capital plan as a trigger project.

Chicago O'Hare 21 is being delivered under a commercial agreement between the Airport and the Airline. The nature of the light-touch economic regulatory regime means that the two parties are free to establish any governance mechanisms they agree are needed to deliver the program.

Under the self-funded and self-delivered model such as such as Frankfurt Terminal 3 and Western Sydney, the airport is afforded greater flexibility in how they raise funds and invest capital. Similarly, they have greater latitude to modify the scope of their projects during planning work as they may not be constrained by regulatory determinations or commercial agreements with airline partners.

These approaches differ from Heathrow's BAU approach, where there is less scope to bypass the economic regulatory processes and deal directly with airline partners and funders.

Bespoke governance framework

Observation: Some projects such as Dublin Airport North Runway are successfully delivered entirely under a BAU framework.

Projects that are delivered under commercial agreements such as Chicago O'Hare 21 can tailor their governance frameworks to the specific needs of each project. These project agreements can specify the workings of the project's governance framework such as the various working groups, their membership and terms of reference, the roles and responsibilities of each party within the governance framework, and the project's change management and dispute resolution mechanisms.

These allow the governance processes for each project (and even at the sub-project level) to be tailored to the specific needs of each project and the stakeholders involved.

Similarly, airports that elect to self-fund and deliver a project, such as at Frankfurt Terminal 3 and Western Sydney Airport, can tailor their governance and delivery models to the specific needs of each project with reduced need for stakeholder and regulatory approval.

Findings and lessons learned

Evaluations of the light-touch models found in projects such as Chicago O'Hare 21, Frankfurt Terminal 3 and Western Sydney Airport found they rely on a strong culture and performance of internal delivery teams.

Projects successfully delivered under this model tend to attribute their success more to the delivery teams' expertise and less to the governance framework, taking the view that the framework gave the team the tools to succeed, rather than the framework driving the project's outcome.

The commercial approach used at Chicago tends to perform better in jurisdictions without a formal economic regulator, and with well-drafted contracts whose structures and processes do not create misaligned incentives. Successful implementation of this governance model emphasises the importance of a robust dispute resolution mechanism that resolves disagreements quickly and efficiently. These models tend to perform better when the airport and the airlines are intelligent clients with in-house capability to manage the higher complexity in decision making brought by the MII mechanism. Furthermore, while the MII process for certain major capital and financial decisions may have helped strengthen cost discipline, it can limit the velocity of the decision making and therefore needs to be considered in balance of required outcomes.

Evaluations of projects using the approach of Frankfurt and Western Sydney found they tend to benefit from reducing complexity and administrative burden by minimising the regulatory overhead and taking on delivery risk in-house. This can free the organisations to focus on delivery and operational readiness, rather than managing external regulatory processes.

Evaluations of the Dublin North Runway governance model noted the BAU regulatory process can impose restrictions when making changes to the project cost or scope after the regulators' determination.

11. Conclusion and Recommendations

Key Takeaways:

- Capital governance frameworks have a rich variety but converge to consistent good practice for regulated infrastructure and airport mega-projects.
- The case studies provide lessons in avoiding certain governance practices which have demonstrated poor outcomes.
- It is recommended that Heathrow Expansion adopt a bespoke and proportionate arrangement which balances efficient delivery with good practice capital governance.

The case studies have identified opportunities and pitfalls of capital governance practices that could be implemented as part of a proposal to CAA for future Heathrow Expansion's capital governance framework. Findings are shown in the table on the next page. Evidence from case studies is referenced.

Recommendations

Expansion has several features which differentiate it from BAU investments and require specific treatment, such as the elevated level of complexity and risk, particularly integration risk – noting the range of projects required to deliver new capacity e.g. M25 relocation, integration of the new runway. Recommendations from the findings of this report are:

1. The capital governance framework for expansion should be developed on a bespoke basis – i.e. outside the current H7 framework. A suitable bespoke framework is consistent with good practice for complex mega-projects at airports and in other comparable regulated infrastructure sectors (CS4, CS5).
2. CAA should make allowance for a multi-control period funding envelope to support effective governance and financing, with flexibility to allow for agreed scope changes (CS5, CS10).
3. A programme-specific assurance framework featuring independent technical and financial assurers for the delivery phase, appointed by HAL (CS5, CS10).
4. A less intrusive role for both CAA and airlines than for BAU projects during the delivery phase (CS8, CS9). Albeit with a relatively high level of engagement in advance of early reviews, and a transparent monitoring framework.
5. Levels of CAA and airline involvement in elements of expansion should be varied to allow efficient delivery, particularly for relatively separable projects such as M25 relocation or river diversions – where airline involvement should be lower, noting their relatively lower levels of expertise for these programmes (CS8, CS9).
6. Noting that expansion projects are likely to be more complex for contractors to price than BAU, the expansion baseline for outputs, schedule and cost should be set proportionately at governance checkpoints (CS5).
7. Changes to the expansion baseline: the change management process will require a balance between enabling efficient delivery and providing CAA/airlines with sufficient visibility on key changes. Observed good practice suggests that changes to the baseline resulting in estimated cost variations or schedule slippages (as notified by the external assurer) should be subject to explicit change control and approval by CAA (CS5).
8. A decision making forum such as a Capital Investment Committee, with a proportionate terms of reference, could be established to appraise and evaluate projects (CS9).
9. Post-investment decision, the role of customers in capital governance should be related to information only (CS4).

Conclusions	Evidence from Case Studies
Theme 1: Overall Governance Framework and Regulatory Model	
A bespoke governance framework that recognises scale, complexity and programme-specific risks should be applied to complex programmes/mega-projects (complex projects typically costing >£1bn). The form of regulatory model/governance framework should reflect the specific characteristics and risk profile of the programme: for example, non-separable elements of brownfield programmes typically have higher integration risk and more interactions with customers/stakeholders, and so typically require a framework that involves those customers/stakeholders more directly than for frameworks for greenfield programmes. Where BAU governance frameworks have been applied without sufficient adaptation to programme risk profiles, delivery has often been inefficient.	The HARP (CS10) and Sizewell C (CS5) programmes are both using bespoke frameworks outside the BAU capex frameworks used by the regulators Ofwat and Ofgem. For both programmes, the regulators have issued specific guidance on the frameworks, taking account of complexity and financing risks. The market response to both programmes has been largely positive. HS2 used a governance framework based on standard BAU DfT processes, without clearly defining responsibilities for the delivery agency HS2 Ltd or recognising the key role of HMT as equity funder, leading to confusion over decision-making and significant slippage.
For airports, a range of governance models have been applied to mega-projects. An adapted BAU framework has been successfully applied for several complex, brownfield airport programmes including Heathrow T5 (CS3) and T2 (CS2) and Dublin North (CS6) programmes.	HAL/BAA delivered the Heathrow T5 and T2 programmes on time and on budget using adapted versions of the CAA BAU capex frameworks applicable at the time. Key CAA adaptations included: enhanced financial triggers based on programme milestones and smoothing of revenues to support financing. The Dublin North programme - also delivered on budget - used an adapted BAU framework with specific milestone-based incentives, linked to airport revenues.
Governance frameworks and programme leadership teams should be sufficiently flexible to allow for evolution of governance requirements during different phases. A development phase (i.e. pre-FID) framework is typically focussed on defining programme scope and risks and securing approvals, which requires different skills (such as commercial analysis) than the construction phase, where the focus is on programme management and integration expertise.	The Crossrail (CS4) governance framework was set up so that at pre-defined milestones (such as the start of systems integration), the governance framework and leadership structure would change to meet the requirements of each phase of the programme. This evolution - approved by ORR - supported effective decision-making by senior leaders and enabled the programme to recover some schedule and cost slippage in the 3 years prior to opening.
Theme 2: Capex Incentives and Change Control	
Governance frameworks for programmes subject to regulation and involving private sector funding and/or financing should ensure that incentives with material financial implications during the construction phase are: • clearly defined by regulators upfront against a relatively small number of specific milestones (good practice suggests no more than 5 milestones). Successful delivery of outputs consistent with these incentives should be linked to releasing revenue or financing. • closely aligned with overall programme outputs.	Specific milestone-based incentives were set by CAA for the Heathrow T5 (CS3) and T2 (CS2) programmes (using triggers), by CAR for Dublin North (CS6) and by Ofwat for HARP (CS10). In each case, no more than 5 milestones were used. For the three regulated airport programmes, achievement of these delivery milestones led to release of regulated revenues.
The change control process during the construction phase (for changes to scope, schedule or cost) should operate at the same strategic level as the	For T5 (CS3) and T2 (CS2), the change control processes allowed HAL/BAA to make effective decisions on addressing changes, leading to delivery of both T2 and T5 on schedule and on budget. T5 has been

Conclusions	Evidence from Case Studies
incentive framework, to avoid the risk of micro-management and allow the delivery body sufficient flexibility to make effective decisions on programme management.	widely praised and used as an example of effective programme management. The Crossrail (CS4) incentive and change control processes were generally well-aligned, allowing the delivery agency CRL to make effective decisions and thus mitigate the risk of unnecessary delays.
Theme 3: Role of Economic Regulator	
Relatively light-touch, proportional regulatory roles have been applied successfully across major programmes, both for airports and in other sectors. Limited evidence was found from the case studies supporting direct roles for the regulator in decision-making once the regulatory framework has been defined. This applies to proposals in CAP3195 (*para 4.10*) that CAA should chair a Capital Investment Committee for expansion, or that CAA should take a more direct role in procurement.	CAA's approach to the successful T2 programme (CS2) at Heathrow entailed a relatively light-touch approach, like its role for BAU capex projects. Delivery of the airport programmes for Frankfurt Terminal 3 (CS8) and Western Sydney Airport (CS9) also utilised a light-touch regulatory approach focused on oversight and monitoring, enabling efficient delivery. Ofwat's approach to the HARP programme (CS10) has focused on early specification of the framework, followed by independent oversight and monitoring – without involvement in the procurement process, which was managed by the water company United Utilities (UU).
Bespoke approaches by regulators can be successfully applied to separable elements of programmes, recognising varying risk profiles of those elements.	For the Crossrail programme (CS4), ORR was involved in the original specification of the framework, by issuing successive statements on the regulatory treatment. It then played no role in decision-making for the new infrastructure. By contrast, the Network Rail "On-Network" works on the existing rail network were treated as a (separable) BAU project – in recognition of the interactions with the operational network, and associated risks. For expansion, separable projects such as the M25 relocation could be treated differently than the core airport infrastructure projects – which involve significant interactions with airlines and other stakeholders.
Theme 4: Role of Customers/Key Stakeholders	
For non-airport programmes, intermediate customers, such as private sector passenger operators for rail programmes, should typically have limited roles in programme governance: for example, as consultees with the same status as consumers - such as rail passengers.	For the Crossrail programme (CS4), passenger operators (TOCs) and Network Rail were involved in the initial consultation process (pre-FID). In the post-FID phase, Network Rail was engaged on specific issues – such as integration of the central section with the existing Network Rail network. TOCs were provided with regular progress updates but otherwise not involved.
For airport programmes, the role of airlines (as customers) should be proportional i.e. related to the programme risks where they can add value through relevant expertise, such as BAA's role during the Heathrow T5 programme (CS3). For most airport programmes, the airline role is usually less intrusive than the roles proposed for Expansion. This is highlighted in case studies such as Western Sydney Airport (CS9), Dublin (CS6) and Frankfurt (CS8). Capital Committees between the airport operator and airlines have been effective as a governance tool. Experience of mostly successful delivery for those programmes suggests that airlines can retain influence for programme specification and outputs during the development phase (pre-FID) through an effective consultation process but should not be involved in decision-making once programme scope and outputs are agreed.	For airport projects, the relatively intrusive role for airlines seen for Heathrow is unusual irrespective of the regulatory model: while airlines are typically key consultees and can influence project specifications to some degree (e.g. the Dublin North Runway programme – CS6), they have limited influence on decision-making. For the Dublin North programme, airlines had visibility on progress of the programme, and the expected implications for airport operations and charges. For the successfully delivered Heathrow T2 (CS2) and T5 programmes (CS3), airlines largely took on proportional roles consistent with the BAU frameworks - for example, without rights of veto for individual projects - and largely relied on CAA to provide oversight. For the T5 programme, BA's role was enhanced to recognise its role as the key customer, for example BA was significantly involved in the systems integration phase of the programme to ensure effective interaction between airport and airline systems. Again, this enhanced role for BA was proportional to the programme risks.

