Los Angeles County Metropolitan Transportation Authority

ARTHUR ANDERSEN

FINAL REPORT OF RECOMMENDATIONS

FOR

CONTRACT NO. LST-135-95

VOLUME A

APRIL 24, 1995

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VOLUME A

CHAPTER

CHAPTER I
Volume A

EXECUTIVE SUMMARY

1 PURPOSE OF THIS REPORT

The MTA (Authority) was established in April 1993 to assume the combined responsibilities of the Southern California Rapid Transit District (SCRTD) and the Los Angeles County Transportation Commission (LACTC). Its mission is to design, construct, operate and maintain a safe, reliable, affordable and efficient transportation system that increases mobility, relieves congestion, improves air quality and meets the needs of Los Angeles County residents.

During 1994, the MTA experienced a series of incidents culminating in the temporary withholding of federal funding appropriations for construction of the Red Line - Segment 2 and Segment 3 rail transit projects. In November 1994, the MTA Board retained our Firm to analyze and develop recommendations to help the Authority create a cost effective, accountable organization for the construction of rail projects in Los Angeles County.

We were requested by the MTA Board to focus our study on the Construction Division within the MTA, that is responsible for designing, building, testing and integrating all rail transit projects. Our scope of work, which is defined by contract No. LST-135-95, contains eight (8) specific tasks to be addressed. The description of each task, as defined in the contract, is shown in Exhibit 1 (*Note: We have reorganized the listing of the tasks as they appeared in the contract to facilitate the flow of discussion in our report. The task definitions remain unchanged.)*

ARTHUR ANDERSEN'S
SCOPE OF WORK

	Task No. per contract
• Review the MTA's construction organization and the decision-making process and make recommendations for improvements.	5
• Review the current responsibilities of the Construction Management (CM) firm and make recommendations on which functions, if any, should be transferred to MTA staff.	3
• Review existing safety and quality assurance procedures and make recommendations on how to improve and upgrade them. Proven practices in the urban rail construction industry shall be used.	7
• Review the cost control process to determine who has responsibility at present for control from project inception to completion. "Inception" includes preliminary design and other factors associated with project start-up. Recommend changes to present system to strengthen cost control.	2
• Review the existing change order and claims process and make recommendations to strengthen the process to insure that the best interests of the MTA are secured.	6
• Make recommendations on a set of progress reports to the Board that will provide the status of each project and highlight issues with each construction project.	4
• Review the contract award process along with other transit properties who have rail construction programs and make recommendations on possible delegation of approval authority to the Construction Committee of the Board.	1
• Review the current risk management program and ensure that the level of reserves is sufficient to cover current claims. Further, review future claims reserves planning and make recommendations concerning sufficiency for future claims.	8

Exhibit 1

As we were completing our report, we became aware, through the media, of the confidential MTA Inspector General (IG) report identifying a number of concerns regarding the recent contract award process for the CM contract on Red Line - Segment 3. With this in mind, we would like to emphasize that our engagement was not purported to be, and was not, any of the items listed below:

1. A development of a "vision" or long term plan for the MTA.
2. A financial audit for the purpose of expressing an opinion as to the fair presentation of the MTA's financial records and statements.
3. A management audit in accordance with government auditing standards for the purpose of identifying whether the MTA has complied with laws and regulations concerning matters of economy and efficiency.

4. A program audit for the purpose of assessing the extent to which the desired results of the MTA established by the legislature are being achieved.
5. An actuarial review of the adequacy of claim reserves.
6. A fraud audit for the purpose of identifying irregularities.
7. A position and compensation review for the purpose of redefining job descriptions and associated salary levels.
8. A "time and motion" study or "desk audit" of individualized work practices or work flow.

Our two - volume (A and B) report of recommendations is in response to each of the 8 tasks identified in Exhibit 1. The approach followed by us, to properly address all major issues related to our work, is described in Section 3 below, which also covers the description of the respective contents of Volume A and Volume B, Parts I & II.

During our review of the Construction Division we identified numerous issues for which we provide recommendations. However, in our opinion, **there are Nine Critical Management issues which require the MTA's immediate attention and action.** Those nine critical issues are listed in the next section, which represents the Executive Summary of our recommendations.

2 THE NINE CRITICAL MANAGEMENT ISSUES WHICH, IN OUR OPINION, REQUIRE THE MTA's IMMEDIATE ATTENTION AND ACTION

The MTA is a relatively young organization still experiencing birthing pains resulting from the merger of two very different entities, the LACTC and the SCRTD. The Authority's challenge is to simultaneously manage one of the nation's largest bus operations and the country's largest public infrastructure project in a demanding, highly visible, political arena. Under these circumstances, it is not surprising to find numerous issues requiring the MTA's immediate attention and action. However, these challenges should not diminish the accomplishments of the last two years which include: transporting approximately 400 million annual bus and train riders; maintaining these service levels following the January 1994 earthquake and despite significant annual operating and capital budget shortfalls; completing over $500 million of rail transit construction; and as part of the ongoing merger process, establishing the new Construction Division, to more closely integrate construction activities into the overall MTA organization.

As stated previously, we have identified numerous issues and have formulated related recommendations which we will cover in detail later in this report. However, it is often the case that a limited number of critical issues are the causes of numerous deficiencies, since they can have a ripple effect throughout an organization, especially in construction. This is the case for the MTA.

The nine critical issues we have identified, which are briefly discussed in this section, help explain why the MTA's rail construction activity suffers from many of the other deficiencies covered in our report. As a result, when reading later in our report, the description of specific issues and our related recommendations, one should keep in mind these nine critical issues.

Also, with respect to implementation of the recommendations contained in our report, these nine critical issues must be fixed first. Otherwise, except for isolated cases, the implementation of our other recommendations would be much more difficult and less likely to succeed.

The nine critical issues, which in our opinion require the MTA's immediate attention and action are listed below:

1. **The MTA urgently needs to hire a strong construction leader with extensive hands-on rail construction/tunneling experience** to head the MTA's Construction Division as the Executive Officer of Construction.

2. **The Office of the Chief Executive Officer (CEO) must provide trust and support to the future leader of Construction and to the Construction Division as a whole.** This can best be accomplished through hiring the contemplated Chief Operating Officer (COO) whose experience must include hands-on exposure to rail construction.

3. **The MTA Board must demonstrate trust and support to the MTA's Construction Division,** once they are convinced that all other critical issues listed here have been resolved by the MTA. They must step back from micro-managing issues and concentrate on the "big picture" matters as they relate to construction.

4. **The future leader of Construction must restore a team spirit among the Division's key managers and leaders.** The key to properly managing the construction activity will be energizing the Division, through its leaders, **around the shared value of urgently restoring the Division's oversight role.** This will require **an aggressive entrepreneurial spirit and approach,** coupled with clear evidence of actions to demonstrate to all players (MTA staff, consultants, contractors, MTA Board) that the Construction Division is serious about protecting the MTA's interests. All players must be motivated **to fix the problem rather than the blame, which will encourage people to take responsibility and accountability for their actions** rather than be risk adverse out of fear of retribution.

5. **The MTA urgently needs to significantly invest in human resources by (a) increasing the actual Construction Division headcount by at least 50%, (b) hiring skilled personnel and (c) upgrading the skills of current staff through training, coaching or other actions.** In this respect, the Division must reevaluate or confirm the staffing requirements developed for the currently approved project management plan (PMP) for each rail construction project. These steps are required since, after adjustment to the current scope of work of the division, actual current headcount appears to be about 65% short of the staffing requirements documented for the current Project Management

Plans (PMP). Two of those PMPs concerning Metro Red Line were submitted to and approved by the Federal Transportation Authority.

6. **The future leader of Construction must also establish an attitude of "healthy skepticism" within its staff as it relates to the contractual and business relationship with the Engineering Management (EMC) and Construction Management (CM) consultants.** This means: (a) clearly define what service is expected to be provided by the consultant (scope, schedule and cost); and then (b) play an effective oversight role on the consultant's deliverables, while maintaining the spirit of team work embodied in TEAMETRO.

7. **MTA management must show clear evidence by its actions that it strongly supports the efforts to elevate the level of importance of quality and safety relative to maintaining schedule and controlling cost.** This can best be exemplified by unequivocally supporting those individuals who would have just cause to issue a stop work order because of a quality or safety issue, thereby demonstrating to the entire construction organization (Agency, consultants, contractors) that MTA management is very serious about quality and safety.

