

Environmental Management Functions	Who Completes NEPA Process?	Who Designs Mitigations?	Who Determines Sharing of Costs/Risks?	Who Obtains Needed Permits?	Who Monitors Environmental Compliance?	Who Conducts Construction Impact Outreach?	Who Evaluates Late Design Change Environmental Impacts?
Traditional Procurement	Owner, for U.S. DOT	Owner	Owner	Owner	Owner and U.S. DOT	Owner	Owner
Limited Turnkey	Owner, for U.S. DOT	Owner	Owner	Owner	Owner and U.S. DOT	Owner	Owner
Turnkey	Owner	Owner	Owner	Turnkey Contractor	Owner and U.S. DOT	Turnkey Contractor	Turnkey Contractor
Super Turnkey	Owner	Owner and Turnkey Contractor	Owner and Turnkey Contractor	Turnkey Contractor	Owner and U.S. DOT	Turnkey Contractor	Turnkey Contractor
Four-Phase Turnkey	Owner with Input from Turnkey Contractor	Turnkey Contractor with Input from Owner	Turnkey Contractor and Owner	Turnkey Contractor	Owner and U.S. DOT	Turnkey Contractor	Turnkey Contractor
Franchise	Turnkey Contractor with Input from Owner	Turnkey Contractor	Turnkey Contractor, with Input from Owner	Turnkey Contractor	Turnkey Contractor for Owner; and U.S. DOT	Turnkey Contractor	Turnkey Contractor

FIGURE 4 Typical roles and responsibilities.

Source: Mendes, Diana, "Environmental Considerations," *Lessons Learned—Turnkey Applications in the Transit Industry* (Washington, D.C.: Federal Transit Administration, U.S. Department of Transportation, October 1997) Pg. VI-13

Session 5—Environmental and Risk Management Considerations

Session Chair:

Frank M. Russo

Senior Director, New Rail Construction

New Jersey Transit

Newark, New Jersey

Session Highlights:

- Pursue innovative approaches in environmental management, such as performance based financial incentives, collaboration with the community with regards to mitigation measures, and agreements with agencies that address the review process, minimizing paperwork and cost to all parties.

- Avoid unresolved environmental issues, since they result in higher risks which in turn result in higher costs. An effort should be made to understand risk probabilities. Establish a proactive environmental management process early in a turnkey procurement process.

- In a turnkey procurement process, risks must be clearly explicit. There are different methods available to manage risk. A methodology for managing risk was presented. A flow-chart process was also presented to help in the process of identifying and managing risk. The different types of risks were discussed with suggested strategies to manage them.

- In an effort to foster and direct community participation in transit projects, the Livable Communities Initiative Program was established by the FTA in 1994. A video was presented showing how communities got involved and challenged projects through legal actions in the Los

Angeles area. Public Participation/Community Participation should have an active role in every phase of a transit project.

- The industry is currently developing insurance policies that would protect design liability. Currently, sureties are applicable only in the construction phase of a project. They are also investigating the possibility of Phase Contracting where the owner accepts the risk in the design phase and the sureties cover the construction phase of the project.

- Presented the contractors' perspective in Risk Allocation: How well companies identify, manage, and mitigate risk directly impact their bottom line. Risk allocation must be balance between the public and private sector. Risks must be placed where they can best be managed. For example, contractors are not well equipped to take on the risks related to the environmental component of a project.

- Explained the BART's experience with the environmental considerations in the extension to the SFO airport. Faced many challenges with respect to stricter regulations, natural conditions (wetlands, threatened and endangered species), negotiations and coordination with the SFO International Airport, and negotiations with other agencies. BART has always taken the position that the responsibility and risks associated with environmental considerations remain always with them. To ensure compliance by the contractor, BART educates the contractor with regards to environmental concerns, provides the contractor with detail specifications that include agreements with the concerned agencies, and monitors though independent inspections.

- Presented the consultant's perspective with regards to environmental and risk management considerations.

The role of a consultant is to identify clients that have a sound commitment to complete projects. One must know the playing field; understanding clients, stakeholders, and regulatory framework. One must push the limits by understanding best practices, relating innovation to established objectives, and valuing good design.

*Diana Mendes
BRW, Inc.
Newark, New Jersey*

Ms. Mendes presented the "Environmental Considerations" resource paper which she co-authored with Paul N. Bay and William D. Byrne for the session. Her presentation discussed how environmental and community issues affect project planning and development. Means are proposed to proactively manage the environmental compliance process to capitalize on the flexibility and advantages of a turnkey approach while reducing the potential for major project risk factors to jeopardize successful project implementation. Case studies of traditional and turnkey projects were reviewed to develop recommendations for successful turnkey execution.

