

Understanding Rail

Turner & Townsend
Rail capability statement

June 2022



Executive summary

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James Corrigan
Infrastructure

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Rail sector leaders

Turner & Townsend is an independent professional services company specialising in program management, project management, cost and commercial management and consulting across infrastructure and the built environment.

We are passionate about transforming performance in major rail and infrastructure programmes. We partner with our clients to make a difference, transforming projects into outcomes that support a green, inclusive and productive world.

With 112 offices in 45 countries, we draw upon our extensive global and industry experience to manage risk while maximizing value and performance during the construction and operation of our clients' assets.

Leaders in rail advisory

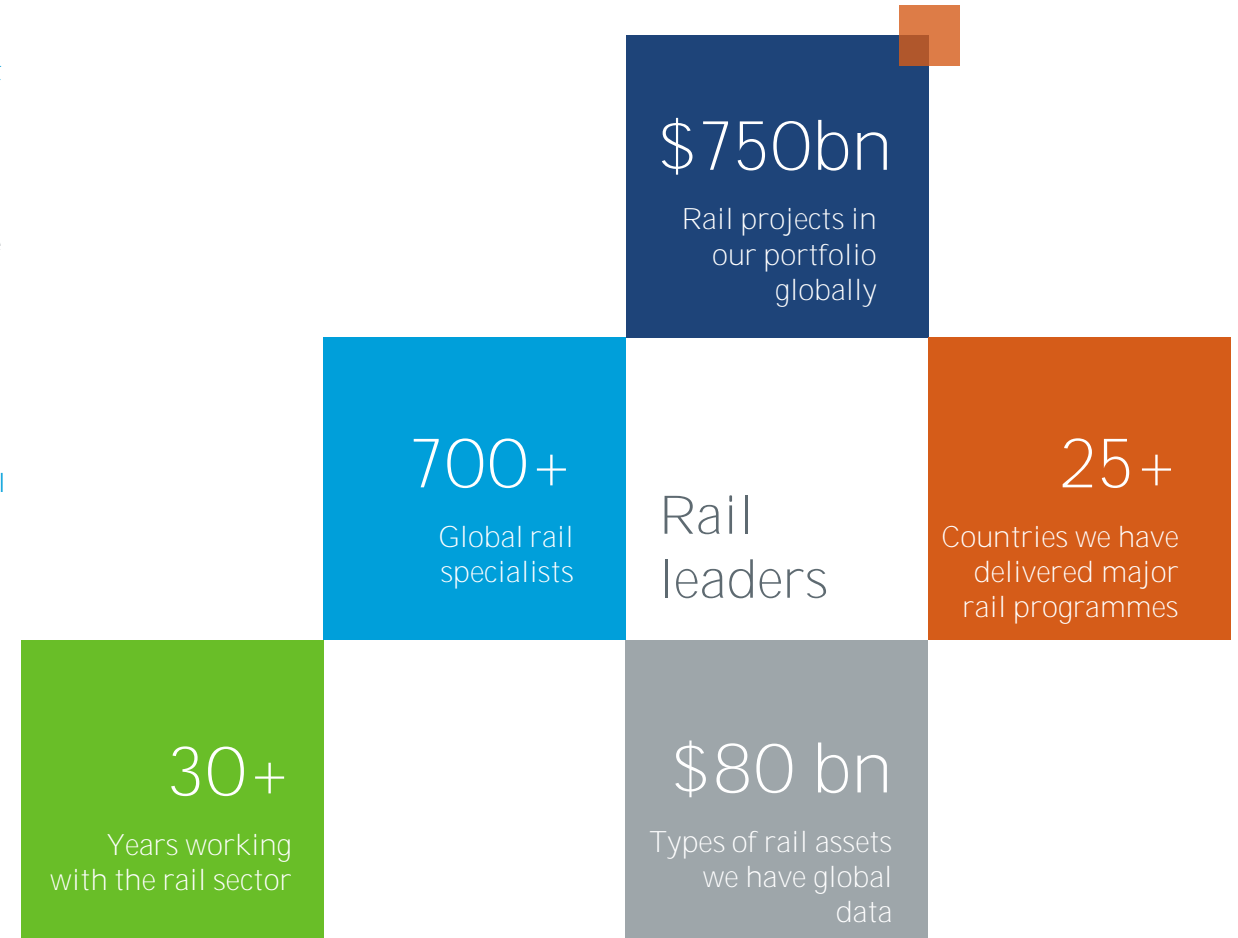
Turner & Townsend support some of the most complex rail projects and programmes globally and guide both owner and investor-operator clients to set their programmes up for success, helping to secure funding and rigorously control the delivery phase to minimise risk and maximise opportunity.

Our experience in programmes worldwide means that we understand that customer expectations and wider impacts can often compete with business case delivery. We deliver practical advice to deliver the appropriate products and services at the right time and manage capital investments to achieve the competing and changeable requirements.

We assure, optimise and deliver rail programme outcomes and employ innovative tools and techniques, driving productivity and performance with leading-edge technology platforms.

With insights into cost, scheduling and long term asset management across the rail sector, we help cut through complexity with intelligent data to inform better decision making and provide confidence from the outset.

We achieve project viability quicker by driving productivity and performance with clients. Examples of our experience are in case studies within this document.



Owner and operator priorities

Through our work with rail programmes globally, we see owners, operators and investors focusing on the following priorities:

Rebalancing
commercial
operations

Maximising
operational
efficiency

Consolidating
space and operational
assets

Shaping
new standards and
regulations

Finding new sources
of revenue

Asset
management
the new bedrock

Technology
commercialising,
investing and
integrating

Next generation
relationships
rail operators,
suppliers,
concessionaires

Capital projects priorities

We see capital investment projects prioritising the following:

Customers at the heart of design and development

Existing projects review and re-evaluation of capital investment plans

Fast tracking projects for future state operation

Resilience of critical supply chains

Future state organisation models and delivery models

Modern methods of construction

Next generation supplier engagement models

Information management requirements to drive performance

How we work

We work hands-on with clients to understand the outcomes they want to achieve before providing solutions and services that enable them to be achieved.

The right support at the right time

We partner with our clients to help them get the most successful outcome throughout the programme or project lifecycle.



Connect

We inform, shape and connect programs and projects to innovation and global or regional leading practice. We do think by:

- Connecting organisations and programs to leading best practice
- Supporting opportunities for successful infrastructure investment
- Benchmarking performance to support decision making
- Unlocking and exploring innovation opportunities and global best practice



Strategy and Transformation

We define and execute sustainable strategies for organisations that own, operate or invest in infrastructure programs. We do this by:

- Raising capability to integrate new assets with existing and optimise operational costs
- Creating affordable business cases
- Establishing program or organisational vision
- Managing complex change
- Supporting programs through stakeholder approvals



Setup

We set strong foundations with models, processes, systems and capability planning. We do this by:

- Establishing program organizational operating models
- Developing integrated program baselines (cost/schedule)
- Building client capability
- Engaging the market and procuring the supply chain
- Establishing effective digital and technology systems to control projects



Delivery

We relentlessly drive and assure performance to deliver successful outcomes. We do this by:

- Providing you with insights to performance, giving confidence you are where you think you are
- Identifying and proposing areas of efficiency and opportunity to meet and beat your performance targets
- Sharing and implementing lessons from other major programs to mitigate common risks and challenges
- Maximising the use of technology to enable effective decision making within the program.

