



# Contents

Contents.....	ii
1. Transmittal Letter.....	4
2. Firm Experience and Team Structure.....	5
2.1 Introduction to Macquarie.....	5
2.2 Relevant Experience and Capability.....	6
2.3 Selected Team Member Resumes.....	9
3. Project Approach.....	12
3.1 Project Scope.....	12
3.2 Macquarie’s Approach:.....	13
3.3 Recommendations for Improvement.....	15
4. Responses to Questions.....	17
4.1 Commercial Questions.....	17
4.2 Funding and Financing Questions.....	20
4.3 Technical Questions.....	21



## 1. Transmittal Letter

Macquarie Capital (USA) Inc. (“Macquarie”) is pleased to submit the following Expression of Interest (“EOI”) for the California High-Speed Rail Initial Operating Segment (the “Project”) issued by the California High-Speed Rail Authority (the “Authority” or “CHSRA”).

Macquarie Corporate Holdings Pty Limited (“Macquarie Capital”), together with its worldwide subsidiaries, is one of the world's leading developers and financiers of major public infrastructure projects. Our track record and experience includes the majority of the Public-Private Partnerships (“PPPs” or “P3s”) completed in the US transportation sector as well as many of the significant transit and rail PPPs globally. Among other projects, Macquarie was the lead developer and financial advisor for the Denver FasTracks PPP project which reached financial close on August 12, 2010. In addition, Macquarie acts as procurement advisor to governments, including advising the Colorado DOT on the I-70 project.

**Nicholas Hann**  
Senior Managing Director

Macquarie Capital Markets Canada Ltd.  
550 Burrard Street  
Suite 2400  
Vancouver BC V6C 2B5

[Nick.Hann@macquarie.com](mailto:Nick.Hann@macquarie.com)  
+1 (604) 605 - 1779

**Eliot Jamison**  
Senior Vice President

Macquarie Capital (USA) Inc.  
10250 Constellation Boulevard  
Suite 2250  
Los Angeles CA 90067

[Eliot.Jamison@macquarie.com](mailto:Eliot.Jamison@macquarie.com)  
+1 (310) 557 - 4312

Please feel free to contact us for further information.

Note: Macquarie Capital (USA) Inc. (the “Respondent”) is submitting this EOI individually.

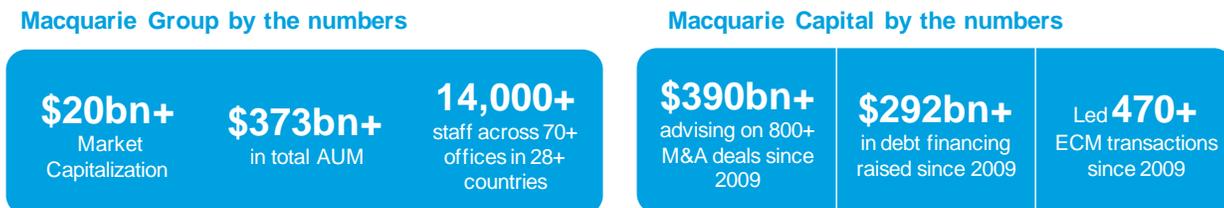
## 2. Firm Experience and Team Structure

### 2.1 Introduction to Macquarie

Macquarie is a registered broker-dealer and is an indirect subsidiary of Macquarie Group Limited (“MGL”; the Macquarie Group of companies, including MGL’s subsidiaries and the funds and similar vehicles managed by such subsidiaries, is referred to as the “Macquarie Group”), a global provider of banking, financial advisory, investment and fund management services. Founded in 1969, the Macquarie Group employs approximately 14,000 people across 73 locations in 28 countries and has a market capitalization of ~US\$21 billion as of March 31, 2015.

MGL is rated A3/Stable by Moody’s Investors Service, A-/Stable by Fitch Ratings, and BBB/Stable by Standard & Poor’s. The primary funding entity of the group, Macquarie Bank Limited, is rated A2/Stable by Moody’s, A/Stable by Fitch, and A/Stable by Standard & Poor’s. As a publicly traded company, MGL is owned by a diverse range of institutional and retail investors.

**Figure 1: Macquarie Group Overview<sup>1</sup>**



Macquarie Capital’s experience with the development and financing of public-private infrastructure projects in the United States is unique and unparalleled in its scale and diversity, and we hope to be able to share our expertise with the California High-Speed Rail Authority. Macquarie Capital has extensive global expertise advising both bidders and governments on a wide variety of procurement strategies to include Public-Private Partnerships, giving it an intimate understanding of the motivations and concerns of all players in the current infrastructure market, including investors, contractors, developers, designers, rating agencies, and asset operators. In advising our government clients, Macquarie Capital draws from a team of over 80 dedicated infrastructure advisory executives in North America and accesses deep rail and transportation expertise from around the world and has long been a leader in the U.S. PPP sector. With a keen focus on successful project delivery instead of analysis for analysis sake, Macquarie Capital’s interests are closely aligned with the client.