Conclusions	Evidence from Case Studies
Theme 5: Assurance	
The effectiveness of assurance processes for programmes largely depends on how assurance frameworks are implemented in practice, rather than how the framework and processes are specified.	HS2 (CS1) and Crossrail (CS4) had similar overall governance and assurance frameworks – for example, in defining the roles of sponsors in decision-making and assurance. Delivery efficiency has varied significantly according to how the assurance frameworks have been implemented. For the HS2 programme, the initial assurance framework was based on good practice, utilising the "three lines of defence" approach with two layers of internal assurance and independent, external assurance forming the third line of defence. However, the body responsible for integration of assurance was dissolved in 2022, leading to confused assurance roles which duplicated processes and led to inconsistency and delays to approvals. For example, the external Project Representative (P-Rep) and Independent Assurance Panel (IAP) have both conducted reviews of Rail Systems activity in the last two years, without any clear benefit to delivery. The lack of assurance integration has been identified as one of the primary reasons for inefficient delivery on HS2. By contrast, a similar assurance framework for Crossrail has been recognised as being largely effective in supporting efficient decision-making on the programme.
Independent assurance for programmes is usually effective in influencing successful delivery where suitably skilled independent assurers have sufficient responsibilities and powers to influence decisions/outcomes, within an integrated, transparent assurance framework. Under these conditions, independent assurance can provide confidence to customers and regulators that programme performance risk is managed through effective external review and should avoid the need for any additional oversight/review from customers or regulators.	For the HARP programme (CS10), external assurers with clearly defined roles were appointed by the customer UU. Turner & Townsend as the Independent Technical Assurer (ITA) is responsible for ongoing technical assurance and review including programme schedule and cost, while Amberside Advisors as the Approved Assurer (AA) provide financial assurance primarily related to the agreed financial model, such as verifying changes in cashflow. Both assurers have joint duties of care to Ofwat, UU and the delivery body CIL. These clear roles have provided confidence to the regulator Ofwat and providers of finance for the programme that project performance and delivery will be effectively assessed and reviewed for HARP, within clear parameters. By contrast, the roles of the P-Rep and IAP for HS2 (CS1) have been largely ineffective in influencing delivery, as noted above in relation to the duplicative review of Rail Systems.

A.1 Case Studies

CS1. High Speed 2 (HS2)

Project Description

The High Speed 2 (HS2) mega programme aims to deliver a new 140-mile high-speed rail line linking London Euston to Birmingham Curzon Street, including new rolling stock. The key objectives of the project include catalysing regional economic growth, provide more capacity on WCML route (particularly in the section north of Birmingham), and more reliable, faster journey times for passengers.

Key stakeholders include the Department for Transport (DfT), His Majesty's Treasury (HMT), Network Rail (NR), Great British Railways (GBR), HS2 Train Operator (quasi-customer), rail passengers and freight operators (end customers and beneficiaries), regional and local planning authorities, landowners along the route.

The Office of Road and Rail (ORR) was expected to set track access charges for HS2 and allocate capacity. Following recent Rail Reform legislation, ORR's role as economic regulator is expected to be significantly reduced as GBR would allocate capacity and approve charges. There is no direct involvement from ORR or other regulators. DfT has the role of funder, shareholder and sponsor for the Programme. HS2 Ltd is an Arm's Length Body (ALB) of the DfT, responsible for the delivery of the Programme and the operational railway. HMT is effectively an equity shareholder.

Regulatory Model

HS2 programme funding forms part of the DfT's Departmental Expenditure Limit (DEL), ring-fenced within the DfT budget. In practice, DEL funding has not been fully ring-fenced, and allowances have often been set annually – compared to a typical 5-year confirmed regulatory funding allowance. In theory the funding allowance is ex ante (within a defined window), in practice the cost estimate and allowances have changed frequently: initial cost envelope already exceeded, with £30 bn already spent or contractually committed. Schedule incentives defined for HS2 and financial incentives for civil works contractors.

The governance framework (set out in the HS2 Development Agreement) relies on DfT roles as both shareholder and sponsor, with most significant decisions taken by the Sponsor Board. Existing DfT governance structures have been used directly (or very marginally adapted) for HS2 i.e. BAU. HS2 Ltd was delegated powers to make decisions re delivery.

Stakeholder and customer engagement requirements are primarily set by Hybrid Bill process. Sponsor Board has co-ordinated most stakeholder engagement. Engagement with NR/GBR via specific forums e.g. Tripartite Cooperation Board.

Key Statistics and Outcomes

Current stage	In Construction
Budgeted capex	£49bn - £57bn (2019p)
Planned operating year	2033
Outturn cost	In Construction
Actual operating year	In Construction
Significant scope change	Yes
Delivered to FID baseline:	
Scope	In Construction
Time	In Construction
Cost	In Construction

Exhibit 4: HS2 Route

Strategic Control, Accountability and Decisions

The governance framework does not provide sufficiently clear criteria related to outcomes, benefits or success criteria. The key driver of providing additional capacity only emerged several years after the programme was launched, with an initial focus on faster journey times. Most success criteria for HS2 Ltd and its supply chain were based on schedule rather than outcomes or explicit benefits.

A confusing, over-complex governance structure (as operated in practice) has generated issues with accountability. Accountabilities have been blurred and the crucial role of HMT as the Financial Shareholder (holding the financial equity risk) is not recognised. The governance and leadership structures have not evolved as the mega programme progresses towards operational service. Good practice, such as from Crossrail, suggests that this evolution should have happened as the Programme moved from design to construction.

Stakeholder Involvement

Efficacy of engagements with customers/key stakeholders are long-winded with processes defined by the hybrid bill process. This has resulted in extended engagement period with landowners and planning authorities, allowing multiple challenges.

The Sponsor Board (run by DfT with HS2 Ltd acting as delivery agency) is the main decision-making body for scope and cost changes. The programme funding allowances comes through annual funding settlements negotiated between DfT and HMT, under standard government departmental processes (meaning in practice HMT ultimately makes funding decisions).

Investment Discipline

Delivery of HS2 has been largely driven by a desire to "build the best". This drove the scope, and in turn cost of the programme and was embedded in the programme's Business Case and Hybrid Bill.

The Stewart Review into HS2 found that "the top-down vision of building a railway that would be the best and fastest has been a major factor in undermining attempts to introduce a culture of cost control." The review also found that the failures of the governance structures, which led to unclear accountability, also contributed to a lack of cost control.

Operationally, the Review highlighted a disagreement on the Estimate at Completion cost of the project between HS2 Ltd and DfT, which has led to the inability to develop a new baseline and the breakdown of the performance management system between the two parties. This has strained the relationship between the two parties and impaired the ability for external stakeholders to impose investment discipline.

Cost discipline was impaired by significant consultation and requirements gathering to satisfy stakeholders and their diverse interests, contributing to progressive scope creep. The unclear external governance structures limited the ability for these parties to impose investment discipline and in part enabled the challenges of cost management from initiation.

Programme Assurance

HS2 has used a three" Line of Defence" (LOD) process, with three layers of assurance. HS2 has used a three" Line of Defence" (LOD) process, with three layers of assurance. The first two Lines are internal provided by separate teams within HS2 Ltd, and the third Line provided by an external organisation.

This structure is consistent in principle with good practice (such as from the regulated water sector). The programme initially used Integrated Assurance (IA) plans under an IA Group. However, the programme now has no integrated plan, and the IA Group has not met since 2022.

In practice, HS2 has multiple layers of assurance with many approval levels, leading to duplication, inconsistency and delays to approvals. For example, external Project Representative and Independent Assurance Panel groups have both conducted reviews of Rail Systems activity in the last two years.

The HS2 programme has lacked a body to provide fully independent third-party financial challenge. By comparison, other major programmes such as Sizewell C and Tideway, benefited from regular independent third-party challenge, such as from providers of finance.

Capex Incentives

Incentives are generally weak and schedule based. Financial incentives for contractors have been heavily weighted to schedule rather than cost. External increases in cost or funding allowances meant that most cost incentives for contractors were effectively removed early on.

In practice, contractors receive more funding as they spent (i.e. an "emerging cost" regime). HS2 Ltd is now introducing more explicit cost-based incentives in response, such as financial incentives on efficiencies (i.e. gain share).

Lessons for Heathrow Expansion

In principle, regulators can fulfil an external review role for Heathrow Expansion. However, in practice lenders and financiers are likely to also be conducting their own reviews for privately financed programmes (such as Tideway). This raises the potential for duplicated effort if CAA reviewed expansion planning and delivery in the same manner, as lenders would likely already be doing this with their own advisors.

An overly complex governance structure with blurred accountabilities may delay a mega-project. The governance structure needs to evolve as the programme progresses, especially once the programme transitions from design into construction. This introduces a further complexity for mega-projects such as Heathrow Expansion that have a necessary overlap between design and early construction works.

Decision-making on significant cost changes should be within a bespoke structure that recognises the complexity and risk profile of the programme (such as higher levels of risk during the development / design phases compared to BAU capex).

Incentive structures should relate to hard milestones (typically linked directly to funding or revenues with flexibility to accommodate changes for specific reasons, such as regulatory changes) and flow down to the supply chain. They should recognise the need to provide as much certainty as practicable for providers of finance by providing clear caps on exposure.

CS2. Heathrow Terminal 2

Project Description

Heathrow Terminal 2 involved the demolition of the existing 49,654m^2 terminal building. The original Terminal 2 building opened in 1955 and was the oldest operational terminal at Heathrow. It was originally designed to accommodate 1.2 million passengers annually, and prior to its demolition was accommodating around 8 million passengers' year. To deliver additional terminal capacity at the airport, a new T2 was to be built across two buildings:

- T2A – the 210,000m^2 main terminal building with 12 narrowbody stands and capacity for 20 million passengers per year; and
- T2B – a 56,000m^2 satellite pier with 16 widebody stands and capacity for 10 million passengers per year.

The earliest references to the project targeted completion in time for the 2012 London Olympics. However, delays during the planning stages of the project meant that the existing Terminal 2 could not be closed until November 2009 once Terminal 5 was opened, giving a revised targeted completion in mid-2014.