8. **MTA management must show the MTA staff and consultants a willingness and conviction to have the true and complete cost picture of each project at any time.** Where appropriate, the staff can utilize confidential periodic reporting to the CEO to protect the MTA's interests in its relations with contractors and consultants. The CEO should then report to the Board on such crucial but sensitive issues, in a similar, appropriate manner.

9. **The future leader of construction must restore a strong emphasis on controlling cost of projects.** In this respect, priority focus should be given to (a) enhancing MTA's staff involvement on cost issues -- cost of changes, thorough cost control of consultants and contractors -- during the entire project life; (b) improving MTA's cost control capabilities, (c) preparing realistic budget commitments, and (d) stabilizing project designs which are currently subject to erratic changes.

3 PROJECT APPROACH AND REPORT CONTENT

In order to properly address all major issues related to the scope of our work, we approached our work by function. For that purpose, we identified seventeen (17) functions which are required for the proper execution of any MTA rail construction project. These functions are listed in Exhibit 2

17 CONSTRUCTION FUNCTIONS

- Engineering
- Real Estate
- Cost Estimating
- Contract Awards
- Contract Administration
- Billings and Payment Applications
- Resident Engineer
- Change Orders and Claims
- Project Control - Schedule
- Project Control - Cost (Cost Control)
- Project Control - Reporting and Management Reporting
- Safety
- Quality Assurance
- Quality Control
- Public Affairs
- Risk Management
- Human Resources

Exhibit 2

For each function, we analyzed the role of the MTA's Construction Division and its consultants, as well as the MTA's understanding of the scope of services to be provided by the function, and the quality of such services. We determined the functions strengths and weaknesses. Whenever weaknesses were identified, we investigated their causes and evaluated their impact, before proposing recommendations to improve the situation. *(Note: For some functions, including Engineering, Real Estate, Resident Engineer, Public Affairs, and Human Resources, our analysis was limited to matters having a potential impact on our eight tasks.)*

Our analyses, findings and detailed recommendations are presented for each of the seventeen functions in Volume B, Parts I and II, of this report. In addition to showing evidence for the issues identified and our recommendations, the content of Volume B helps

the reader understand each function, both in terms of construction activity in general and for the MTA in particular.

Our summary recommendations are presented in Volume A. Due to the nature of the nine critical issues identified and covered in the previous section, we considered it necessary to (a) briefly summarize the characteristics of rail transit construction in general and those particular to the MTA, and (b) to cover human resources issues first since they represent, in our opinion, the number one priority and have impacts throughout the various functions analyzed. Consequently, the first two chapters of Volume A, following this Executive Summary, discuss these matters. Chapters IV - XII separately address each of the eight tasks in the order previously described. Exhibit 3 lists each chapter in Volume A and the related task(s) where appropriate.

Volume A - Table of Contents

Exhibit 3

II. Background

CHAPTER II
Volume A

BACKGROUND

CHAPTER OUTLINE

This chapter will first cover the major characteristics of any transit Agency's rail construction, as follows:

Section 1: Nature of construction activity and major differences compared with operating a transportation system

Section 2: Specific features of construction activity

Section 3: Framework for Agency's management role in construction

Then characteristics and issues specific to MTA's Construction Division will be covered as follows:

Section 4: The start of the MTA

Section 5: MTA's management role in construction

Section 6: MTA's Construction oversight organization

Section 7: Credibility of MTA's rail construction program

Section 8: Other issues

1 NATURE OF THE CONSTRUCTION ACTIVITY AND MAJOR DIFFERENCES COMPARED WITH OPERATING A TRANSPORTATION SYSTEM

The Construction unit of any transit agency manages a project based business governed by an approved capital budget. Each of its construction projects is unique and is managed by a small team of non-unionized professionals, most having completed their college education. The projects vary in size, can be underground and/or above the surface, may use light or heavy rail, are located in different parts of the community with vastly different needs, and the time to complete these projects is measured in years.

The Operations unit of a transit Agency can in turn be described as a process or transaction based business that manages repetitive tasks. For example, everyday it schedules and operates a fleet of buses and trains over the same set of routes operated by thousands of mostly unionized employees. It routinely maintains this fleet and reorders the same parts and supplies, like tires and fuel. It manages its business with an operating budget and most of its tasks and/or projects are completed in hours or days.

On the basis of these descriptions one may expect these two units to have substantially different needs and support requirements from top management and therefore they would be managed as circumstances required.

When comparing the two activities, major differences exist also in risks and challenges faced by each activity, which are summarized below:

- **Operations**: **The risks** (cost, technical issues, delays) **are widely spread** throughout the Operations activities and their respective organizations (bus operations, bus maintenance, train operations, train maintenance, etc.) **and are reasonably manageable.** As a result, **the leverage between a cause (a problem) and its effect,** financial or otherwise, **is relatively small.**

- **Construction: The risks** associated with construction (cost, technical issues, schedule) **are highly concentrated** because of the technical complexity, financial magnitude and limited number of projects. Also, the conditions of execution of construction activity - from design to final acceptance through on site construction work - are generally complex. As a result, the management of construction related risks is subject to great and permanent challenge. Also, **the leverage between a cause (a problem) and its effect**, financial or otherwise, **is large**.

2 SPECIFIC FEATURES OF CONSTRUCTION ACTIVITY

Construction activity, whether transit rail construction or otherwise, has some specific features, which are outlined in the following paragraphs, and which further illustrate the risks and challenges encountered.

2.1 Numerous Players involved in construction activity creating numerous interfaces

Rail Transit Construction in the United States will generally involve the following major players:

- Agency construction staff
- Other Agency support staff
- Agency planning as well as operations Divisions
- Lead Engineering Management Consultant (EMC)
- Engineering Subcontractor consultants and/or Section Designers
- Major contractors for tunneling and stations construction
- Subcontractors to those major contractors
- Vendors for systems equipment (mechanical and electrical)
- Suppliers or specialty contractors for installation of the equipment, then for testing and integration
- Vendors for rolling stock
- Construction Management (CM) consultant
- Specialty consultants (soil investigations, etc.)

Such a list, which is not complete, is indicative of the interface issues among those players. In summary, the following questions are of great importance when numerous and different players are involved:

- Is the scope of each player well defined?
- Is the limit of scope between two or more players an issue or is it well defined too?
- Are the various scopes fairly stable or are they subject to substantial modification?

These questions illustrate how risks may occur because of poor scope definition, lack of scope stability and unclear interfaces.

2.2 Challenges specific to Construction

Some of the challenges and risks specific to construction are defined below:

- **Scope of project**: Is the project well defined, well divided into sub-projects for proper execution by each player? Is the scope of work stabilized - or frozen - early enough to allow proper estimating, planning, etc.?

- **Cost**: How reasonable is the original budget? How true and complete is the cost picture of a project at any time? And many other vital questions such as how optimistic or pessimistic is the latest cost estimate to complete the project?

- **Contingency**: Because of the risks involved, a reasonable contingency reserve is always necessary for construction projects. But how realistically is the contingency reserve established at the beginning of the project? How are the risks identified and evaluated, whether requiring a contingency or not? How realistically is the level of contingency evaluated again periodically during the project life?

Other challenges and risks exist with respect to matters such as **schedule of the project, quality and safety, nature and magnitude of changes, financing of cost overruns.**

All the above explain why rail construction activity in a transit Agency generally benefits from a specific organization and special attention and care.

2.3 Necessary Cooperation between Construction Division and other Divisions of the agency

Within an Agency, the Construction Division is to execute a rail construction project, which was planned and programmed earlier by another Division responsible for that task.

The execution of the project must fully address the needs of the ultimate customer of the Construction Division, i.e. the Operations Division of the Agency.

Finally, to work efficiently, the Construction Division requires the full, speedy and efficient support of any centralized function within the Agency.

All of the foregoing issues illustrate why cooperation between Divisions within an Agency is essential to the process of the rail construction projects.