Services we provide to our rail clients

We provide organisation-wide support in addition to project level delivery, all whilst connecting clients to the latest best practice.

How we help

We partner with our clients to help them get the most successful outcome from their investment in rail and infrastructure.

Programme strategy and set-up

Developing organisational and programme level strategies to enable the right capabilities and execution.

Advisory and specialist services

Lean and operational excellence advisory.

Technology and data

Unlocking the potential of technology, data and information modelling to drive performance, support great decision making and create collaborative working environments.

Asset management

Performance diagnostics and capability analysis that allow asset owners to understand both the capability they need now and over the whole lifecycle of the asset.

Procurement

Developing and delivering procurement and supply chain strategies that get the best results from the market and reduce potential claims.

Project management

Delivering great outcomes by lowering project costs, reducing risk, speeding up processes and improving consistency on projects and programmes.

Controls and performance

Applying robust and proactive controls from a clear baseline to deliver confidence in programme and project performance.

Cost and commercial management

Driving and safeguarding your commercial interests from start to finish.

Safety, health & quality

Embedding the strategies and culture that support effective operations and maintain a safe and healthy environment.

We support rail clients globally

We work with the largest international rail clients globally. Our representative experience includes:

The map features several colored circles representing project locations:

- UK (Orange and Yellow circles):** Transport for London UK, Edinburgh Tram UK, Network-Rail LNER UK, Crossrail UK, High Speed 2 UK.
- Austria (Yellow circle):** Semmering Tunnel Austria.
- Ireland (Grey circle):** Dublin Metro Ireland.
- Hong Kong (Green circle):** Hong Kong MTR Hong Kong.
- Singapore (Green circle):** KL Singapore HS Link Singapore.
- India (Green circle):** Virgin Hyperloop India.
- Canada (Blue circle):** Metrolinx RER Canada, Scarborough Rapid Transit Canada.
- USA (Blue circle):** Metropolitan Transport Authority USA.
- South Africa (Green circle):** Transnet South Africa, Gautrain South Africa.
- KSA (Blue circle):** Jeddah Metro KSA, Qatar Rail Qatar.
- Australia (Orange circle):** Inland Rail Australia, Sydney Metro Australia.
- Australia (Orange circle):** Canberra Light Rail Australia.
- New Zealand (Orange circle):** City Rail Link New Zealand.

Representative experience

We provide programme and project services – from complex transformation advisory to tactical project delivery support.



Transcend, Crossrail Commercial and controls support, UK

Providing integrated programme and delivery management services as part of the fully integrated Crossrail team. This including supporting the Crossrail Learning Legacy programme, which shared learnings, best practice and innovations.



Transport for London Change management and lean advisory, UK

Provided senior leadership support and change expertise to support the design of the Major Projects delivery business. Supporting this, we provided lean advisory services to drive operational excellence across TFL.



Metropolitan Transportation Authority Asset management advisory, USA

Established an asset management system and set out an Asset Management Policy with defined business and sustainability objectives. This has helped ensure that every dollar spent on their USD1tn asset portfolio is spent in a way which will maximise long term value.



HS2 Commercial and controls advisory, UK

Developed the procurement approach for civils packages and established data and benchmarking reporting to support HS2 to review the size of the commercial and controls organisations before entering into contract.



Virgin Hyperloop Cost and commercial management, India

Appointed to deliver cost estimate services for a high-speed infrastructure system. We worked collaboratively with stakeholders to understand technologies, design development and customer outcomes.



Australian Rail Track Corporation, Inland Rail Programme Management Office, Australia

Establishing a programme management office at programme and organisational levels to enhanced governance processes and support decision making.

Representative experience

We provide programme and project services – from complex transformation advisory to tactical project delivery support.



Semmering Base Tunnel Project supervision, Austria

Strategic project supervision advisory to ensure the project meets the business benefits to improve and upgrade the infrastructure.



Sydney Metro Cost Management, Australia

Establishing the programme management office for Sydney Metro North West in addition to providing commercial, programme and controls advisory across the broader programme.



Gautrain Rapid Rail Link Commercial services, South Africa

Support towards various department duties which contributed towards the project lifecycle.



Hong Kong MTR Advisory, Hong Kong

Commercial, advisory, contract and project management support to projects at various stages of the project lifecycle, including feasibility study, concept estimates through to pretender cost estimation.



Jeddah Metro Pre contract cost and commercial services, Saudi Arabia

End-to-end executive programme management function establishment including leading the design, procurement, execution and control of the programme.



City Rail Link Commercial management and controls, New Zealand

Providing robust cost and commercial management and estimating support to enable the critical rail link development.

Independence

We do not have ties to any design, construction or engineering team, so we approach every task with an independent mind-set focused entirely on getting the best outcome.

Unique data

With rail data exceeding \$50bn, we can provide the insights and comparisons that are essential to inform decision-making at any stage of a project lifecycle.

Global & local insight

Our experience working with investors, owners, operators and the public sector enables us to bring unique insights and highly experienced teams. We combine this with our **'on the ground' local knowledge** to deliver results.

Complete industry experience

We work across diverse rail assets and operations including Light, Metro and Heavy rail infrastructure, and with governments, local authorities, TOCs and supply chains.

Outcome focused

We know that with the right approach projects of any complexity can be kept under control. To enable this, we focus on achieving the outcomes required, as well as tasks.

Complex programme thinking

We set ourselves clear targets, and constantly strive to stay ahead of the complex rail environment. We aim to set the pace for our industry.

Making the difference

What do we bring that is unique and adds value to our rail clients?



Turner & Townsend

Case studies



Quick reference guide – case studies

Project name	Client name		Asset type	Rail type	Enterprise/ organisational strategy	Programme advisory/ set up	Contracts and procurement	Cost, commercial management	Controls and performance	Project management services	Other advisory - data & technology - SHEQ - asset management - Lean
High Speed Two	HS2 Ltd	UK	Railway	High speed		✓	✓	✓	✓	✓	✓
Edinburgh Tram	Edinburgh City Council	UK	Railway	Light rail		✓				✓	
Crossrail	Transcend	UK	Railway, Stations, Tunnelling	Light rail		✓	✓	✓	✓		
Major Projects Directorate	TFL	UK	NA	Light rail	✓	✓		✓	✓	✓	✓
East and West Surfacing programme	Network Rail	UK	Stations, electrification	Light rail					✓	✓	
Power Supply Upgrade Programme	Network Rail	UK	Electrification , power	Intercity rail				✓	✓		
Werrington Grade Separation	Network Rail	UK	Railway, Tunnelling	High Speed Rail, Freight		✓				✓	
Transpennine Route Upgrade	Network Rail	UK	Railway, Tunnelling	Intercity rail							
Kings Cross Remodelling	Network Rail	UK	Station	Light rail, stations							
Semmering Base Tunnel	ÖBB- Infrastruktur AG	Austria	Tunnelling, railway	Intercity			✓	✓			
Jeddah Metro	Foster + Partners	KSA	Stations, railway	Light rail		✓	✓	✓			
Qatar Railway	Qatar Railways Company	Qatar				✓	✓				