<sup>1</sup> Note: Macquarie Group staff numbers, AUM, and market cap as at March 31, 2015 at exchange rate of 1 AUD = 0.7689 USD; Macquarie Capital figures as of March 31, 2015; numbers exclude some JVs. Macquarie Capital statistics include acquisitions

**We are a full-service, capital provider with a diverse client base and market leading presence**



**Most Innovative Bank  
Project Finance / Infrastructure  
2014**

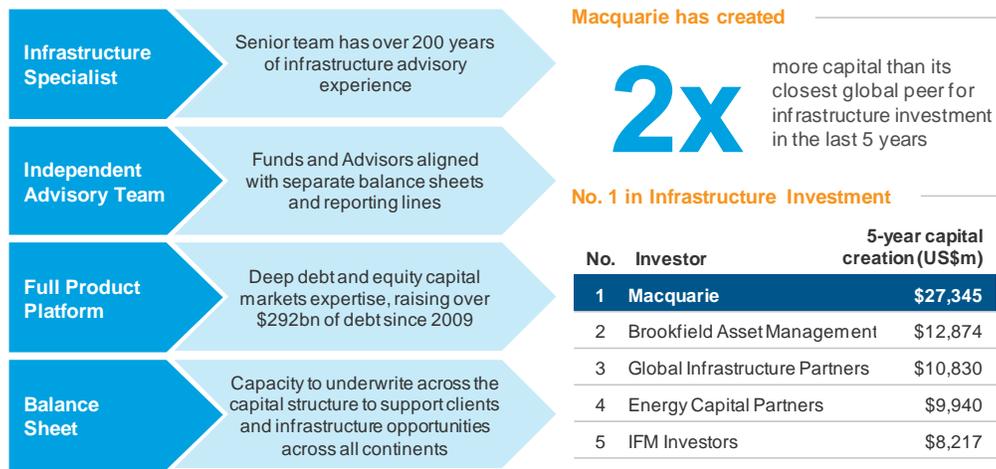


**Best Project Finance  
Advisor  
2013**



**Global Social Infrastructure  
Deal of the Year  
2013**

**Figure 2: Macquarie Group is the World’s Leading Infrastructure Investor**



## 2.2 Relevant Experience and Capability

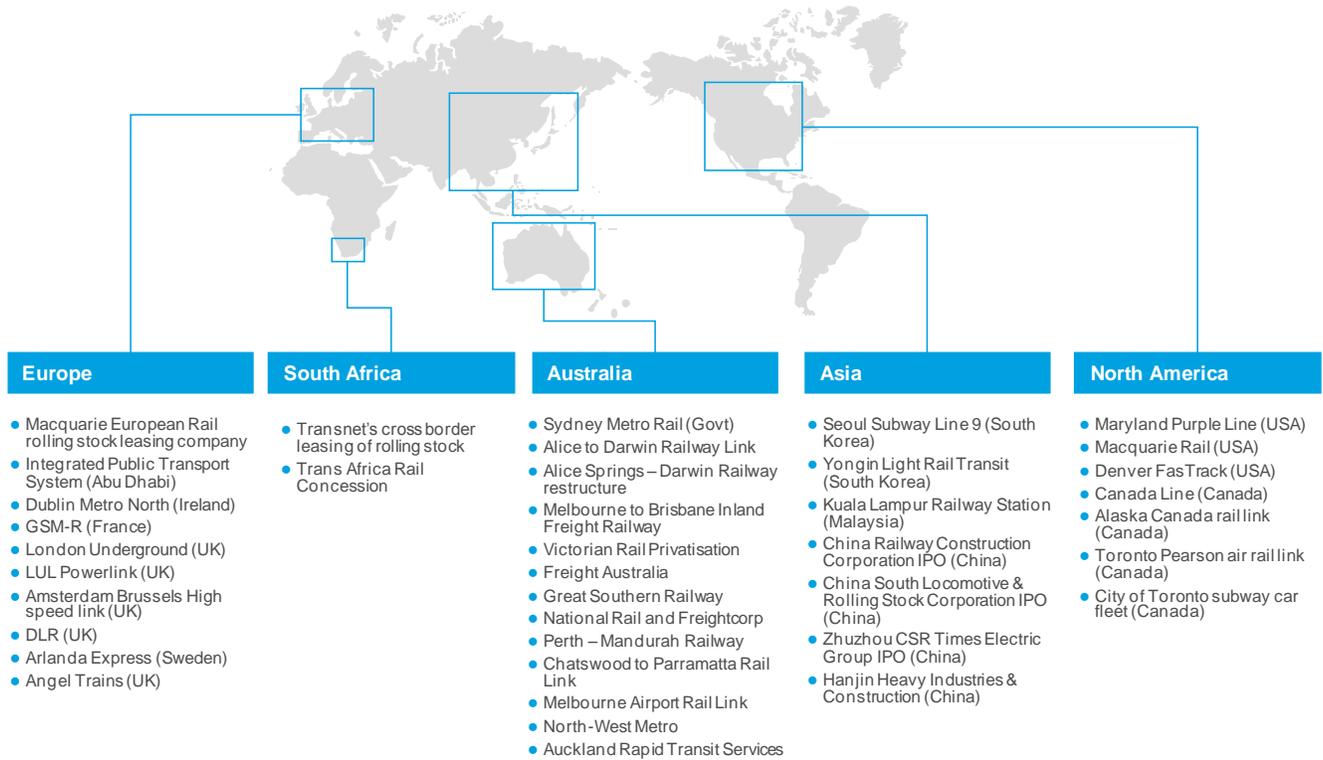
The Macquarie Group has historically been a global market leader in investing in infrastructure and infrastructure-like businesses across the world and in advising third-party clients and affiliated funds in doing so. Macquarie Group has extensive infrastructure holdings across the world. Approximately 100 million people use essential services provided by MGL-managed businesses every day. This includes over 1.2 million vehicles per day on Macquarie Group-managed roads, nearly 250,000 parking spaces, and over 75 million passengers at international airports. In addition, 20 million households are linked up to utilities owned or managed by Macquarie Group, including over 8 million water and/or wastewater customers.

