DB Mobility Networks Logistics

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09.24.2015

Expressions of Interest for the delivery of an IOS RFEI HSR#15-02

Dear Ms Harnagel,

Please find attached the expression of interest from DB International GmbH.

DB International GmbH is submitting individually and not as part of a joint venture or consortium.

Yours Sincerely

DB International GmbH

[redacted]

Marc Giesen
Director Consulting

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Expression of interest for the delivery of an Initial Operating Segment

RFEI HSR#15-02

California High-Speed Rail Authority

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September 28, 2015

Table of Contents	Page

1	Firm Experience and Team Structure	3
2	Project Approach	6
3	Commercial Questions	9
4	Funding and Financing Questions	15
5	Technical Questions	18

1. Firm Experience and Team Structure:

DB Group and DB International GmbH

DB Group is a modern diversified services company providing complete mobility and logistics solutions. With about 296,000 employees today, DB is certainly one of the most powerful transport companies in the world.

The Deutsche Bahn Group has vast experience in passenger and freight transport. With its affiliates, it offers the whole range of rail transport services. With its powerful transportation network of more than 20,500 miles and about 30,000 trains per day, it offers the competence of the largest passenger and freight rail transport in Europe. The introduction of the railways to Germany laid the foundations for industrialization. Rapid exchange of goods over large distances became possible for the first time and travel was opened up to the masses. At the start of the new Europe, the railways boosted reconstruction and economic growth. Now, with Germany reunified and European countries growing closer together, the rail network is linking people and markets together.

The transport performance has grown continuously for several years. This is largely due to the reform process initiated about more than a decade ago, with major impacts on the improvement of service quality and the attractiveness of railway for passengers and freight clients.

A short history of Deutsche Bahn Group

Deutsche Bahn Group (DB) follows in the tradition of Deutsche Bundesbahn, Deutsche Reichsbahn, Stinnes and Schenker, which have been providing mobility services by rail, road, sea and air since the start of the 19th century. Its services are still shaping the market and society throughout Germany, Europe and worldwide today.

In 1835, Germany's first railroad line opened, a 4 mile route from Nuremberg to Fuerth, marking the dawn of the railway age and setting the foundations for the country's industrialization. Rapid exchange of goods over large distances became possible for the first time and travel was opened up to the masses. At the start of the new Europe, the railways boosted reconstruction and economic growth. Eight state-owned railways were amalgamated in 1920 to form the Deutsche Reichsbahn, administered and financed centrally. Now, with Germany reunified and European countries growing closer together, the rail network is still linking people and markets together.

Over the last 14 years, the German railway has successfully undergone a historic transformation, from a state-run operation to a competitive business that is fully viable on the open market. The Railway Reform in 1994 marked the start of what was probably the largest corporate reorganization in the history of the German economy: beginning with the merger of Deutsche Bundesbahn and Deutsche Reichsbahn (the former West/East German railway companies, respectively), the reform included the restructuring of business divisions into independent limited companies operating

under the umbrella of a holding company and a strategic reorientation emphasizing cost management and profitable growth.

A comparison between 1993 – the year before the Railway Reform – and 2009 shows the positive effect the Railway Reform has had on transport services. In the rail passenger transport sector, the figure for transport performance in 1993 was 62 billion passenger kilometers; in 2008, this figure was 25 percent higher although due to world economic crises this figure decreases slightly by 1.3 percent in 2009.
These figures show that, compared with the structures before the Railway Reform, passenger and freight transport has seen significant growth. And the success story has continued up to the pre-sent day. This has been achieved in the face of active competition, with over 200 (independent) railway companies in operation and with the train path kilometers of competitors increasing all the time.

Deutsche Bahn Group today

Deutsche Bahn Group is a modern diversified services company providing complete mobility and logistics solutions. With turnover of approximately $44 billion in 2014, about 296,000 employees and about 20,500 miles of track operated, DB is a uniquely positioned rail-service provider. Our analysis of the transport market shows three distinct but interconnected needs that must be fulfilled, as shown below: passenger transport, infrastructure and transport and logistics form the core of our business.