Furthermore, the foregoing illustrates that the **Construction Division is sometimes a provider of services (i.e., a transit rail segment ready for operations, for example) to other Divisions of an Agency, but that in turn it is expecting to be provided with the right services by other Divisions.**

2.4 Strong Construction Leadership and team spirit required

This may appear as a common sense statement, but it is based on our extensive construction expertise as well as on our recent visits to other U.S. Transit Agencies.

A strong leader, with extensive hands-on construction experience, energizing a small team of managers around him, will drive all the construction players in the right direction, i.e., the respect of a Revenue Operations Date, together with cost containment, executed in a safe and quality manner, and only limited unforseeable surprises.

Most of the construction players will mirror the actions of the leader and his small team when fixing a problem.

2.5 Necessary trust and support of the Construction team by the Agency's Office of the CEO and Board

In light of the challenges faced by construction, what again may appear as a common sense statement is in fact also essential to the success of rail construction projects.

Regardless of the strength of the construction leader, he/she and his/her small team at first, then the whole construction division need trust and support of the Agency's Office of the Chief Executive Officer and Board. Such trust and support are essential to properly manage the construction projects and energize all the construction players, with the necessary aggressive entrepreneurial spirit and approach, towards protecting the Agency's interests.

3 FRAMEWORK FOR AGENCY'S MANAGEMENT ROLE IN CONSTRUCTION

Before we discuss in the next section of this Chapter how MTA's Construction Division has organized its project management structure to carry out its mission, it is appropriate to discuss the various options available to an owner for its management role. On the basis of our industry experience and for purposes of this report, we have defined three alternatives for the owner - Administer, Oversee and Perform. These choices occur over a continuum as illustrated in exhibit 1.

MTA MANAGEMENT ROLE FRAMEWORK

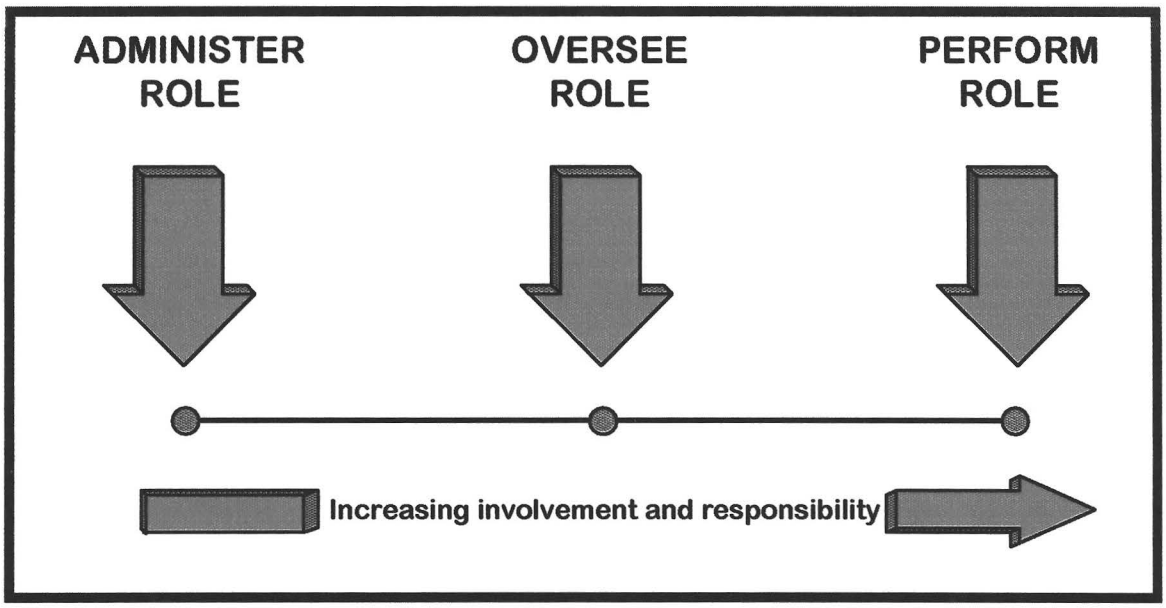


Exhibit 1

There are actually many variations or combinations of these three alternatives successfully used by owners today. We have simplified the number of alternatives to these three for purposes of our report. We define these alternatives as follows:

ADMINISTER - In the *ADMINISTER* role the owner has a small staff that administers the process of reviewing the project output to ensure compliance with the contract before approving payment. Sometimes, a consultant is part of the team providing both the oversee and perform roles. Other times no consultant is involved. An example of this situation is a Design/Build project. This structure is commonly referred to as "Turn Key" and performed for the owner by a General Contractor (GCS). The owner administers the GCS contract.

OVERSEE - In the *OVERSEE* role the owner has a larger staff that critically reviews all tasks the consultant performs, but on a periodic basis. The consultant (e.g. Construction Management [CM] firm) has the contract responsibility for ensuring that the contractors are meeting or exceeding their contractual obligations.

PERFORM - In the *PERFORM* role the owner has a large staff which performs all the tasks related to ensuring that the contractors[1] are meeting or exceeding their contractual obligations. A consultant is typically not part of the team because the owner has absorbed the consultant's functions.

An example using cost control will illustrate the differences between these alternatives:

- If the owner is **administering** the cost control function it checks for compliance with contractual terms (e.g. costs do not exceed contract total) and performs little or no critical analysis. The responsibility for such analysis rests with the consultant such as a CM.

- If the owner is **overseeing** the cost control function, it actually reviews all the work described above which is performed by the CM. The owner performs analysis to test the accuracy of the information and identify trends or issues, and challenges the results provided by the CM as a means of testing and increasing their validity.

- If the owner is **performing** the cost control function, it will collect relevant cost data from each contractor, analyzing it by contract, compiling the data for the project and assessing the overall propriety and impacts.

In our experience an owner's preference for developing an in-house organization vs. outsourcing to a consultant will typically have the greatest impact on the outcome of the decision. The strength of the other reasons or factors such as program schedule and economics, geographic location, and program reputation, will determine how difficult it will be to accomplish the owner's preference. We will discuss these other factors later in this chapter.

[1] For purpose of this definition , we define the contractor as the party providing actual construction services (e.g. tunneling, station construction)

4 THE START OF THE MTA

MTA as Defined by Assembly Bill No. 152

The MTA was established by the California State Legislature in April 1993 to assume the combined responsibilities of the SCRTD and the LACTC. Its mission is to design, construct, operate and maintain a safe, reliable, affordable and efficient transportation system that increases mobility, relieves congestion, improves air quality and meets the needs of all Los Angeles County residents.

The Assembly bill created an Authority consisting of 14 members. The composition of the Board members is defined in exhibit 2. Each member has an alternate who can be present and speak at all Board meetings with the member but can vote only in the member's absence.

LACMTA Membership

Five members of the Los Angeles County Board of Supervisors
The Mayor of the City of Los Angeles
Two public members and one member of the City Council of the City of Los Angeles appointed by the Mayor of the City of Los Angeles
Four members, each of whom shall be a mayor or a member of a city council appointed by the League of California Cities
One nonvoting member appointed by the Governor

Exhibit 2

The bill also directed the Authority to reserve to itself exclusively, certain powers and responsibilities which included: establishment of overall goals and objectives and the Authority's organizational structure; adoption of the aggregate budget; and approval of final rail corridor selections and contracts for construction and transit equipment purchases exceeding five million dollars ($5,000,000). A complete set of the Authority's minimum powers and responsibilities as defined in the bill can be found in exhibit 3.

LACMTA MTA Membership Powers and Responsibilities

- ⇨Establishment of overall goals and objectives
- ⇨Adoption of the aggregate budget for all organizational units of the Authority
- ⇨Designation of additional included municipal operators
- ⇨Approval of final rail corridor selections
- ⇨Final approval of labor contracts covering employees of the Authority and organizational units of the Authority
- ⇨Conducting hearings and the setting of fares for the operating organizational unit
- ⇨Approval of transportation zones
- ⇨Approval of the issuance of any debt instrument with a maturity date that exceeds the end of the fiscal year in which it is issued
- ⇨Approval of benefit assessment districts and assessment rates
- ⇨Approval of contracts for construction and transit equipment acquisition which exceed five million (5,000,000) dollars
- ⇨Establishment of the Authority's organizational structure

Exhibit 3

Today, the MTA organization reflects the structure defined above by AB No. 152 with the important addition of an Administrative Division as depicted in exhibit 4.