The key stakeholders involved with this project were BAA as the developer, Star Alliance and their member airlines who were to operate from the terminal. CAA were the economic regulator overseeing the Terminal 2 project. The project was primarily governed under the Q5 price control period (2008-2013), with some rollover to the Q6 period (2014-2021)

Regulatory Model

Heathrow is subject to RAB-based economic regulation model. This process is governed by the Civil Aviation Authority, the UK's aviation sector regulator responsible for price regulation at Heathrow.

Prices for Heathrow are set by CAA in five-year price control periods. These are calculated based on forecasted traffic, operating expenditure, capital expenditure, the weighted average cost of capital, commercial revenues, and other regulated charges and give a "maximum allowable yield per passenger", which is the maximum per-passenger charge that Heathrow may levy.

The Terminal 2 project was governed within an adapted BAU regulatory framework and primarily fell within the Q5 price control period (which set aside £1.2bn for the project), with £250m falling under the Q6 price control period.

Under the Q5 price control regime, Heathrow (then-BAA) put forward a proposed five-year capital investment plan to CAA, which included the T2 project. CAA consulted with airlines and other stakeholders on this plan and its constituent projects. Comments received during this consultation informed a final adjusted capex proposal published by CAA.

Key Statistics and Outcomes

Current stage	Operational
Budgeted capex	£2.5bn
Planned operating year	2014
Outturn cost	£2.5bn
Actual operating year	2014
Significant scope change	N
Delivered to FID baseline:	
Scope	Y
Time	Y
Cost	Y

Exhibit 5: Heathrow Terminal 2 Departures Entry

Strategic Control, Accountability and Decisions

The CAA defined explicit "triggers" within their price control regimes. These triggers are informed by submissions from Heathrow, airlines, and other stakeholders and incentivise the timely and efficient delivery of key projects within the capital investment plan. They achieve this by requiring Heathrow to pay a predefined monthly rebate if trigger (i.e. milestone) dates are missed. This serves to prevent Heathrow from gaining a financial benefit from the slow delivery of a project.

The Q5 decision paper summarises the triggers relevant to Terminal 2 as follows:

- March 2011 – Demolition of T2 sufficiently complete to enable start of T2A construction and terminal building substructures complete within main terminal floorplate – £2.78m monthly trigger payment
- February 2012 – Completion of T2A building weather-tight – £3.03m monthly trigger payment
- November 2012 – Construction of T2A sufficiently progressed for operation trials to commence – £1.22m monthly trigger payment
- November 2012 – Completion of T2B centre, and completion of connectivity between T2A and T2B – £0.98m monthly trigger payment

These explicit triggers, and the potential penalties they may impose, informed decision making and delivery of the Terminal 2 project.

Stakeholder Involvement

The Terminal 2 project (and Heathrow's capital investment program more broadly) were informed by engagement with Heathrow's airlines, specifically with the Star Alliance airlines that would form the terminals primary tenants and key customers. While these airline stakeholders were consulted, there was no formal requirement for agreement.

As noted in the *Regulatory Model* section above, the CAA received comments from stakeholders on Heathrow's Q5 and Q6 five-year capital plans (which at the time included proposals for Terminal 2). The CAA incorporated these comments and made adjustments to the level of funding allocated to capital works in Q5 and Q6 were assessed as necessary.

Investment Discipline

The funding of Terminal 2 through the CAA's regulatory process encourages investment discipline. This is because capex allowances factored into the CAA's price caps are independently assessed and adjusted by the regulator. They considered:

- Heathrow's capital plan and other written submissions
- Stakeholder submissions commenting on Heathrow's capital plan
- An assurance process undertaken by the CAA to ensure Heathrow's capital spending allowances were appropriate and representative of an efficient project. This was undertaken through a benchmarking process comparing Heathrow's costs for the Terminal 2 programme against comparable projects, and reports developed by independent experts.

The CAA developed a mid-Q5 review of capital spending at Heathrow to assess the actual performance of the Terminal 2 programme and make recommendations for remedies and adjustments to the regulatory process for the next price control period.

Collectively, this structured process of independent oversight and approval from the CAA ensures investment by Heathrow into Terminal 2 was disciplined and efficient and met stakeholder requirements.

Programme Assurance

The Independent Funds Surveyor (IFS) were appointed in 2013 and provided independent technical assurance for the later part of the delivery phase for the T2 programme, in addition to the standard Heathrow 2-line internal assurance. The IFS had a joint duty of care to HAL and the Heathrow airlines through the AOC (Airline Operators' Committee), reporting to the joint Capital Portfolio Board. CAA approved the IFS role, which complemented its own monitoring of T2 and other capex programmes - for example through its ex-post efficiency review of capex incurred during Q5.

Capex Incentives

CAA, as part of their Price Control Periods, set milestone-based triggers (as described in the *Strategic Control, Accountability and Decisions* section previously), and BAU controls on capex under the Q5/Q6 price control framework. CAA has also used ex post capex reviews (for both Q5 and Q6) to assess the efficiency of major capex programmes such as Terminal 2 to inform the use of these controls for future programmes. No such inefficiencies were identified within these reviews.

The trigger system required Heathrow to pay financial penalties in the event milestones on the Terminal 2 project were not delivered by the pre-specified date. The intent of this system was to provide clear incentives for Heathrow to deliver Terminal 2 in a timely manner, as under the CAA Price Control regime, it may have been possible for Heathrow to gain a financial advantage by delaying capital works that were pre-funded within the price control period.

However, the CAA's approach to triggers changed from Q5 to Q6 following lessons learned from the delivery of various projects. This is because setting triggers too early may not be appropriate for large and complex programmes as they can reduce flexibility earlier in the projects' planning stages.

Lessons for Heathrow Expansion

The Terminal 2 programme was delivered on-time and on-budget using an adapted version of the BAU regulatory framework. For example, CAA allowed for adjustment of HAL revenues as delivery progressed, including funding of efficient development costs.

Stakeholders were informed by the Airport during the project's planning and delivery phases and were consulted by the CAA during their price determination process.

Financial penalties set by CAA as "triggers" under the Q5 process appear to have been effective in encouraging project delivery to remain within the funding envelope, however the CAA changed the approach to triggers in the Q6 period following lessons learned from various projects.

That is to say, the CAA process provided limited scope for Heathrow to submit the Terminal 2 project for scrutiny and receive a funding determination when the project was ready, nor a mechanism to adjust funding as the project scope (and therefore capex) evolved. Instead, decisions on the funding of the project had to be made by the CAA based on the level of planning prepared at a point in time with limited consideration for unresolved design decisions, and evolving scope and cost estimates.

CS3. Heathrow Terminal 5

Project Description

The Terminal 5 (T5) project entailed the design, construction and commissioning of a fifth passenger terminal at Heathrow, including additional supporting infrastructure and transportation connections.

The programme was developed to increase the total terminal capacity (i.e. as distinct from *airport* capacity) at Heathrow to around 90 million passengers per year, an increase of 30 million. Helping the airport to meet proven demand from existing operators and future traffic growth. Contributing to relieving congestion in the existing airport infrastructure.

The key stakeholders involved in the project were, BAA, British Airways, proposed sole airline operating at T5, first-tier suppliers, CAA, CMA (Competition and Markets Authority), DfT and planning authorities.

CAA were the primary economic regulator overseeing the project, with CC (Competition Commission)/CMA in an approval role. The project was primarily governed under the Q4 price control period (2003-2008) and under Q3 (1997 – 2002) and Q5 (2008-2013).

T5 is a complex multi-modal transport interchange designed to handle 30 million passengers per year over a 260 Ha site. The project included construction of two large terminal buildings, an air traffic control tower, a 14,000-space car park, an airport hotel, over 60 aircraft stands and new taxiways, a baggage handling system, a new energy centre and road and railway transport links.

Regulatory Model

Heathrow was subject to a RAB-based economic regulation model. This process was set by the CAA and reviewed by CC/CMA, who together were responsible for economic regulation at Heathrow.

As part of the RAB model, prices for Heathrow were set for five-year price control periods, such as Q4. The price control process produced a "maximum allowable yield per passenger", which is the maximum per-pax charge that BAA could levy.

The T5 programme was funded within the BAU regulatory framework throughout the price control periods, with some specific conditions:

- Milestone-related triggers (*see Capital Incentives section below*)
- Allowing BAA to smooth (bring forward) charges before completion of construction to improve financeability. This approach allowed BAA to begin earning a return and depreciation on (a portion of) project CapEx incurred during construction, before the T5 project was complete and operational
- Allowing a differential rate of return on the RAB to reflect the additional risks of T5.

Under the Q4 price control regime, Heathrow (then-BAA) was regulated under the single-till approach.

Key Statistics and Outcomes

Current stage	Operational
Budgeted capex	£4.3bn
Planned operating year	2008
Outturn cost	£4.3bn
Actual operating year	2008
Significant scope change	N
Delivered to FID baseline:	
Scope	Y
Time	Y
Cost	Y

Exhibit 6: Heathrow Terminal 5 Aerial View

Strategic Control, Accountability and Decisions

The CAA defined explicit "triggers" within their price control regimes. These triggers are informed by submissions from Heathrow, airlines, and other stakeholders and incentivise the timely and efficient delivery of key projects within the capital investment plan.

CAA defined five specific triggers (success criteria) for the T5 programme, which reduced charges for non-completion of specific sub-projects:

1. Diversion of twin rivers
2. Early release stands
3. Handing over to NATS of the visual control room
4. Full weatherproofing of the core Terminal 5 building
5. Full weatherproofing of Satellite 1

Stakeholder Involvement

The programme was delivered through the T5 Agreement, a relational contract between the BAA and the T5 first-tier suppliers. The Agreement's unique approach allowed BAA to hold project delivery risk. Incentives were set for suppliers which flowed down specific risks, with an emphasis on rewarding successful delivery/performance. This approach gave BAA greater control over the financial implications of risk and thus tighter overall budget control.

BA, as the proposed sole occupying airline at T5, was engaged throughout the project's planning and delivery, however no formal requirement for their agreement was required.

Investment Discipline

As part of the T5 Agreement, BAA invested in a centralised insurance policy to cover construction risks. This approach encouraged suppliers to apply innovative approaches and drive efficiencies in delivery.

The governance framework under the T5 Agreement empowered suppliers to accelerate decision making and use innovative approaches to problem solving, in order to benefit the programme.

The CAA provided oversight of the programme through the control period.

Programme Assurance

CAA assurance of T5 was primarily through its monitoring of the programme.

BAA's implemented programme assurance was driven by the T5 Agreement. BAA brought the project management capability in-house and made innovative production management an integral part of the project leadership approach.

BAA implemented a 'devolved governance' model by which it sought to empower suppliers to accelerate decision-making and problem solving. This approach encouraged T5 suppliers to achieve exceptional performance.

Additionally, BAA created a "one team" culture and insisted on co-locating on site with the teams. This approach supports them in maintain a monitoring and oversight of programme progress.

Capex Incentives

The CAA implemented capital expenditure triggers during Q4, as recommended by the Competition Commission. These triggers were welcomed by stakeholders, namely British Airways, with some proposed changes.

The T5 Agreement was based upon an open book commercial arrangement between BAA and its key suppliers, with fair profit for good performance and incentives for exceptional performance. Additionally, BAA put in place an industrial relations policy with a performance-based bonus scheme.

BAA's decision to accept project risk was vital in the development of a positively unique project culture. As accountability was lifted, those working on T5 could work positively as the emphasis is placed on delivering solutions and results.