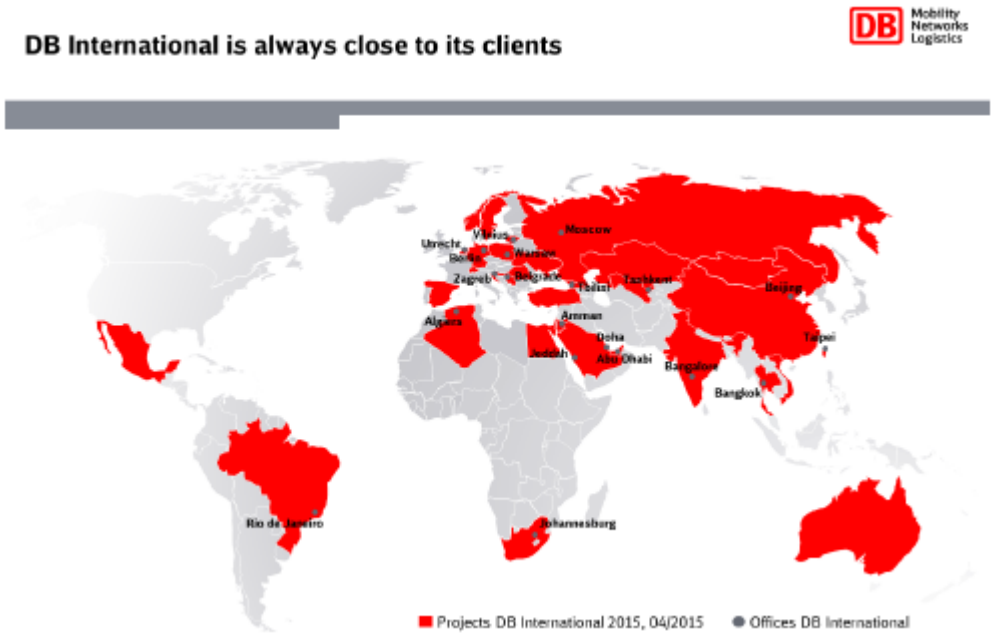
DB International GmbH (DBI)

DB International GmbH as a 100% subsidiary of Deutsche Bahn is one of the world's leading consulting and engineering companies with an annual turnover of $190 million (2014). The firm provides consultancy services in the transportation sector, particularly in the fields of railways and rapid transit systems.
DB International GmbH was established in 1966 by the Deutsche Bahn AG, formerly Deutsche Bundesbahn, and the Deutsche Bank AG under the name of DE-Consult (Deutsche Eisenbahn-Consulting GmbH). In January 2007 the name of the company was changed to DB International GmbH.

The Mission Statement says: DB International offers the worldwide renowned railway know-how of the Deutsche Bahn for transport projects from conception through to realization. We advise our international clients and develop for them innovative and economical solutions for their mobility and transportation services.
Since its foundation, DB International has worked in more than 100 countries involving more than 2,000 projects. Knowledge of German technology is thus supplemented by comprehensive experience gained on international projects. DB International has either carried out and/or is currently executing various projects in the following countries.

DB International GmbH is represented by branch offices in Germany and maintains a large number of project offices overseas.

DB International GmbH branch offices are located in many countries, such as in Abu Dhabi (United Arab Emirates), Algiers (Algeria), Athens (Greece), Bangkok (Thailand), Beijing (China), Bucharest (Romania), Jeddah (Kingdom of Saudi Arabia), Kuala Lumpur (Malaysia), Taipei (Taiwan), Vilnius (Lithuania) and Moscow (Russia).



Contribution and Benefit to the project

DB International GmbH (DBI) is the international engineering consultancy arm of the Deutsche Bahn AG (German Railways). DB International GmbH has been involved in the High-speed rail in Germany, which started operation in 1991 through its holding company Deutsche Bahn AG that maintains rolling stock and infrastructure and operates High-Speed as well as conventional passenger and freight rail in Germany. DB International GmbH has worldwide experience in High Speed rail, in projects such as Haramain High Speed rail (Saudi Arabia), High Speed 2 (United Kingdom), Turin – Milano High Speed Line (Italy), Taiwan High Speed Rail (Taiwan), as well as the Changsha–Kunming and Hangzhou–Changsha High Speed Lines in China.
DB International GmbH is submitting this EOI individually and not as part of a consortium.