Macquarie Capital has extensive experience in developing and financing transportation infrastructure projects. One of our core business areas is to act as the developer and financier for Design-Build-Finance-Operate-Maintain (“DBFOM”) transactions. Macquarie Capital has an unparalleled ability to raise 3rd party debt for large and complex infrastructure projects in all market conditions. We have privately funded numerous infrastructure projects utilizing a wide variety of financial instruments (bonds (taxable and tax-exempt), bank debt, private placement) and have expertise in complicated deal structures. In many circumstances, we are able to attain the most competitive cost of capital that results in winning bids to deliver advanced project scopes in the most financially efficient manner.

**Figure 3: Selected Macquarie Rail Experience**

Project	Location	Description
XpressWest	Los Angeles, CA and Las Vegas, NV	Currently acting as financial advisor for this high speed rail project
Abu Dhabi DOT	Abu Dhabi, UAE	Currently acting as advisor to Abu Dhabi DOT on development and procurement of integrated light rail lines
Purple Line P3	Maryland, USA	Currently acting as financial advisor and developer for light-rail PPP
Denver FasTracks Eagle P3	Denver, Colorado	Financial advisor and developer for the \$2bn commuter rail PPP project
Tren Liviano Project	San Juan, Puerto Rico	Acted as financial advisor to the City of San Juan, Puerto Rico on the P3 development of a 5.3 mile light rail system
Canada Line	Vancouver, Canada	Advisor to TransLink on a PPP for the C\$2bn commuter and airport rail link
Arlanda Bahn	Stockholm, Sweden	Financial advisor to Macquarie European Infrastructure Fund on the acquisition of the Arlanda Link
London Underground Tubelines	London, UK	Financial advisor to consortium including Bechtel for 30 year concession for the refurbishment and maintenance of the Jubilee Northern and Piccadilly Lines of the London Underground Network
Bondi Beach Railway	Sydney, Australia	Financial advisor and founding shareholder of 2.4 km rail tunnel linking Bondi Junction to Bondi Beach foreshore
Sydney Metro	Sydney, Australia	Financial advisor to Transfield / Bouygues on heavy rail line linking Sydney metropolitan railway with Sydney Airport, Australia
Yongyin Light Rail	Seoul, Korea	Financial advisor to Bombardier on the financing of Yongyin Light Rail Transit system
Hong Kong West Rail Line	Hong Kong	Financial advisor to KCRC on the construction of US\$10bn West Rail Commuter Rail Project, Hong Kong
Brisbane Airport Rail Link	Brisbane and Gold Coast, Australia	Financial advisor and founding shareholder in the A\$220m Brisbane Airport Rail Link 8.3 km heavy rail line linking the Brisbane Airport, the City of Brisbane and the Gold Coast

**Figure 4: Macquarie’s Global Rail Experience**



## 2.3 Selected Team Member Resumes



**Nicholas Hann**  
**Senior Managing Director**  
Macquarie Capital

Nicholas Hann has over 25 years experience in infrastructure and project finance transactions, in particular rail and transportation projects. Nicholas is a Senior Managing Director with Macquarie Capital Markets Canada Ltd. and has extensive experience in the structuring and financing of major infrastructure projects across a wide span of countries in both public and private sector roles.

Nicholas has acted as principal investor, asset manager, consortium bid director, financial advisor, debt arranger, and government business advisor, giving him insights into the full range of commercial, political, technical, legal, and financial issues associated with large scale infrastructure investments.

He has played a key role in important rail infrastructure projects, including leading the Denver Transit Partners (“DTP”) consortium in its successful bid for the Denver Eagle P3 commuter rail project. Nicholas’ has also played an integral role leading the consortium announced as preferred proponent for the development of a high speed rail project connecting Southern California to Las Vegas, advising the Province of British Columbia on Canada’s first mass transit P3, the Canada Line, and the subsequent Evergreen Line to extend Vancouver’s commuter rail system. Nicholas also advised the City of Vancouver for plans to develop a \$50-80M light rail streetcar network for the downtown precinct.

Select projects include:

- XpressWest High-Speed Rail – Las Vegas, NV
- Purple Line P3 – Maryland, Washington, DC
- Abu Dhabi DOT – Abu Dhabi, UAE
- Kentucky NG-KIH Project – Kentucky, KY
- Denver Eagle P3 – Denver, CO
- Richmond-Airport-Vancouver – British Columbia, Canada
- Sea to Sky Highway Improvement Project – British Columbia, Canada
- BC Hospitals, Vancouver & Abbotsford – British Columbia, Canada
- Northeast Anthony Henday – Edmonton, Alberta, Canada
- Puerto Rico PR-22 and PR-5 – Puerto Rico

Mr. Hann received his MA in Economics and Politics from University of Oxford and is an Associate of the Chartered Institute of Bankers.



**Eliot Jamison**  
**Senior Vice President**  
Macquarie Capital

Eliot Jamison joined Macquarie in 2011 and has worked in PPP and infrastructure financing for seven years. Prior to joining Macquarie, Eliot was a principal at Infrastructure Capital Partners where he advised project developers, government agencies and institutional investors on transportation, energy and other infrastructure projects, including the Denver Fastracks rail PPP (for which he raised over \$750 million in committed debt financing).

