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Global Market Appetite for Metro Rail

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Abstract

Large infrastructure programs such as railway developments across the globe have the potential to attract a large number of local and international industry actors wanting to participate in the delivery of individual mega-projects and a pipeline of infrastructure initiatives. The level of international participation can vary significantly depending on the geographical location of the project and the procurement approach taken by clients.

Our summary report aims to understand procurement strategies and engagement initiatives by different client organisations in different jurisdictions. Drawing on global experience, insights can be identified that may assist in removing potential blockers to those industry actors that are not participating in the Australian market.

A total of three case studies were developed for this research project: Doha Metro (Qatar), Los Angeles Metro (USA), and Ontario Line (Canada). There are lessons from these jurisdictions that can be applied in a local context to the substantive Sydney Metro program (Australia).

Key words: Metro rail; Procurement; Project Delivery; Funding.

1.Introduction

The NSW government, through Sydney Metro and Transport for NSW, has undertaken a range of proactive market engagement activities, which provide a reasonable level of understanding of industry views for the significant pipeline of transport infrastructure proposed over the next decade. It is clear that there is a high level of interest and appetite from both local and international organisations to contribute to the Sydney Metro program in particular.

However, the two new Sydney Metro lines currently in planning and delivery (as well as future augmentation of these lines and new lines) present new and complex delivery challenges that would benefit from additional targeted market analysis. This paper presents the results of a rapid research study aimed to compile metro rail case studies covering an initial set of comparable jurisdictions to identify which local and global industry actors were procured. In this context, metro rail refers to railway infrastructure that is providing a rapid mass transit service within a major metropolitan area.

2. Methodology

The scope of this analysis was focused on a desktop review to understand industry participants and the nature of procurement for comparable metro rail projects. Importantly, research was supplemented with a series of interviews with project teams directly involved in the delivery of projects with the aim of drawing out the key risks, interfaces, and blockers to participating that may be experienced by industry actors.

Leveraging off Mott MacDonald's global experience, an initial scan identified 14 jurisdictions with potential to be included:

- Los Angeles Metro and integrated transport network (USA)
- San Jose light rapid transit (USA)
- Ontario Line and wider public transport services (Canada)
- Crossrail (London, UK)
- Warsaw Metro (Poland)
- Baku Metro (Azerbaijan)
- Rotterdam Metro re-signalling program (Netherlands)
- Delhi Metro (India)
- Bangalore Metro (India)
- Doha Metro, particularly the Terminal station at Hamad International Airport (Qatar)
- Singapore Mass Rapid Transit network (Singapore)
- Kaohsiung Metro (Taiwan)
- Beijing Metro (China)
- Auckland City Rail Link (New Zealand)

To obtain relevant insights quickly, a short list of jurisdictions was selected using projects that had strong existing relationships with client teams and contemporary involvement in project delivery. A total of three case studies were developed for this research project based on the flowing criteria:

1. Level of relationship with the metro rail project team
2. Availability of public information regarding the procurement process
3. Alignment of the metro rail project with a customer outcomes approach
4. Scale and complexity of the metro rail project

The resulting rapid analysis of jurisdictions is presented in Table 1.

Table 1: Rapid analysis of jurisdictions to focus on three case studies.
Scoring: 1, Low; 2; Moderate; 3, High.

Jurisdiction	1: Relationship	2: Availability	3: Alignment	4: Scale & complexity	Total
Los Angeles Metro and integrated transport network (USA)	3	3	3	3	12
San Jose light rapid transit (USA)	3	1	2	1	7
Ontario Line and wider public transport services (Canada)	3	3	3	3	12
Crossrail (London, UK)	2	3	3	3	11
Warsaw Metro (Poland)	3	1	2	1	7
Baku Metro (Azerbaijan)	2	1	1	1	5
Rotterdam Metro re-signalling program (Netherlands)	1	3	1	1	6
Delhi Metro (India)	2	2	2	3	9
Bangalore Metro (India)	1	2	2	3	8

Doha Metro, particularly the Terminal station at Hamad International Airport (Qatar)	3	3	3	3	12
Singapore Mass Rapid Transit network (Singapore)	1	2	2	2	7
Kaohsiung Metro (Taiwan)	2	1	2	2	7
Beijing Metro (China)	2	1	1	2	6
Auckland City Rail Link (New Zealand)	1	3	3	1	8

A questionnaire was prepared in advance of meeting with project teams across the shortlisted jurisdictions. Each case study involved two separate semi-structured interviews with the local project teams involved. The knowledge of local project teams unlocked key insights and provided access to new (public) documentation.