DB International GmbH is interested in both the IOS-South scope and the IOS-North Scope.

2. Project approach

From our experience in various High Speed Rail projects in Germany and world wide, we recommend:

- To separate the project into four conventional Design and Build work packages:
  - Rail Infrastructure
  - Civil
  - Structures
  - Rolling stock.

This would increase the number of bidders as specialist suppliers in these fields could offer their best commercial and technical offer.

Furthermore, a limitation of the package size especially for the civil works seems to be preferable in order to limit the risks for the contractors.

Once these work packages have been constructed, operations could be managed by the state until passenger numbers pick up to normal levels. The operations along with the rolling stock maintenance could be tendered to a private operator who would run the train operations as a franchise model (UK rail franchising model) while paying the state to allow it to run trains.

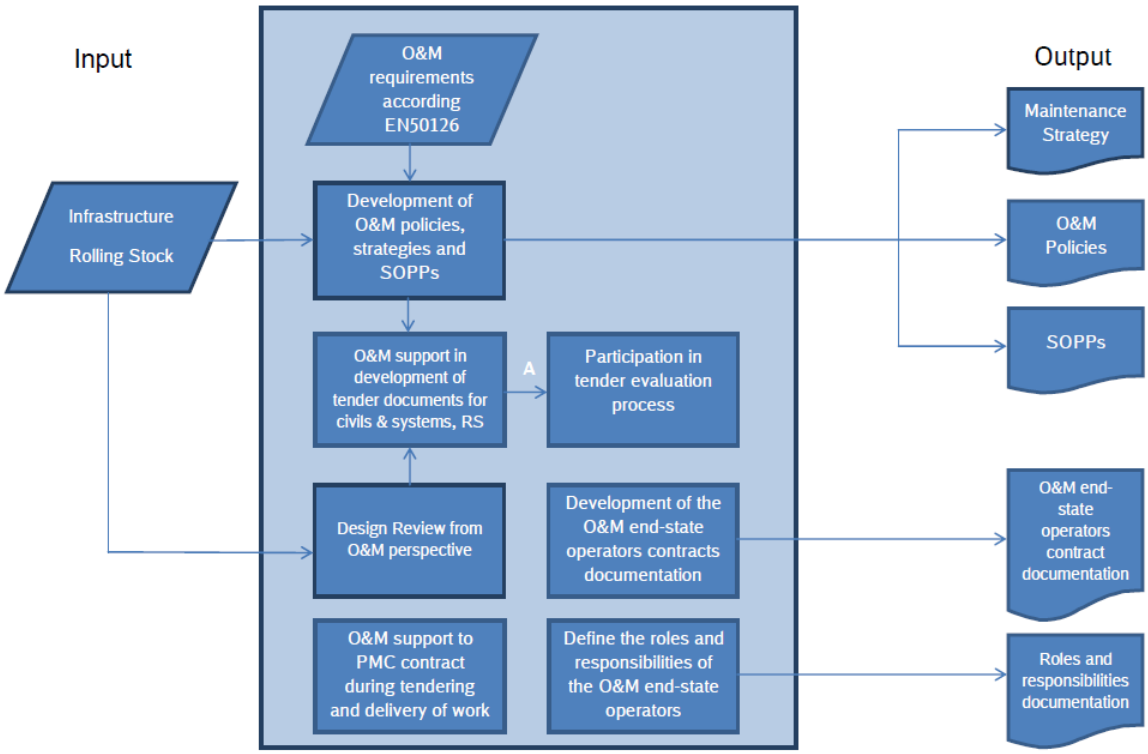
From DBI's experience, it is highly advisable to include all the needs of operations and maintenance from the early design stages of the infrastructure. This is especially necessary when the operator is only involved from the later stages of the project. In order to take the operations and maintenance aspects into account when designing the infrastructure, the implementation of a so called "shadow operator" is highly recommended.