Previously Eliot was a member of Babcock & Brown's North American Infrastructure Group where he worked on projects such as the BART Oakland Airport Connector and the acquisition of ICS Logistics.

Eliot has held positions at Merrill Lynch (mergers and acquisitions group), Bessemer Partners (a leading private equity fund, now named Lindsay Goldberg) and Origo Inc. (providing strategic and financial advice to both public and private sector clients).

Select projects include:

- XpressWest High-Speed Rail – Las Vegas, NV
- Purple Line P3 – Maryland, Washington, DC
- Kentucky NG-KIH Project – Kentucky, KY
- I-35 Improvement Project – Austin, TX
- Denver Eagle P3 – Denver, CO
- Ridley Terminals Inc., Prince Rupert – British Columbia, Canada
- Northeast Anthony Henday – Edmonton, Alberta, Canada
- Alaskan Resource Infrastructure Project – Alaska, AK
- Presidio Parkway PPP – San Francisco, CA

Mr. Jamison received his MBA from the University of California, Berkeley (Haas School of Business) and his BA from Columbia University. He is also a CFA Charterholder.



**Philip Chua**  
**Associate**  
Macquarie Capital

Philip Chua joined Macquarie Capital Advisors in 2009 in the Vancouver office as a member of the North America PPP / Infrastructure & Utilities team focusing on projects across Western Canada and the US West Coast. Prior to joining Macquarie, Philip worked on the management team of a media start up firm in London and in the equities research division of UBS.

Select projects include:

- XpressWest High-Speed Rail – Las Vegas, NV
- Abu Dhabi DOT – Abu Dhabi, UAE
- Purple Line P3 – Maryland, Washington, DC
- Kentucky NG-KIH Project– Kentucky, KY
- Regina Wastewater Treatment Plant Upgrade – Saskatchewan, Canada
- Ridley Terminals Inc., Prince Rupert – British Columbia, Canada
- Northeast Anthony Henday – Edmonton, Alberta, Canada
- Southeast Stoney Trail –Alberta, Canada
- Puerto Rico PR-22 and PR-5 – Puerto Rico
- Sacramento Convergence Stadium, – Sacramento, CA

Mr. Chua received a BCom from the University of British Columbia.

---

## 3. Project Approach

### 3.1 Project Scope

We understand the Authority will oversee the planning, design, construction and operation of a High-Speed Rail System in California (the “System”). The development of an Initial Operating Segment (“IOS”) is an important first step towards the establishment and functionality of the System. The Authority is currently contemplating two options as part of the procurement known as IOS-North and IOS-South (collectively the “Project”). Furthermore, according to the Request for Expressions of Interest (“RFEI”), we understand the Authority’s objective is to seek input on the following:

- Delivery of either, or both, of the IOS-North and IOS-South project scopes under a Design-Build-Finance-Maintain (“DBFM”) model or alternative method (inclusive of CP 1-4 maintenance under one contract);
- Procurement of Rolling Stock from a Rolling Stock Manufacturer (“RSM”) through a separate Design-Build-Maintain (“DBM”) contract; and
- Procurement of a Train operator under a separate contract.

The Project scope includes the following key elements:

#### **IOS–North:**

The scope of this Project element involves the design, build and maintenance of Civil Works, Track, Infrastructure and Systems between the San Jose / Merced and Bakersfield section of the IOS. The Developer would also be responsible for financing this scope based on an availability payment (“AP”) mechanism and for the integration of all components across the ~290 mile IOS–North alignment.

#### **IOS–South:**

Developer responsibilities would be similar to IOS-North requirements with respect to DBM of Civil Works, Track, Infrastructure and Systems but would apply to ~300 mile alignment between Merced and Burbank. AP financing mechanism and integration of all components would fall under Developer’s scope of work.

#### **Rolling Stock:**

The RSM contracted by the Authority would manufacture, deliver, test and commission Rolling Stock for the IOS under a performance based DBM agreement. The RSM would also be responsible for DBM of facilities used to house and maintain Rolling Stock.

#### **Train Operator:**

In a contract separate from the IOS and Rolling Stock scopes, a Train Operator would be procured through the Authority who would be responsible for train management, operational planning, marketing, safety, security, customer services and ticketing of passengers.

## 3.2 Macquarie's Approach:

Macquarie is interested in either the IOS-South or IOS-North project scopes, we would actively consider participation in the procurement of either or both segments should the procurement include a private financing component (DBFM or DBFOM). We have followed the developed of California High Speed Rail for many years and are pleased to see the progress that has been made. We look forward to participating in upcoming procurements and remain available to provide further feedback to the Authority if requested.

Macquarie would approach the Project Scope in the following capacities:

- Developer, Financial Advisor and Equity Investor. Macquarie's financial strength and stability of its capital structure support its ability to make substantial investments in infrastructure assets and ensure its ability to build, operate and maintain the Project in accordance with Authority's expectations.
- Lead or joint-lead in a consortium that would also include a Design-Builder (or joint venture) and O&M Provider. Specifically, Macquarie envisions an organizational structure in which Macquarie along with partners which may include some or all of the design-builder, rolling stock manufacturer and operator (depending on the scope of the project and each participants' business interests) comprise the equity participants for the team, which will form a special-purpose vehicle that will be the concession company (the "Concessionaire") for the Project, holding the concession contract with the Authority. The Concessionaire will also enter into a design-build contract with the DB Partner; an operating contract with a potential O&M provider (if applicable); a rolling stock contract with a Rolling Stock Manufacturer (if applicable) and various financing agreements with potential capital providers.