Quick reference guide – case studies

Project name	Client name	Location	Asset type	Rail type	Enterprise/ organisational strategy	Programme advisory/ set up	Contracts and procurement	Cost, commercial management	Controls and performance	Project management services	Other advisory - data & technology - SHEO - asset management - Lean
Abu Dhabi Metro and Light Rail Transit	Fluor	UAE	Railway	Light rail		✓		✓			
Virgin Hyperloop One	Virgin Hyperloop One	India	Railway	High speed			✓	✓			
Shatin to Central Link	Hong Kong MTR	Hong Kong	Railway, data	Light rail	✓	✓					✓
Kuala Lumpur-Singapore High Speed	Singapore Ministry of Transport	Malaysia, Singapore	Railway	High speed		✓	✓	✓			
MTA	New York Metropolitan Transportation Authority (MTA)	USA	Stations, railway	Light rail	✓						✓
Metrolinx Regional Express Railway	Metrolinx	Canada	Railway, stations	Light rail			✓	✓	✓		
Scarborough Rapid Transport	Scarborough Rapid Transit	Canada	Stations, utilities	Light rail				✓			
Maryland LRT P3	Maryland Purple Line	USA	Railway	Light rail				✓			
Inland Rail Program	Australian Rail Track Corporation	Australia	Railway	Freight rail		✓	✓	✓	✓		✓
Sydney Metro North West	Transport NSW	Australia	Rail, Stations	Light rail		✓	✓	✓	✓		✓
City Rail Link	City Rail Link	New Zealand	Railway	Light rail			✓	✓	✓		
Canberra Light Rail Network	Transport Canberra & City Services	Australia	Railway	Light rail			✓	✓			
Metronet	Public Transport Authority of WA	Australia	Rail	Light rail		✓	✓	✓	✓		

Quick reference guide – case studies

Project name	Client name	Location	Asset type	Rail type	Enterprise/ organisational strategy	Programme advisory/ set up	Contracts and procurement	Cost, commercial management	Controls and performance	Project management services	Other advisory - data & technology - SHEO - asset management - Lean
Parramatta Light Rail	Transport for NSW	Australia	Railway	Light rail			✓	✓			
Newcastle Light Rail	Transport for NSW	Australia	Railway	Light rail				✓			
Cost Governance Framework	Queensland Rail	Australia	Organisation	Light rail		✓					
Cross River Rail	Transport for NSW	Australia	Railway	Light rail		✓	✓	✓	✓		
Melbourne Metro 1	Victorian Department of Transport	Australia	Railway	Light rail		✓		✓			
Regional Rail Revival	Rail Projects Victoria	Australia	Railway	Light rail		✓		✓			
Melbourne Airport Rail Link	Rail Projects Victoria	Australia	Rail	Light rail				✓			
Auckland City Centre Light Rail	Auckland Transport	Australia	Rail	Light rail				✓			
Forrestfield Airport Link	Public Transport Authority	Australia	Rail	Light rail			✓	✓	✓		
Perth MAX Light Rail	Western Australia Department for Transport	Australia	Rail		✓		✓	✓			

Case study

Inland Rail Program, Australia



Australian Rail
Track Corporation
(ARTC)

Program Management
– Inland Rail Program

2019 - Present

Client challenge

The Australian Government selected the Australian Rail Track Corporation (ARTC) to deliver the Inland Rail program, in partnership with the private sector. The program will complete the backbone of the national freight network by providing transit times of less than 24 hours for freight trains between Melbourne and Brisbane via regional Victoria, New South Wales and Queensland. Comprising 13 projects and spanning 1,700km from Melbourne to Brisbane, Inland Rail will transform how Australia moves goods around the vast country, creating more opportunities for regions to connect to cities and businesses to markets.

How we added value

ARTC appointed Turner & Townsend, supported by SNC-Lavalin, as Program Management Office (PMO) provider. We operate as a large integrated team across the entire program, leading the development and deployment of a PMO framework, systems and resource. The wide distribution of high value works and number of stakeholders requires PMO specialists who could instil confidence, provide program planning, whilst maintaining control. We:

- Undertook a maturity assessment (using our global C6 tool) and hosted stakeholder engagement workshops to understanding bottlenecks and needs across the program.
- Developed a PMO structure and team which met the unique requirements. This involved implementing a revised organisational design through a matrix structure where PMO best practice and key resources could be deployed into the 13 packages of the project. The function included management structures, resource on-boarding processes, team building activities and a PMO Charter.
- Managed the change and engagement with stakeholders. This included forming an executive leadership group of Inland Rail senior management and suppliers to collectively be the agents of change and drive one fit for purpose and efficient approach and operating model.
- Provided on ongoing governance, assurance and support. This included creating an **'operating rhythm' to continually ensure that there was understanding of the operating model, targets and barriers to delivery across all staff and projects.**

Benefits we enabled

- By implementing a robust mechanism of gate controls we helped ensure that the project information was accurate, complete and fully informed. This supported alignment of scope, budget, schedule risk, approvals and forecast activities
- **Delivery of PMO 'best practice'** management plans which included change control. This resulted in more thorough impact assessments and reviews on the impact on projects.
- We are now developing systems and processes for ARTC at an organisational-level which provide longer term value and implement the lessons learnt from the Inland Rail Program to other projects.

Case study

Sydney Metro, Australia



Transport NSW –
Sydney Metro

Programme
management office

2011- present

Client challenge

The Sydney Metro program is Australia's largest public transport program that will shape the future growth of Australia's biggest city for future generations. The program comprises of Sydney Metro Northwest – a 36 km project encompassing 13 stations and 22 six-car trains to accommodate 4,000 people. Operations commenced May 2019. Sydney Metro City & Southwest – a new 30 km metro line extending metro rail from the northwest under Sydney Harbour, through the 7 new CBD stations and 11 upgraded stations from Sydenham to Bankstown.

How we added value

Turner & Townsend have supported Sydney Metro since very early phases of Sydney Metro Northwest in 2011 by preparing the capital cost for inclusion in the business case submission to state government. As the project moved into the delivery phase we provided the commercial, controls and project office function until the project was completed on time and on budget. Our work has included:

- Establishing the strategy to management the complex interdependences and interfaces between the multiple contract packages for each project. We did this through advanced mitigation strategies which were developed, approved and implemented. This reduced the potential impact of substantial delays from the handover of one contract to following contracts
- Established the processes, systems and tools for effective program management. This included establishing information systems, policies and processes which were designed to create a single source of truth.
- Alignment of cost, schedule, scope and risk to the approved business case. This included Independent Baseline Reviews (IBRs) which were carried out at key stages of the project lifecycle.

Utilising the experience and lessons learnt on Sydney Metro Northwest we prepared the capital and operations and maintenance cost estimates and managed the master schedule for the business case phase of Sydney Metro City & Southwest and Metro West. We are currently providing the PMO for the delivery phase of Sydney Metro City & Southwest.

Benefits we enabled

- Sydney Metro Northwest began operating in May 2019 – on time, under budget and operating to plan.
- Our understanding of a broad range of contract forms and commercial models including cost reimbursable, fixed price and complex PPPs enabled us to proactively manage the complex contractual interfaces.
- Embedded change management processes which enabled transparency and were strictly complied with. This enabled all changes to the approved baseline of the project to be captured, assess and approved prior to being incorporated.