The task of the shadow operator includes:

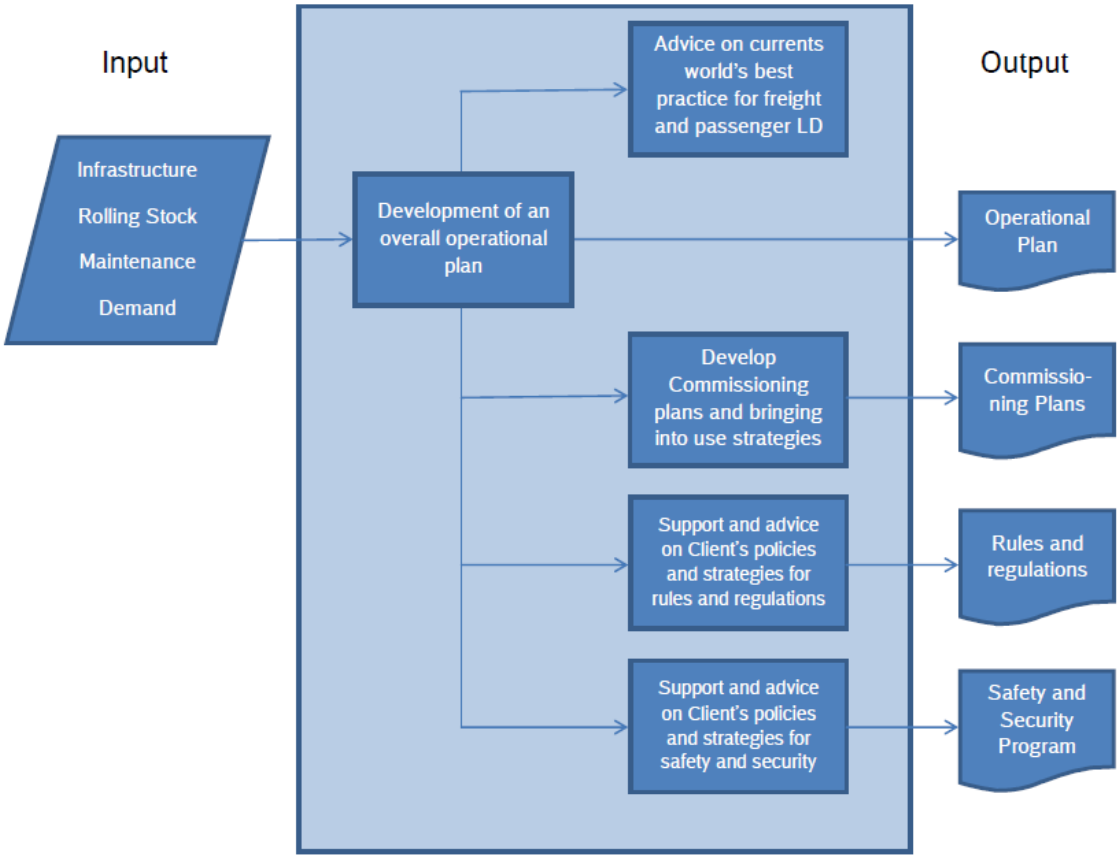
- Definition of the requirements for operations and maintenance,
- Support during the drafting of the tender documents for construction, equipment and rolling stock on behalf of the future operator,
- Support during drafting of the operator contracts,
- Formulation of the regulations for operations and maintenance and
- Planning of operations and processes.
- Fundamentals of operations and maintenance through an operations plan and maintenance plan.
- Support through all design phases in order to avoid poor design (alignment, run time calculations, scheduling simulation, Maintenance depots for rolling stock and infrastructure).
- Technical support to High Speed Rail specific issues, e.g. slab track, Maintenance of high speed track etc.

The following flow chats describe the major processes of the work of a "shadow operator".

Maintenance



Operation



DB International GmbH has fundamental experiences in acting as shadow operators for example as shadow operator for the Long Distance railway project in Qatar (Qatar Rail).

As acting as shadow operators, DB International GmbH focuses on the needs and expectations of the future operator and maintainer. Furthermore, DB International GmbH implements sales systems that enable open interfaces for distribution via different sales systems.

Due to DB International GmbH extensive experience in operation and maintenance, DB International GmbH can furthermore represent the client's interests against those of the suppliers. DB International GmbH can therefore manage any operational and maintenance dependencies in the case of a separation of civil works, structures, and rail infrastructure.

3. Commercial Questions

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.

