

MIA MOVER – PROJECT DELIVERY IN A CONSTRAINED FINANCIAL ENVIRONMENT

Sanjeev N. Shah ⁽¹⁾, P.E., M.ASCE (Primary Contact)

Larry Coleman ⁽²⁾

Franklin Stirrup ⁽³⁾, P.E.

Pedro Hernandez ⁽⁴⁾, P.E.

Carlos Bonzon ⁽⁵⁾, P.E., Ph.D.

- (1) Principal, Lea+Elliott, Inc., 5200 Blue Lagoon Drive, Suite 250, Miami, FL 33126; PH 305 500 9390; Fax 305 500 9391; snshah@leaelliott.com
- (2) Manager of Planning Projects, Lea+Elliott, Inc., 5200 Blue Lagoon Drive, Suite 250, Miami, FL 33126; PH 305 500 9390; Fax 305 500 9391; ldcoleman@leaelliott.com
- (3) Project Manager, Miami Dade Aviation Department, P. O. Box 592075, Miami, FL 33159; PH 305 876 7922; Fax 305 876 8067; FStirrup@miami-airport.com
- (4) Division Director, Miami Dade Aviation Department, P. O. Box 592075, Miami, FL 33159; PH 305 876 7928; Fax 305 876 8067; PHernandez@miami-airport.com
- (5) Project Manager, Bermello Ajamil & Partners, Inc., 2601 S. Bayshore Drive, Suite 1000, Miami, FL 33133; (305) 859 2050; cbonzon@bermelloajamil.com

ABSTRACT

The MIA Mover is an elevated Landside Automated People Mover (APM) system that is being implemented at Miami International Airport (MIA) by the Miami-Dade Aviation Department (MDAD). The MIA Mover will provide a convenient and reliable means for transporting passengers between a centrally located MIA station and the Miami Intermodal Center (MIC). One of the first elements of the MIC constructed under the supervision of the Florida Department of Transportation is a Consolidated Rental Car Facility which was recently completed and opened in July 2010. Other elements of the MIC programmed to come on line in the near future include links to the regional transit and commuter rail systems.

MDAD commitments for the operational readiness date for the MIA Mover necessitated that the entire project (infrastructure and operating system) be procured under a single Design-Build-Operate-Maintain contract (inclusive of infrastructure and operating system). The DBOM Contractor was selected and the Contract was awarded in July 2008. This paper examines the project implementation process at an operating airport, in a constrained financial environment, with a special focus on project management initiatives that have kept the project on schedule and within budget while accommodating flexibility to support on-going strategic airport improvements to the ground transportation infrastructure and an airport city.

PROJECT AND CONTRACT INFORMATION

The MIA Mover (previously known as the MIC/MIA Connector) is an elevated Landside Automated People Mover (APM) system that is being implemented at Miami International Airport (MIA) by the Miami-Dade Aviation Department (MDAD). The MIA Mover will provide a convenient and reliable means for transporting passengers between a centrally located MIA station and the Miami Intermodal Center (MIC). The MIC includes the Consolidated Rental Car Facility (CRCF), which was the first element of the MIC to become operational in July 2010.

After 9/11 and its impacts on the Aviation Industry and MIA, efforts were undertaken to re-evaluate the overall MIA Capital Improvements Program in conjunction with the uncertainty presented by business and economic conditions. This re-evaluation resulted in several significant changes to the project. First, the MIA Mover was modified to operate in a “straight configuration,” with approximately 2.00 km (1.25 miles) of dual lane guideway with a single Station serving the MIA terminals versus the previous plan that had approximately 2.80 km (1.75 miles) of dual lane guideway and 3 stations serving the MIA terminals(1). Second, the capacity requirements for the system were modified to support ridership commensurate with 39 million annual air passengers (MAP) in the 2015 time frame compared to 48/55 MAP previously projected for 2015 and reaching approximately 48 million annual air passengers by 2033. These modifications resulted in reduced project budgets without compromising the primary goal of the system - provide a connection between the Miami Intermodal Center and Miami International Airport.