The questionnaire, interviews and analysis aligned with the UK Government's Infrastructure and Projects Authority's (IPA's) Project Initiation Routemap (IPA 2016). The Routemap is based around six pillars of procurement which form the basis of understanding an effective procurement approach:

1. Understanding requirements (outcomes and key specifications): including questions related to integrated land use and transport outcomes, the customer, and operations.
2. Engaging the market: including the market sectors required to deliver the project, processes of engagement, and the range of international companies participating.
3. Packaging the works: including the number and typologies of contracts, how turn-key approaches might have been considered, and funding approaches.
4. Choosing the risk allocation (contracting) model: including critical risks for the project, alignment of risk allocation and capability of industry actors, and how procurement approaches might influence risk.
5. Choosing the route to market/tendering: including what inhibiting factors might be observed for industry actors to participate in procurement activities.
6. Communicating the benefits: including engagement with stakeholders and the community, benefits realization, and how environment or social outcomes might be set during the procurement process.

This initial market appetite analysis was conducted in a sprint format, covering high level information on each case study. There is an opportunity to further develop the case studies to more detail, which would require additional interviews and research activities to be undertaken.

A summary of insights was prepared, and a comparison of key success factors applied in the context of current and future Sydney Metro delivery activities.

3. Case studies

3.1. Doha Metro

An overview of Doha Metro is provided in Table 2.

Table 2: Project overview: Doha Metro

Project element	Specification
Client	Qatar Rail
Location	Doha, Qatar
Cost	Approximately USD$36 billion committed to date (including both Phase 1 and Phase 2). Equivalent to approximately AUD$47 billion.
Length	Phase 1 (Doha Metro) construction contracts awarded to the value of USD$17 billion.
Timing	76km (current – Phase 1), 18km (Phase 2), plus approx. 300km (planned)

Doha Metro in Qatar is a driverless rapid transit system. Phase 1, which covers a length of 76 kilometres with 37 stations across 3 lines, commenced construction in 2013 and began operation in May 2019. The cost of the overall metro rail project is USD$36 billion, which includes part of Phase 2 that will ultimately expand the network to 300 kilometres and almost 100 stations. Qatar Rail, a state-owned company, is the sole owner of the project.

3.1.1. Market context

Doha Metro was one in a series of metro developments across the Middle East beginning in the mid 2000's, following an increase in oil prices and investment thereafter. This series of developments commenced with Dubai Metro and continued in the UAE, Saudi Arabia, Kuwait and Bahrain. This is shown in Figure 1.

Figure 1: Timeline of metro rail investment in the Middle East.

For all the projects delivered between 2009 and 2017, a single contractor approach was used. This single Turnkey model, or Engineering, Procurement, and Construction (EPC) contract, required several consortiums to be formed and new entities to be created to bid on these projects. Regional politics added further complexities as any international bidders would require a local partner to help undertake stakeholder management, obtain permits and maintain client relationships. Notwithstanding this, given that many of these projects were announced around a similar time, it was expected that interest from participants would be boosted by long-term opportunities in the region.

More recently, a Public Private Partnership (PPP) approach is being tested in Bahrain and Kuwait. The necessity for this approach stems from a reduction in sovereign wealth (lower oil prices) and therefore an interest in alternative funding and financing options.

3.1.2. Approach to procurement

Doha Metro is the only project to date that has taken a different approach to procurement. Qatar Rail proceeded with a disaggregated packaging approach, which was primarily adopted due to the ability for several aspects of the project to progress simultaneously by dividing the works into numerous components. This allowed Qatar Rail to commit to its hard delivery timeline, achieving completion in advance of the 2020 FIFA Club World Cup (which was subsequently deferred to 2021 due to Covid-19).