Although the combination of civil works, track, traction power, and infrastructure are likely to yield innovation and cost savings as the consortium will have to manage the interfaces internally. There is also an incentive for the consortium to optimize costs, as it too will benefit from the cost savings. The advantage of including maintenance into the contract is that it encourages the contractor to think of the whole life cycle costs of the product, not just the initial capital costs.

However, the separation of civil works, structures, and rail infrastructure if combined with excellent project management supplied by the CHSRA, can reduce project costs by selecting the best offer (in terms of cost and/or technology) for each individual discipline.

Rather than the client having to choose the best global offer, the client is able to pick and choose the best combination of offers. This does not only reduce project costs, it also leads to increased competition by offering more suitable offers in certain disciplines.

In order to limit the dependencies from one manufacturer and to increase competition, DB International GmbH strongly advises the separation of civil works, structure and rail infrastructure.

Once the railway line has been opened, it can be operated by the CHSRA for a few years before the section can be sold as a concession for a defined length of time (normally 30 years) in rail projects, as this is the standard lifetime of ballasted track and rolling stock.

The separation of civil works, structures and rail infrastructure would not be compatible with a combined DBFM project. However nor would combining all subsystems into one contract, since the financial risk are greater for the civil and structures contractors as there are considerably larger investment costs needed for civil works and structures in comparison with the rail infrastructure. Whereby the reliability and availability of the line and therefore of the availability payments made to the contractors are mostly dependent on the rail infrastructure rather than the civil works.

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 affected? What are the key risks that are most appropriate to transfer to the private sector?

Many but not all risks can be transferred to the private sector by using the proposed delivery strategy (i.e., combining civil works, track, traction power, and infrastructure), however there will be a financial cost to the transfer of risk.

As the DBFM model is to be paid by availability of the infrastructure rather than the number of trains passing over it this will allow the passenger risk to be transferred to the train operator.

The integration and interface risks can and should be managed by the state, if the interfaces are clearly defined as it is done in Europe - the interfaces of rolling stock and infrastructure (including civils) are clearly defined due to the horizontal split of infrastructure and train operations.

The interfaces are manageable by the State and are in the State's interest as it encourages competition among suppliers and contractors, thus reducing costs in the short term.

If the state manages interfaces, the rail systems can be tendered separately, which can assure that the chosen solution should be a compatible one with future and current technologies and not a stand-alone solution, hence reducing costs in the future when additional equipment/infrastructure is needed. This is important, so that the state is not dependent on one supplier.

Again, we want to emphasize that the interface risks can be reduced by taking into consideration all aspects of operations and maintenance early in the project design phase. This can be done by implementing a so called "shadow operator" as described in the project approach section of this document.

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?

Income from renting commercial spaces in stations, parking lots and value capture from surrounding land belonging to the project which can be developed (TOD etc.) should not be underestimated, and can enhance the project success.

If the train operator has the farebox risk then the stations should be managed (but not necessarily owned) by the train operator (UK franchising model) as stations are a major part of the passenger experience.

From the preliminary planning to the detailed design, it is essential to involve all aspects of operations and maintenance. This can be performed by a so-called "Shadow Operator".

The shadow operator is a consultant with experience in running and maintaining high-speed rail systems.

The analysis performed by the shadow operator takes into account all aspects of operations over the entire life cycle of the infrastructure and the vehicle fleet from an operations point of view. The maintainability of the infrastructure within the defined maintenance windows is also analyzed and infrastructure adjustments proposed so that the system is built to run well.

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)?

By separating the delivery of civil works, structure and rail infrastructure and spreading payments for the separate disciplines over different time frames, not only can the sum of the early availability payments be less but they can also be spread over the entire lifetime of each asset. For example, the average lifetime of track is about 30 years, whereby the average lifetime of a bridge is 50 years. The track work contractor can be paid over a 30-year period whereby the bridge contractor can be paid back over a 50-year period. In Europe each contractor handles their own risks while the interfaces are managed by the State.

A combination of civil works and rail systems (track, traction power, and infrastructure) into one contract seems to be unfavorable, since the financial risk is greater for the civil contractor in the consortium. There are considerably larger investment costs needed for civil works in comparison with the other systems. However the availability and reliability of the line and therefore of the availability payments made to the consortium are mostly dependent on the rail systems rather than the civil works.

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?