After conducting a peer review, MDAD elected to go with a DBOM contract procurement for the project with the adopted straight configuration and it was authorized for advertisement in December of 2004. The procurement documents were structured as performance specifications to permit system suppliers to propose their proprietary technologies to fit within the established site specific constraints. Since the adopted configuration had two stations, instead of multiple station stops, cable-propelled technologies could be applied and the procurement strategy and documents were structured to accommodate multiple classes of technologies in an effort to encourage competition. The procurement process, including challenges associated with the hyper-inflationary pressures of the market place during the ongoing procurement, was described in a paper entitled “MIA Mover Procurement” that was presented at the 2009 ASCE APM Conference.

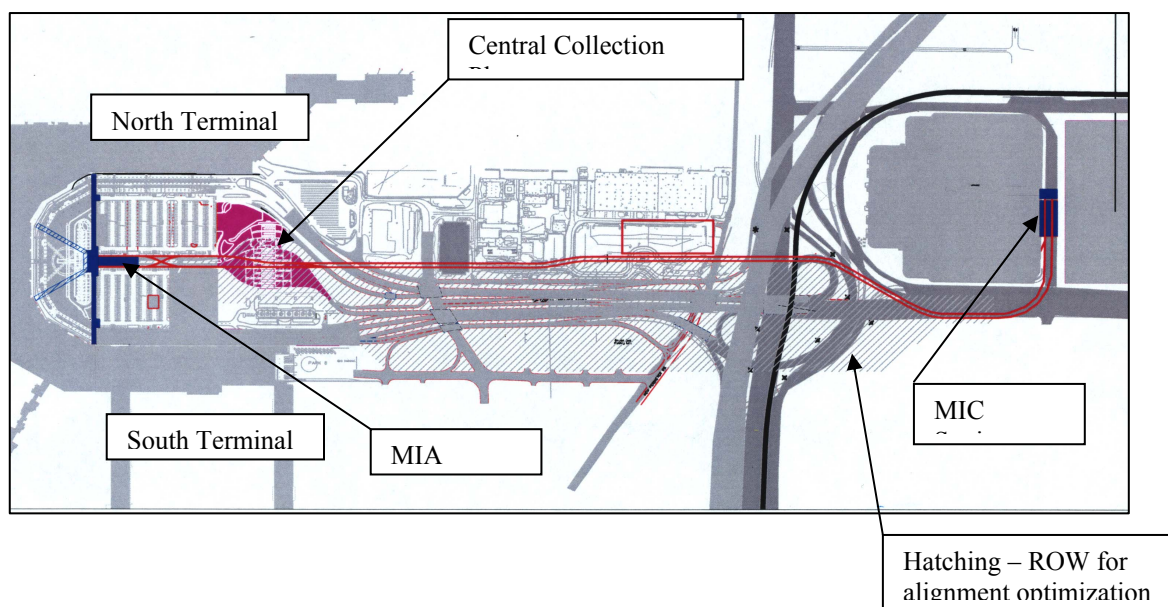


Figure 1: MIA Mover APM System – Straight Configuration

1.) The process followed in reexamining the various project parameters such as ridership, alignment, need for compatibility with future airport needs and other operational considerations was previously described in a paper entitled *MIA Mover – Post 9/11 Strategy* that was presented at the 2005 ASCE APM Conference

The DBOM Contract was awarded to Parsons-Odebrecht Joint Venture (POJV), with Mitsubishi Heavy Industries of America supplying the Operating System (CrystalMover technology) as a key subcontractor to POJV. Table 1 presents a summary comparison of the as-bid pricing and the as-awarded contract value subsequent to negotiations that concluded on March 27, 2008.

Table 1: Comparison of Base Proposal Price and As Negotiated Price in US \$

Description	Base Proposal Price	As Negotiated Price
Fixed Facilities*	\$ 220,059,258	\$ 152,396,640
Operating System*	\$ 99,066,445	\$ 94,103,360
Phase 1 System	\$ 319,125,705	\$ 246,500,000
Allowance Account	\$ 31,912,571	\$ 12,325,000
sub-total	\$ 351,038,276	\$ 258,825,000
Parking Allowance	\$ 3,250,000	\$ -
IG Audit Account	\$ 797,814	\$ 616,250
Total Phase 1	\$ 355,086,090	\$ 259,441,250

Final contract documents reflecting the negotiations were prepared and the contract was awarded by the County on July 1, 2008. Notice to Proceed was then issued on September 8, 2008 and the project is scheduled for completion in three years or September 2011.