Macquarie Capital has significant experience with availability payment based Design-Build-Finance-Operate-Maintain delivery method and believes this procurement method would maximize the value of the Project by integrating the Train Operator scope within the procurement of the Project. The DBFOM P3 project delivery model encourages consortia to create fully integrated teams that will bid for the Project that will incorporate design, construction, operations and maintenance innovations, which ultimately drives down the cost for the procuring authority. Also, the procuring authority likely will benefit from an accelerated schedule with design and construction occurring in parallel, as well as more certainty and efficiency in lifecycle cost planning. The PPP structure allows the public sector to retain strategic control and involvement in the project.

As a general principal, the use of a PPP procurement approach on a project involves additional financing capacity in the form of equity and allows the procuring authority to access a larger pool of capital that would otherwise be excluded in more traditional procurement strategies. Equity also serves as a mechanism to incentivize consortium members to produce the best project outcome and facilitates accountability from sponsors and optimal risk transfer.

As stated in the RFEI, the Developer of IOS- North and IOS-South will be repaid for its capital invested in the form of an AP mechanism. In addition to availability payments, there are two other broad payment mechanisms available under a DBFOM contracting approach that the Authority can consider in its procurement strategy:

- Milestone payments during construction and / or substantial completion payments upon successful commissioning of the projects; and
- Private sector sharing in fare-box revenues and / or other ancillary commercial revenue streams.

In order to increase the amount of upfront capital raised, the Authority may consider including rights to a portion of fare-box revenues as another source of payment to the Developer. However, fare-box revenue risk transfer is challenging for the private sector to accept and recent experience suggests that 5-10% of total private sector operating revenues is a realistic target in terms of private sector fare-box risk while still keeping cost of capital low. It may be possible to transfer more fare-box revenue risk but there would be a cost of capital trade-off and so would need to be carefully analyzed to determine the optimal level of revenue risk transfer. In order to determine the viability and desirability of this approach, further information and investigation of ridership potential and risk would be required.

Overall, the DBFM or DBFOM P3 approach addresses the Authority's desire to deliver the Project in the most time and cost efficient manner while ensuring the proper amount of risk between the public and private sectors has been transferred. The coordination of design, construction, financing and operating elements within a consortium allows for synergies to be realized that can have a direct effect on project timeline.

**Potential hurdles to overcome in terms of project time and budget are as follows:**

- The private sector will need to have a firm understanding of what funding sources would be available at the beginning of any procurement, including the status of Cap-and-Trade proceeds and state / federal funds, and whether any further approvals or appropriations are needed for those funds to be spent and assigned to the Project.
- We anticipate that service payments from the Authority will need to contribute a material portion of the funding. Private sector lenders and equity investors will require reasonable assurances on the certainty of receiving service payments, provided performance requirements are met. They will also require similar clarity regarding termination provisions including assurance of compensation in the unlikely event the Authority defaults on its obligations or certain force majeure events occur. Significant attention will therefore be placed on the strength of the payment covenant from the Authority. Based on our experience on other rail projects, the financial markets are likely to seek assurances on the importance and priority of service payments in the Authority's budgeting process, as well as how this process fits in with overall State of California budget processes. In our experience, this can be achieved in a number of ways and we would be happy to provide further guidance to the Authority.
- There are several process related initiatives that the Authority can undertake to reduce unnecessary expenses and make the procurement process more efficient. The Authority should seek to standardize agreements and conform to precedent where applicable, which will reduce legal fees. The Authority should consider conducting and sharing due diligence with all short listed proposers such as environmental phase I and II reports, geotechnical investigations, right of way / title research, etc.; this will eliminate duplicative due diligence by multiple proposers. Additionally, the Authority should limit the amount of design work that it requires as part of a bid and allow proposers and their financiers to determine what is required. The Authority should split the proposal into multiple pass / fail submissions (technical and financial) that allow proposers to be certain that their technical proposals have been accepted before submitting financial proposals.
- Having the Authority secure the environmental approvals, right-of-way and any other necessary federal approvals is vitally important in maintaining project schedule and budget. The environmental approvals, including identifying any hazardous materials, are necessary so that the major design requirements and mitigations are known by commencement of the RFP phase. Additional geotechnical work should be done by the Authority in consultation with and on behalf of shortlisted

bidders early in the RFP phase. The Authority should negotiate strong agreements setting out responsibilities for relevant utility relocation as early as possible for the benefit of the bidders in advance of the RFP. Right-of-way approvals and any other federal approvals are also critical so bidding parties understand the restrictions by the start of the RFP phase. With the exception of a Pre-Development Agreement, bidders will expect the Authority to advance environmental permitting, to reimburse bidding costs in the event of a failure to obtain such approvals and to take the risk of any environmental challenges or changes after the bid date.