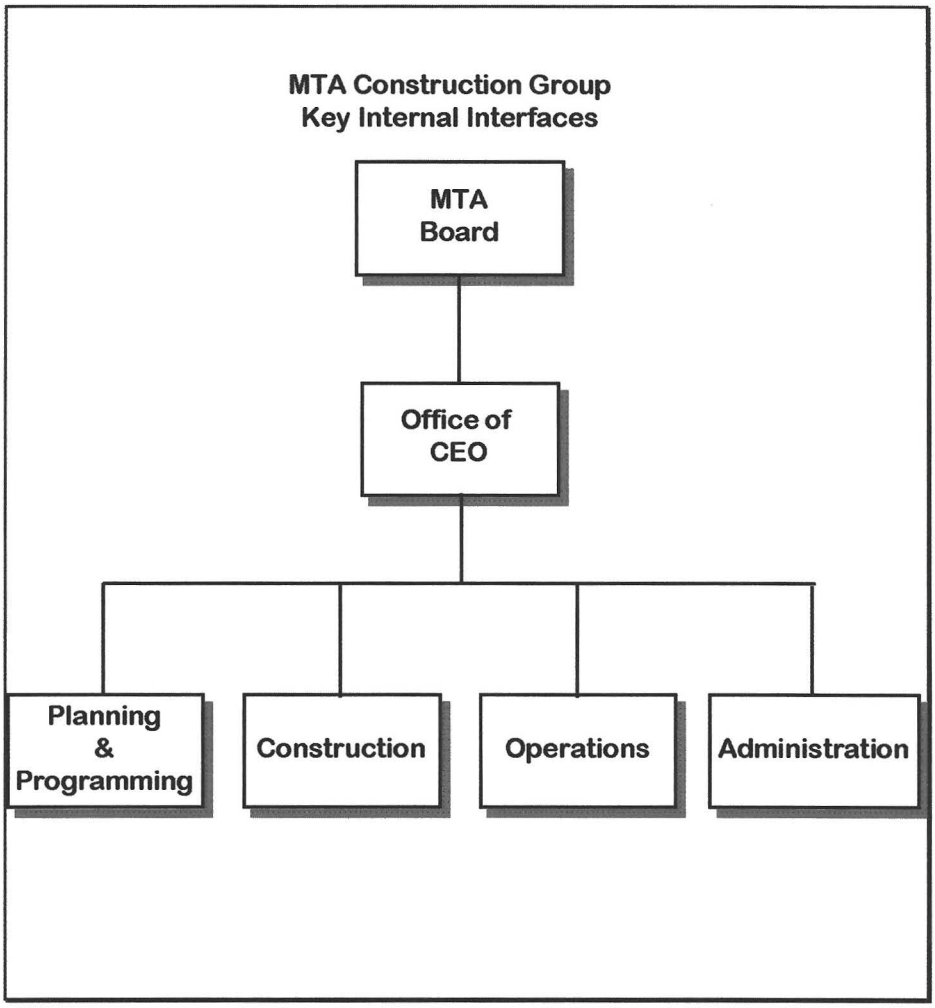


Exhibit 4

A closer examination of the Construction unit shown in exhibit 5 reveals an organization structured around the various ongoing projects currently under design or construction. It is interesting to note that the MTA is combining two segments of the Metro Red Line, that have different Revenue Operation Dates (ROD), Segment 2 and Segment 3 - North Hollywood, under one Project Manager. Quality and safety currently report to the Construction unit leader. This is a recent change reflecting the increased emphasis that Construction is placing on these two critical areas. *(NOTE: Prior to this change quality and safety reported to the leader of Technical Operations and received their day to day direction from their assigned project manager. We will discuss this issue in greater detail later in this report.)*

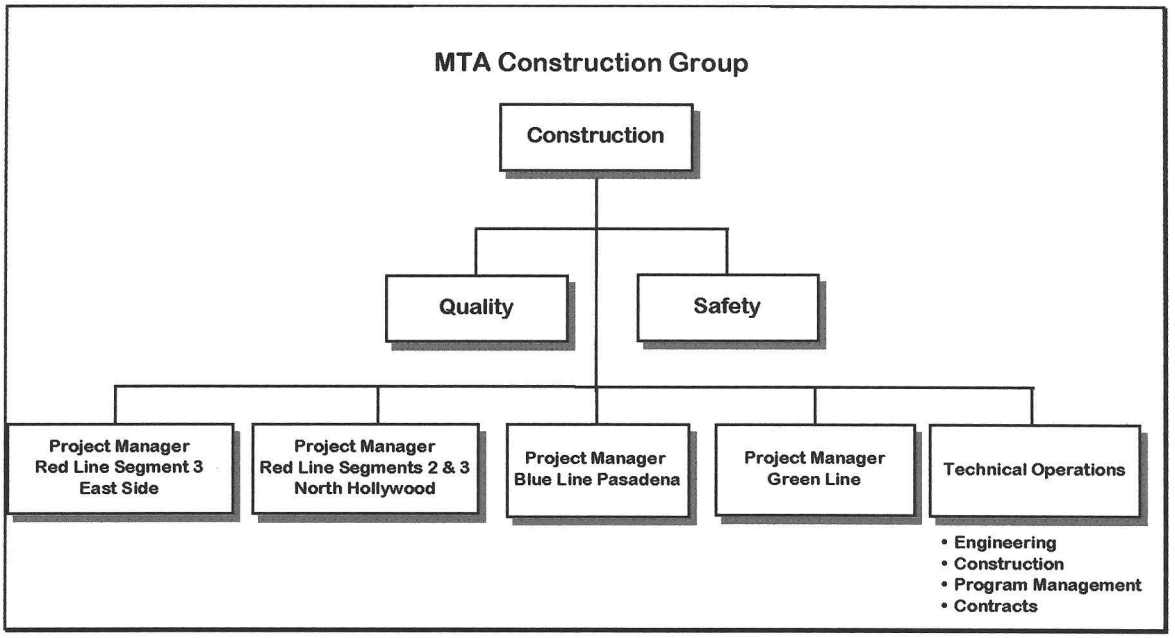


Exhibit 5

5 MTA'S MANAGEMENT ROLE IN CONSTRUCTION

Based on the definitions of the three alternatives previously discussed, we must first determine what is the current role of the MTA - *ADMINISTER? OVERSEE? PERFORM?*

Let's examine the factor of owner preference. For the MTA's Construction Group, there was a strongly established preference dating back prior to the MTA's existence for a lean organization of 150-200 people leveraged through a team of qualified consultants. A clear choice of the oversight role. Further evidence of this choice can be found in reviewing existing contracts and program management plans which clearly define the MTA's role to oversee the CM's performance.

However, since becoming part of the MTA, this approach has been questioned and there appears to be a growing preference of favoring a performing role and transferring CM responsibilities into the MTA. Evidence supporting this trend includes the recent transfer of CM responsibilities for quality assurance and quality control, and safety to the MTA for Red Line - Segment 2. Further evidence can be found in the "Request for Information & Qualifacations" (RFIQ) for CM services for North Hollywood for Red Line - Segment 3. The RFIQ clearly defines the MTA to be responsible for quality assurance and safety and introduces the possibility of transferring additional functions such as the Resident Engineer to the MTA.

We understand these recent actions to transfer quality assurance, quality control and safety to the MTA are part of an agreement between the MTA and FTA which reinstated Federal funding for Red Line Segment 2. However, during our review it has become clear that this transition is incomplete and in a state of flux. For example, in some cases, discussed elsewhere and later in this report, CM personnel have been seconded to the MTA to fill critical positions.

The MTA appears to be caught in between the oversee and perform role, a potentially dangerous position which needs to be addressed by MTA's top management immediately along with the new leader of the Construction unit as soon as that person is hired.