During price control period Q4 the Service Quality Rebate (SQR) was implemented. This scheme meant that BAA's revenue should reflect the quality of service provided. This provided a financial incentive to BAA to meet a set of standards, including timely delivery of projects. This scheme was enhanced with additional measures throughout Q5.

Lessons for Heathrow Expansion

T5 and its related projects were delivered under an adapted business-as-usual regulatory model and delivered on-time and on-budget. This approach suited a complex project such as this as it involved several sub-projects.

Stakeholders were heavily involved in the project planning phase, both as approvers and consultees in the Heathrow's project gateway processes. Additionally, stakeholders were consulted by the CAA when evaluating Heathrow's five-year capital spending proposals. During this process, airlines did not have veto rights as present in the current framework.

CS4. Crossrail

Project Description

The Crossrail programme has delivered a high-frequency, high-capacity, fully digital railway serving central London, Heathrow Airport, and South-East England. It delivered 118 km of route with 21 km of twin-bore tunnels, 10 new stations and new rolling stock. The Elizabeth Line provides additional capacity and new connectivity for East-West journeys across London, while generating economic benefits. The key drivers include catalysing economic growth, providing more capacity for East-West journeys, and more reliable, faster journey times for passengers.

Key stakeholders include: Transport for London (TfL) and the Department for Transport (DfT) (joint sponsors), then-Her Majesty's Treasury (HMT) (key funder), Greater London Authority (GLA), Network Rail, Office for Rail and Road (ORR), Crossrail Limited (CRL) Train Operator (quasi-customer), rail passengers and freight operators (end customers/beneficiaries), major businesses and landowners along the route – e.g. HAL.

TfL set up CRL as the delivery body as a public sector Special Purpose Vehicle (CRL), reporting to DfT and TfL as joint sponsors. Network Rail was responsible for delivery of enhancements to the network outside the new central section.

The central section is operated by Rfl-I (Rail for London Infrastructure Ltd), a subsidiary of TfL. ORR sets track access charges for the Elizabeth line concessionaire and allocates capacity. Following recent Rail Reform legislation, Great British Railways (GBR) will allocate capacity and approve charges.

Regulatory Model

The overall regulatory model is an adapted RAB framework, where ORR regulates ongoing charges to recover Operations, Maintenance and Renewals (OMR) costs in a similar way to the rest of the network, and TfL-I recovers publicly funded capex through an ex-ante Investment Recovery Charge. NR recovers its own capex through a RAB addition. Last month, TfL expressed concern over the future role of GBR once ORR's economic regulation powers are reduced as ORR did not have any meaningful role in governance/decision-making during delivery, while GBR will.

The delivery governance model is shown in the image right.

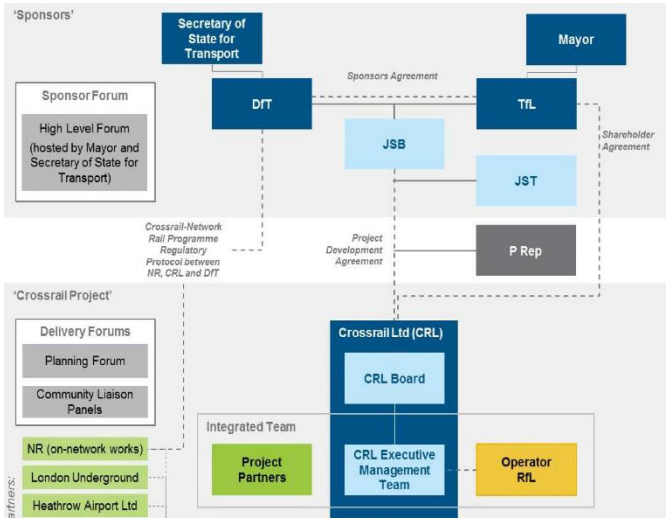
The funding envelope for the CRL capex was set by the joint sponsors, with most of the funding for the overrun coming from TfL. Funding for NR works was set by ORR through an ex-ante RAB addition, with an allowance for additional financing costs for timing differences. Capex incentives were limited (*see below*).

TfL/DfT created a new, bespoke delivery vehicle with specific responsibilities under the Development Agreement. The TfL-DfT sponsors' agreement also created a sponsor team with a specific remit – so not treated as BAU. The governance structure changed at pre-specified milestones during the programme e.g. at start of systems integration.

Key Statistics and Outcomes

Current stage	Operational
Budgeted capex	£14.8bn
Planned operating year	2018
Outturn cost	£18.8bn
Actual operating year	2022
Significant scope change	N
Delivered to FID baseline:	
Scope	Y
Time	N
Cost	N

Exhibit 7: Crossrail Governance Structure



Strategic Control, Accountability and Decisions

The project's baseline schedule and funding envelope were clearly set by joint sponsors within a Project Development Agreement (PDA). The PDA was a bespoke agreement that is broadly similar to a one between a PPP/PFI agreement between a private-sector SPV and a sponsor.

The PDA clearly defined the project's governance framework including:

- The 'Sponsors' Requirements' – that is, the scope and specification of the project
- The principles by which CRL will deliver the Sponsors Requirements
- The roles and responsibilities of the parties and how they will interact
- Funding envelopes and spending rules
- The content and form of Management Information required by the Sponsors
- The systems and processes which will need to be in place and by when
- Intervention points and step-in rights.

The use of the PDA ensured that these roles, responsibilities and processes were clearly understood and agreed by all parties prior to the projects' commencement. In addition, these processes were able to be tailored to the unique requirements of Crossrail as they were directly negotiated between the parties, rather than being imposed externally from a regulator.

Stakeholder Involvement

The roles and responsibilities of the key stakeholders, TfL, DfT and CRL, were defined within the PDA.

Wider stakeholders, such as London Boroughs, were not involved as heavily in planning and delivery of Crossrail. During planning and delivery, wider stakeholders were invited to various forums and non-contractual boards and panels based on their level of interest and influence in the programme. This provided regular structured forums for coordination, information sharing and dispute resolution.

This structure ensured that stakeholders had clear avenues to engage with CRL through a structured process, while ensuring parties to the PDA maintained control of the project's scope and delivery.

However, HMT provided Government funding for Crossrail only in the same proportion that London contributed to the wider UK economy (meaning HMT funded roughly 30% of project costs). The remaining 70% of the project's £18.8bn budget was funded by London through fare revenue (30%), and business rates and development levies (40%).

The role of businesses and developers in contributing to the largest single source of funding for Crossrail (in addition to playing a role in realising many of the project business case's wider economic benefits), meant that the buy-in and involvement of property development stakeholders across London (such as developers, investors, council planning officers and so forth) were important to the project's long-term success.

Investment Discipline

The delivery of Crossrail through a PDA meant that the project scope, cost and delivery plan could be negotiated and agreed by the joint sponsors early in the project's development.

This ensured the Sponsors fixed key project requirements early and implemented a robust change control process within the Agreement. Consequently, detailed planning for Crossrail could be undertaken on a robust baseline that had been suitably reviewed and validated by the joint sponsors and key stakeholders. This meant that scope creep could be managed through the Agreement as it limited how key project requirements and scope elements could be modified during delivery.

The PDA specified robust governance processes to support the project by defining how decisions are made between sponsors, how decisions are delegated between different project parties, how sponsors can and cannot initiate changes and so forth.

Programme Assurance

The PDA adopted a concept termed "earned autonomy". Under this framework, CRL had a lower degree of autonomy and was subject to stronger assurance and oversight processes during the project's planning phase. This was to ensure adequate oversight and assurance during project planning when the ability to influence and change the project's requirements and scope were at their greatest, and consequently the schedule and financial impact of doing so at its lowest.

As the project progressed from planning and confidence in the requirements, scope and delivery plan grew, responsibilities and decision-making authority were progressively transferred to CRL as it "earned" increasing levels of autonomy.

These transfers were granted over a three-year period following structured external reviews and aligned to clear pre-defined milestones. These milestones included:

- Passing of the *Crossrail Act*, the project's enabling legislation
- Core project documents and agreements signed
- Interim review of project, cost and delivery strategy (following which CRL was granted freedom to issue their own tender notices for major contracts)
- Permission granted to award the four main tunnelling works contracts (following which CRL was granted authority to award delivery contracts)
- Full transfer of operational powers to TfL (following which CRL was granted operational powers including tendering and managing contingency).

Capex Incentives

The PDA implemented several measures to incentivise CRL to deliver the project's requirements within the agreed funding and schedule. This included:

- CRL senior leaders could earn a bonus of up to 200% of base salary, linked to performance against in-year targets
- The joint sponsors (TfL in the first instance, with DfT stepping in at elevated trigger levels) had step-in rights (Intervention Points or IPs) for significant under-performance, though in practice these IPs were triggered too late to allow corrective action.

The PDA provided three key intervention points. The triggering of these points was linked to evolution of forecasted outturn cost compared to estimates and established a clear and unambiguous process for managing cost increases during delivery:

- The first intervention point, IP0, would be triggered if the forecasted outturn cost exceeded the P50 cost estimate. At this stage CRL must submit a remediation plan to TfL.
- The second point, IP1, occurred if the forecasted outturn cost exceeded the P80 cost estimate (at which point the contingency held by CRL would be exhausted). At this point the project would be drawing on contingency held by TfL, and consequently TfL given the right to step in and replace Directors and Senior Executives (in effect taking control of the project).
- The third point, IP2, occurs at the P95 cost estimate (when TfL's contingency would be exhausted). At this stage, DfT can intervene directly, or TfL can hand the project to DfT.

Lessons for Heathrow Expansion

The governance framework for Crossrail was broadly similar to HS2; however, Crossrail had enhanced, clearer roles for the joint sponsors which in practice gave them more visibility and control over schedule and cost.

The governance framework was mostly implemented successfully and proved resilient given the inevitable changes in scope and schedule during delivery of such a large and complex programme.

The role of CRL as a separate, non-BAU delivery agency was largely successful. ORR's role as economic regulator during construction was clear and limited to Network Rail works for the central section and not involved with CRL-delivered works.

The project was delivered under a PDA, which was a bespoke agreement developed specifically for the unique requirements of this project. It was broadly similar to PPP/PFI agreements used between private-sector SPVs and sponsors, which allowed a balance to be struck between adopting a bespoke fit-for-purpose project agreement, while using a tested framework that was familiar to industry.

The PDA was successful in defining the overarching governance framework for the project. It established the roles and responsibilities of each party, the project's requirements and scope, and provided a clear change control procedure.

The PDA was successful in implementing an "earned autonomy" system where external assurance was at its strongest (and independent authority held by CRL at its lowest) during the planning phases of the project. TfL and DfT as the sponsors progressively handed off authority and autonomy to CRL as the project progressed through predefined milestones.

CS5. Sizewell C

Project Description

Sizewell C is a planned 3.2 GW nuclear power station on the Suffolk coast that aims to deliver low-carbon baseload electricity for around 6 million homes, support thousands of jobs, and strengthen UK energy security. The project is in advanced development with site works and a government-backed financing structure to enable construction and operation.

Key benefits promoted by the promoter include reliable low-carbon electricity, energy security, and regional economic impact. Sizewell C is expected to create and support thousands of jobs across the supply chain, deliver local investment, and contribute to national net-zero objectives by avoiding millions of tonnes of CO_2 emissions annually once operational.