### 3.3 Recommendations for Improvement

#### **Our specific recommendations and comments include:**

- We recommend that the Authority include a broader scope for both upfront delivery and ongoing O&M of the project, in particular adding rolling stock and systems as well as long term operations, resulting in a DBFOM contract. Given the size of the overall project it would not be realistic for this contract to cover the entire scope, it should relate to either the IOS-South or IOS-North (depending on the overall strategy adopted by the Authority and which is intended to open first). In the specific responses below we provide additional considerations on size and scope. For remaining areas of the project we recommend separate packages, procured as either DB contracts or potentially DBFM if the size and scope justify it. Having one core DBFOM contract is important in order to transfer sufficient integration and interface risk to the private sector.
- We believe the Authority should structure the RFP phase and project documents with the intent to maximize design flexibility. In general, the Authority should focus on establishing (i) assessment criteria to allow the private sector to optimize the IOS and related Project scopes' objectives; and (ii) performance output specifications for the Project rather than detailed design. DBFOM and DBFM projects are most effective where the level of design completed by the owner is at a conceptual level and the private sector partner is able to innovate solutions which best meet the performance specifications. This flexibility is particularly important with respect to track layout, systems, signaling and Rolling Stock. In practice it may be necessary to fix some horizontal aspects of the right of way design in order to support the environmental permitting process and the land acquisition schedule.
- To the extent the Authority provides construction and / or design specifications for the Project as well as the Rolling Stock and Train Operator, we recommend that these be provided in a framework describing performance or operations standards that allow the Authority flexibility to implement an innovative approach. With respect to the Project lifecycle, any mechanism for future upgrades or expansion to be undertaken by the private sector will need to be carefully structured to ensure appropriate incentives to optimize costs.
- The direct cost of Rolling Stock is a relatively small portion of overall project costs, but flexibility on the design and procurement of Rolling Stock has significant influence on both the cost and risk transfer associated with the entire project. While Rolling Stock could be procured by the Authority separately from a DBFM (or DBFOM) delivery of the Project, Macquarie's experience suggests that this is a suboptimal solution in terms of maximizing the risk transfer achieved to the DBFM (or DBFOM) contractor. The private partner should select, procure, integrate and commission its Rolling Stock. If the Rolling Stock solution is imposed upon the DBFM contractor, they will typically find it challenging to optimize design of the project to best meet the Authority's performance specifications

and will find it challenging to accept full integration risks or full maintenance risks. This integration risk is further compounded by the separation between the DBFM Project Developer, Train Operator and RSM. Our experience has been that competition is maximized, risk transfer is most effective and cost savings are greatest where Rolling Stock is a fully integrated part of the project (i.e.: not separately procured) and where the private bidder is allowed flexibility in selection of its Rolling Stock supplier. In the successful Canada Line P3 project in Vancouver, the winning private partner did not select its Rolling Stock supplier until it had already won the bidding process. In the case of the Denver FasTracks Project, the winning bidding group was able to compete its Rolling Stock providers late in the overall bidding process, resulting in meaningful cost benefits. That specific approach may be more challenging for this project, in particular due to its size and the existence of additional civil and infrastructure scope packages outside the control of the P3 Developer. However, the examples are intended to illustrate the general principle that increased flexibility and a wider scope can lead to innovation.

- Macquarie encourages the Authority to proceed with the procurement as quickly as possible subject to the environmental process and funding certainty. The market is receptive to an accelerated procurement timeline to reduce bidders' procurement costs and generate near-term interest in the Project. Drawn out procurement schedules may result in a lack of focus and interest from private market participants. Further, for a project with unique characteristics such as this one, it is important for the market to know relatively early whether the Authority is committed to a DBFM or DBFOM delivery model or alternative form of procurement. The Authority should give clear direction on what form of procurement they choose, as this sets bidder expectations and enhances the credibility of the project.

## 4. Responses to Questions

### 4.1 Commercial Questions

- 1. Is the delivery strategy (i.e., combining civil works, track, traction power, and infrastructure) likely to yield innovation that will minimize whole-life costs and accelerate schedule? If so, please describe how. If not, please recommend changes to the delivery strategy and describe how those changes will better maximize innovation and minimize whole-life costs and schedule.**

Combining civil components such as civil works, track, traction power and infrastructure will likely result in some efficiencies as interrelated components can be designed in a way that is cost-effective to construct and maintain. In particular planning for long term maintenance within the original design is expected to reduce long term costs. Schedule can be accelerated through parallel design and construction work, for example early civil works packages may be started while final design is ongoing.

While there may be some room for innovation across these components, we would expect the inclusion of Rolling Stock, systems, operations (and potentially stations) to yield the greatest amount of design freedom with resulting efficiencies and innovation. The DBFOM PPP approach, discussed above, would allow for this maximization in value and would best serve the Authority's objective of delivering the IOS-North and IOS-South in a manner with the lowest cost and risk. Project size and inter-operability are challenges which need to be overcome in taking this approach so we recommend that a core element of the project, most likely in either the north or the south, be undertaken as a DBFOM with other procurement methods, potentially including DBFM for other smaller segments.

- 2. Does the delivery strategy adequately transfer the integration and interface risks associated with delivering and operating a high-speed rail system? What are the key risks that will be borne by the State if such risk transfer is not effected? What are the key risks that are most appropriate to transfer to the private sector?**

The delivery strategy only partially transfers the integration and interface risk associated with delivering and operating a high-speed system to the private sector. Under the proposed scope split, the Authority retains a number of scope elements, such as Rolling Stock and train operations, where the most critical integration and interface risks are likely to occur.

Given the bespoke configuration of these components, it is challenging to effectively transfer the associated risks to the private sector unless the design and procurement of these components is incorporated into the DBFM scope from the outset. For example, ridership is in some measure contingent on the quality of the operations. The interfaces between rolling stock, systems and infrastructure are among the most important and challenging to manage. As a result, the full benefits

of a P3 procurement approach in a rail project require inclusion of all of these elements within one consortium's responsibility.