6 MTA'S CONSTRUCTION OVERSIGHT ORGANIZATION

On the basis of MTA Construction's choice of "oversee" as its owner's management role it has established the following three primary external relationships with an Engineering Management Consultant (EMC), Construction Management (CM) firms (one for each project), and various contractors and subcontractors which together form TEAMETRO. These relationships are depicted in exhibit 6:

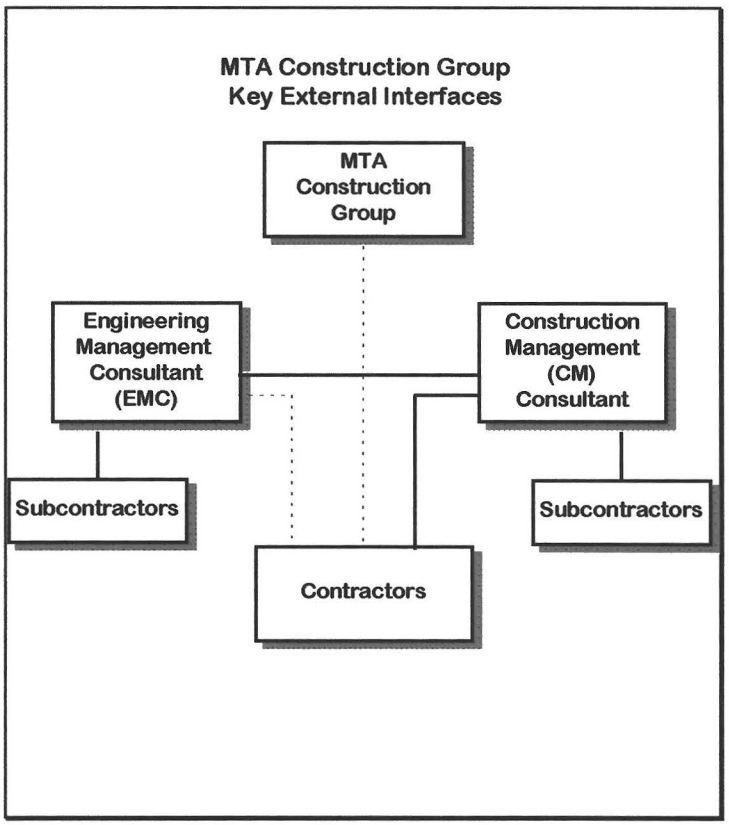


Exhibit 6

The quality of these relationships and how well Construction is performing its oversight role is the subject of detailed discussions later in this report as it relates to specific functions being performed by various members of TEAMETRO.

The Engineering Management Consultant (EMC) is primarily responsible for the design of the construction project. It reports directly to the MTA. The EMC is responsible for managing the subcontractors hired by the MTA to design various parts of the project (e.g., tunnels, stations). The details of the EMC's organization can be found in exhibit 7.

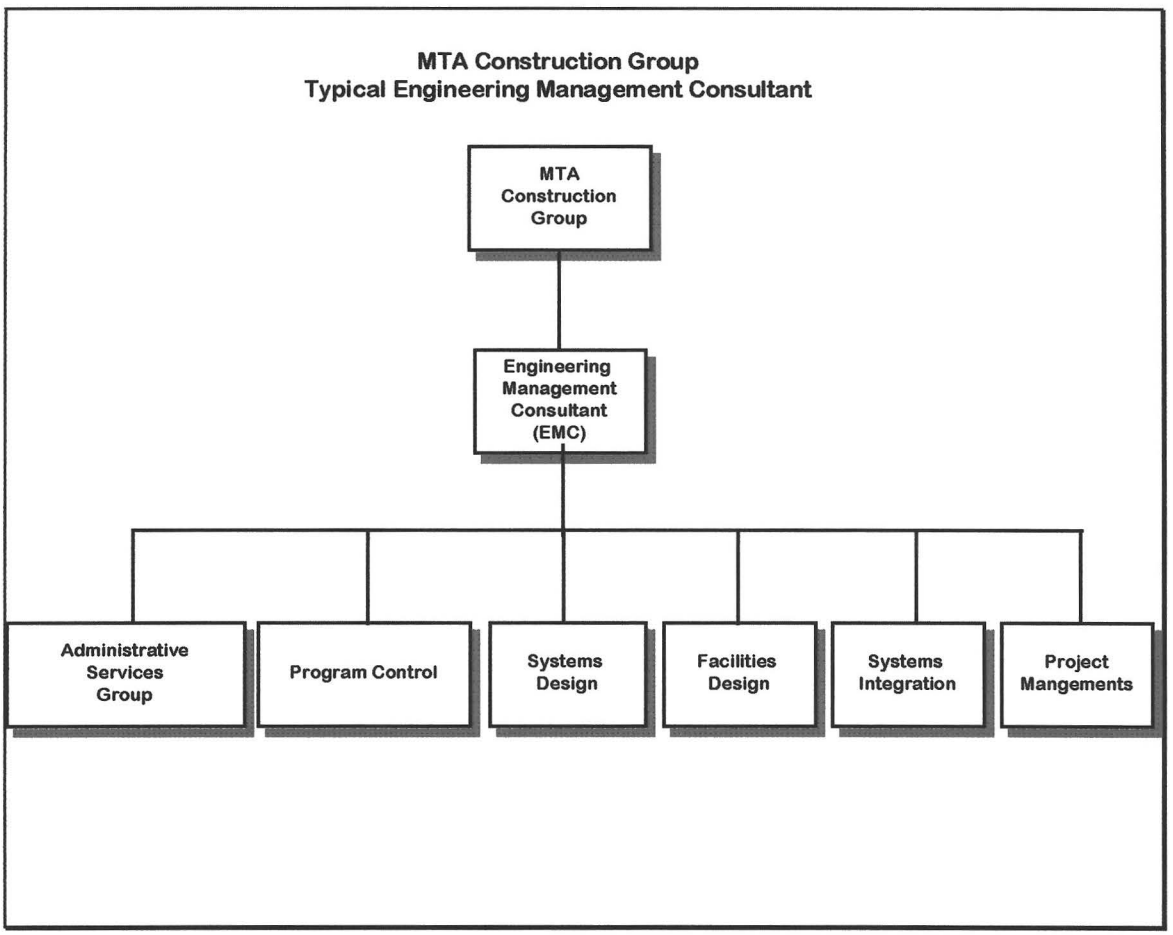


Exhibit 7

The Construction Management (CM) firm is primarily responsible for performing the Resident Engineering (RE) function as it relates to the administration and management of the construction contracts and to ensure that the construction is of specified quality with a management team capable of successfully assisting in the construction management on behalf of the Authority. (*Note: The RE function, as defined by the MTA, shall be executed through the RE Office at the construction site and shall have the necessary technical and administrative expertise and support to fully administer all provisions of the construction contracts and to meet the necessary project reporting and control procedures as established by the Authority).* A closer view of a typical CM's organization utilized by firms contracted by the MTA is depicted in exhibit 8.