Sizewell C involves multiple UK government departments and independent regulators: the Department for Energy Security and Net Zero (DESNZ) and HM Treasury lead policy and funding, Ofgem oversees economic regulation under the RAB model, the Office for Nuclear Regulation (ONR) and the Environment Agency handle safety and environmental consents, and local authorities and statutory consultees manage planning and community impacts.

Sizewell C's major technical and engineering challenges centre on complex ground and coastal conditions, large civil and marine works, the technical demands of the European Pressurised Reactor (EPR) design, and the logistics of a multi-year, high-volume construction programme.

Regulatory Model

Capital expenditure at Sizewell C is controlled through a structured regulatory process by Ofgem. The approach is designed to allow construction to be funded while ensuring that consumers only pay for costs that are necessary and efficiently incurred.

Ofgem establishes an initial baseline covering the project scope, cost assumptions and delivery profile. This baseline defines what types of expenditure may be eligible for inclusion in the Regulated Asset Base (RAB), but it does not guarantee that all forecast costs will be recovered. During construction, the project company must provide regular regulatory reporting in line with Ofgem's Regulatory Instructions and Guidance. These submissions include detailed information on actual and forecast capital spending, explanations of variances against the baseline, and evidence of cost control and delivery performance.

Capital expenditure is added to the RAB progressively, reflecting costs that have been incurred. Ofgem assesses whether this expenditure is within the approved scope and whether it has been efficiently managed. Where costs are poorly justified or inefficient, Ofgem can delay or disallow their inclusion in the RAB.

Ofgem also applies ongoing efficiency assessments and can require revised forecasts or tighter controls if delivery performance weakens. Overall, capex deployment is treated as a continuous, evidence-based regulatory process rather than a one-off approval.

Key Statistics and Outcomes

Current stage	In Construction
Budgeted capex	£38bn (2024p)
Planned operating year	Mid to late 2030s
Outturn cost	In Construction
Actual operating year	In Construction
Significant scope change	In Construction
Delivered to FID baseline:	
Scope	In Construction
Time	In Construction
Cost	In Construction

Exhibit 8: Sizewell C Concept

Strategic Control, Accountability and Decisions

Sizewell C is delivered through a layered governance and delivery structure led by a project company (Sizewell C/NNB Generation Company) and EDF as the principal developer, with major public-private ownership, government oversight for funding and regulation, and a tiered supply-chain and contractor model to manage construction, safety and commissioning.

The UK Government holds a significant stake alongside private investors and energy companies; EDF is a major developer and operator partner on technical delivery. The government's role includes negotiating financing, approving contractual frameworks and taking a long-term equity position to reduce financing risk.

NNB Generation Company holds the site licence, manages consenting and signs major contracts. The programme uses stage-gated governance with clear decision gates for financing, consenting, procurement and commissioning. A central programme office manages schedule, cost control, quality assurance and nuclear safety culture; integrated project controls and independent assurance functions monitor progress and compliance.

Critical interfaces include regulatory approvals (ONR, Environment Agency), grid connection, marine works and shared services with Sizewell B. Major decision gates are final investment decision, nuclear site licence milestones, environmental permits, and fuel-loading authorisations.

Stakeholder Involvement

There are several stakeholders ranging from the project sponsor (EDF) and numerous government and regulatory bodies. The customer of Sizewell C's outcome is ultimately the downstream consumers of the energy generated as represented by the British government.

Whilst the project company NNB Generation is the contracting entity, EDF is responsible for technical engineering, construction and operational delivery. HM Treasury provides approvals related to financial release through to final investment decision. Other key stakeholders include DESNZ, ONR, environmental agency and local authorities.

Beyond final investment decision, key stakeholder interfaces are between the project company, Environmental Agency, ONR and Ofgem. The nature of the engagement is primarily related to safety, environmental and economic oversight related to the overall development of the project.

Investment Discipline

The project establishes the auditable cost baseline and funded scope that underpins RAB revenue recovery at FID; this baseline becomes the reference for all subsequent change control and regulatory assessment.

Ofgem's periodic construction-phase checkpoints require the licensee (project company) to submit evidence against the baseline (progress, procurement outcomes, independent assurance reports and updated forecasts). The reporting rules (RIGs) set the format, timing and content of these submissions so Ofgem can decide whether to allow incremental revenue draws or require adjustments.

Ofgem's role as economic regulator is also impacted by requirements from ONR. For example, the ONR has specific requirements and hurdles that need to be met through the gated process including granting the site licence, construction authorisation, commissioning, fuel loading and operations.

Programme Assurance

Independent programme assurance is third-party verification required at each regulatory and commercial gate to validate cost, schedule, technical and safety claims before Ofgem, ONR, government or financiers accept them.

Independent assurance on Sizewell C covers four core areas: cost and commercial, schedule and delivery, technical and safety, and governance and compliance. For economic checkpoints and RIG reporting, Ofgem expects independent cost and risk validation to justify any baseline or change acceptance; the RIGs set the reporting format and evidence expectations used by the regulator. For nuclear safety, ONR requires independent technical assurance of safety cases, QA systems, supplier traceability and competence before issuing construction permissions or pre-operation consents.

Assurance providers must be independent, suitably qualified and free of conflicts; outputs include formal assurance reports, RAG findings, recommended mitigations and an auditable evidence pack (contracts, invoices, test records). These reports are submitted to Ofgem. Terms of reference define materiality thresholds that trigger formal re-assurance. Assurance findings escalate to the project board, independent assurance committee and regulators as required. Where assurance is insufficient, Ofgem or funders may withhold revenue recovery or FID, and ONR may withhold construction permissions.

Capex Incentives

Ofgem's Economic Guidance and the RAB licence modifications set a framework where capex is admitted into the regulated cost baseline only after passing stage-gates (FID, construction checkpoints, pre-operation) supported by RIG submissions and independent assurance. If Ofgem does not accept a cost into the baseline, that cost is typically borne by the licensee or its shareholders, not automatically passed to consumers; the licence also defines materiality thresholds (lower and higher bounds) and cost-sharing formulas for different classes of overspend.

Broadly the capex incentives are assessed as follows:

- Capex is assessed at pre-PCR (preconstruction review)
- The project company can add 100% of incurred costs up to the lower threshold to the RAB.
- 50% of costs incurred that are between the lower and higher thresholds can be added to the RAB.
- 50% of underspend below the lower threshold can be added to the RAB.
- Costs above the higher threshold have a cap. This is held commercial in confidence.

Lessons for Heathrow Expansion

Sizewell C's capital governance framework brings together incremental adjustments from lessons learned on Hinkley Point. It highlights the preference towards a RAB based model as is the case for Heathrow. There is also a robust gated governance process like Heathrow.

The stakeholder involvement in project delivery is targeted to where engagement is appropriate based on their interest. Limiting end user/customer engagement to FID and transitioning to regulatory bodies for subsequent delivery governance provides a suitable baseline (i.e. Ofgem and ONR).

The programme assurance process is holistic and defined by regulatory requirements for both economics and safe operations. The key highlight to this is the streamlined engagement whilst requiring robust evidence for assurance.

The capex incentives provide a different approach which is generally symmetrical although it is unknown what the cost overrun cap may be.

Note that there are more safety driven elements to the capital governance framework for Sizewell C which are relatively immaterial to Heathrow Expansion.

CS6. Dublin Airport North Runway

Project Description

Dublin Airport's North Runway is a 3,110m parallel runway located 1,690m north of the existing 2,637m runway.

The runway had long been signposted within the Airport's master plans. It provides capacity for additional aircraft movements to facilitate growth that otherwise could not have been accommodated at Dublin Airport's existing main runway alone.

The runway was developed by DAA, the airport's operator. Other key stakeholders include the Irish Government (who referenced a need for the runway in their 2015 National Aviation Policy), and their airlines (with Aer Lingus and Ryanair forming the two main hub airlines based at the airport).

The planning application for the project was submitted to Fingal County Council in 2004 and granted by An Bord Pleanála (an appeals body) in 2007. Commencement of works were delayed by the Global Financial Crisis and began in 2016 achieving completion in 2022.

Airport charges at Dublin are regulated by the Commission for Aviation Regulation (CAR), who impose price caps on a five-yearly basis. Funding for the project was first included in the 2010-14 price determination with a trigger of 25 million passengers over a 12-month period, at which point an additional €0.59 could be added to the passenger movement charge to fund the project. A traffic downturn following the GFC meant that this trigger was not reached until 2015 (whereas pre-GFC trajectory could have seen this reached as early as 2009).

Regulatory Model

Capital expenditure at Dublin Airport is controlled through a structured regulatory process by the Irish Aviation Authority (IAA). The approach allows capital expenditure to be funded through airport charges while ensuring airlines and passengers only pay for efficiently incurred and relevant costs.

IAA establishes a baseline opening Regulated Asset Base (RAB) at the beginning of the five-year price control period. Forecasted capital expenditure is incorporated into the RAB. This expenditure is determined by IAA based on DAA's capital plan and stakeholder comments and represents IAA's view of efficiently incurred capital spending that "meets the reasonable requirements of current and prospective users [and] proposes costs for projects that are reasonable estimates."

IAA can classify capital projects as baseline (meaning they are included within the capital plan' or 'trigger-based' (meaning they may only be charged back to airlines in the form of aeronautical charges if pre-defined project triggers set by IAA are met).

The North Runway project was incorporated within the 2010-14 price control period, with a trigger of 25 million passengers per year. This mean that the project would not be included in the RAB and the capital plan until this trigger was met (thereby incentivising the efficient use of capital).

This trigger was met in 2015, meaning the project was primarily funded within the 2015-19 and 2020-25 price control period.

Key Statistics and Outcomes

Current stage	Operational
Budgeted capex	€247m
Planned operating year	2020
Outturn cost	€320m
Actual operating year	2022
Significant scope change	N
Delivered to FID baseline:	
Scope	Y
Time	N
Cost	Y

Exhibit 9: Dublin North Runway

Strategic Control, Accountability and Decisions

Outcomes and success criteria were clearly identified for this project in the form of triggers and milestones determined by IAA following consultation with DAA and airlines.

These milestones were aligned to key project deliverables and split payments by airlines to DAA for runway works into three tranches. These served as clear success criteria and desired outcomes and drove DAA decision making through the planning and delivery process:

- Milestone 1 – Main works start - €0.06 added to per-passenger price cap
- Milestone 2 – North runway fully operational – €0.50 added to per-passenger price cap
- Milestone 3 – House Buy-out complete (relates to land acquisition) – €0.03 added to price cap

The intent of these milestones by IAA were to ensure users would only pay for the project once benefits could be realised and encouraged the efficient delivery of the project as a known, fixed payment would only be received following completion of the project.

Stakeholder Involvement

Under the regulatory process, IAA made a determination in October 2014 that DAA will reach the 25 MPPA trigger for the north runway in 2015 and commenced a formal process to determine the allowable cost recovery for the works that involved stakeholder consultations:

- In November 2015, IAA commenced a review on the timing and manner of cost recovery for the north runway and invited comments from DAA and airline stakeholders regarding the scope of this review.
- IAA published a consultation report in June 2016 and final review scope in October 2016.
- A draft decision on the regulatory treatment of the runway was published by IAA in January 2017 with stakeholder comments invited and incorporated into a decision published in April 2017.

Investment Discipline

The milestone structure described previously means that sees DAA only receive a pre-determined per-passenger payment from airlines. These charges are set by IAA following consultations with airlines and are payable only following milestones also set by the IAA within the same consultation process.