Case study

City Rail Link, New Zealand



City Rail Link
Limited

Cost Management and
Project Controls

2019 – Present

Client challenge

City Rail Link is a transformational urban rail project with twin tunnels 3.45km long under the commercial heart of Auckland, New Zealand reaching depths of up to 42metres below the city, providing for 2 new sub terrain stations, at 15m deep and 32m deep plus wider network improvements and future proofing to 6 further stations.

This project was commissioned to match estimates of peak hour passengers reaching 36,000 in 2035 effectively doubling the previous capacity of the rail system in Auckland.

How we added value

Turner & Townsend was commissioned to deliver full cost management services to assure the project delivery is on budget.

We implemented project controls and cost management services to manage the full budget, whilst in parallel undertaking various estimates and cost plans in areas pertaining to property, stations, utilities, public realm landscaping, along with contract measures.

City Rail Link procured an Alliance to deliver a substantial portion of the works. To support this, we also acted as the independent estimator and programme assurance advisor.

Benefits we enabled

- Major benefits of the City Rail Link will be significantly improved customer service levels by better matching public transport demand and supply; expansion of the economic potential of Auckland, driving productivity increases by enhancing access to jobs, and providing access to special housing areas making affordable housing in outer areas more viable through effective transport access to the city.

Case study

Canberra Light Rail System, Australia



Transport Canberra
& City Services

Cost management
services

2014 - present

Client challenge

The ACT Legislative Assembly has embarked on the Canberra Light Rail Network program to provide high quality, reliable and convenient public transport that will attract people, business and investment to Canberra. The light rail network will encourage smarter land-use and create a transport system that puts the needs of people first and caters for the ever-expanding city.

How we added value

Across the Canberra Light Rail Network, we have supported the following projects:

- Canberra Metro – We undertook the cost estimator role which initially involved the formulation of detailed cost estimates to support the business case. During the development of the final business case, our services expanded to include the provision of interface management for the utilities, construction and procurement advice. We worked closely with the design and engineering team to identify value engineering opportunities which enabled the maximisation of design solutions in parallel with reducing costs and enhancing the value capture for the overall project.
- City to Woden – We oversaw cost planning of the capex and opex budgets. In developing City to Woden cost plans, various alternative alignment options have necessitated rapid appraisal of significant structures and potential strengthening works to existing bridges, this has informed decision making for the overall project scope.

Benefits we enabled

- The light rail project team have benefited from our ability to draw on our extensive knowledge of local and global rail projects. This has enabled access to the most up to date and relevant market data to identify key challenges and support strategies to manage and effectively transfer the risk where appropriate.

Case study

Metronet, Perth



Public Transport
Authority

Program Management
Office

2018 - present

Client challenge

Through significant transport investment including Perth's most ambitious program of rail projects, METRONET will drive land use change in more than 5,000 hectares of land within walking distance of the new stations, creating vibrant new communities. It will play a **central role in connecting our suburbs, reduce road congestion and create jobs to meet Perth's future planning needs.** The project will deliver 72 kilometres of new passenger rail and 18 new stations over 5,000 hectares of land.

How we added value

The METRONET Office required a Program Management Office (PMO) to provide centralised control, independent scrutiny, oversight and consolidated reporting on the METRONET program of projects.

Through our PMO Service, we have established baselines, driven consistency and standards, benchmarked against global best practice, scrutinised deliverables, enabled decision making, implemented governance and control, control change and provided additional project management resources where required.

Benefits we enabled

Our in-depth understanding of the PTA organisation and the project vision has enabled us to provide the client a strong, multi-disciplinary team that can deliver the project. We have the capacity and global footprint to mobilise our resources to work on projects of the size and complexity of PTA's budget.

Case studies



Transport for NSW

Parramatta Light Rail (PLR)

PLR is one of the NSW Government's latest major infrastructure projects being delivered to serve a growing Sydney. Light rail will create new communities, connect great places and help both locals and visitors move around and explore what the region has to offer.

Impact

Following excellent service delivery, we were appointed, in select competition, to provide cost planning services for the final business case. Transport for NSW also exercised the option to extend our services for the final business case contract to include pre tender estimates and tender evaluation services. We are currently providing Cost Planning services to both Stage 1 and Stage 2 projects.



Transport for NSW

Newcastle Light Rail

The NSW Government is committed to the revitalisation of Newcastle and the long-term growth and prosperity of this area. A new light rail system, running on a 2.7 km alignment, will ensure continued economic growth and increase connectivity to new activity precincts in the city centre.

Impact

We were appointed to provide an independent estimator review of the managing contractor's **Target Budget Offer (TBO) for the fixed infrastructure works**. Transport for NSW benefited from our ability to draw upon other light rail, infrastructure, utilities and building sector experience to review, challenge and benchmark the various elements of the world, through learning gained from other similar light rail projects.

Case studies



Transport for NSW

Advanced Train Control Systems

The long term demand on the Sydney trains network will require rail infrastructure and signalling systems that enable improved network performance and provide increased capacity for passenger and freight services.

Impact

We are providing cost modelling inputs/outputs for the funding submission approvals process. Our extensive experience of providing specialised independent cost modelling outputs for European Train Control Systems, through both local and global experience, has produced robust and detailed cost plans to support the development of the business case and potential project funding models.



Transport for NSW

New Intercity Fleet

Transport for NSW procured a new fleet of 64 intercity trains for NSW. The new trains are to significantly enhance the level of service presently provided in the NSW intercity and Sydney outer suburban system.

Impact

Our experience of rolling stock procurement in Queensland, New South Wales, and recent research of European rolling stock enabled a rapid appraisal of the likely costs and associated risks that the New Intercity Fleet will be subject to. Additionally, we-established methodology for normalising different international contracts for application in Australia ensured that the most likely costs were identified for both the final business case and the final approved budgets.

Case studies



Queensland Rail

Cost Governance Framework

To deliver improved efficiencies, Queensland Rail was elected to deliver a cost governance framework. The cost governance framework scope of work was intended to cover: estimating; budget and cost control; and earned value management. A plan was also required to support implementation of the cost governance framework across assets.

Impact

We provided a preliminary report to establish the current approach of cost governance and organisation maturity. cost plans to support the development of the business case and potential project funding models. We delivered the required outcomes through deploying a team that had the diverse blend of expertise, underpinned by rail sector technical knowledge to provide a robust solution to the challenges Queensland Rail faced.



Transport for NSW

Cross River Rail

The inner city is the hub of South East Queensland's rail network. The bottleneck in the inner city rail network restricts the number of trains and passengers from around South East Queensland moving into and through the city. A new corridor through the inner city will **make it possible to add more trains to the region's network. Cross River Rail will give more passengers quicker access to the CBD and the opportunity to travel to new destinations with easy interchanges.**

Impact

Working as part of an integrated multi-disciplinary project team, our scope of service included: preparing cost estimates, advising design cost implication, preparing cash flow forecasts, assessing risk and contingency, and preparing maintenance and operational cost plan.

Case studies



Victorian Department of Transport

Melbourne Metro 1 (MM1)

MM1 will be a new metro service running from Sunbury to St Kilda Road via the CBD. MM1 will be a significant catalyst in transforming the remainder of the northern group into a series of segregated 'metro-style' lines utilising the northern loop and direct lines.