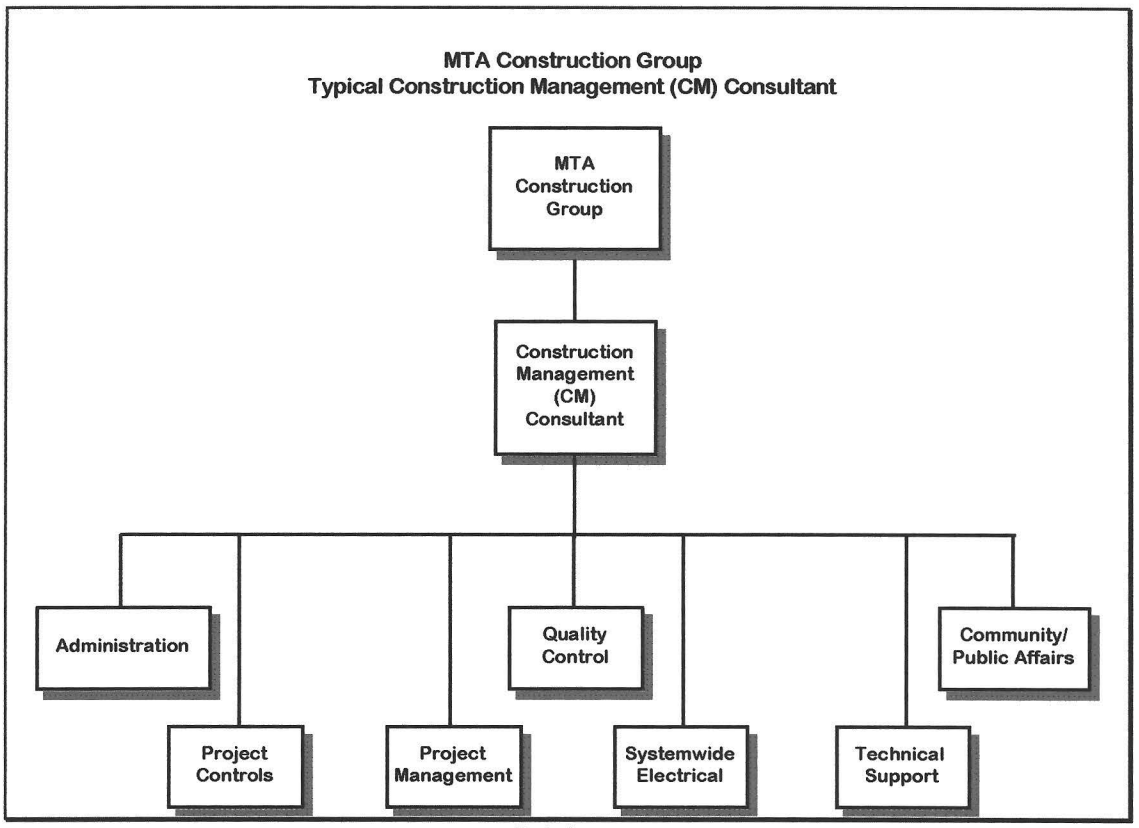


Exhibit 8

Our final view of the MTA's Construction Organization is depicted in Exhibit 9 which shows Construction's internal organization and important interfaces formed by the CM and EMC organizations and the internal service providers of other MTA units.

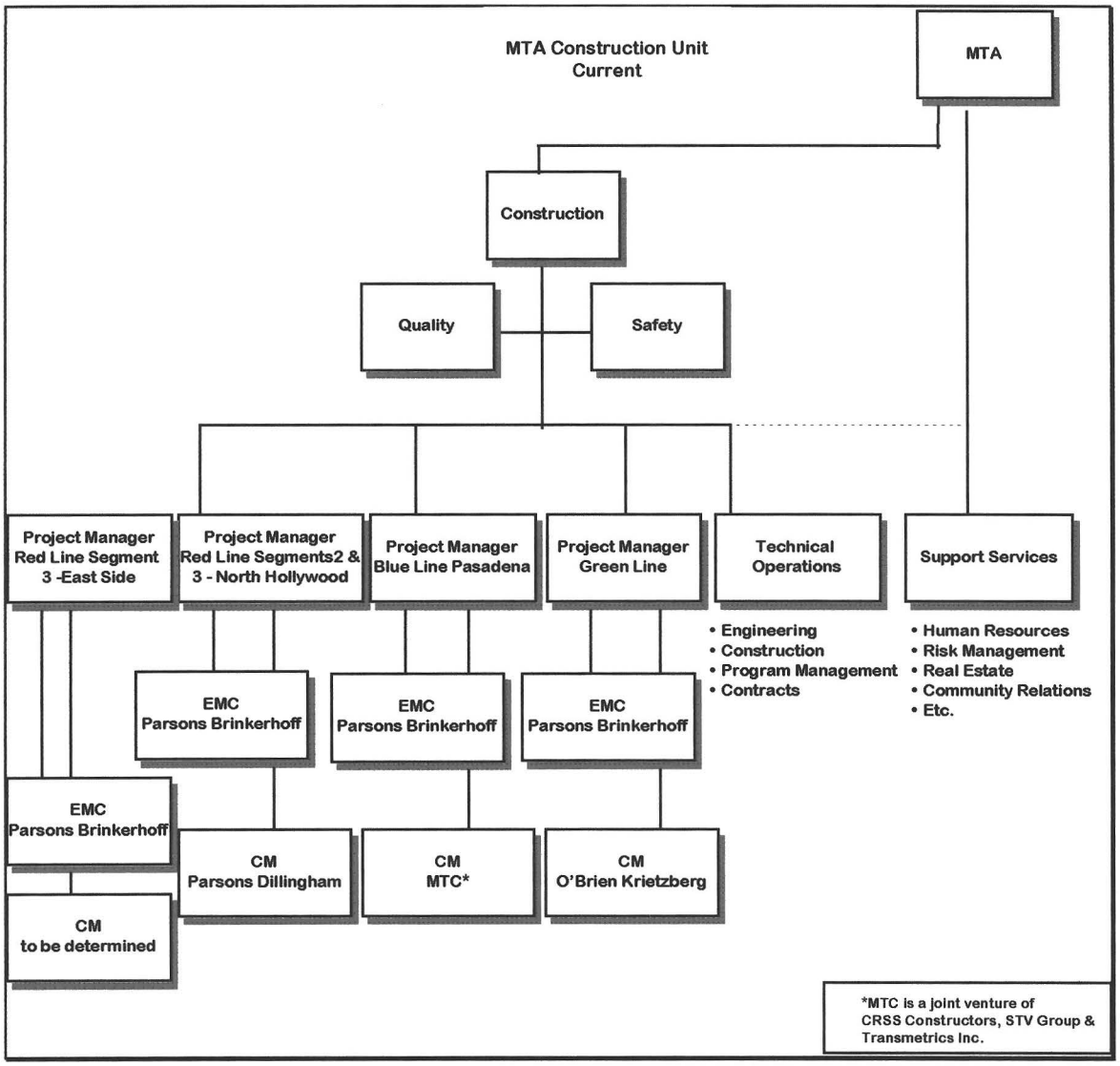


Exhibit 9

7 CREDIBILITY OF MTA'S CONSTRUCTION PROGRAM

We did not find clear indications that the MTA's construction program has yet established the necessary long term credibility. Both the Los Angeles area's current level of attractiveness and the program's current reputation present difficult challenges.

- **Program Economics and Schedule**: The MTA 20 year plan, while a step forward in realism, still appears to contain significant uncertainty regarding availability of funding, and if available, when and how much will ultimately be directed toward rail, bus or other alternatives.

- **Geographic Location**: The MTA has a challenge attracting the "best and brightest" to its Los Angeles County program. The area's image as the "Golden State" and land of opportunity has diminished in recent years. The county has been slow in coming out of the recession, still retains its relatively high cost of living and has been plagued by a series of natural and man-made problems.

- **Program Reputation**: The reputation of the MTA's rail construction program appears to have suffered recently. This can be attributed in part to: recent events involving Hollywood Boulevard; FTA funding withholding; the departure of the RCC President and the abolishment of the RCC; employee related issues such as the wage freeze, uncertainty regarding benefits, job classification and security; the current low level of mutual trust and support among the Board, MTA top management, MTA staff, its consultants (e.g., CM, EMC); and finally the MTA's image and reputation with the public. We have not seen evidence that this situation is improving. As such, it represents the strongest obstacle to attracting the "best and brightest".

8 OTHER ISSUES

The Construction Division did suffer, since the MTA's inception, from the overall financial difficulties faced by the Agency. Such difficulties resulted in constant and significant denial by the MTA management of staffing requirements made by the Construction Division, followed by cost reductions. Such actions resulted in further reductions of the number of

staff personnel working in the Construction Division.

Experiencing both the integration into the overall MTA Organization and significant staff headcount freeze or reductions, seems to have been fairly painful to the Construction Division.

In addition, in October 1994, the Construction Division lost its Executive Officer, who has not been replaced since.

As of today, strong construction leadership does not exist. Trust and support does not exist from the MTA's Office of the Chief Executive Officer or from the Board.

The foregoing may be summarized as follows:

The Construction Division of the MTA has been heavily shaken over the last two years.

III. Investing in Human Resources: The Number One Priority

Construction Division Staffing	Positions
Current Staffing	141
Total urgent current staffing needs, as above	69
Total minimum required staffing level for FY 95	210

Exhibit 3

We understand that the MTA constantly follows the practice of filling many open positions, as they become vacant or as a new need is identified and approved, with consultants' seconded employees. As noted later in this Volume A - in Chapter VI on Quality and Chapter VIII on Safety - we do not concur with such a practice.

Seconded employees are not MTA staff. The MTA must play an oversight role on construction activity and is responsible for large expenditures of public funds. Such a role cannot be played long term with the same efficiency by seconded personnel, whose professional careers are not with the MTA. During short term transition periods, the use of seconded consultants' employees can be considered valuable to the Authority. Beyond such very short transition periods, issues related to the need for independent assessments or adequate protection of MTA's interest preclude such a practice from being a viable alternative.