These essentially fix the available revenue DAA can recover from airlines for the project and in turn incentivises the airport to deliver the project in an efficient manner.

Furthermore, the clear trigger point of 25 MPPA which was set in 2009, 6 years before being reached in 2015 (albeit due to a downturn in passenger traffic following the GFC), set by IAA following engagement with airline stakeholders, establishes a clear decision point that is known to all parties. This process ensures that non-build options such as demand and slot management have been adequately explored and implemented by DAA prior to runway works commencing, ensuring that investment is suitably justified.

Programme Assurance

IAA conducted its own monitoring of the north runway project and other capex programmes through its ex-post efficiency review of capex incurred during the 2010-14 and 2015-20 price control period. This included assessment of which milestones had been reached (if any), and monitoring of actual capex incurred against the budgeted allowances. Following these reviews, any necessary ex post adjustments are made.

Capex Incentives

Payments from airlines to DAA to fund the project were structured into tranches based on predetermined milestones as described previously. This serves to provide an incentive for DAA to deliver works in an efficient manner with respect to both time and cost, as only a fixed payment is available, and only payable once works are complete.

Similarly, DAA set penalties for overspending in the form of 50/50 risk sharing between DAA and airlines. Under this system, a €246m allowance was made by IAA for the runway works. An approximately €70m overspend saw the final project cost increase to approximately €320m.

Under the risk sharing framework, this €70m overspend was split between DAA and the airlines on a 50/50 basis. This allowed DAA to pass on to users only half of any overspend more than what IAA had previously determined to represent an efficient level of expenditure.

Lessons for Heathrow Expansion

Under this capital governance framework, IAA established clear incentives for DAA to complete works in an efficient manner by allowing costs to be recovered from airlines only after works were completed, and only for an "efficient" level of capex.

A process of consulting stakeholders and publishing clear and easily understood milestones and per-passenger costs allowed stakeholders to easily understand how much the runway would add to aeronautical charges on a per-passenger basis, and when they would be levied.

A limitation of this model is that it imposed a rigid regulatory framework onto large and complex (and often dynamic) capital programme. As such, modifying project scope or cost in response to changing conditions may have been more complex than under other models.

While some airline stakeholders expressed disapproval of the 50/50 risk sharing process, the IAA was of the view that it encouraged collaboration between DAA and airlines by aligning incentives though a clear painshare/gainshare mechanism.

However, during a review the IAA left open the possibility to remove the 50/50 risk sharing process, instead requiring DAA to re-consult with airlines and IAA on an increased capex allowance (called a supplementary capex allowance). This ensures any overspend is being properly scrutinised by IAA prior to being passed through to airlines.

CS7. O'Hare 21

Project Description

The Chicago O'Hare Transformation Programme, also known as O'Hare 21, is the largest terminal expansion since the airport's opening in 1944. The project seeks to increase terminal capacity and deliver an improved passenger experience. Key works under the programme include:

- Construction of two new satellite terminal concourses D and E, and the extension of existing Concourse L.
- Demolition of the existing Terminal 2 and replacement with the *O'Hare Global Terminal*, which allows the main passenger terminal to accommodate international arrivals for the first time (currently only available at Terminal 5).
- Associated reconfiguration of the existing Terminal 5 to reduce its focus on processing inbound international arrivals.

The project's key stakeholders are American Airlines and United Airlines, who are the main hub airlines operating at Chicago O'Hare.

The project is being delivered without an economic regulator. Chicago Airport are delivering the programme under an Airline Use and Lease Agreement signed with the airlines in 2018. This is a commercial agreement with a 15-year term which specifies the facilities and infrastructure each airline is entitled to, rates and charges, and the O'Hare 21 programme including the agreed requirements, scope and cost, and the mechanisms through which airlines will participate in governing the programme.

Regulatory Model

O'Hare 21 adopts a light-touch regulatory model where the project's scope, cost, and governance and assurance processes are negotiated and agreed between each airline and the airport under a Use and Lease Agreement.

This means that unlike other projects such as Dublin North Runway or Heathrow Terminal 2 and Terminal 5, no economic regulator is involved in the determination of allowable capital expenditure and setting of rate and charges, or in defining capital governance frameworks. Instead, these elements were negotiated and agreed between O'Hare Airport and the airlines under a commercial agreement as with any ordinary business-to-business commercial agreement.

Under the agreement, O'Hare must consult and seek approval from a *Majority in Interest* (MII) upon various events outlined within the agreement such as scope changes or cost increases. This *Majority-in-Interest* approval constitutes receiving endorsement from the long-term signatory airlines together representing 70% of the total charges paid by all airlines in the preceding year. This means that scope and cost issues that arise during the delivery of the programme are resolved between the airport and airlines using a type of supermajority voting system, which allows for more direct and flexible decision-making than is possible with an external regulator. However the FAA noted that MII allows 'dominant carriers to delay-or-cancel' projects, which may result in hurdles to decision-making agility.

Key Statistics and Outcomes

Current stage	In Construction
Budgeted capex	USD $8.5bn
Planned operating year	2026
Outturn cost	USD $12bn (est.)
Actual operating year	2034 (est.)
Significant scope change	N
Delivered to FID baseline:	
Scope	In Construction
Time	In Construction
Cost	In Construction

Exhibit 10: O'Hare 21 Concept (new buildings in white)

Strategic Control, Accountability and Decisions

The programme scope and its intended outcomes and success criteria were explicitly outlined within the Use and Lease Agreement negotiated between the Airport and Airlines in 2018.

The scope of the programme was included within the schedules of the Agreement and formed the baseline cost and scope. Any alterations to this scope, and any cost increases would need to be negotiated between the Airlines and Airport using a process set out within the agreement.

This took the form of the identification of 23 sub-projects that made up O'Hare 21. The Agreement structured O'Hare 21 into 23 discrete sub-projects.

For each sub-project, the Agreement clearly specified the agreed budget, scope, and events triggering MII approvals. These elements were negotiated and agreed privately between the airport and airlines following a commercial negotiation.

For example, the Agreement specifies that Satellite Concourse D shall have a total cost of USD $578.2 million excl., utilities and BHS costs, and specifies 7 triggers requiring MII review, such as if concourse width falls below 45 metres or length reduces by 20m, or any alterations to the use of MARS gates.

These provide clear and unambiguous requirements that the Airport and its designers must deliver, ensuring these stakeholder requirements are negotiated and agreed during the early planning phase.

Stakeholder Involvement

Under the Agreement underpinning O'Hare 21, stakeholders play a core role in the programme governance framework. For example, the entire programme scope, cost, timeline, and benefits and intended outcomes are specified in the Agreement as described previously.

Under the framework adopted by O'Hare 21, stakeholders form a core part of the programme governance framework. The entire programme scope, cost, timeline, and benefits and intended outcomes are the subject of a commercial negotiation between the airlines and airport.

Furthermore, stakeholders play a key role in the Programme Assurance process (see relevant section below). Together they represent a majority on the programme board (known as the Executive Working Group) and have clear contractual rights to approve and reject scope and cost changes above a predetermined threshold.

For example, the Agreement requires the 60% design to be presented to the Working Group for the airlines to verify the scope and budget aligns to the Agreement. If the Airport fails to prove this, the Airlines have a series of remedies provided to them under the Agreement which are discussed within the *Capex Incentives* section.

This means that stakeholders take a very active role in the day-to-day delivery of the programme, are conduct detailed reviews of design submissions, and have powers to reject non-compliant submissions.

Investment Discipline

If a sub-project under the Agreement is forecast to exceed its agreed cost at the 60% or 90% design stage, Airlines on the Executive Working Group may recommend design modifications. Where the forecast overspend is under 50% of the Agreement budget, the Airport may proceed to the next design stage without adopting those recommendations; where the overspend exceeds 50%, the Airport must obtain MII approval or revise the design submission. Construction bids that exceed the agreed project cost likewise require MII approval before proceeding.

Majority-in-Interest approval requires long-term signatory airlines representing 70% of terminal charges in the prior year, which in practice generally means receiving consent from both United and American Airlines. The Agreement gives airlines active rights to reject design submissions that deviate from the pre-agreed scope or exceed budget thresholds by a predefined amount. In particular scenarios, airlines may be able to challenge the Airport for greater control over the programme.

Overall, the framework fixes project scope and cost prior to detailed design and establishes clear governance to maintain investment discipline, limit scope creep, and prevent parties gaining an advantage through ad-hoc scope or requirement changes; failure to secure required approvals forces design revision or formal escalation.

Programme Assurance

The Use and Lease Agreement specify the programme assurance framework for O'Hare 21. The primary assurance body is the Executive Working Group, whose roles and responsibilities and terms of reference are established within the Agreement.

- The Executive Working Group consists of representatives from the Airport, each long-term signatory airline (who also represent their alliance partners, such as United Airlines for Star Alliance), and one representative for all international airlines who are not already represented through their airline alliance.
- The Agreement requires Airport to present each O'Hare 21 sub-project to the working group at the 30%, 60%, and 90% design milestones. If these presentations report a cost increase above the budget specified within the Lease and Use Agreement, the airlines may recommend the Airport modifies the project to reduce costs.
- The Agreement specifies the cost increase and scope change thresholds at which the Airport remedy the design. It also specifies the situations in which the Airport must seek a Majority In Interest review of the project before advancing to the next design stage.

This results in a clear and unambiguous programme assurance framework that involves key stakeholders. The regulatory model of the programme means that this framework could be custom-tailored to the O'Hare 21 programme through commercial negotiations between the Airport and airlines.

Capex Incentives

The project Agreement imposes penalties on the Airport in the event of even a forecasted capex overspend during the 60% and 90% design stages. These range from requiring the airport to undertake re-design work on a given sub-project at their own expense so that it meets the required scope and cost, through to providing avenues by which Airlines may be able to challenge the Airport for greater control over the programme.

This creates a clear incentive for the Airport to develop a scheme that aligns to the capex budget agreed between the airlines and Airport as the cost of any scope deviations have to be borne by the Airport in the form of design fees, or the endorsement of what is in practice a supermajority of airlines.

The detailed scope requirements and previously described triggers requiring MII reviews for any changes to key scope items reduce the opportunity for the Airport to gain an advantage by value-engineering the design for any element of the programme, as many obvious candidates for value engineering would likely trigger an MII review.

Lessons for Heathrow Expansion

O'Hare 21 uses a bespoke commercial governance model negotiated directly between the Airport and airlines, in contrast to Heathrow's regulator-led approach under CAA/CMA oversight and five-year price controls. This bespoke agreement allows participants to tailor governance, assurance, stakeholder engagement, change management and operational processes to each sub-project, and its 15-year term provides longer-term certainty than periodic regulatory settlements. The model can align incentives, speed decision-making and lock scope and budget before detailed design.

However, the approach transfers a large degree of delivery risk to the Airport. Iterative 30%, 60% and 90% design submissions must be reworked until they fit the agreed budget, with the Airport bearing those costs. This Agreement lacks a dedicated third-party arbitration mechanism, so disputes over thresholds such as what constitutes a "substantial" change can lead to legal involvement. Contractual provisions could put the Airport at risk of losing some of their control over the programme if it fails to meet scope or cost targets, which in some scenarios may also encourage an adversarial dynamic between the parties when performance slips. In addition, the MII mechanism has the potential to slow decision making as key decisions require supermajority approval from a number of airlines. Experience to date shows the practical benefits of bespoke commercial governance alongside clear drawbacks in dispute handling and risk allocation. A key lesson is to incorporate an efficient and independent arbitration or dispute resolution processes, and clearer change control definitions to reduce legal friction, protect programme momentum, and preserve collaborative relationships.