The Contractor's scope of work includes the design, construction, manufacturing, installation, testing and commissioning of the Fixed Facilities and the Operating System. This specifically includes the following items:

- Stations and Guideway structures;
- Maintenance and Storage Facility (co-located as an on-line facility under the MIA station);
- Power Distribution System sub-station, including tie-in with the primary feeders from Florida Power & Light (the local utility company);
- Integration of the facilities with existing facilities/infrastructure in a manner to not adversely impact Airport operational needs;
- Establishment and integration of the Operating System requirements (specific to the MHI CrystalMover technology);
- Manufacture, integration, testing and commissioning of the Operating System elements, i.e. Vehicles, Automatic Train Control, Traction Power Distribution System, Communication System, Operations and Maintenance facility equipment and Central Control equipment;
- Project and Schedule Management, including Quality Control of Contractor's activities.

At the completion of the Capital project (in September 2011), the Contractor has an obligation to provide Operations and Maintenance services at established annual prices (which were competitively procured as part of the procurement process) for five years, with Owner options to extend for two additional five year terms. This specific requirement was included in the competitive procurement (and was a selection criteria) to assure that life-cycle costs were considered in the selection of the best value to MDAD.

CONTRACT MANAGEMENT APPROACH

The DBOM project delivery approach provides MDAD with a single point of responsibility as to the project execution; this responsibility lies with the DBOM Contractor. As such, the Contract Management approach focused on a streamlined approach to accomplish the following goals:

- Monitor Contractor's work performance as to Schedule and Budget
- Review Contractor's work for conformance with the Contract requirements
- Identify potential areas of concern in a proactive manner so that appropriate mitigations could be timely implemented, while avoiding interference with Contractor's means and methods or creating opportunities where the Contractor's contractual responsibilities could, inadvertently, be modified.

To accomplish this goal, MDAD established a team of technical consultants with specific responsibilities. The team was led by MDAD's Project Manager, and included the following entities:

- Lea+Elliott, Inc. responsible for the supervision of the Contractor's work as related to the Operating System elements. Lea+Elliott had previously developed the DBOM Contract documents and had been extensively involved with the procurement process, negotiations and the final award of the contract.
- Bermello Ajamil & Partners, responsible for the supervision of the Contractor's work as related to the Fixed Facilities elements.
- The team was also supported by specialized consultants focusing only on schedule and cost issues.

At the outset, MDAD reiterated and all the team participants committed to a vision for an on-time, on-budget project completion. Each participant further committed to working in a spirit of teamwork to accomplish the vision.

Key areas of risk to the vision were identified. These include:

- Contract required submittals and their reviews
 - o A submittal schedule with planned, expected and status of all contract required submittals was established.
 - o Contractually mandated Owner review process/times were included
- Site access dates
- Interfaces with facilities provided by Other Agencies – such as the MIC Station that was being designed/constructed and provided as a “shell” to the MIA Mover DBOM

Contractor

- MIA Operational requirements
- Change control and QA/QC procedures to audit the work.
- System Safety Certification – this was identified early on so that potential issues could be proactively identified and addressed as part of the design process.

Project progress meetings were held on a weekly basis to address status of work, upcoming work and potential areas that might need proactive mitigation. Submittal reviews were performed with a key focus on contractual conformance, with deference to the Contractor's professionals of record on design judgment, constructability and means and methods. Even though MDAD had no obligation to review Contractor's internal coordination, in a spirit of teamwork, the Owner's team performed these reviews and proactively identified potential issues that the Contractor was able to timely address – the resolutions included no change with clarification, or changes to address the interfaces. Also, even though the system is being implemented along and over the main entrance to MIA, there has been no impact whatsoever on MIA operations due to the extraordinary and excellent on-going coordination with MIA's Landside Management staff.

