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**Moving DFW Airport In the 21st Century
APM Procurement Process**

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ABSTRACT

Dallas/Fort Worth International Airport has embarked on a five-year process to design, procure, and install a fully automated, bi-directional Automated People Mover (APM) system to optimize passenger connections within the airport's Central Terminal Area. The system should be fully operational in 2005. A procurement process to select a system supplier was initiated in February of 2000 and after a procurement process spanning eight months, the contract was awarded to DaimlerChrysler Rail Systems (N.A.) of Pittsburgh in October of 2000.

The procurement process was defined over a period of months by a team of DFW Airport staff and consultant staff from Lea+Elliott, Inc., a member of the airport's "Airport Development Team" for staff augmentation

Determination of the process to be used for procurement of the APM system supplier involved several early key decisions such as the breakdown of work between the facilities (guideway, stations, and maintenance/storage facility) and the APM system elements. The airport made the decision to separate the facilities procurement from the system procurement to support an accelerated program schedule, including the design and construction of a new international terminal. The considerations for deciding to separate these elements will be explained.

Other factors affecting the procurement methodology included minimizing the potential for legal challenge and maximizing competition to provide competitive pricing. This paper will include discussions of the significance of these factors. DFW Airport's Board of Directors determined in 1998 that a two-step process would be followed, wherein suppliers would present proposals to be evaluated against extensive performance criteria. After an extensive review and comment period and interactive sessions with the suppliers, the proposals would be determined to be compliant or non-compliant with the specifications and only the

complying suppliers would be invited to submit a final price for both the APM system and for a five-year Operations and Maintenance contract. The firm submitting the lowest responsive bid for the system and the O&M would be awarded the contracts.

Analysis of the procurement process includes a description of the project schedule and tasks and the overall effectiveness of the selected approach. The time line from advertisement to contract award will be explained and evaluated for "lessons learned" and recommendations to refine or improve the process will be presented.

This significant undertaking is believed to be the largest airport APM in the world and the opportunity to assess objectively the process by which the system was procured is extremely relevant to today's APM industry. The lessons learned and the recommendations will be instrumental in the selection of a procurement approach for future airport APM projects. This has been evidenced by the increasing number of inquiries and visits of numerous officials from other U.S. airports during the first four months of 2001.

Project Background

Dallas/Fort Worth International (DFW) Airport has embarked on an ambitious five-year Capital Development Program valued at \$2.6 billion. Among the several key elements in the program is the design, procurement, and installation of a fully automated, bi-directional Automated People Mover (APM) system scheduled to be operational in 2005. The APM will optimize passenger connections within the airport's Central Terminal Area (CTA). Along with the APM system, a new international terminal, airfield enhancements and other infrastructure improvement projects will upgrade DFW Airport's facilities to better serve the flying public who use DFW as a connecting or origin/destination airport each year. To date, the future APM at DFW Airport is reportedly the largest airport APM in the world.

The procurement process to acquire the APM system began in mid-1997, when the Airport Development Department completed a qualifications-based selection to add a new professional services consultant to its Airport Development Team (ADT). The ADT augments staffing capacity of the department during periods of significant design and construction. Team members work side-by-side with DFW Airport staff to plan and program various capital projects. The consultants are rotated in such a way that a new firm is added each year and serves for a number of years depending on the department's needs. In 1997, the department specified that the firm to be selected would have transportation planning expertise in APM acquisition, design management, and construction administration. The selected firm was Lea+Elliott, Inc. of Arlington, Texas.

Almost immediately, Lea+Elliott provided two professionals, working full-time at the airport, who were quickly integrated into the department's staff. Meanwhile the Lea+Elliott home office in nearby Arlington, Texas geared up for on-call services as required to develop the planning and procurement process to acquire the APM system. Numerous planning and programming studies were completed. Forecasts of demand for APM service were completed, reviewed, presented and updated. Key decisions were derived following the studies and augmented by extensive discussions at weekly APM team meetings. An airside versus landside guideway configuration feasibility and constructability analysis was completed, resulting in the recommended airside configuration. A four-terminal (servicing the airport's major carrier) versus six-terminal (serving all airlines) APM system was studied and debated and presented to the airport's executive and senior staff. It was finally determined that a six-terminal configuration, serving all airline gates, best met the airport's projected needs well into the twenty-first century.