The civil (design & construct) works were split into seven major packages – first by line and then by underground and at-grade/elevated. There was a separate package for major stations and other minor packages and consulting contracts (Figure 2).

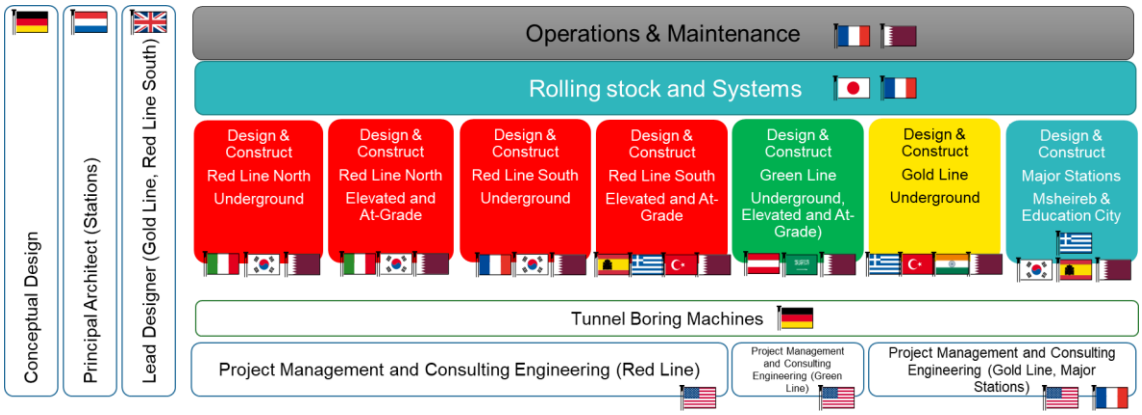

Figure 2: Procurement approach for the Doha Metro with the origin of industry actors for each package identified.

Each line was generally comprised of two Design & Construct (D&C) packages with a Project Management Consultancy (PMC) contractor supervising and managing works on that line. The systems component had one consortium for the overall network.

In each major package of work, joint ventures and consortiums are formed by a partnership of local and international contractors. While the bulk share is taken by the internationals who bring international expertise to the project, significant involvement from Qatari firms is encouraged and taken by the consortiums to provide support needed in terms of authority approvals, stakeholder management and navigating local legislation.

3.1.3. Wider industry actors

In the case of Doha Metro, given the breakdown of work into numerous packages, there was a high level of market participation from contractors based in various countries. Typically, contractors involved in metro projects across the Middle East region are from Germany, Spain, France, Italy, Turkey, Egypt, Japan, South Korea, India and Saudi Arabia.

In addition to the successful bidders for the packages identified in Figure 2 above, there are other major players who operate in the region, such as Siemens (Germany) for rolling stock and signalling. There was minimal involvement from the Americas, and no involvement from China. Large civil contractors from the Americas are not very active in the region, while Chinese contractors not considered by Qatar Rail on projects such as the Mecca Metro.

Qatar Rail generated significant global market interest to attract the required number of international contractors to meet their delivery timeframe. The Middle East region does not

appear to face significant issues in getting interest from global contractors and suppliers to bid for projects due to:

- many companies already operating in the region on large infrastructure projects;
- the size of contracts being sufficiently large for contractors to invest;
- a programme of future projects – strong pipeline of work and deep market;
- most of the major contractors and suppliers having regional experience and regional offices; and
- major companies having local sponsors and agents who provide local intelligence and services to navigate local rules and resolve disputes.

3.1.4. Takeaways

A high level of international participation in delivering Doha Metro can be attributed to the following key factors:

- The certainty of a large pipeline of metro rail construction and operation opportunities in a single jurisdiction/region meant international contractors were more willing to invest and make a long-term commitment of people and capability in the region. In Australia, the pipeline of large-scale metro rail infrastructure projects is not as certain.
- Adopting well-known and used international contracting models and contract terms. Australia faces the problem of using bespoke contracting arrangements which are less favourable and attractive to contractors, rather than standard form contracts.
- The requirement for local contractors seemed to further encourage international companies to establish local offices, partnerships and relationships in the jurisdiction.
- A focus on large Turnkey projects provided experience and momentum for the winning teams. Only recently has there been a shift to private financing and disaggregated contract packaging. The latter for Doha Metro driven by the political desire to open by 2020.
- The client having very little or no experience of developing large scale metro projects, hence needing to bring in international expertise.