Several global rail precedents indicate that unless the DBFM scope is appropriately defined, the private sector is unwilling to accept integration and interface risk, which often leaves the public sector with significantly more risk than intended.

**3. Are there any other components of a high-speed rail system that should be included in the scope of work for each project (e.g., Rolling Stock, train operations, stations)? If so, how will this help meet the Authority's objectives as stated in this RFEI?**

As mentioned previously, inclusion of Rolling Stock, train operations and stations in the DBFM increases the amount of design freedom among bidding consortium members, which allows for greater innovation, cost optimization, risk transfer and delivery certainty. Rolling Stock, signaling, train operations, customer service and revenue maximization (whether through ridership, on-board services or at the stations) are closely interrelated from a technical and planning perspective. Collaboration of various parties within a bidding consortium also encourages the development of accelerated delivery approaches especially if the procurement process rewards early completion.

This should contribute to the Authority's goal of minimizing whole-of-life costs, maximizing ridership revenues, ensuring appropriate risk transfer and accelerating schedule.

**4. What is the appropriate contract term for the potential DBFM contract? Will extending or reducing the contract term allow for more appropriate sharing of risk with the private sector? If the Respondent recommends a different delivery model, what would be the appropriate term for that/those contract(s)?**

We believe 30-35 years to represent an appropriate term for the DBFM contract considering the useful life of the core infrastructure, potential changes in technology, long-term investment horizons and global precedents.

A reduction in contract term would likely increase the annual cost to the Authority of the financing as it would reduce the amount of debt that can be repaid over the lifetime of the project (and be raised to finance the project) for any given payment amount. A reduction in contract term would also reduce the risk transfer to the private sector, as the O&M provider and long-term investors would commit to the project for a shorter period than the useful life of the project. An extension in contract term (beyond 30-35 years) would be unlikely to provide significant financial benefits as the present value of future payment decreases significantly for periods far in the future. In addition debt is more limited beyond 35 years and so the number of providers and amounts available would be reduced, especially for a project of this size. Some O&M providers may not be willing to take on commitments of this duration given uncertain asset conditions.

When deciding on a longer term, the useful life of the core infrastructure asset would need to be taken into consideration including the cost of projected major maintenance and / or system upgrades and contracted operating costs.

**5. What is the appropriate contract size for this type of contract? What are the advantages and disadvantages of procuring a contract of this size and magnitude? Do you think that both project scopes should be combined into a single DBFM contract?**

We believe that the ideal size would be in the \$4-5bn range with an effective maximum size estimated to be in the \$6-8bn range, mainly due to the available capacity in the financing markets and the complexity of financing projects beyond a certain size (number and type of sources). In addition there will be limitations on the size of design-build contract, even with multiple construction contractors acting as a consortium (which we expect on this project). Larger procurements are possible depending on whether milestone payments during construction are made available. There will be a balance between not increasing project size beyond the market capacity and ensuring sufficient scope in a DBFOM contract to transfer delivery and interface risk to the private sector. Determining the right balance will require further detailed work on the cost of different scope elements and physical segments.

The advantages of procuring a contract in the \$4-5bn range rather than a smaller amount include economies of scale (both technical and financial) as well as increased bidder interest from international consortia to compete and expend development costs.

We do not believe it is advisable to combine both project scopes (North & South) into a single DBFM contract, given the significant size and largely separate geographic and technical footprints.

If our proposed strategy of including a DBFOM contract is adopted, this contract should be for either the IOS-South or IOS-North (depending on the overall strategy adopted by the Authority and which is intended to open first). Given project size considerations we do not recommend that the DBFOM contract cover the entire remaining scope for the IOS but rather contain as much as possible of this scope within the size parameters which we have outlined with additional elements procured as separate packages either as DB contracts or potentially DBFM if the size and scope justify it. The DBFOM contract Developer should have responsibility for providing Rolling Stock, systems and operations of the entire IOS. Ideally the Developer should have full maintenance responsibility as well however some carve-outs may be required with respect to elements that were not originally delivered by the Developer.

**6. Does the scope of work for each project expand or limit the teaming capabilities? Does it increase or reduce competition?**

Generally, the scope of work would serve to increase teaming capabilities and competition. An expanded scope provides competing bidders greater freedom to select consortium partners and deliver competitive solutions, provided there are no prohibitive restrictions on unique elements such as Rolling Stock. The global market for high-speed rail is well-developed with many players capable and interested in participating in a project of this size.

## 4.2 Funding and Financing Questions

- 7. Given the delivery approach and available funding sources, do you foresee any issues with raising the necessary financing to fund the IOS-South project scope? IOS-North project scope? Both? What are the limiting factors to the amount of financing that could be raised?**

As mentioned previously, we think that the ideal size for each project would be in the \$4-5bn range with an effective maximum size in the \$6-8bn range. The most critical prerequisite for the financing is securing funds from a credit-worthy off-taker to pay for long-term availability payments that cover the majority of capital costs.

Long-term infrastructure investors are usually reluctant to take revenue risk on a passenger rail project or off-taker risk so will typically require an investment grade off-taker credit. In addition, the DBFM scope must provide for a clearly delineated allocation of risks between the private consortium and the Authority, especially where the Authority is responsible for specific components.