CS8. Frankfurt Airport – Terminal Programme

Project Description

Frankfurt Airport is located approximately 12km southwest of central Frankfurt, Germany. Plans to develop a new terminal (Terminal 3) at the airport were announced in 2009. The terminal building will have a total floor space of 403,000m^2, including 12,000m^2 of retail space, and a SkyLine people mover.

The terminal is being built in several phases. The first phase, comprising the main terminal building and 2 piers, began in 2015 and is expected to go into operation in 2026. The second phase, consisting of 1 pier, was already structurally completed in April 2022. The expansion will add capacity for an additional 19 million passengers per year to the airport. This will help to alleviate pressures on the existing terminals and address long-term capacity constraints.

Frankfurt Airport is operated by Fraport Ausbau Sud GmbH (FAS) a wholly owned subsidiary of Fraport AG, a partially government-controlled enterprise. FAS was founded as an independent project company in 2016 to implement the South Expansion project, including Terminal 3.

The State of Hesse and City of Frankfurt own a majority stake of Fraport AG. The remaining shares are publicly owned. Other stakeholders include Deutsche Lufthansa AG, holding roughly 8%.

Frankfurt Airport is regulated by the Hessian Ministry of Economic Affairs, Energy, Transport, Housing and Rural Areas (HMWVW).

Regulatory Model

Frankfurt Airport is partially state owned, the government therefore maintains oversight and monitoring of the Airport, including the delivery of capital programmes.

Additionally, the Airport is regulated by a multi-year framework agreement between the airport and airlines. This framework embodies elements of price cap regulation. This framework includes a review board, with representatives of airlines, the Airport and local government.

Key Statistics and Outcomes

Current stage	In Construction
Budgeted capex	€4bn
Planned operating year	2026
Outturn cost	In Construction
Actual operating year	In Construction
Significant scope change	In Construction
Delivered to FID baseline:	
Scope	In Construction
Time	In Construction
Cost	In Construction

Exhibit 11: Frankfurt Terminal 3 Concept

Strategic Control, Accountability and Decisions

The Terminal 3 expansion was proposed between Fraport and the city of Frankfurt in the late 1990s, leading a two-year mediation process. Representatives from Fraport, the government of the state of Hesse, along with other stakeholders were involved in the process of developing and agreeing the terms for expanding the airport. This mediation set out the desired outcomes, benefits and success criteria for the project.

In 2000, the Hessian Government agreed to the expansion of the airport. Following finalisation of the zoning plan the official building permit was issued in 2014.

The process required more than 15 years of intensive planning, approval processes and checks between the government and Fraport.

The Fraport Executive Board held responsibility for the overall risk management of the programme. The Supervisory Board monitored the efficiency of internal controls and risk management frameworks in alignment with German corporate governance laws.

Stakeholder Involvement

The planning and implementation of the expansion followed a wide-ranging public debate concerning the need and acceptability of Frankfurt Airport's future development. Criticism from residents, municipalities and other organisations in the surrounding area was taken seriously.

In 2008, the State Government of Hesse, together with Fraport, Deutsche Lufthansa, the DFS and BARIG (Board of Airline Representatives in Germany), established the Airport and Region Forum. Since then, the forum has bundled the dialog on the development of Frankfurt Airport and cooperation in the region. Key priorities are the sharing of substantive information with the region's population, monitoring the airport's noise footprint as well as the development of noise abatement measures.

Investment Discipline

The framework adopted for Terminal 3 saw programme scope and cost agreed between Fraport and the government prior to permission of the expansion being granted.

Additionally, regular inspections of the terminal and oversight from the government during the development were carried out to assess progress against the defined scope.

The terminal was required to pass inspections as critical milestones before a project stage could be closed out and the next stage could begin. This allowed the regulator to have control in the development and how this compared with the defined scope.

Programme Assurance

Terminal 3 was required to undergo official inspections as a critical regulatory requirement before it could cease being a construction site. These inspections covered a range of critical areas, such as fire safety. Fraport announced that Terminal 3 had passed all necessary inspections in October 2025, marking formal approval of completion of the construction programme. Following this approval the Airport began operational readiness.

The Government also maintained oversight of programme development by undertaking joint site tours of Terminal 3, along with Fraport executives.

As a direct investor in Terminal 3, the European Investment Bank required a project progress report from FAS every year. These reports provided an overview of programme progress and specific areas of interest, such as updates on significant environmental aspects.

Capex Incentives

Terminal 3 was largely funded by the operator Fraport AG, making it one of Europe's largest privately funded infrastructure projects. Funding was also provided by the European Investment Bank.

Capital incentives do not appear to be included as part of the development of Terminal 3.

Lessons for Heathrow Expansion

Terminal 3 is due to be completed on time and within its budget. The project is therefore regarded as successful.

FAS largely credit the successful delivery of the project to the strong culture and performance of teams involved.

The successful delivery of the programme demonstrates that a light-handed regulatory approach focused on oversight and monitoring can enable programmes to be successful.

However, it is important to recognise that the governance framework was just one of several factors contributing to the successful delivery of the Terminal.

CS9. Western Sydney International Airport

Project Description

Western Sydney International Airport (WSI) is located approximately 44km west of central Sydney, Australia. Western Sydney International Airport (WSI) is located approximately 44km west of central Sydney, Australia. The airport is a greenfield development, featuring a 3.7km runway and a terminal designed for both domestic and international flights. The airport aims to accommodate up to 82 Mn passengers per year by 2063, significantly alleviating congestion at existing airports in the region. The airport is in construction and is on track to begin operation in 2026. The airport is one of the largest infrastructure projects in Australia in recent years and will be the first major greenfield airport development in decades. The airport is a transformational infrastructure project that will generate economic activity, provide employment opportunity to individuals in the Western Sydney region, and meet Sydney's growing aviation needs. Key stakeholders involved in the WSI project include the Australian Government, WSA Co., Key stakeholders involved in the WSI project include the Australian Government, WSA Co. Key stakeholders involved in the WSA project include the Australian Government, WSA Co., a government-owned company responsible for building and operating the airport, and airlines. WSA is subject to various legislative requirements including:

- Corporations Act 2001 (Cth)
- PGPA Act
- PGPA Rule
- Airports Act 1996 (Cth).

Regulatory Model

Airports in Australia, including WSI, typically operate under a light-handed economic regulatory regime that is designed to facilitate commercially negotiated outcomes. Airports in Australia, including WSI, typically operate under a light-handed economic regulatory regime that is designed to facilitate commercially negotiated outcomes. Airports in Australia, including WSA, typically operate under a light-handed economic regulatory regime that is designed to facilitate commercially negotiated outcomes. Airport users, including airlines and operators of landside services, negotiate directly with airport operators on charges and other terms of access to a range of infrastructure services.

Light-handed economic regulation is intended to achieve outcomes that would be consistent with those found in markets with effective competition, but will only do so if there is both:

- Transparency as to how the airport operator is performing over time, to enable an assessment of whether it is likely to be exercising its market power.
- A credible threat of additional regulation if an airport operator is found to be exercising its market power to the detriment of the community.

The light-handed approach to the economic regulation of airports includes the general provisions of competition and consumer law, and airport-specific regulations that were introduced following the privatisation of airports.

Key Statistics and Outcomes

Current stage	In Construction
Budgeted capex	AUD $5.3bn
Planned operating year	2026
Outturn cost	In Construction
Actual operating year	In Construction
Significant scope change	In Construction
Delivered to FID baseline:	
Scope	In Construction
Time	In Construction
Cost	In Construction

Exhibit 12: Western Sydney Airport Phase 1 Concept

Strategic Control, Accountability and Decisions

As part of the sale of Sydney Airport in 2002, Sydney Airport Group was given the Right of First Refusal to develop and operate WSI. As part of the sale of Sydney Airport in 2002, Sydney Airport Group was given the Right of First Refusal to develop and operate WSI. As part of the sale of Sydney Airport in 2002, Sydney Airport Group was given the Right of First Refusal to develop and operate WSA.

In 2016, a Notice of Intention was issued to Sydney Airport Group for the development of WSA. Sydney Airport Group declined this opportunity to build and operate the Airport. This meant that the Australian Government had the choice to either offer the project to another private company or build and operate WSA itself.

The Australian Government announced it would take on the project by creating a government-owned company, WSA Co. Limited, to build and operate the airport.

Stakeholder Involvement

WSA Co. is a wholly-government owned Commonwealth company, operating under the Public Governance, Performance and Accountability Act 2013 and at an arm's length from the Australian Government. In doing so, WSA has considerable discretion in its operational and commercial decisions, within the constraints of the abovementioned legislation.

WSA Co. has flexibility and discretion in its operational and commercial decisions, within the parameters of the Corporations Act 2001, the Public Governance, Performance and Accountability Act 2013, associated subordinate legislation, the Commonwealth Government Business Enterprise Governance and Oversight Guidelines (GBE Guidelines) and the Government's policy objectives.

Western Sydney Airport was developed by WSA Co., with oversight from the Department of Infrastructure.

Stakeholders, such as airlines were not involved in the planning and development of the Airport. This approach can benefit delivery of programmes as it can allow the Airport to develop without delays from third parties. However, this can lead to issues once the project is finalised if the airport is not suitable for airlines to operate.

Investment Discipline

The governance approach allowed WSA Co. control of the development of the airport, with oversight from the government.

As a government entity WSA Co. were responsible for submitting regular update reports, this approach provided the Government with an overview of the progress of the programme and how it compared with the predefined scope.

WSA Co. risk management approach was established in 2017. The Risk Management Policy, Framework and the Audit and Risk Committee Charter provided the mandate from the Board of Directors and management for how risks were managed. The risk management framework was reviewed and updated in 2021 to align with the stage of the project and the current risk maturity. WSA Co. were required to provide advanced warning of any risks likely to occur during the programme to the government.

Programme Assurance

WSA Co. is accountable to the government as sole shareholder for its performance in relation to the delivery of the Western Sydney Airport.

WSA Co. are required to submit quarterly progress reports to Shareholder Departments that provide an update on activities undertaken for the previous quarter, including financial performance. These reports provide updates against the key performance indicators outlined in WSA Co.'s Corporate Plan.

Additionally, WSA Co. are required to provide the Shareholder Ministers with an early warning of any potential risks or issues arising from the project.

Capex Incentives

There is no disclosure of capital incentives provided to WSA Co. or other stakeholders for the successful delivery of the Western Sydney Airport.

However, the NSW government and Western Sydney International Airport launched a $16 million fund to entice international airlines to the airport. Comprising $8 million in government funding, matched by funding from WSI, the 'Western Sydney International Take-Off Fund' will encourage airlines to operate at the airport, reducing risk of delays to operation of the airport once the project is complete.

Lessons for Heathrow Expansion

The (anticipated) successful delivery of WSA on time and within budget demonstrates that a light-handed regulatory approach can be beneficial for the progress and development of a mega-project.

This is partially due to the reduced complexity and delays resulting from managing regulatory frameworks and processes. Allowing WSA Co. to focus on delivery and operational readiness.

However, it is important to recognise that the governance framework was just one of several factors contributing to the successful delivery of the airport.