As the project progressed, there were several instances wherein the Contractor requested expedited or partial reviews of submittals to facilitate the ongoing construction activities. MDAD's team supported these reviews with a clear understanding from the Contractor that all risks associated were to be borne solely by the Contractor.

The DBOM approach provided the Contractor opportunities to optimize their designs while still demonstrating compliance with the performance based contract requirements. Even though the Contract structure was fixed price, lump-sum, the pricing forms were broken down into a sufficient level of detail to create a comprehensive work breakdown structure (WBS). One specific WBS addressed the modifications necessary to an existing parking garage due to potential interference with the guideway structure. It was recognized early on, that a proposer could avoid the interference and therefore the related scope of work. Upon Notice-to-Proceed, the Contractor had 30 days to submit a preliminary work schedule and a Schedule of Values (firm to the next 120 days during which time these documents would be finalized for the remaining duration of the project). The Schedule of Values had to co-relate to the WBS and the pricing forms. During the preliminary design phase, the Contractor proposed an alignment alternative that would avoid the interference with the existing parking garage. The project contract structure permitted the deletion of this specific scope of work, with a resulting savings to the project of approximately \$4 Million US. This savings permitted MDAD to authorize enhancement to certain architectural features of the stations, such as use of architectural cladding, instead of stucco and paint finishes. Further, MDAD was early on able to authorize the Contractor to incorporate sustainability requirements with a target for achieving the LEED Silver designation; at this time, the project is on track to achieve a LEED Gold designation.

The infrastructure has been practically completed, vehicles and major operating system equipment has been delivered to the project site, installation of the running surfaces, power rail and guidance rails is complete. Remaining activities are primarily focused on final installation, integration and testing and commissioning leading to substantial completion and beginning of passenger service.

The project management focus is now turned towards proactively managing the remaining activities. These include:

- System integration into the fixed facilities
- Finalization of hazards mitigations
- Site Acceptance Test procedures, schedules and reports
- Buildings and Operating Systems commissioning activities
- Real time verification of timely updates to As-Built documentations
- Safety audits, to proactively address Safety Certification processes
- Training procedures, including for Owner designated personnel
- Close-out of open items, including outstanding Non Compliance Reports
- Operations and Maintenance procedures and manuals
- Coordination with MDAD personnel who will assume responsibility for the completed project to establish a proper and integrated hand-off procedure.

As of the writing of this paper, the project is on-time and on-budget, and there are no known impediments to successful completion of the project. Further, the allowance accounts are still available to address unforeseen conditions that may arise.

CONCLUSION

It is critical that the Owner's project vision be clearly established – this vision guides not only the procurement strategy, the project delivery approach but also the contract administration/management during project execution. Even though the project contracting approaches typically place the Contractor and Owner's teams in adverse positions, it is crucial to remember that the common goal shared by all participants is the same – i.e. an on-time, on-budget project completion in a spirit of teamwork.

To accomplish this, each project participant must have a clear understanding of their role, their contractual authority, including limits of that authority. The need to establish professional relationships throughout the process cannot be overstated. This facilitates appropriate and timely communications that can help proactively mitigate issues. A lean project management team, with each member committed to the project vision, is the key to success. Further, timely and constant communications to apprise the Owner of the project status, and to seek appropriate policy decisions, is essential.

For a project to be successful, it is very important that consultants (engineers, planners, architects) act fully and solely in their role as the technical experts providing necessary technical input and information in assisting the Owner in framing the appropriate policy issues and making the appropriate policy decisions. This approach was found to be beneficial to MIA in general and the MIA Mover project in particular.



**Figure 2: MIA Mover Airport Station Looking East
October 2010 – Parsons-Odebrecht Joint Venture**



**Figure 3: MIA Mover Guideway Approach to Intermodal Center Station
October 2010 – Parsons-Odebrecht Joint Venture**



**Figure 4: First MIA Mover Vehicle Delivered
December 2010 - Lea+Elliott Staff Photo**