Whether the system would service secure versus non-secure areas of the airport ended when the team concluded that only passengers who had cleared security would be able to access Phase I of new system. Future connectivity to Dallas/Fort Worth rail transit systems was considered and provisional linkages and rights of way were preserved, although the initial phase of APM development will serve only the CTA. Finally, with the design and construction of new International Terminal D included as a key element of the Capital Development Program and the anticipated near-term development of new Terminal F, the programming documents were completed. Thus the alignment was defined – a bi-directional, airside, elevated guideway to convey an APM system to all six terminal areas, and capable of transporting 5,000 passengers per hour per direction (pphpd) on opening day with an expansion capability of up to 8,500 pphpd.

Key Issues for Selecting the Procurement Process

Once the preliminary planning and programming were well defined, the procurement process was established by the airport staff and consultants for presentation to the DFW Airport Board, the airport's governing body. The train vehicles and automatic train control would be solicited as a single contract as would a separate five-year Operations and Maintenance contract. Fixed facilities, including guideway, stations, terminal station renovations, Maintenance and Storage Facility (MSF) and infrastructure upgrades would be contracted separately to an A/E design team, to be selected based on qualifications, and to the Board's selected general contractor for construction. An accelerated design and construction schedule, tied to the airport's financing strategy for bonds, dictated that the A/E design team be engaged as quickly as possible to provide early design for what would become essentially a design/build approach to the guideway and fixed facilities. The design/construction administration consultant team would be engaged in the spring of 2000 to begin design of the guideway and fixed facilities, using a "worst case scenario" approach for guideway

dimensions until the train supplier selection could be determined in October of 2000.

While planning and programming progressed, the APM team also studied recent APM procurement strategies at other U.S. airports. Results of these procurements were tabulated and presented to executive and senior staff at DFW airport. The APM team's overriding goal for the train supplier solicitation was to procure the APM system while encouraging maximum participation and competition, to encourage cost savings while minimizing the possibility of legal challenge. After studying a "best value" versus "low bid" contracting mechanism, the team concluded that the optimal procurement method would be the "best value" approach, wherein technical compliance, management approach and price would be assigned weighted numerical values and in the end the airport would receive a system that met its performance expectations while remaining in a competitive price range. The APM team developed preliminary procurement documents and defined a detailed evaluation process, using committees assigned to perform technical, operational, legal, and contractual compliance reviews and completing a scoring matrix that included pricing.

However, in May 1998, the DFW Airport Board met to focus on the procurement strategy. The Board determined that it was in the airport's best interest to pursue a "low bid" approach to reduce the potential for subjective decision-making. The Board directed the APM team to pursue a two-step low-bid process instead of the best value approach. The Board requested that the Procurement Documents be revised to reflect a process wherein technical and management proposals would be reviewed for compliance to the performance specifications. Firms evaluated as responsive to the specifications would be requested to submit lump sum Formal Offers for the system contract and the five-year Operations and Maintenance contract. The total of these two lump sum bids (the overall lowest lump sum amount) would determine which firm would be awarded the contracts.

Once the Airport Board made its decision, the APM team moved to refine the Procurement Documents to reflect this two-step approach – evaluation of technical, management, and Operations and Maintenance proposals (without consideration of price) followed by Formal Offers (bids) after four evaluation teams determined a qualified list of suppliers who complied with the technical specifications. An eight-month process was spelled out – from public advertisement through date of contract award. The process is portrayed graphically in Figure 1. The schedule detailed submittal of proposals, initial review of proposals, return of evaluation comments back to suppliers, responses/proposal revisions submitted to the Airport, and two-day meetings with suppliers. At the conclusion of the meetings, final comments and requests for clarification were to be sent back to the suppliers. The suppliers then had fourteen days to re-submit their final proposals for final review to determine compliance and to announce a qualified list of proposals.