The project development process (System Planning; Major Investment Study; Preliminary Engineering; Final Design and R-O-W Acquisition; Construction, and Operation) were discussed and examined relative to the integration and coordination of the National Environmental Policy Act of 1969 (NEPA). This was introduced as a "framework in which to develop transportation improvements which are integrated into the fabric of the host communities and which are supportive of community planning goals." The conduct of project development in the context of traditional and turnkey project approaches was considered (see FIGURE 4). Differences in projects relative to the specificity and range of alternatives at varying stages of project development and the affect of these factors on the conduct of the NEPA investigations of the social, economic and environmental (SEE) factors was examined.

An overview of procurement process options was presented including traditional, limited turnkey, turnkey, super turnkey, four phase turnkey and, franchise. The environmental management considerations in design-build projects were discussed and examined in the context of traditional and turnkey project case studies.

The lessons learned are:

- "Contingencies must be provided in the project budget and schedule to deal with inevitable project design changes. This is true in conventional procurement, but more so in turnkey procurement options."
- Environmental considerations and the prospective impacts of the project may influence the selection of an

appropriate procurement process.

- Assign responsibility for environmental management functions to the parties who are best equipped to resolve the issues that are likely to arise at each stage of the project development process.

- In turnkey projects, address environmental issues early and clearly define responsibilities for environmental processes.

- Honor previous steps and agreements in the project development process. The further in the process changes are made the more costly they become.

- Innovative approaches in environmental management could benefit turnkey procurements. These include:

- (1) Performance standards could be used to encourage avoidance of protected resources and community features through the use of financial incentives.
- (2) Development of area-wide enhancement banks to which turnkey projects could make a financial or 'project' contribution to satisfy mitigation needs.
- (3) Development of programmatic agreements with key federal and state resource agencies at the project outset to increase control over public agency review periods and to streamline documentation requirements.

- Avoid unresolved environmental issues since they result in higher risks which in turn result in higher costs.

- An effort should be made to understand risk probabilities.

- Establish a proactive environmental management process early in a turnkey procurement.

The major project risk factors related to the environmental process involve cost, delay and public relations risks. Independent of whether a traditional or turnkey procurement is selected, all of these risk factors need to be considered. For some risk factors there may be advantages to the turnkey approach, while for others turnkey may be disadvantageous.

*Douglass B. Lee
Volpe National Transportation Systems Center
U.S. Department of Transportation
Cambridge, Massachusetts*

Mr. Lee's presentation paralleled the resource paper "Identification and Management of Risk on Turnkey Transit Projects" which he prepared for the workshop. Comparing turnkey and traditional procurement, two characteristics are recognized:

- (1) Turnkey procurement requires making risks

explicit.

(2) Different risk control methods are used with turnkey.

Risk can not be eliminated, it can only be minimized. Risk is always present at some level. Achieving risk minimization requires the management of risk. A flow chart process was presented to help in the process of identifying and managing risk.

Uncertainties, unknowns, and unforeseen events are inherent in capital construction projects. Nineteen risk

categories were recognized: political, funding, financing, right-of-way, speculative effort, bids exceed estimates, geotechnical, hazardous material, underground utilities, inflation, application of government regulations, permit approval, changed requirements, design and system integration, construction performance, acts of God, operating risk, market risk and, contested conditions. The allocation of these risks between the owner and the contractor is considered (see FIGURE 5).

Risk management instruments were introduced and examined relative to their application to transit projects.

Risk	Owner	Contractor
Political	full	
Funding	full	may participate
Financing	full	may participate
Right-of-way	full	up to full
Speculative Effort	before RFP	before RFP
Bids exceed estimates	full	
Geotechnical	discretionary	discretionary
Hazardous materials	discretionary	discretionary
Underground utilities	discretionary	discretionary
Inflation	prior to award	after award
Application of government regulations	regulatory changes only	full compliance with existing regulations
Permit Approval	traditional	may participate
Design and system integration	traditional	turnkey
Changed requirements	full	
Construction performance	may share	full
Act of god (force majeure)		full (insurance)
Operating	Design-Build	Design-Build-Operate
Market (ridership or revenue)	Design-Build	Design-Build-Operate
Contested decisions	partial	partial

FIGURE 5 Risk allocation to participants.