3.2. Sepulveda Transit Corridor (LA Metro)

An overview of the Sepulveda Transit Corridor is provided in Table 3.

Table 3: Project overview: LA Metro (Sepulveda Transit Corridor)

Project element	Specification
Client	Los Angeles County Metropolitan Transportation Authority (LA Metro)
Location	Los Angeles, Sepulveda Corridor between the San Fernando Valley and the Westside of LA
Cost	Approximately USD$6 to 11 billion for the delivery of the project (including a future extension to LAX)
Length	15 miles (24km) with the option to extend by another 4-5 miles to include the LAX area.
Timing	San Fernando – Westside scheduled to open by 2033-35

The Sepulveda Transit Corridor covers approximately 60 square miles (about 15,500 hectares) between the San Fernando Valley (the Valley) and the Westside of Los Angeles, including the Los Angeles International Airport (LAX) area of Los Angeles County. The purpose of the Sepulveda Transit Corridor Project (the Project) is to provide a high-quality transit service that

effectively serves the large and growing travel demand between the San Fernando Valley and the Westside, including the LAX area.

For transit to be a competitive travel option that attracts new riders, there is a need to increase the speed, frequency, capacity and reliability of transit service and provide convenient connections to existing and planned transit lines.

LA has historically been a city built with car ownership in mind. The Sepulveda corridor has been the major transportation corridor between the Valley and the Westside for 90 years. As LA's San Fernando Valley and Westside have grown, LA Metro, the California Department of Transportation (Caltrans), and its predecessor agencies have undertaken multiple efforts to improve mobility in the Sepulveda corridor. Depending on the time of the day, a car ride between the Valley and the Westside can currently take between 30 minutes and 2 hours. The development of a train connection between the two areas is expected to reduce this travel time to under 30 minutes while having the capacity to transport up to 20,000 passengers per hour.

3.2.1. Market context

LA Metro (the client) is required to investigate a range of concepts to meet the mobility and access needs of the Sepulveda Transit Corridor. Therefore, they are seeking to co-develop multiple Transit Solution Concepts as a requirement of the environmental review process. Land acquisition will be evaluated as part of the environmental review and ultimately influence the final option selected.

This approach provides the private sector with considerable time to develop and test solutions in parallel with genuine stakeholder and community engagement. This seems likely to increase buy-in for schemes that deliver Environmental, Social and Governance (ESG) outcomes while also diluting the potential for political announcements that might then need to be defended. The alignment with environmental approval requirements takes pressure off the critical path and potentially avoids having to modify planning approvals after contract award.

3.2.2. Approach to procurement

LA Metro is using a pre-development agreement (PDA) approach to procurement for the Sepulveda Transit Corridor Project. The approach provides an opportunity for early contractor involvement in project definition and design, in collaboration with the public project sponsor.

A firm or consortium of firms awarded a PDA (the "PDA Contractor") provides technical work products supporting the ongoing development of a project as it progresses through review and approval processes.

When the project scope and design are sufficiently developed, if conditions are met as specified in the PDA, LA Metro may offer the PDA Contractor the opportunity to submit a firm fixed price proposal to LA Metro for the delivery of the project. If the proposal is acceptable to LA Metro, the PDA Contractor may be awarded a contract for delivery and implementation.

The timeline for this approach is described in Figure 3.

Figure 3: Project procurement schedule including significant co-design in advance of awarding a public-private partnership.

LA Metro has selected two PDA Contractors to each identify and develop a Transit Solution Concept who will develop very different Transit Solution Concepts (Figure 4). Each Contractor will be paid during the PDA engagement and is required to perform a variety of management, design and analysis tasks, and to develop and submit for LA Metro's approval a progressive series of deliverables to help LA Metro define a project alternative and advance its design, and to develop a plan for delivery and implementation of that project alternative.

In addition to the two PDA alternatives, LA Metro is developing an additional three alternatives as a requirement of the environmental review. Land acquisition will be evaluated as part of the environmental review and ultimately influence the final option selected.