Impact

We were commissioned by the Victorian Department for Transport to undertake an independent peer review of the scope and cost estimates prepared for the Melbourne Metro MM1 project. The study focused on a high level review of the project scope and capital cost estimates with a detailed focus on the CBD South Station.



Rail Projects Victoria

Regional Rail Revival

The Regional Rail Revival project is a joint initiative of the Australian and Victorian governments. It involves upgrading of every regional passenger train line in Victoria to deliver the infrastructure needed for more frequent and reliable train services for regional Victorians.

Impact

We have been commissioned to provide timely and accurate on-site cost estimating services, undertaking both strategic and elemental estimating and covering various disciplines involved in the project.

The Authority have benefitted from our extensive experience and involvement in numerous national and international rail projects which has enabled us to provide robust cost plans.

Case studies



Rail Projects Victoria

Melbourne Airport Rail Link (MARL)

Melbourne Airport Rail Link (MARL) will integrate Melbourne Airport into the urban and regional transport network through Sunshine Station by a heavy rail connection. This **connection will improve the airport's accessibility and provide a frequent and consistent rail service to support Melbourne Airport as a transport gateway.**

Impact

We have been commissioned to provide timely and accurate on-site cost estimating services, undertaking both strategic and elemental estimating and covering various disciplines involved in the project.



Auckland Transport

Auckland City Centre Light Rail

Auckland Transport (AT) is investigating a light rail network as a possible way to relieve traffic congestion on busy arterial roads. This follows an independent study in 2012 (the City Centre Future Access Study), which predicted future transport demand and identified ways to meet it.

Impact

We reviewed the indicative capital cost estimates and provided independent assessment and assurance as to whether the scope and cost estimates were robust. We brought best practice cost planning to the Auckland City Centre Light Rail project through our extensive experience working on light rail projects across Australia and involvement in numerous international light rail projects.

Case studies



Public Transport Authority (PTA)

Forrestfield Airport Link (FAL)

PTA embarked on one of the most iconic projects, with 8km twin tunnel from Forrestfield to Perth Airport set to be completed by 2020. The FAL will improve connections to and from Perth Airport, the eastern suburbs and regional centres and is designed to relieve pressure on existing roads and provide a reliable alternative for airport workers and passengers.

Impact

We are providing advisory services for the \$2bn airport link. Our role includes project controls, procurement and transaction services. Our strong understanding of PTA as an organisation means we know the high qualified team members that will benefit the project.



Western Australia Department for Transport

Perth MAX Light Rail

The Metro Area Express (MAX) is the proposed light rail network set to power Perth's public transport into the future. This visionary project intends to introduce a new era of public transport, supporting the city's transformation by providing a frequent, high-capacity service in the inner-north, central west and eastern suburbs of Perth.

Impact

Our initial role is to carry out due diligence reviews of the projects business case estimates as well as providing advice and support to the Department for Transport with regards to the project business case development.

Case study

Virgin Hyperloop One, India



Virgin Hyperloop
One

Cost and Commercial
Management

2018- present

Client challenge

The Indian State of Maharashtra set out to build a Hyperloop to link the two cities of Pune and Mumbai. The Hyperloop high-speed infrastructure system will transport passengers and goods at aircraft speeds in pods through a low-pressure, vacuum tube, cutting journey times by 90 percent. The technology provides significantly more benefits to traditional transportation modes – sea, rail, road, and air – by offering energy-efficient, on-demand, and cost-effective service, while reducing the overall footprint of the system. The planned route will link central Pune to Mumbai, with a possible option of adding an additional connection to the upcoming Navi Mumbai International Airport. The estimated travel time on this route is 25 minutes, eventually enabling 150 million journeys every year along a 132 km track and saving 90 million hours of travel time.

How we added value

We were appointed to deliver cost estimate services for the project. In such a unique scheme, which is yet to be built anywhere in the world, the challenge was to leverage our global experience on other transportation schemes, such as high-speed rail, and derive cost benchmarks. We needed to understand the technology, which would power the project, so we worked collaboratively with stakeholders to stay on top of design development.

We put together a world class team, combining our global expertise and local talent in India. This team undertook extensive local market engagement which provided insight into the local supply chain, capabilities and constraints to assess the feasibility of the project. Our cost estimation tool which we applied to this project enabled us to provide greater certainty to our client.

Once completed, the Hyperloop technology could enable India to leapfrog to a higher **trajectory of growth in the coming years and change people's commute forever.**

Benefits we enabled

We drew upon our global rail database of benchmarking data to inform decision and the estimating process. This data has been compiled from major rail programmes globally

Case study

Hong Kong MTR, Hong Kong



Hong Kong MTR

Technology advisory

2018 - present

Client challenge

The Shatin to Central Link (SCL) is one of the strategic railway lines that was approved and funded in 2008 by the Government and the MTR is entrusted with its planning and design. The SCL will extend the railway network to areas that are yet to be served by MTR. This project is divided into 2 phases and is expected to be completed by 2020.

How we added value

We were initially appointed to carry out an independent review into the works on the Shatin to Central Link Project and to make recommendations to MTR Corporation about technological solutions which it could adopt in future projects.

These included introducing digitalised data capture, encouraging the corporation to implement short-term data capture solutions to support long-term strategy, and converting a paper-based documentation system to a digital-based platform.

We are supporting MTR Corporation's building information modelling (BIM) team to align BIM requirements across the design and construction stages. We later began work with MTR Corporation's project transformation programme board to review, re-configure and update its project integrated management system (PIMS) which defines the management systems, processes and controls for the delivery of railway extension and major operations projects in Hong Kong.

The overall intention is that the PIMS review provides project delivery processes that are consistent, integrated and cohesive, and which incorporate best practice while being fit-for-purpose to support the Corporation in the projects it has planned for the future.

Benefits we enabled

- We have offered an improvement route map of project management process and procedure which has been endorsed by senior executives. Our work has supported MTR Corporation to set a clear framework for improvements to transform how its programme of works will be delivered in order to achieve better time, cost and quality results. Ultimately, the corporation will have a modernised programme management systems and framework for delivering best in class major metro system capital works in the region.

Case study

Kuala Lumpur Singapore HS Link, Malaysia



Kuala Lumpur-
Singapore High
Speed

2013 – Present

Client challenge

In 2013, Singapore and Malaysia governments officially agreed to build a high speed rail link between Kuala Lumpur and Singapore by 2020 with construction anticipated to start by the end of 2016. The total system length from Kuala Lumpur to Singapore is approximately 350km and the service will include an Express Service non-stop from Kuala Lumpur and Singapore. A Transit Service will also stop at Putrajaya, Seremban, Melaka, Muar, Batu Pahat, and Nusajaya and finally customs and immigration services for both Singapore and Malaysia will be located at Kuala Lumpur, Nusajaya, and Singapore.

How we added value

The Singapore Ministry of Transport and Singapore Ministry of Finance required a team to undertake an independent review of the railway scheme assessing the overall economic impacts, ridership forecast analysis, ownership and management structures, plus estimated costs for construction and whole of life cycle costs.