German experience of building High Speed lines, typically show a split of the line into sections of 25 – 30 miles for construction purposes. This allows more companies to bid for the construction due to capacity issues and reduced risk. This helps small and medium-sized businesses be able to offer their products or services, which in turn increases the competition from suppliers with less capacity, therefore reducing costs.

If both project scopes were to be combined into a single DBFM contract, a single contractor or consortium would have to have the capacity to build 300 miles of High Speed line, therefore reducing the number of bidders and increasing the total cost. For maintenance purposes, a larger section can reduce cost due to the pooling of maintenance and inspection vehicles.

Both project scopes should be split into the following “work packages”

- Rail infrastructure
- Civils
- Structures
- Rolling Stock

This would allow each specialty to be bid by bidders who are specialists in the respective field.

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

The large size of the project (in cost and volume) will reduce the number of bidders (therefore competitiveness) to those companies who are able to obtain financing on such a large scale as well as having the capacity and the logistic chain for such a large project.

The only example of a high speed PPP project which involves combined operations, rail infrastructure, civil works, structures and rolling stock, is the Taiwan High Speed rail. It has a length of 211 miles at a cost of $18 billion. There were only two competitors who bid for the line, the limited number of bidders was due to the vast (in terms of finance and range of systems) size of the project.

By increasing the volume of the project and/or increasing the number of competencies this will reduce the number of bidders.

4. Funding and Financing Questions

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 there are no equivalent PPP projects of this scale in the USA, Lenders may see this project as higher risk, and will need reassurances of risk mitigation or risk allocation to the public sector.

Financiers will need to have guarantees of cash flow from the state, as well as strict construction supervision in order to assure themselves that what is being built is of the appropriate quality. The assets have minimal, if any, resale value so reliability of the system must have the highest priority.

With regards to availability payments these must be set according to applicable KPIs.

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

By funding infrastructure through public funds via a traditional Design and Build contract, after a few years of operations, the infrastructure can be sold as a concession. The concessionaire would be responsible for maintenance and availability of the infrastructure. Payment to the concessionaire could be either through:

- The number of train paths sold – if the train operator does not carry farebox risk
- Availability payments – if the train operator does carry farebox risk

As the publically financed loan/bond would be cheaper than the privately financed loan, added to the concession income, this would cost less over the long term. However, this would require 100% financing by the state during the construction phase and during the first few years of operations.

If a PPP were to be implemented for the construction phase, the financiers would need to be certain of:

- Cash flow guarantee by the state.
- The suitability and predictability of legal and regulatory structures as well as the role of the public institutions.
- The predictability of proven technology and not be a test bed for new systems or technologies.

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?

The train operator could carry the farebox risk, however this would be best done, by allowing a period of normal operations under public control, in order to allow passenger number to pick up to normal levels. By allowing the Operator to then bid on a farebox risk based on real ridership and revenues after this "build up" period, would allow the operator to bid a more competitive price as the operator would have a real basis upon which to base its bid.

5. Technical Questions

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 splitting of Rail infrastructure, civil works, Structures and rolling stock can reduce costs due to the smaller volume and range of systems bidders have to bid for.

PPP projects take many years to set up and will therefore delay the implementation of the project, since there is little rail experience for such a large project in the USA and therefore a PPP has many risks attached to it.

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.

Separately procuring the design and construction will reduce cost due to the increase in competition between bidders, as there will be a larger pool of bidders to choose from.

If life cycle costs are taken into consideration during the separate procurement process, this may help to reduce life cycle costs.
In a combined bid, the bidding consortium will regard construction costs with a higher importance than the life cycle costs which are spread over the life of the project (approx. 30 years).

Therefore separate tendering may reduce life cycle costs if this is taken into consideration when choosing a supplier.

The contractual setup time of a PPP is considerably longer than a conventional Design and Build contract. Similar projects such as the Channel tunnel between the UK and France needed many years to be finalized.

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.

In order to accelerate the construction phase the rolling stock should be tendered as soon as possible, due to the long lag times for tendering, construction, testing and commissioning. This will also allow the civil, structures and rail systems to have a common aim of the rolling stock. Therefore cross-sections and interfaces will be designed for the rolling stock which is already being developed.

It is imperative not to use the project as a testbed for new technologies.

Compiled
Frankfurt, September 28, 2015
DB International GmbH