PDA team 1 – Sepulveda Transit Corridor Partners (USD $69.9m proposal for the review phase)
The proposed solution is a bombardier-type sky train using driverless technology. The heavy rail concept would include the construction of tunnels between the Valley and the Westside. More than 60 per cent of the concept would travel underground, with the remainder of the line traveling primarily in an aerial section. A Valley-to-Westside trip would take just under 20 minutes.
Anticipated development cost is USD10.8b

Bechtel Infrastructure (lead) *(USA)*	Design Management, Stations, Maintenance & Storage Facility, Geotechnical
Mott MacDonald *(USA, UK-owned parent company)*	Tunnel, Ventilation, Structural Underground and MEP Stations
TY Lin *(USA)*	Track/Alignment, Elevated Guideway, Utilities and Drainage
SYSTRA *(France)*	Traction Power, Communications, Signal & Train Control and Systems

PDA team 2 – LA Skyrail Express (USD63.6m proposal for the review phase)
The proposed solution includes a surface alignment down the I-405 freeway using a monorail technology. Proposed travel times via monorail are estimated at 24 minutes.
Anticipated development cost is USD6.1b

John Laing (co-lead) *(UK)*	Project management, finance
BYD (co-lead) *(China)*	Project management, technology supply and systems integration, co-lead O&M contractor
HDR *(USA)*	Lead Engineer
Skanska *(USA/Sweden)*	Lead Construction Contractor
Gensler *(USA)*	Architect
Innova *(USA)*	Structural Engineer
ACI *(USA)*	Co-lead operation and maintenance contractor

Figure 4: As at April 2021, the project has entered the Pre-Development Agreement and Environmental Review stage with two PDA Contractor teams.

3.2.3. Wider industry actors

Prior to an initial qualification phase, LA Metro held an industry review to gauge interest. During this initial qualification phase in 2019, 16 suppliers originally expressed interest. Of this cohort, two dropped out and four suppliers carried forward to the PDA proposal phase (August 2020).

The final two suppliers then progressed into the PDA and Environmental Review phase which is due to be completed in 2025.

Other major industry actors included (prior to final round) included Tutor Perini (USA) and Lane Construction (USA, Italian-owned parent company).

In the US, local contractors are generally outgunned by Spanish contractors who have a better track record and more experience in the design / build stage of infrastructure projects. In the LA region, Spanish contractors have previously won work delivering the I-405 freeway and several segments of the California High Speed Rail. Prominent Spanish contractors include Dragados, OHL, and Ferrovial.

3.2.4. Takeaways

One of the initial drivers was project completion prior to the 2028 Los Angeles Summer Olympics. However, more recently the client has acknowledged that the project will not be completed by then. Notwithstanding, the overall schedule is still likely to be quicker than progressing a more traditional design and construct approach. Rather than a long period of the client setting requirements then seeking solutions from the private sector over a relatively short timeframe, the PDA approach facilitates the co-design of requirements and innovation over a longer period of time.

By taking a PDA approach, LA Metro aims to:

- produce a project scope that is legally, environmentally, technically, and financially feasible;
- optimise project lifecycle performance, risk allocation and management, constructability, and affordability through early design solutions, innovation, and private sector PDA Contractor's rigor and resources;
- accelerate the delivery process through focused application of resources in parallel activities to facilitate an earlier opening;
- develop a financing strategy that may be used to distribute project funding over a long-term contract and efficiently leverage available LA Metro funding; and
- select a qualified contractor that understands and supports LA Metro's project priorities; including optimising service performance and system integration (short and long term); minimising lifecycle project costs (design-build and operations and maintenance), and mitigating community and environmental impacts.

The Transit Solution Concepts proposed by the PDA Contractor teams have strong alignment with the city-building aspirations of the Western Parkland City.

3.3. Ontario Line

An overview of the Ontario Line is provided in Table 4.