We developed the scheme cost model for economic modelling purposes of the railway scheme. Our cost model included both initial construction costs and whole of life cycle costs over a 50-year period and was based on benchmarks from our extensive experience and data from many other rail programs globally.

Over the duration of our commission, we consulted with Singapore Ministry of Transport and Singapore Ministry of Finance directly to confirm the various technical assumptions required.

Benefits we enabled

No design and/or engineering information was available to Turner & Townsend at the time of developing our cost model.

However we were able to use our extensive rail experience globally and technical understanding of high speed railway projects to tailor our benchmark data to the specific scheme which was then presented to the ministry level of the Singapore government.

Case study

Jeddah Metro, Saudi Arabia



Jeddah Metro

Pre-contract cost and commercial services

2015 - 2017

Client challenge

Taking a long-term, sustainable approach, the vision for Jeddah's transport network includes the design of a metro consisting of 63 Prototypical, 6 Interchange and 5 Special Stations, servicing in excess of 160km of track over four individual routes through the city. The scheme will interconnect the city of Jeddah realising a modern transport infrastructure to match the prosperous and thriving economy. Successful delivery of the project will ensure a sophisticated, fully integrated, multi-modular public transport network.

How we added value

Foster + Partners Team (FPT) were appointed to develop the architectural vision for Jeddah's city-wide public transport plan and Turner & Townsend were sub-consultants to deliver pre-contract cost and commercial services. Through successful integration within the design team based on a collaborative working agreement, great outcomes have been achieved including:

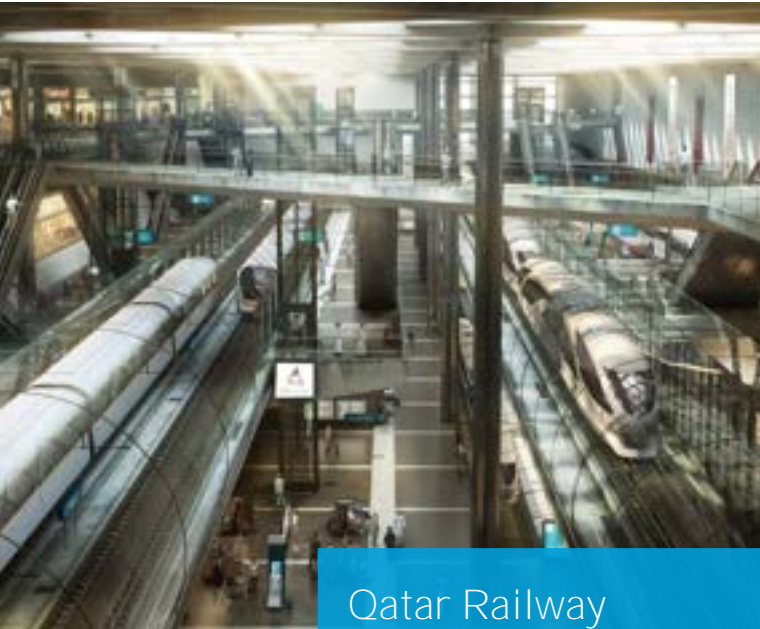
- Specification driven area and cost benchmarking of key elements of the proposed scheme, utilising regional offices and harnessing our expert knowledge and data capability
- Development and evolution of Cost Plans incorporating Whole Life Cost analysis for all aspects of the project
- Preparation of robust procurement documentation to ensure clarity and accessibility to achieve best buy in the Kingdom of Saudi Arabia market
- Development and delivery of a signature architects' vision within the constraints of a restrictive client budget

Benefits we enabled

- Our experience of similar projects in the region, including Doha Metro and Abu Dhabi Metro, allowed us to apply accurate cost data, providing the client with greater cost certainty in the development of their design.
- Monthly cost reports incorporating smart data representation techniques allows the team to understand and directly export our analysis into the clients customised project reports.

Case study

Qatar Railways Company, Qatar



Qatar Railway

Strategic Program
Management

2011-present

Client challenge

Qatar Rail is delivering a new Doha Metro and Tram network comprising of 109km of underground tunnels, 15km elevated, at grade track with 39 stations and a new tram network for Lusail City. The program included the procurement and subsequent contract management of design consultants and PMC consultants framework contracts for the large design and build (D&B) contracts, 8 mega D&B contracts for delivery of contracts for the various line tunnels and stations enabling work, Utility diversions and City Centre road logistics, MEP and building work for the 39 stations, rolling stock, systems, VHTS, BACS, FM and operating contracts for the operational phase.

How we added value

Turner & Townsend was initially engaged as the procurement, commercial & controls advisor within the Strategic Program Advisor role and since has expanded the role to work directly with Qatar Rail as sole Commercial Consultant.

In our role as Strategic Program Advisory, we were responsible for establishing the overall management infrastructure and contracting strategies. This involved drawing upon our work on other major rail programs globally and having a thorough understanding of different contracting strategies. Most recently, we have directly worked with Qatar Rail to provide both procurement and contract management support.

Throughout our time working with Qatar Railways Company, we have provided 20 procurement and contract management professionals and in line with client requirements, we have flexed our team size and requirements to align with the client and procurement lifecycle needs.

Benefits we enabled

We succeeded in protecting our **client's commercial position** and implemented advice proactively on how to resolve disputes by avoiding formal legal proceedings in a cost effective manner.

Case study

Abu Dhabi Metro, UAE



Abu Dhabi Metro

Cost Management Services

2013-2014

Client challenge

The Abu Dhabi Metro and Light Rail Transit (LRT) lines will complement each other and serve key attractions across the city, providing increased access, allowing travel without the use of cars and reducing the amount of traffic. The proposed Metro and LRT are part of the **overall Integrated Public Transport Network (IPTN) strategy, developed to meet Abu Dhabi's present and future transport requirements**. On completion Phase 1 of the Abu Dhabi Metro will consist of one line, 20 km in length with 12 stations and Phase 1 of the LRT will consist of three lines running a total length of circa 51 km with 79 stops.

How we added value

Turner & Townsend were appointed by Fluor to assist in the delivery of their commercial and estimating obligations under their role as the Project Management Consultancy for the Department of Transport (DoT). Services provided consisted of the following:

- The IPTN Master budget captures all the current DoT schemes that form part of the long term 2030 vision for the Emirate and requires a periodic update to advise the DoT on the current CAPEX and OPEX status. Through our interrogation of over 20 projects and numerous sub-contracts, we successfully produced an updated estimate and cash flow assessment for the entire IPTN scheme up to 2030.
- We delivered a Metro and LRT Cost Benchmarking Report to the DoT. The report examined a number of key rail cost metrics to demonstrate fundamental relationships and provide appropriate cost ranges for elements such as stations, tunnelling and rail systems. Our global team provided sample data and our currency and escalation methodology provided the DoT with a quality product tailored for the UAE market.
- Review of the Metro and LRT Preliminary Design submissions with a focus on the CAPEX and OPEX estimates. This facilitated the successful close-out of the design stage and reduced the risk of the project progressing.

Benefits we enabled

Case study

High Speed Rail commercial and controls support



High Speed Two

Pre and post
commercial and
controls advisory

2015 - present

Client challenge

High Speed Two (HS2) Ltd was established by the UK's Department for Transport in 2009 to develop, build and operate a new high-speed rail network linking London, Birmingham, Leeds and Manchester. Known as High Speed Two (HS2), this major programme required expertise in baseline estimating, procurement, commercial management, and project controls to support the critical period moving from development to delivery.