In the context of this project, it may be possible and advisable to incorporate a modest ridership risk component to the revenue stream in order to increase the amount of upfront capital that can be raised. Further investigation would be required in order to determine how much ridership risk may be finance-able.

We recognize that the Authority plans to use Cap-and-Trade auction proceeds to fund service payments for the Project. Although the existence of this financing is a positive attribute, certainty over its allocation towards the Project scope and availability across the operating period would need to be determined in order for lenders and investors to agree to invest based on repayment from Cap-and-Trade proceeds. We understand that CHSRA has been working to provide greater long term clarity around these funds and would be pleased to provide further specific feedback on measures to increase the bankability of this revenue stream.

Based on the information presented in the RFEI we have estimated the present value of the C&T revenue based on the assumption that it continues at or above the current estimated levels. This present value, estimated at between \$6 and 10 billion depending on assumptions, is a reasonable indicator of the amount financing that may be able to be raised based on the identified C&T revenue stream. Based on this estimate and the available bond funds we expect that additional funding sources would be required in order to complete either the IOS North or South. We would encourage the Authority to provide further information prior to the procurement on whether additional sources are expected or if existing identified sources are intended to fully fund the project.

- 8. What changes, if any, would you recommend be made to the existing funding sources? What impact would these changes have on raising financing?**

As mentioned above, we believe it's critical to secure funding and set out affordability thresholds for the project before formally starting the procurement process. If the affordability threshold was particularly tight, the Authority could specify an affordability envelope and ask bidders to provide the maximum construction and services scope that can be delivered within that scope.

The Authority should also explore the possibility of utilizing low cost federal loans to finance the Project. This source of funding would help bridge any potential deficits that the Project might present. The Federal Railroad Administration (“FRA”), under the U.S. Department of Transportation, oversees the Railroad Rehabilitation and Improvement Financing (“RRIF”) program that has provided ~\$3.5bn towards the development of railroad infrastructure since May 31, 2015. RRIF funding may be used to develop new railroad track, facilities and other project scope items. The Transportation Infrastructure Finance and Innovation Act (“TIFIA”) might also present a possible source of funding. The TIFIA Act provides credit assistance through direct loans, guarantees and lines of credit for large surface transportation projects.

**9. Given the delivery approach and available funding sources, is an availability payment mechanism appropriate? Could financing be raised based on future revenue and ridership (i.e., a revenue concession)? Would a revenue concession delivery strategy better achieve the Authority’s objectives?**

Yes, an availability payment mechanism is appropriate. Ridership on high-speed rail systems is difficult to forecast and depends on a variety of factors including alternate modes, fare structure and user preferences. Asking the private sector to price this risk is likely to result in the private sector applying a discount to forecasted revenues which may be significant. This discount is often particularly steep in the early years when revenues are expected to ramp up, which presents a challenging cash flow profile to finance against.

Nonetheless, transferring a portion of the revenue risk to the private sector can be viable and help incentivize service level quality and revenue maximization. It can also provide the ability to raise incremental upfront capital, however, for the reasons noted above this incremental amount is likely to be limited relative to overall project financing requirements.

We recommend a primarily availability-payment based payment mechanism with further exploration of the potential to transfer some rights to ridership revenue in exchange for greater up front financing capacity.

### 4.3 Technical Questions

**10. Based on the Authority’s capital, operating, and lifecycle costs from its 2014 Business Plan, describe how the preferred delivery model could reduce costs, schedule, or both. Please provide examples, where possible, of analogous projects and their cost and/or schedule savings from such delivery models.**

The inclusion of a confidential Alternative Technical Concept (“ATC”) process will allow for the private sector to provide the Authority with value-add innovation at the Authority’s sole discretion. Under a confidential ATC, proposers would be allowed to submit innovative technical concepts to the Authority in a discrete manner. The Authority would then evaluate the merits of these ATCs and either allow or disallow proposers to include them in their final proposal. Most importantly, the

acceptance of a proposer's ATC by the Authority would not be communicated to other proposers. The confidential dissemination of ATCs encourages proposers to be innovative in order to gain a competitive advantage.

In the Florida I-595 Project, the use of ATCs resulted in a 4 year project delivery, 15 years sooner than a traditional delivery. In addition to the expediting the schedule, ATCs yielded over \$200m in cost savings through the effective implementation of innovative design ideas and concepts.

Through the effective coordination across the design, construction, financing, operations and maintenance teams, a Macquarie led consortium incorporated 17 alternative technical concepts into the Denver Eagle FasTracks PPP project scope that saved the procuring authority ~\$300m and reduced overall operations and maintenance expenses.

**11. How does this compare to separately procuring each high-speed rail component (i.e., separate contracts for civil works, rail, systems, power separately)? Please discuss design/construction costs, operating / maintenance / lifecycle costs, and schedule implications.**

Procuring elements separately creates significant interface and schedule risk as it does not offer a single-point of responsibility fixed-price date-certain delivery mechanism secured by financial guarantees. There is also no effective long-term risk transfer to the private sector given the absence of long-term investors performing due diligence and remaining invested across construction and operating periods.

**12. For each project, are there any technical changes to the respective scope of work that would yield cost savings and/or schedule acceleration while still achieving the Authority's objectives? If so, please describe.**

Effective coordination between the RSM and the Developer would best be accomplished under the same procurement contract. The separate procurement might cause delays or interface risk as the RSM is responsible for the integration of on-board signaling devices and certain radio devices onto train sets.