4 EFFICIENCY OF THE HUMAN RESOURCES FUNCTION

Based on a status report of vacant positions prepared by the Construction Division's Program Management function, the following findings related to time intervals experienced (all times in calendar days) in hiring approved but vacant positions, have been identified.

- Average time all current openings have been vacant = 97 days
- Average time experienced from request to advertisement of a position = 78 days
- Average time experienced from request to offer = 141 days

These findings are developed below:

a. **Existence and Length of Vacancies:** The Construction Division is expected to play an oversight role on large expenditures for the MTA despite, (a)experiencing important vacancies, and (b) enduring these vacancies over a significant period of time. We have evidence that the current situation is not an isolated case. Experiencing long-lasting vacant positions is a real threat to the control of construction expenditures for projects like Red Line - Segment 2 which is scheduled to have a total duration of some 83 months.

   The challenge of performing true design and construction oversight is made even more daunting when the vacancies experienced include the position of the Construction Executive Officer., vacant now almost six months.

b. **Excessively Long Hiring Process:** Construction Division managers have, on several occasions, voiced their concerns over the inability to quickly fill all their authorized positions. As the above figures demonstrate, on average, nearly five months elapse before a request for a position results in an offer being made to a candidate. Of these five months, 55% of the delay is internal to the MTA.

Because most of the positions under active recruitment for the Construction Division require skilled management experience, limited opportunity exists to reduce the timing duration of two months from position advertisement to hiring. However, the time it takes the MTA to bring a job proposal to the market is far too long in absolute terms, and extremely long with respect to Construction Division challenges. When maintaining schedule and cost control are of the essence, an efficient organization should be able to advertise jobs as quickly as one to two weeks after the need has been identified.

Because of the very high number of current vacancies and additional staff needs covered in the preceding two sections, **the foregoing efficiency problem needs to be fixed urgently**.

5 PROJECT MANAGEMENT PLANS

The total minimum required staffing level for FY 95 has been identified to be 210 positions for the Construction (see Exhibit 3). This is 24 positions lower than the staffing requirement documented for the current Project Management Plans (PMP), after adjusting for the Division's current scope of work and for the effect of our recommendation on quality control.

Dealing effectively with such a difference is essential from both an internal and an external perspective.

Internally, we understand that the PMPs are the MTA's reference document for definition of scope, responsibilities, and resulting organization and staffing models for each rail construction project.

Externally, the two PMPs concerning Red Line - Segments 2 and 3, have been previously submitted to and approved by the Federal Transportation Authority.

6 HISTORY OF DENIED STAFFING REQUIREMENTS

Over the last two years the Construction Division endured constant and significant denial of staffing requirements by the MTA management. Furthermore, the Construction Division faced other obstacles over the last two years in staffing even to the level authorized and was sometimes forced to actually reduce its actual headcount.

7 OUR RECOMMENDATIONS

Recommendation #1: **The MTA urgently needs to hire a strong construction leader with extensive hands-on rail construction/tunneling experience** to head the MTA's Construction Division as the Executive Officer of Construction.

Recommendation #2: The Office of the Chief Executive Officer **(CEO) must provide trust and support to the future leader of Construction and to the Construction Division as a whole.** This can best be accomplished through hiring the contemplated Chief Operating Officer (COO) whose experience must include hands - on exposure to rail construction.

Recommendation #3: **The future leader of Construction must restore a team spirit among the Division's key managers and leaders.** The key to properly managing the construction activity will be energizing the Division, through its leaders, **around the shared value of urgently restoring the Division's oversight role.** This will require **an aggressive entrepreneurial spirit and approach,** coupled with clear evidence of such actions to demonstrate to all players (MTA staff, consultants, contractors, MTA Board) that the Construction Division is serious about protecting the MTA's interests. All players must be motivated **to fix the problem rather than the blame which will encourage people to take responsibility and accountability for their actions** rather than be risk adverse out of fear of retribution.

Recommendation #4: **The MTA urgently needs to significantly invest in human resources by (a) increasing the actual Construction Division headcount by at least 50%, (b) hiring some 69 skilled professionals and (c) upgrading the skills of current staff through training, coaching or other actions**

Recommendation #5: The efficiency of the Human Resources function, as it relates to the current needs of construction division, requires specific temporary organization change. **A "tiger team" or task force should be established immediately to serve Construction's Human Resource needs.** This task force would include additional HR personnel beyond the usual compliment that currently serves the Division. These additional people would also be co-located for the duration of the task force which would end when Construction's HR crisis has passed.

Recommendation #6: **The Division must reevaluate or confirm the staffing requirements developed for the currently approved project management plan (PMP) for each rail construction project.** These steps are required since, after adjustment to the current scope of work of the Division, actual current headcount appears to be 93 positions or about 65%

short of the staffing requirements documented for the current project management plans (PMP). Two of those PMP's concerning Metro Red Line were submitted to and approved by the Federal Transportation Authority.

Recommendation #7: **The future leader of Construction must also establish an attitude of "healthy skepticism" within its staff as it relates to the contractual and business relationship with the Engineering Management (EMC) and Construction Management (CM) consultants.** This means: (a) clearly define what service is expected to be provided by the consultant (scope, schedule and cost); and then (b) play an effective oversight role on the consultant's deliverables, while maintaining the spirit of team work embodied in TEAMETRO

Recommendation #8: **Seconded employees should be utilized only on a very temporary basis and MTA's open positions should be filled by MTA staff as quickly as feasible.**

This chapter in Volume A has only addressed the most critical recommendations for this function. Chapter XVII of Volume B addresses the Human Resources function in greater depth and includes the entire compliment of our recommendations. In addition, Chapter XVII of Volume B discusses our detailed findings, analysis and justifications in support of all our Recommendations.

CHAPTER IV
Volume A

MTA'S DECISION MAKING PROCESS
Our recommendations - Task No. 5

1 SUMMARY

In a public authority like the MTA, decision-making is a hierarchical process, complete with multiple sign-off and/or approval levels. It is not unusual for a decision to include (a) the Construction Division of the MTA (b) the MTA Board, and (c) the Office of the CEO.

This approach to decision-making can slow the process and may not always yield the best decisions if everyone involved believes their other colleagues will check the issue carefully. We found this attitude to be present at the MTA. In addition, the MTA decision-making process is hampered by a lack of both leadership and willingness of individuals or groups to accept responsibility for their decisions throughout the MTA.

Our comments in this chapter will focus on the role and performance of each of these decision-making groups and include our findings and recommendations.

2 CONSTRUCTION DIVISION OF THE MTA

2.1 The current absence of a leader of the Construction Division is the greatest handicap

During the last almost six months, the Construction Division has been without a permanent leader. During this same period the organization did, and continues to, face several of its most severe challenges. This Construction Division leadership position is critical to the ultimate success of the MTA organization as a whole, not just the Construction Division.

This fact was verified by our visits to four other transit properties. In every case, each property was led by a person who implemented his or her clear definition of how to organize and manage their Construction Division, which we have termed "owner's preference". Every property was different. Each was successful by its own standards. The

MTA today does not have that clear leadership preference. In its absence, others inside the MTA are beginning to experiment with their personal visions of the division. The Construction division's mission, and how to achieve it, is becoming blurred.

Given the issues confronting the organization today, this absence of clear vision can be exceedingly dangerous, particularly in the complex construction, social, and political environment that exists today.

2.2 The significant shortage of MTA Construction personnel is eroding decision making capabilities of remaining staff

During the first two years of the MTA's existence, Construction had encountered increasing difficulty in filling open positions included in their capital budget. In addition, certain positions throughout the Construction Division need to be upgraded if the MTA is to successfully execute its mission.

For example, in the Red Line - Segment 2, the critical position of Deputy Project Manager - Construction was vacant for about 4 months until January 1995 and had been previously occupied by three different people over the last two years including a seconded CM employee.

The Construction Division is currently actively attempting to fill 61 positions, including the permanent position of the Executive Officer for Construction addressed in paragraph 2.1. In addition, after taking into consideration all our evaluations of staffing needs as covered in the previous Chapter III, there is a net need of 8 more positions to fill.