How we added value

Turner & Townsend has provided more than 200 specialist commercial and controls professionals to support HS2 since our appointment in 2015. Our team has fully-de-badged and works alongside HS2 staff from senior Board level to delivery. Our objective was to embed excellence in commercial, collaboration, innovation, and contractual processes to drive success and outcomes. This approach, and the corresponding processes and capability we have enabled, have enabled key milestones to be achieved. Highlights have included:

Pre-contract commercial management

- Developed the strategy for and delivered the ITT procurement process for the Main Works and Civils Contract (MWCC). This included commercial evaluation management, negotiations and leading the commercial capability programme-demonstrating capability to DfT and BICC to award & manage the contracts. As part of this we developed a detailed plan to ensure it was delivered on time; the ITT was completed in 6-9 month timeline which is considerably shorter than expected for a tender of this scale and complexity. It also enable the award of suppliers without any challenge.
- Integration of our team into the Stations procurement team, enabling Station Design Services Contracts & the Construction Partners for Old Oak Common & Euston. This included works information compilation, procurement plans, formation of agreements, PQQ and ITT evaluation, negotiation, scenarios to demonstrate readiness and contract award, configured CEMAR and ran a number of scenarios before award.
- Transfer of knowledge from procurement to delivery teams across Phase One.

Post-contract commercial management

- Developed the Contract Commercial Handbook and CEMAR, demonstrating commercial readiness to DfT to secure funding.
- **Providing multiple resource teams in the "Areas" (Main Works Civils, Enabling and Stations).**
- Supporting the Phase One Executive reporting to the Board. This involved working with an integrated team to bring together the four MWCC joint venture organisations. Serviced included monitoring contractor performance, applications for payment, variances to cost and schedule, and risk management.

Case study

High Speed Rail 2, UK



How we added value (continued)

Project controls

A major workstream within the HS2 programme was the delivery of 'Project Controls Improvements' specifically designed to demonstrate to external stakeholders that the project could control and govern itself during the investment period. Our work included:

- Working against a bespoke maturity model, based upon P3M3 and CMMI methodologies, we independently assessed the maturity of the HS2 project controls organisation; considering the strategic functions of the controls function. These included how work was scheduled and planned (including for integration with the supply chain through the NEC contract Works Information (WI)) and how change was controlled in the project, including for top down and bottom up change, assessing the project delegations and ensuring transparency in decision making.
- Preparing comparative cost estimates as part of the multi-criteria analysis of different design considerations including tunnel alignment, station location and configuration, design of structures, type of permanent way
- Preparation of the capital cost estimate for the preferred project for input into the project. This included cost benefit analysis as part of the business case submission which was scrutinised by independent auditors and UK Government
- Quantitative Risk Assessment to determine the exposure and contingency levels for the programme, including for the alignment of risk to delegated authority
- Program-level cost and schedule change control, integrating with the commercial function to assure contracts change and works authorisation was closely aligned
- Preparation of works information within the NEC contract to assure the supply chain was aligned and supported the core client working practices
- Operating of the reporting process providing visibility at contract, geography and organisational level with regard to project performance

Benefits we enabled

- Through our change programme, we have delivered improvement of over 25% over a 12-month period.
- Achieving £50m+ cost savings by proactively working with the MWCC supply chain to drive value into the programme. We supported the negotiation phase of MWCC resulting 1+% reductions to initially tendered fees.
- Our procurement leaderships for the MWCC contract was delivered in 9 months and without challenge
- Our benchmarking enabled programme-level comparisons with international high speed rail schemes. This enabled HS2 Ltd to review the size and capability of their commercial and controls organisations, before they entered into contract.
- Efficiency in the reporting process, whilst demonstrating to the DfT that all performance information was derived from the core project controls systems.

Case study

Edinburgh Tram Network, UK



Edinburgh Tram

Requirements management and programme advisory

2011 - present

Client challenge

Edinburgh Tram Project was initially a 12km long tram line that will link the airport with the city centre and deliver an environmentally friendly, fast and high-capacity service. The track is predominantly off-street, but there is a significant on-street section through the city centre which has required substantial enabling works before infrastructure construction. In 2011, The City of Edinburgh Council required additional project and commercial manager support due to existing delays to help regain public confidence and to recover the project which was faced with a inaccurate and inconsistent project and programme reporting and a poorly defined master schedule.

How we added value

Turner & Townsend were appointed in 2011 and setup and implement a full Programme Management Office (PMO) to manage the main infrastructure and rolling stock contracts and to manage the extensive enabling works contracts including utilities diversions and structures. Our role has involved:

- Managing the enabling works contracts including utilities diversions and structures.
- Achieving the level of control and reporting required on such a high profile project, in conjunction with the Council.
- Introducing an overarching planning and reporting capability providing up to date accurate information on which to base decision making.
- Identification of the true project risk profile with the implementation of effective risk mitigation actions.
- Hands on construction management of enabling works packages to minimise delay and disruption to the project overall.
- **Implementation of the client's cost and programme savings goals.**
- Integrated Master programme schedule and project interface management
- Distilling the programme requirements into 5000 individual outputs (Requirements Register) that could be tracked, followed by establishing a verification and validation (V&V) process with the stakeholders which allowed them to deliver and assure their outputs, followed by a series of compliance audits by the Turner & Townsend team.

Benefits we enabled

- A comprehensive master schedule of works integrating infrastructure and enabling works
- Greater visibility and control of the complex works and accurate and consistent project and programme reporting
- Phase 1 has seen much higher than anticipated passenger numbers resulting in a 10% improvement to the forecast year on year revenue.
- Delivery into operation 6 weeks ahead of programme, allowing revenue service to commence early and reducing journey times to Edinburgh Airport by 5 mins.

Case study

Crossrail – Transcend joint venture, UK



Crossrail

PMO, Project Controls
Planning and
Scheduling.

2013- ongoing

Client challenge

As Europe's largest construction project, Crossrail is one of the most complex programmes ever undertaken in the UK. When complete it will increase London's rail capacity by ten percent with ten new station, 118.5km of rail way systems and more than 1.5 million people will be brought within a 45 minute commute of central London. The Crossrail Bill was given Royal Assent in July 2008, giving planning permission and the powers for the railway to be built, operated and maintained.

How we added value

Setting up the programme

- In response to the government's 2010 Comprehensive Spending review, we led an integrated value management process that has resulted in the identification of programme savings totalling £1 billion
- Developed Crossrail's programme procurement strategy including the demonstration of how capacity will be secured, risk transfer and methods of partnering will be utilised. We supported the tender evaluation team in successfully awarding all main tunnelling contracts and the first of the major station contracts
- Created a robust programme wide estimating methodology and processes including developing the work breakdown structure.
- Developed the initial control baseline, aligning scope, cost, schedule and risk; a crucial element in achieving full funding approval
- Played a key role in developing the organisational design and governance arrangements

Establishing programme controls: Turner & Townsend worked as part of the Programme Partner played a key role in establishing Crossrail's Programme Controls set-up. At the outset, the aim was to develop a world-class controls function which, through robust reporting and sound programme management protocols, would support the Crossrail programme to deliver the works safely and to time, specification and cost. We:

- Established and cascaded programme wide cost control procedures to all Industry Partners, enabling cost control, predictability and remedial action planning
- Assessed whole life costs and developed an asset replacement/enhancement model, facilitating effective decision making
- Specified and procured the programme controls toolkit, which included the implementation of PRISM G2 cost management software
- Worked with partners to develop and implement the data warehouse to provide the 'single source of truth'
- Supported the development of the Programme wide change control process and reporting, resulting in quality reporting and control.