Budgetary constraints led to a delay in the APM procurement process for the first nine months of 1999. A planned industry review of the Procurement Documents was delayed and never came to fruition. When the Airport Board adopted the Capital Development Program budget in November of 1999, the procurement process re-gained its momentum, with public advertisement and release of Procurement Documents scheduled for the first quarter of 2000.

At this time, and as the documents were undergoing final review by Airport staff, an independent peer review and an independent cost estimate were performed by outside consultants retained under separate contracts with the Airport Board. The peer review resulted in minor changes to the Procurement Documents. The independent cost estimate was well within the range of the Board's internal estimate.

DFW Airport APM Procurement Summary

The two-step process to acquire an APM for DFW Airport was launched in early February 2000 when public advertisements were run in local newspapers. Concurrently, the advertisement was sent to a database of potential suppliers who had indicated interest in the project over the three prior years. A two-day mandatory pre-proposal conference was held in mid-February, 2000 and was attended by approximately 50 people each day. During the conference the procurement approach was defined in detail, the contract requirements explained, technical specifications reviewed, and Disadvantaged/Minority/Women Owned Business Enterprise goals were discussed by the Airport's Small and Emerging Business Department. Several local businesses attended the conference to meet potential suppliers and to market their services. An aerial "birds-eye" flyover video of the airside alignment was shown to the conference participants, as was a virtual reality video of the simulated system. A bus tour of the APM alignment was conducted and all attendees were encouraged to take advantage of this opportunity to view the challenges associated with installing an APM system on a guideway elevated 50 feet in the air with aircraft parked beneath.

Once the Procurement Documents had been made available, the APM team received questions on prescribed forms and responded to all questions via addenda. Meanwhile, during the sixteen-week period from date of first advertisement until due date for submittal of proposals, potential suppliers were to prepare the three components of their proposals, as follows:

- Parcel I – Documents to include an original proposal form (corporate/joint venture information and an index of contents), a Power of Attorney to designate an authorized representative, a Non-Collusion Certificate, Evidence of Insurability, Authorization to do Business in the State of Texas, and an overall document index.

- Parcel II – The suppliers' Technical Proposal to include an executive summary, proposed system design, system safety and security, compatibility with airport facilities, aesthetics, system availability, and operations and maintenance information, management and project administration, and technical conditions.
- Parcel III – Qualifications Statement, consisting of a transmittal letter, proposer identifying information, financial capacity, human and physical resources, direct experience with proposed system technology and similar projects, experience in operations and maintenance, record of past performance on similar projects and contractual conditions.

Proposers were also required to submit a 1/32nd scale model of their proposed vehicles.

During the solicitation period, the DFW Airport Board's Operations Committee was briefed on the solicitation process and schedule, with which they concurred. At that time the Committee also requested that the Airport Development Department meet with outside legal counsel for an independent review of the contract documents from a legal/contractual standpoint. Some changes suggested by the attorneys were incorporated into the Procurement Documents and issued via addenda to all entities that had purchased them. It was also agreed that the independent legal counsel would be available to the Airport Development Department throughout the remainder of the solicitation process. The Operations Committee also requested that they be informed of the status of the evaluation process as it evolved.

Evaluation Summary

On the proposal due date of May 26, 2000, DFW Airport received six proposals from five different suppliers. The suppliers included Daimler-Chrysler Rail Systems (ADtranz), Marubeni, The Airport Connector Team (TACT, which included Bombardier, Sumitomo and Mitsubishi), Siemens Transportation Systems (two proposals), and Texas Air Train (a consortium headed by Raytheon Infrastructure). The proposals and train models were transported to an isolated site on the airport where the evaluation teams were scheduled to work for the entire evaluation period. The evaluation of the proposals began on schedule on May 29th by four evaluation teams, each considering various components of the parcels submitted. The evaluation teams were comprised of DFW Airport staff from the Airport Development Department, Operations Department, airport legal counsel and consultant staff. The evaluation was scheduled, directed, and managed by Airport Board staff. DFW Airport executive staff monitored the process closely.