Source: Lee, Douglass B., "Identification and Management of Risk on Turnkey Transit Projects," *Lessons Learned—Turnkey Applications in the Transit Industry* (Washington, D.C.: Federal Transit Administration, U.S. Department of Transportation, October 1997) Pg. III-18

Frank E. Enty
Interim Executive Director
Conference of Minority Transportation Officials
Washington, D.C.

Mr. Enty discussed the role of community participation and consensus development on successful turnkey project development. The FTA Livable Communities Initiative program was introduced as an innovative effort to foster and direct community participation in transit projects. A video was presented showing how communities became involved in transit project planning and challenged projects through legal actions in the Los Angeles area.

Mr. Enty discussed the importance of public involvement in the transportation planning and project development processes. The development of community consensus and support for important project elements was presented. Active community participation throughout all phases of transit project development was advocated as a mechanism to engender broad public support and minimize project opposition.

The presentation closed with the caution that projects which fail to involve broad public involvement and community participation are vulnerable to public opposition and the risks of political uncertainty.

Lynn Schubert
President, The Surety Association of America
Iselin, New Jersey

Ms. Schubert discussed the challenge of liability protection for turnkey projects in which the design-build-operate responsibilities are covered by a single agreement with a private consortium. Design liability is not covered by surety bonds. Construction liability and performance are protected through surety bonds. Turnkey projects may be denied surety bonding because of the complex design-build contract where construction responsibility cannot be separated from design responsibility. It was proposed that phased turnkey projects could facilitate surety bonding. In the phased approach, during the initial design phase, the owner could accept the design risk and no surety bond would be necessary. The construction stage would be the second phase of the turnkey where surety bonding would provide construction liability protection. The Surety Association of America is currently working with the New Jersey Department of Transportation to explain the turnkey process to the contractors in that state.

The need to increase the understanding of design-build was stressed. An example was drawn from New Jersey, in which legislation to facilitate a design-build project was resisted by contractors because of inadequate understanding of the turnkey concept.

Ronald W. Oakley
President, Infrastructure Operating Company
Fluor Daniel, Inc.
Greenville, South Carolina

Mr. Oakley emphasized that risk management is part and parcel of the practice for private design and construction companies. Companies which manage risks well survive. Companies which do not manage risks well do not survive in business. The allocation of risk is an important aspect of risk management.

While there are many kinds of risk (Fluor, Inc. has detailed as many as thirty-five kinds of risk), Mr. Oakley defined four major categories of risk; political and regulatory, contracting, financial (including funding and debt service), and execution. In turnkey projects, the allocation of risks between the public and private participants to achieve a balance is the goal. In general, risk should be placed where it is best managed.

Several examples of risk allocation were considered. It was noted that political risk as exemplified by legislative changes can be costly to companies conducting business in the uncertain legislative environment. Right-of-way acquisition (risk) is not appropriate for private companies that do not have the power of eminent domain. Design and build risk can be borne well by private contractors. Permit approvals are complex and varied. Some permits can be the responsibility of the private contractor. Other permits, most notably environmental approvals, should be the responsibility of the public owner. The uncertainties attendant to environmental permits requires a high risk cost in the related contracts.

It is important to make the risk explicit early in the turnkey procurement process.

Ellen Smith
Construction Engineering Agreements Manager
Bay Area Rapid Transit District
Oakland, California

Ms. Smith reviewed the environmental, administrative and regulatory requirements governing an 8.2 mile, \$1.2 billion extension of a Bay Area Rapid Transit Line through five cities into the San Francisco International Airport. The project's complexity was reviewed including the intensely developed urban complex (crossing and parallel transportation features) through which the corridor travels and the sensitive natural environmental features and resources (i.e., wetlands, endangered species) that must be negotiated. In the instance of the airport, construction on the airport property is the responsibility of the airport as a contractor to BART.

The speaker noted the rigorous provisions of the

California Environmental Quality Act with strong mitigation requirements that carry the force of law. An open challenge to BART is how to achieve environmental compliance through its contractors. The environmental permitting has resulted in detailed specifications affecting design and construction.

Several innovative measures were discussed to achieve environmental compliance:

- Training of contractors: BART will train the contractors personnel regarding the measures and mean necessary to comply with environmental requirements, and
- Contractors will have an environmental monitor on their staff to assure conformity with the permit terms.
- BART will monitor contract environmental compliance with independent inspections.