Case study

Crossrail – Transcend joint venture, UK



"The high quality Turner & Townsend resources that have been deployed and integrated across our team have been invaluable during Crossrail's evolution to become an effective, delivery-focused organisation."

Dave Allen, Finance Director, Crossrail

How we added value (continued)

- Supported the development of the Programme wide change control process and reporting, resulting in quality reporting and control
- Led programme-wide value management, engendering a behavioural mind-set focussed on continuous improvement
- Developed Contract Administration systems, tools and procedures, including contract administration manuals
- Designed and implemented standardised reporting dashboard formats
- Established and implemented commercial assurance and cost audit processes.

Building a cost-led culture: Working through Transcend Turner & Townsend has been instrumental in developing a cost-led culture in order to improve cost predictability and cost certainty. We:

- Maintained the cost management system and provided assurance on cost data integrity. This included identifying commercial risk through our commercial assurance process
- Developed a performance assurance function to measure and drive improvement **of the Tier 1 suppliers' performance in areas including health and safety,** commercial, quality, community relations, social sustainability and environmental
- Setting-up a commercial close-out performance management regime
- **Joined Crossrail's Learning Legacy Steering Group, assisting in the set-up and implementation of Crossrail's Learning Legacy and sharing lessons learnt via** Crossrail International to other major rail programmes globally.

Project managing the Crossrail Engineering Safety and Assurance (CESA)

Case: Working alongside our Vertex Systems Engineering consultancy business, we are supporting the CESA to enable the transition from a project environment into an operational railway, whilst ensuring that all engineering safety and assurance obligations are achieved.

Benefits we enabled

- Developed a performance assurance function which resulted in a 48% increase in supply chain performance. The model was adopted by Infrastructure UK for adoption as a UK wide standard to drive improved supply chain performance.
- Leading an integrated value management process that resulted in the identification of programme savings totalling £1bn, in response to the governments Comprehensive Spending review.
- Set a new standard for major programme learning through the Crossrail Learning Legacy (CLL). This included being CLL Ambassadors, developing specific guidance and driving industry engagement so that other projects could benefit from new tools
- Leading the tender evaluation team to successfully award all of the main tunnelling, station and systemwide contracts.

Case study

Transport for London (TfL), UK



Transport for
London

Major Projects
Directorate and project
support

2017 - Present

Client challenge

TfL deliver and oversee complex programmes and projects in challenging stakeholder environment and require specialist advisory and support in achieving business or project outcomes on a regular basis. Examples include the restructuring and development of a change programme for TfL's new Major Projects organisation and enabling the Maintenance Modernisation (MM) Programme to help transform front-line Fleet and Track maintenance – removing inefficiencies in resources and time. In addition to priority projects, additional resource is frequently required to provide direction, leadership or support to maintenance or renewals works.

How we added value

Turner & Townsend are members of the Project Management and Commercial Management frameworks and have worked with TfL since 2007. We have supported:

- Major Projects Delivery business: supported the establishment of the new TfL Major Projects Delivery (MPD) business. We provided a senior Interim Major Projects Director who supported the design and establishment of the business and developed the strategy and Target Operating Model (TOM) for this new organisation. Supporting this, we designed a new Project Controls service, which sits in the Major Projects delivery business, and serves all TfL capital projects.
- Lean Delivery Partner for Maintenance Modernisation: supported the transformation of front-line Fleet and Track maintenance by removing inefficiencies. Key deliverables included the delivery of lean coaching to senior leaders (40+ managers over 5 months), implementing lean operating systems and visualisation and ensuring long term cost-effectiveness by coaching the BI team in lean mind-sets, tools, and management. Key to this was effective change management and communication and supporting project teams in solving problems.
- Pilot implementation of Ares PRISM G2 for Project Controls: we defined stakeholder requirements what could be measured throughout the project and undertook systems configuration design and implementation, including identifying relevant areas where data transformation was needed. We led TfL in the go-live of the system and provide appropriate user coaching and familiarisation activities.

Benefits we enabled

- Supporting the identification of **the 'real' critical path** through the full programme through development of the Integrated Master Schedule to include all the scope and introduce the necessary relationships between multiple projects
- Developing a sustainable future change capability, supported through senior leadership guidance and knowledge sharing
- **Reduced TfL's reliance on** external consultancies through coaching management levels on lean techniques so that they could be self-sustaining

Case study

Network Rail Crossrail, UK



Network Rail Crossrail (NRCR)

East and West
Surfacing programmes

2015 - 2019

Client challenge

TfL deliver and oversee complex programmes and projects in challenging stakeholder environment and require specialist advisory and support in achieving business or project outcomes on a regular basis. Examples include the restructuring and development of a change programme for TfL's new Major Projects organisation and enabling the Maintenance Modernisation (MM) Programme to help transform front-line Fleet and Track maintenance – removing inefficiencies in resources and time. In addition to priority projects, additional resource is frequently required to provide direction, leadership or support to maintenance or renewals works.

How we added value

Turner & Townsend were engaged by NRCR to provide a team of 56 personnel covering project, engineering and construction management across the East and West Surface programmes. Key project involvement included the £250m integration of the Great Western Main Line (GWML) with the Westbourne Park tunnels and Old Oak Common Depot and the £160m Old Oak Common (OOC) Depot programme. We:

- Led early engagement with key stakeholders to fully define requirements at the outset, including TOCs, lineside neighbours and heritage specialists. For example, we secured consent approval from English Heritage to modify the Paddington station canopy and Brunel bridges to allow the electrification of Platform 1/2 resulting in completion of the IEP stabling programme 3 months early.
- Mobilised multiple suppliers to deliver this major programme and were directly involved in responding to the Carillion liquidation and transferring duties to Amey rail in January 2018, preventing delay to the ongoing programme
- Coordinated staged possession and isolation arrangements along with managing the access/egress of multiple engineering train and plant movements. This ensured we were able to deliver a careful sequence of Pway, civils, OLE, E&P and signalling modifications/ testing with zero overruns during the programme.
- Led the section 61 planning application process for developing a long-term schedule of piling and heavy civils. We negotiated with Westminster Council to minimise related noise/vibration pollution and the impact to the local residents.

Benefits we enabled

- Successful delivery of the largest blockade and signalling **data change in NR's history**.
- £1.5m savings and 3 months programme reduction to the interfacing electrification of the OOC Depot by fast tracking the lineside ATFS feeder installation, enabling the early electrical commissioning of the depot.
- Successful introduction of the new signalling data change with interfacing PWay, OLE systems and other lineside infrastructure.
- Led a programme with 150 students known as Budding **Brunel's to encourage young members of the West London community into engineering**.

Our team



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