Table 4: Project overview: Ontario Line

Project element	Specification
Client	Infrastructure Ontario (planning and delivery) and MetroLinx (operations)
Location	Toronto, Ontario, Canada
Cost	$10.4b - $12b (Canadian) (the Australian dollar is roughly equivalent)
Length	15.6km with 15 stations proposed.
Timing	Targeted opening date: December 2029. Contract award forecast for 2022. Early/enabling works due for completion April 2022

The Ontario Line is a stand-alone rapid transit line, intending to connect the Ontario Science Centre in the north-east of the city, to Ontario Place in the south-east of the city, located in close proximity to the Billy Bishop Toronto City Centre Airport.

The Project aims to provide faster and more consistent access to transport, for the 255,000 people that live within a 10-minute walk of an Ontario Line station. The Ontario Line project will deliver a fully automated and electrified rail system, with travel from Exhibition Place to the Ontario Science Centre in 30 minutes (reduced from the current travel time of 70 minutes). This will be done with the introduction of 15 stations across 15.6km of new tunnelled, at grade and elevated rail line.

The Project will create a 45 minute or less commute time for more than 57,000 jobs for Toronto residents. By delivering the upgrades, this will aim to reduce road congestion and the current crowding experienced on the existing Line 1 (Yonge-University Line).

3.1.1. Market context

Infrastructure Ontario in particular has established an internationally recognised approach to public-private partnerships (PPP or P3) with a focus on output specifications. This has facilitated the contracting of over 100 Public-Private Partnerships since 2005 establishing a diversity of international industry actors that continue to operate in the Canadian market.

During the second half of 2019, market feedback was sought by Infrastructure Ontario and Metrolinx, and received from the majority of the market, that a singular contract for the Ontario Line would be too large for most, with the likelihood of only two companies being able to service one large overarching contract. As a result of this market engagement, the decision was made the Ontario Line is currently being procured via three separate P3 contracts:

- Rolling stock, systems, operations and maintenance (RSSOM)
- Southern line civil, stations and tunnel works
- Northern line civil, stations and tunnel works

The Ontario Line project has also involved a series of early/enabling works, which have been procured using more traditional procurement methods instead of P3. These enabling works are forecast for completion by April 2022.

The Ontario Line is progressing on schedule with early works forecast for completion by April 2022 ahead of the next Provincial election. Requests for proposals were issued in December 2020 for the RSSOM contract and Southern Civil, Stations and Tunnel works. The later was awarded in May 2021. The request for proposals for the Northern Civil, Stations and Tunnel works is due to be issued in early 2022.

3.3.2. Approach to procurement

The proposed approach to procurement of the Ontario Line is built upon the existing mature P3 (PPP) model. Infrastructure Ontario has been executing P3 contracts since 2005. Through this model, suitable risks associated with the design, construction and financing of the project will be transferred to the private sector.

The PPP or P3 model introduces private finance rather than relying on separate client funding, often referred to as 'traditional funding'. The PPP therefore incentivises a long-term relationship with a high degree of risk transfer to the private sector. The client (public sector) pays instalments to the private sector supplier in the form of a service fee to fund and deliver infrastructure and related services over an agreed term (typically 15 to 30 years).

The private sector supplier typically designs, delivers and finances the facilities and operates and/or maintains them to output specifications. PPP contracts hold the supplier financially liable for the infrastructure assets condition and performance throughout the contract term.

3.3.4. Wider industry actors

The Ontario Line attracted a diversity of international market players, with the six consortiums across the two contracts having a mix of international representation, including but not limited to:

- RSSOM Consortiums
  - Connect 6ix: Australia, Italy, France
  - ONConnects: Canada, Keolis France, Germany
  - ONLineLinx: UK, France, Germany, Singapore
- Southern Civil, Stations and Tunnel consortiums:
  - Community Transit Link: Canada
  - ON-Linx: Italy
  - Ontario Transit Group: Spain

3.3.4. Takeaways

Infrastructure Ontario has established an internationally recognised approach to public-private partnerships (PPP or P3) with a focus on output specifications. Adopting well-known and used international contracting models and contract terms would strongly support at least five of the ten NSW Government Action Plan commitments to the construction sector (NSW Government 2018).

The advantages of harmonising contract terms to encourage international participation in local markets could provide the single greatest benefit in terms of improved resource efficiency. There are parallels between Sydney Metro West and the Ontario Line.