CS10. United Utilities HARP (Haweswater Aqueduct Resilience Programme)

Project Description

The Haweswater Aqueduct Resilience Programme (HARP) is a c. £3 billion major water programme in the region supplied by United Utilities (UU) in North-West England. It involves the design, construction, financing and maintenance (DBFOM) of six tunnel sections of the 110km Haweswater Aqueduct. The aqueduct is being upgraded to enhance the supply of drinking water to residents of Cumbria, Lancashire, and Greater Manchester.

Completed in the 1950s, the existing pipeline needs essential maintenance and upgrading to ensure it can continue to supply future customers, including replacement of six tunnel sections. Key stakeholders are UU, Cascade Infrastructure Ltd (or CIL, a consortium of STRABAG, Equitix and GLIL Infrastructure), Ofwat, EA, DWI, the Independent Technical Advisor (ITA), and regional/local planning authorities. Customers are households (2.5m people) and businesses in the UU region.

CIL has a 33-year DBFOM contract called the "CAP" (Competitively Appointed Provider) agreement to deliver and maintain the HARP programme, appointed by UU after competitive procurement and approved by Ofwat.

Ofwat regulates HARP. The Department for Environment, Food and Rural Affairs (Defra), Environment Agency (EA) and the Drinking Water Inspectorate (DWI) also have specific interests for resilience and quality of drinking water supply. His Majesty's Treasury (HMT) is an interested party (but not involved) in implementation of Direct Procurement for Customers (DPC) model.

Regulatory Model

Ofwat has issued project-specific guidance for HARP, as the first programme to be approved under Ofwat's DPC model (n.b. this is CAA Model 5b). UU will recover costs through charges to water customers under Ofwat's Allowed Revenue Direction (ARD). Revenues allow for the agreed CAP Unitary charge with some adjustments e.g. deductions for poor performance.

Revenues are calculated based on the CAP procurement process, meaning UU's revenue for HARP is a direct pass-through of the competitively determined costs of the project, not as part of UU's general revenue (from water bills). UU recovers the cost it pays CIL through a specific charge to customers, assured annually with reconciliation adjustments.

This means HARP sits outside Ofwat's BAU framework, with separate charges not subject to 5-yearly periodic reviews. UU's own costs, such as for procurement, are recovered through the usual BAU process.

Capital governance by Ofwat relies on extensive independent assurance, primarily by the ITA but also by the financial "Approved Assurer". Ofwat monitors specific KPIs during construction and operation.

Regulatory Reporting and assurance requirements from Ofwat are set through the CAP agreement and the Ofwat Guidance. The HARP programme outputs will also contribute to general UU KPIs, such as Ofwat Performance Commitments (PCs) for water supply.

Key Statistics and Outcomes

Current stage	FID (late Development)
Budgeted capex	£3bn
Planned operating year	2035
Outturn cost	In Construction
Actual operating year	In Construction
Significant scope change	In Construction
Delivered to FID baseline:	
Scope	In Construction
Time	In Construction
Cost	In Construction

Exhibit 13: HARP

Strategic Control, Accountability and Decisions

Outcomes and benefits were clearly defined through the CAP procurement process, primarily constituting upgraded infrastructure that provides additional capacity.

Risk Allocation Structure

Risks primarily allocated to CIL as per the CAP:

- Design and Construction Risks:
- Maintenance and Lifecycle Risks
- Financing Risks, including securing capital
- Performance Risks: e.g. pain/gain incentives
- Permits and Consents (during construction): While UU secured initial planning permissions, the CAP is responsible for acquiring and complying with all necessary permits and consents during the construction phase (e.g., from EA, local authorities).

The following risks are retained by UU:

- Initial Planning Consents
- Major External/Force Majeure Events: subject to Ofwat's approval and contract clauses.
- Operational Risk (post-concession): At the end of the concession, assets and maintenance responsibility will be handed back to UU.

Oversight

An ITA and Approved Assurer were appointed to provide assurance to both United Utilities and Ofwat, offering independent oversight of costs and project delivery to protect customer interests.

Stakeholder Involvement

UU acted as project promoter and sponsor, with CIL responsible for finalising Design, construction, financing, operating and maintaining HARP. Ofwat is the economic regulator, setting output targets and defining the cost recovery framework under the DPC model.

UU was responsible for consultation with customers and key stakeholders including EA and DWI.

This model gave CIL as the delivering organisation flexibility and discretion in its delivery, operational and commercial decisions within the parameters set by the DPC. UU retained responsibility for managing stakeholder involvement with customers and across government.

This meant that CIL as a delivery organisation was able to focus on delivery, with external stakeholders having limited involvement in planning and delivery once the DPC agreements were finalised.

Investment Discipline

The use of a DPC model to deliver the project, with delivery being undertaken through a DBOFM contract by a concessionaire, meant that project requirements, scope, budget, and payment structure were in effect "locked in" at the time of financial close and could only be changed through a formal contractual variation process.

The fixed nature of these core delivery elements, combined with the change management process, means that CIL has a clear incentive to deliver the scope as agreed within the contract and not over or under-scope elements of the project. Likewise, UU had an incentive to not change any sponsors' requirements following financial close as this would incur a direct financial cost to them.

The DPC agreement was let by UU through an open bidding process. This allowed UU to award the contract to a consortium based on a transparent evaluation criterion and in turn reduced the incentive for a bidding consortium to over or underdo their submission to gain an advantage at the expense of project outcomes.

Programme Assurance

The assurance process for HARP is specified within the DPC agreement and takes a multi-layered system through both the construction and operation phases:

ITA: Turner and Townsend, appointed by UU. They provide assurance on the project's costs, delivery, and overall management by CIL. The ITA will assess the CIL's construction costs, programmes and compensation claims, providing quarterly assurance reports to Ofwat and UU, and verify that maintenance and asset management complies with requirements. They may also review any variation requests or event notices from CIL during the construction and operation phases.

Approved Assurer (AA) - Amberside Advisors. This role focuses on financial aspects, such as reviewing and approving revisions to the financial model used for the project.

Ofwat review independent verification reports and conduct a monitoring process to determine what level of revenue UU can recover from customers annually.

Capex Incentives

The CAP agreement between CIL and UU uses a target cost model with "pain/gain" incentive mechanisms. This means that if CIL outperforms and delivers HARP at a lower cost, the value is shared with customers.

Likewise, if CIL underperforms and delivers HARP at a greater cost than within the agreement, some of this expense is borne by UU and in turn their customers.

The agreement contains incentives during Project Delivery and Construction around key elements including:

- Timely completion of design, construction, and commissioning of tunnel sections.
- Meeting quality standards and technical specifications for new infrastructure.
- Managing environmental impacts during construction e.g. a bespoke PC for GHG emissions during construction.

Lessons for Heathrow Expansion

The HARP project is the first such project to be delivered using Ofwat's new DPC agreement. These agreements are reminiscent of a more traditional PPP/PFI arrangement and have been established by Ofwat, as the economic regulator in the water sector, to allow water companies to competitively procure more aspects of an infrastructure project, including sourcing financing. Ofwat's core objective of this model is that outsourcing more of the delivery of major infrastructure projects will enable water companies to realise benefits through increased innovation in project design and delivery, and lower lifecycle costs. Ofwat introduced this model in their 2019 price review, and stated in their 2024 review that going forward, the DPC approach should be used by water companies as the default model to deliver major infrastructure projects.

The advantages of this model are that they strike a balance of retaining the role of an economic regulator, while giving regulated companies the flexibility to deliver projects using long-term agreements (providing greater long-term certainty). Because these consortiums provide their own financing, they mitigate the constant challenge for regulated companies in trying to fund long-term capital projects under 5-year regulatory periods.

They can allow the project agreement to be tailored to the unique needs of each project and its parties through commercial negotiations conducted prior to financial close, fixing these terms at financial close and providing greater certainty to parties thereafter. However, this approach could introduce additional costs from arising from allocating risks to third parties, and potentially from fragmenting risks across the project.

B1. Glossary

ALB	Arm's Length Body
AOC	Airline Operators Committee
BAA	British Airports Authority (former operator of Heathrow, Gatwick, and other UK airports)
BARIG	Board of Airline Representatives in Germany
BAU	Business as usual
BHS	Baggage Handling System
bn	billion
CAA	Civil Aviation Authority (UK)
CapEx	Capital Expenditure
CAR	Commission for Aviation Regulation (Ireland)
CC	Competition Commission (UK)
CIL	Cascade Infrastructure Limited (a consortium of STRABAG, Equitix, and GLIL Infrastructure)
CMA	Competition and Markets Authority (UK)
CRL	Crossrail Limited
DAA	The operator of Dublin Airport (previously known as the Dublin Airport Authority)
DBFOM	Design, Build, Finance, Operate, Maintain (a PPP model)
Defra	Department for Environment, Food and Rural Affairs (UK)
DEL	Departmental Expenditure Limit
DESNZ	Department for Energy Security and Net Zero (UK)
DFS	Deutsche Flugsicherung, Germany's air navigation service provider
DfT	Department for Transport (UK)
DPC	Direct Procurement for Customers – a UK water infrastructure delivery model
DWI	Drinking Water Inspectorate (UK)
EDF	Électricité de France
EPR	European Pressurised Reactor
FAA	Federal Aviation Administration (USA)
FAS	Fraport Ausbau Sud GmbH, the operator of Frankfurt Airport and a subsidiary of Fraport AG. Also referred to as Fraport
FID	Final Investment Decision
Fraport	Operator of Frankfurt Airport. See FAS
GBR	Great British Railways
GFC	Global Financial Crisis
GHG	Greenhouse Gas
GLA	Greater London Authority
HAL	Heathrow Airport Limited
HARP	Haweswater Aqueduct Resilience Programme (UK)
HMT	His Majesty's Treasury
HMWVW	Hessian Ministry of Economic Affairs, Energy, Transport, Housing and Rural Affairs (state of Hesse, Germany)
HS2	High Speed 2
HS2 Ltd	High Speed 2 Limited
IA	Integrated Assurance
IAA	Irish Aviation Authority
IFS	Independent Funds Surveyor
ITA	Independent Technical Advisor
LOD	Line of Defence
MII	Majority in Interest
MPPA	Million Passengers per Annum
NNB	The EDF subsidiary developing Sizewell C nuclear power station

NR	Network Rail (UK)
Ofgem	The Office of Gas and Electricity Markets (UK)
Ofwat	The Water Services Regulation Authority (UK)
OMR	Operations, Maintenance and Renewals
ONR	Office for Nuclear Regulation (UK)
ORR	Office of Rail and Road (UK)
PCR	Preconstruction Review
PDA	Project Development Agreement
PPP/PFI	Public Private Partnership / Private Finance Initiative
P-Rep	Project Representative
QA	Quality Assurance
RAB	Regulated Asset Base
RfL-I	Rail for London Infrastructure Ltd
RIG	Regulatory Instructions and Guidance
SOS	Secretary of State (UK)
SPV	Special Purpose Vehicle
SQR	Service Quality Rebate
T2	Terminal 2
T3	Terminal 3
T5	Terminal 5
TfL	Transport for London
TfL-I	Transport for London Infrastructure Ltd
TOC	Train Operating Company
UU	United Utilities
WCML	West Coast Main Line (a railway corridor in the UK)
WSA Co	Western Sydney Airport Corporation (a delivery company)
WSI	Western Sydney Airport