Initially the teams reviewed all six of the proposals for responsiveness, to determine if all required information had been provided at the time of submittal.

Once it was determined that all six proposals met the basic submittal requirements, the evaluation teams began their work in earnest. For four weeks the teams worked, at first evaluating the proposals independently and then convening to assemble questions for clarification to be mailed to each supplier by the end of the fourth week. After each individual on every team completed an independent review, the individual evaluation teams met collectively to discuss the review comments and to consolidate comments upon concurrence of the team. The Airport Development Department provided support staff to assist in assembling the voluminous comments. The process of evaluating individual comments, consolidating similar comments, eliminating comments that the majority of a team judged irrelevant or not applicable, and packaging a concise package of questions/comments for clarification that met with the teams' approval was extremely painstaking.

In retrospect, the intensity of this review period was an extremely worthwhile and necessary exercise. The evaluation teams gained an enormous understanding of the six proposals and were very well prepared for the meetings with the suppliers that would occur in July 2000. The comments packages on the six proposals were mailed to the five suppliers on June 23, 2000. At that time, the suppliers were requested to respond in writing to all questions and comments within fourteen days. They were also informed of the dates, determined by a random drawing, of their two-day meeting with the evaluation teams.

Beginning in mid-July, the two-day meetings with each supplier began (it should be noted that the Siemens Transportation Systems, which had submitted two proposals, was allocated a third day to discuss the technical proposal of the second technology). DFW Airport staff, allowing a half-day each for management and contractual/legal issues, and a full day for a discussion of each technical proposal, set the agenda for each day. Suppliers were requested to limit their attendance to no more than six people at each session due to space limitations. Additionally, at random periods during the evaluation process, members of Airport Board executive staff and the Airport's internal auditors observed the discussions with each supplier. The Board's legal counsel and two outside counsel provided legal representation during the contractual conditions discussions.

As the discussions progressed, a written list of outstanding issues was recorded on a white board and later transmitted to each supplier, stressing that the suppliers would have one final opportunity to provide evidence of compliance for any issue on which the evaluation teams had outstanding questions. It was made clear in the meetings that on several of the proposals there were issues of non-compliance that, left unresolved, would eliminate the suppliers from the procurement process and that they would not be invited to submit a Formal Offer. These "fatal flaws" were made clear to the suppliers in the meetings. The written issues were transmitted in writing to each supplier, to be received the day after

their interview had concluded. The suppliers, in turn, had fourteen days from the final day of their interview to submit their final clarifications of their proposals.

During this period following the interviews, one of the suppliers notified DFW Airport in writing that it was withdrawing from further consideration, presumably because there was not sufficient time to correct the numerous areas of non-compliance in its proposal. The other four suppliers (of five proposals) provided final proposal clarifications within the prescribed fourteen-day period. As each of the responses was received, it was distributed to all of the evaluation teams for review, to compare the revisions and clarifications with the identified areas of non-compliance or request for clarifications. A final evaluation matrix was charted addressing whether areas of non-compliance had been corrected in the final proposal clarifications. At the conclusion of this process, the teams agreed unanimously that only two of the remaining proposals, those submitted by DaimlerChrysler Rail Systems and Marubeni, had revised their proposals as requested and were technically compliant with the performance specifications.

Formal Offers and Award of Contract

Prior to notifying the suppliers of their status, the evaluation teams met to formally brief the DFW Airport Board on the outcome of the evaluation process and to request the Board's concurrence to invite the two qualified firms to submit formal offers. Each supplier was then notified of the status (either compliant or non-compliant). The two compliant firms were formally requested to submit Formal Offers on September 15, 2000.