Joe Aiello
Vice President
Frederic R. Harris, Inc.
Boston, Massachusetts

Mr. Aiello discussed risk management from the perspective of the contractor. The contractor wants a client that is committed to the project with the fortitude and resources to see the project through completion. The contractor's risk management necessitates that the contractor: know the playing field; push the limits, and understand that there is no free lunch. These terms were expanded on:

- Know the playing field—The contractor must understand the client, the relevant stakeholders, and the regulatory environment. In addition, the contractor must have a clear understanding of the project's objectives.
- Pushing the limits—This means that the contractor must know the best current practices, relate innovation to the project's objectives and value good design.
- No free lunch—This recognizes the importance of project planning, community participation and a reasonable allocation of risks between the contractor and the owner.

Mr. Aiello considered the particulars in the context of the Tren Urbano project. where he noted that the project planning had continued for a number of years resulting in a preliminary light rail alternative before finalizing on a rapid transit project. The interest of the client in fast tracking the project's completion, with the maximum local design-build content, resulted in an owner-consortium contractor agreement with clear accountability between the parties. Early hurdles included the project technology (light rail or rapid transit), right-of-way acquisition, and environmental approvals. The early decision on a strategic approach (design-build) resulted in the contractor having a project

development responsibility and perspective as contrasted to a more limited engineering perspective.

Mr. Aiello closed with the following recommendations and observations resulting from the Tren Urbano experience to date:

- (1) An early Environmental Management Plan with clearly delineated responsibilities for environmental permitting is an asset.
- (2) Remember to focus on the needs of the customer.
- (3) The role of the government should include resolving the externalities, managing public involvement and environmental mitigation.
- (4) The private sector responsibilities should include control of costs and schedule, and the management of the construction.

Frank Russo
Senior Director New Rail Construction
New Jersey Transit
Newark, New Jersey

Mr. Russo addressed the New Jersey turnkey demonstration risk allocation. He noted that during the six month contract development phase following the contractor selection, the allocation of risks was fully explored, considered and defined prior to the contract agreement. The following risk allocations have been effectuated:

- Agency (New Jersey Transit) risk assignment: environmental; geotechnical; wetlands; hazardous materials; political; funding of the design and construction; and community action.
- Contractor risk assignment includes: schedule; finance of the vehicles; all performance requirements including, quality assurance and quality control, and operational performance.

Discussion

QUESTION: Should there be a policy decision to make the environmental process smoother for transit projects when compared to other types of projects?

ANSWER: The FTA approach of imposing environmental considerations early on is correct. The FHWA has a different approach allowing for environmental consideration after design, thus increasing the risk of litigation.

AUDIENCE: No agency will promote the relaxation of current environmental laws.

QUESTION: Were there any FTA funds involved in

the internal light rail project at the San Francisco International Airport?

ANSWER: No, this light rail system did not use any FTA funds. It was funded by the Airport.

QUESTION: Have there been any surety bonds issued for the operation phase of a transit system?

ANSWER: No, there is a type of bond called the maintenance bond that covers the contractors liability for 5 years after construction.

QUESTION: Can we do away with bonds in a turnkey procurement approach?

ANSWER: Bonds are required if the project is being funded by either the state or federal government.

QUESTION: Why don't Surety Companies move faster against contractors?

ANSWER: There is a vast difference in the responses of different sureties companies. The surety bond is a tri-party agreement and all responses have to be addressed and balanced this way. The Surety Association of America wants to spread the word on good experiences. Sometimes the company is called too late. The last thing a surety company wants to see is a default.

QUESTION: How do we protect the process from litigation at the very start?

ANSWER: By promoting agencies working together early on to resolve issues. All disciplines should be involved in the environmental process.

QUESTION: Is there something about a mass transit

project that makes it harder to assess risk?

ANSWER: The challenge of a mass transit project is the operations and maintenance phase with the systems and vehicles providers. The trend now is to organize teams in which the risks are distributed among the members.

QUESTION: Why did New Jersey choose a fifteen year operations and maintenance contract?

ANSWER: The agency thought it was a good approach since it established a long-term relationship in which the contractor/operator had to assume responsibilities for the success of the project. The agency made some revenue guarantees and asked the contractor to estimate the cost of operation.

QUESTION: Wouldn't early public participation generate more opposition to a project?

ANSWER: The opposition will be there, the earlier you deal with it the better. Ultimately, the people will be the customers and if you do not begin by being a good neighbor you will face problems later on. Public participation should be encouraged.

QUESTION: Regarding environmental concerns—How is ownership of the issue dealt with?

ANSWER: The agency is the owner of the process and ensures the contractor complies based on a partnership. As environmental concerns arise the agency should stand up and face them. Contractors are recognized as the primary mechanisms for allocating risks among the participants in transit projects.