The ability of the private sector to successfully develop and deliver metro rail projects appears to be enhanced when industry actors or consortia are provided with high levels of ownership. For example, the PPP approach undertaken by Infrastructure Ontario is intended to set high levels of responsibility for the provision and operation of infrastructure.

4. Conclusions

The development of the three metro rail case studies presented an opportunity to make a few key observations pertaining to the procurement approaches taken.

Doha Metro:

- The certainty provided by a strong pipeline of mega-scale metro and rail infrastructure projects was key to attracting international contractors, who have been willing to make a long-term investment of people and capability in the region.

- The requirement for local contractors seemed to further encourage international companies to establish local offices, partnerships and relationships in the jurisdiction.
- The Doha Metro project represented a shift to disaggregated contract packaging, driven by its short delivery timeframe.

Sepulveda Transit Corridor:

- The Los Angeles County Metropolitan Transportation Authority, established in 1951, is responsible for transportation planning and coordination, designing, building and operating rapid transit services.
- Taking a Pre-Development Agreement approach facilitates the co-design of requirements and innovation over a longer period of time.
- Alignment with environmental approval requirements relieves pressure on the critical path and potentially avoids having to modify planning approvals after contract award.

Ontario Line:

- There is a significant presence of international players involved in consortia currently tendering for Ontario Line contracts.
- Rolling stock, systems, O&M PPP are concurrently out to market with the first major civils package. This supports early buy-in and input from the future operator.
- Being a mature government client pertaining to contract form, Infrastructure Ontario have contracted over 100 PPPs since 2005. Management of PPP transit solutions is conducted by a mature government client (Metrolinx).

In investigating the three global case studies, it appeared that the level of international participation in individual projects was influenced by the application of some high-level success factors:

- **The level of client maturity.** Clients with a relatively lower level of maturity (e.g. Qatar Rail) opted for turn-key procurement solutions delivered within a pre-defined framework, and predominantly transferring risk to the private sector. Clients with a high level of maturity (e.g. LA Metro) chose to invest into a range of project alternatives upfront, leaving room for flexible decision-making and co-design of solutions, thereby lowering risk for all parties involved.
- **The strength of the regional project pipeline.** Railway projects in geographies with a strong pipeline of work providing opportunities for partnerships with locally based firms (e.g. Doha Metro) was a key benefit in attracting great participation from international contractors.
- **The level of contract maturity.** Government clients with a proven, easy to implement approach to engaging contractors (e.g. Ontario Line) provided a low-risk market access point for international contractors.
- **The level of ownership by industry actors.** A high level of project ownership offered to industry actors (e.g. Sepulveda Transit Corridor) was a key selling point to organisations looking to tender for the project.

Comparatively, Australian clients, such as Sydney Metro, have room to improve in all four success factors as identified in Table 5 below.

Table 5: Project maturity across key success factors (Legend: • low •• medium ••• high)

Project element	Doha Metro	Sepulveda Transit Corridor	Ontario Line	Sydney Metro (comparative)
Level of client maturity	•	•••	•••	••
Strength of the regional project pipeline	•••	••	••	•
Level of contract maturity	•	••	•••	•
Level of ownership by industry actors	•	•••	••	••

The key success factors that appear to be leading to greater participation can all be influenced by client organisations. In the context of Sydney Metro, these success factors align with known constraints to partnering with the international private sector. An ongoing focus on these success factors would support the implementation of the NSW Government Action Plan: "A ten-point commitment to the construction sector". This Action Plan aims to:

1. Procure and manage projects in a more collaborative way
2. Adopt partnership-based approaches to risk allocation
3. Standardise contracts and procurement methods
4. Develop and promote a transparent pipeline of projects
5. Reduce the cost of bidding
6. Establish a consistent NSW Government policy on bid cost contributions
7. Monitor and reward high performance
8. Improve the security and timeliness of contract payments
9. Improve skills and training
10. Increase industry diversity

Improving our understanding of metro rail projects across other global jurisdictions can help re-frame the discussion locally about key blockers to participation by international industry actors in current and future Sydney Metro delivery activities. Desktop research provides an overview of participation and approaches. Making the direct connections with practitioners that have a direct involvement across the three comparable case studies has then provided insights into how and why international industry actors are participating.

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