After the Request for Formal Offers was issued, the two suppliers who had submitted the three non-compliant proposals requested a meeting with a senior DFW Airport Executive to present explanations of why they believed they were in fact compliant with the technical specifications. The meetings were scheduled and the suppliers were given an opportunity to request reconsideration. However at the conclusion of these meetings the decision of the evaluation teams was upheld.

On September 15, 2000, DaimlerChrysler Rail Systems and Marubeni presented Formal Offers for the APM system contract and the Operations and Maintenance contract. Each component of the bid was read and the total lump sum amount, the basis of award, was announced. DaimlerChrysler Rail Systems (ADtranz) submitted the low bid and was recommended for award of the contracts. At its October 2000 meeting, the DFW Airport awarded the system contract to ADtranz. Notice to Proceed was issued for early November. At its November 2000 meeting, the Board awarded the Operations and Maintenance contract to ADtranz. The system is expected to be up and running by March of 2005.

Lessons Learned

- *Allow enough time to conduct the procurement process.* While developing the procurement schedule, many DFW Airport staff felt the eight-month timeline was too long (and there was considerable pressure to press on with the project because the APM is a key component on which other Capital Development Program projects depend). Eight months turned out to be “not long enough” in terms of the time available to review the large number of proposals submitted. The review teams literally devoted three and one-half months in the evaluation process, with a full-time effort expended by more than a dozen staff and consultants. It cannot be overstated that developing and adhering to an organized procurement approach will minimize the potential for protests, claims and project delays.
- *Conduct a thorough review of the specifications.* And when you think you have everyone’s input -- do it again! Even though the specifications were reviewed by staff, consultants and senior airport management, required revisions were subsequently discovered and changed by Addenda.
- *Spend the extra money for legal counsel.* The DFW Airport Board Operations Committee insisted that staff engage independent legal counsel who would be available for consultation and to attend the meetings with suppliers. The attorneys were very helpful in revising several areas of the specifications. Indeed, they provided outstanding counsel during the procurement process and supported the evaluation team during meetings with potential suppliers.
- *Dedicate adequate Owner staff to the project.* It was always uppermost in DFW Airport’s strategy that the Airport staff control the process, correspond with the suppliers, and oversee all contact with suppliers once the proposals were submitted. During the procurement process, the proposals and models were secured at the Owner’s facility, to ensure minimal risk of proprietary information being released to outside parties.
- *Clarify very specifically and in writing what you expect the suppliers to accomplish in their responses.* Even though some of the suppliers were told at least twice in their on-site meeting, in a cover letter, and in the Request for Proposals that they would have this final opportunity to revise their proposal and correct non-compliant issues, some claimed later that they did not know and were not told that this was their final opportunity. The airport was quite confident that this information had been transmitted. When in doubt, be repetitive – in writing.
- *A consistent and thorough approach for procuring an APM system of this magnitude is not be inexpensive.* Fortunately, DFW Airport’s senior management was willing to invest the resources necessary to conduct a procurement process that was fair, that secured competitive bidding, and that avoided legal entanglements and consequential delays to the program. In retrospect, the seconded consultant staff, independent review of specifications, independent cost estimate and outside legal assistance

proved extremely beneficial and were well worth the significant costs to the program

Progress Report

As of April 2001, the process to design the DFW Airport APM is on schedule. Informal meetings with ADtranz prior to Notice to Proceed provided a “jump start” with the supplier’s engineering staff in Pittsburgh. An initial partnering session has occurred and will continue on a quarterly basis. ADtranz has its program management staff on site at the airport in trailers adjacent the Capital Development Program’s facility. This proximity facilitates communication and allows issues to be brought forward with no delays. A large APM design team is working to complete design as the Airport’s general contractor is erecting columns in two of the six terminal areas. The design-build team is committed to the schedule as outlined in the Procurement Documents for the APM system. This significant project will certainly facilitate DFW Airport’s goal of being “The Airport of Choice” and provide optimal transportation connections for future customers.