These unfilled human resource needs appear to be caused by several factors: (a) MTA top management dictated headcount reductions following denials of staffing requests; (b) A new, cumbersome, time consuming, bureaucratic hiring process mandated by the MTA; (c) The centralization of Human Resources and the subsequent erosion in responsiveness; and (d) The increasing difficulty of attracting qualified people to the MTA program.

This situation has existed during a difficult period for the Construction Division and has severely impacted the staffs' morale and their ability to do their job.

2.3 MTA's staff lacks oversight and accountability in the management of its consultants and contractors

The manner in which the MTA's Construction Division has managed its team of consultants and contractors lacks accountability and has prevented the parties from fulfilling their TEAMETRO partnership concept. TEAMETRO is the name of the partnership the MTA's Construction Division has formed with its team of consultants and contractors. As is the case with most partnerships, it is an arrangement created for the mutual benefit of all parties involved in accomplishing a mutual objective, in this case, "To build a world-class Metro Rail System for the Los Angeles Community".

Our review has identified instances where the Construction Division has not aggressively protected the best interest of the MTA. This type of behavior appears to be prevalent throughout most of the organization. These actions appear to have been taken in good faith in the acknowledged interest of maintaining good partnership relations. However, the consequences of Construction not maintaining a healthy level of skepticism related to the actions of its consultants and contractors, can be significant for the MTA. It can manifest itself in distrust, cause communication failures and poor management decisions, which we believe have resulted in more change orders being approved for higher than expected cost.

2.4 The Construction Division is a schedule driven organization, often at the detriment of cost, quality and safety

The Construction Division is clearly focused on maintaining schedule to meet the Revenue Operations Date (ROD). A clear danger with this focus is the consequence of the tradeoffs being made between maintaining schedule versus quality, cost, and safety.

A successful construction program is continuously making these types of tradeoffs during the course of the project. When each of these important factors is given due consideration, the correct decision will likely emerge. When one factor, like schedule, is often given priority over the others, bad decisions can result that are harmful to the project.

Factual experience described in various chapters of Volume B, as well as comments from discussions with MTA staff and consultants, confirm this state of mind.

For example, to maintain schedule, the Request for Qualification (RFQ) for CM services for Red Line - Segment 3 North Hollywood was issued prior to understanding and addressing all the implications of the organizational changes recommended by the FTA and being studied at the time by our Firm. This may have lead to higher cost quotations from the consultants to cover the uncertainty they would face in the future and/or could ultimately lead to subsequent significant changes to the CM's contract that could increase cost.

2.5 Our recommendations

Construction Division:

Recommendation #1: Support CEO efforts to hire leader for Construction Division as soon as possible. It must be the MTA's highest priority.

Recommendation #2: Help MTA top management understand Human Resources (HR) requirements and/or make tradeoffs of fewer people versus longer schedule for projects. Work closely and effectively with HR staff. Be responsive to their needs for accurate and timely forecasts of Construction's human resource needs. Measure their performance. Tell them when they succeed and, when they don't, help them to understand how they can improve. Enter into contract for their services that spells out mutual agreement.

Recommendation #3: Elevate the priority of quality and safety by including these two factors along with cost and schedule in every Division decision to fully understand the impact and tradeoffs of the outcome.

Recommendation #4: Clean up ambiguity in criteria for issuance of stop work orders.

Recommendation #5: Provide Board with timely, objective, accurate information to encourage fact based decision making and begin to rebuild trust in the staff's capability.

Recommendation #6: Support Board members' necessity to learn about the construction industry by understanding their needs and how to most effectively deliver information to them. If given the opportunity, participate at offsite training.

Recommendation #7: Work with Board members in between Board meetings to anticipate and answer questions to avoid micro-managing. Succeeding at this and the previous recommendation would begin to change the current "fixing the blame versus fixing the problem" attitude.

Recommendation #8: Help top management understand unique needs of Construction organization and, in turn, accept the need to standardize and/or equalize certain differences among MTA divisions for the good of the entire MTA (e.g. benefits, job descriptions, compensation policy).

Recommendation #9: Clean up any ambiguity in contracts that prevents the consultants from doing their job or the MTA from effectively overseeing performance. Then, challenge Construction organization to be more aggressive in protecting MTA's interest and maintaining a healthy level of skepticism regarding the consultants' actions and challenge consultants to do their job as specified by their contracts.

Recommendation #10: Require the CMs and the EMC to each physically co-locate a small liaison team of consultant personnel with the Construction Division. This proximity would provide quick access to the consultants and improve communications and teamwork. Use this as a test case to determine if fully co-locating the consultants with the Construction Division would be advantageous to TEAMETRO.

Recommendation #11: Ensure consultants and contractors are providing timely and accurate information. Get out in field and test their data. Share critical cost and schedule information with Board in timely fashion while protecting confidentially.

Recommendation #12: Encourage cross-functional teaming, particularly in the early stages of a project. Set up liaison teams to Planning and Programming. Encourage Operations to do same with Construction.

Recommendation #13: Continue and strengthen efforts to reengineer processes.

Consultants and Contractors:

Recommendation #14: Elevate status of quality and safety by your (i.e. consultant's and contractor's) leadership statements and actions: For instance, encourage making a tough decision that may impact schedule or cost to support a clear position regarding quality and/or safety; demonstrate the importance of quality and safety by the caliber of people responsible for these areas in your organization.

Recommendation #15: Work with MTA to identify and clarify ambiguity in contracts.

Recommendation #16: Help MTA identify and evaluate tradeoffs among quality, safety, cost and schedules.

Recommendation #17: Actively participate in TQM teaming efforts.

Recommendation #18: Support the Construction Division efforts to establish consultant liaison teams that are physically co-located at the Division to provide quick access to key consultant personnel and improve communication and teamwork. Evaluate if full co-location of all consultant personnel would be advantageous to TEAMETRO.

Recommendation #19: Continuously improve processes to decrease costs while improving quality and responsiveness.

Recommendation #20: Work to build trust among TEAMETRO partners and the Board by providing timely, objective and accurate information.

3 MTA BOARD

3.1 The Board has limited construction and transportation experience and lacks continuity

The MTA is handicapped by the makeup of the Board, whose members have only limited construction and rail transit experience, and by lack of continuity of Board and committee members.

As was covered in detail in Chapter II of this volume, all the voting members of the Board, with the exception of the two public members appointed by the Mayor of Los Angeles, are elected officials subject to periodic reelection to maintain their position on the Board. This impacts the effectiveness of the Board in two important ways:

- First, because most of the members are career politicians, they bring to the Board very limited experience in dealing with complex, multi-billion dollar construction projects that include an extensive amount of underground tunneling.

- Second, as elected officials, they have limited ability to control their continuous participation on the Board to gain a deep understanding of the complexities of construction and the issues facing the MTA. Since its inception in April 1993, 24 months ago, there have been twenty Board members who have served on the Board with an average tenure of approximately 16 months. Alternates turnover slightly more frequently than voting Board members. This situation is further exacerbated by the fact that a new Chairperson, who is elected by fellow members for only a one year term, can reappoint members to the various committees further destabilizing member continuity.

This lack of continuity forces the Board members to be very dependent on their own limited staff resources to understand MTA issues and to rely heavily on the MTA staff for guidance. The erosion of trust in the capability of the staff to do staff work makes this a difficult situation for Board members. However, there has been some progress made in this area with the recent appointment of four non-voting, ex-officio members of the Construction Committee who bring years of construction experience to the committee.

3.2 Decisions taken by the Board, which is divisive among itself, are often the result of a politically charged, rather than fact based decision making process

Too many of the decisions, both big and small, that decide the fate of Los Angeles County's future rail transit system are the result of a politically charged versus fact -based decision making process.

In an ideal world, MTA's decisions would be based entirely on their technical merit with due consideration given to the impact to cost, schedule, quality, and safety. However, the issues related to Board members, who are elected officials of limited construction experience and lack continuity, will often lead to a political versus fact based decision making process.

This situation is compounded by the Board's decision to allow alternate members present at meetings participate in the discussions even though they cannot vote when the regular member is present. It is not unusual for an alternate to have a different opinion than the regular member about an issue which further politicizes the decision process.

Two examples of political based decision making in the MTA's construction program are described below:

- Station entrances of Red Line - Segment 2 have been redesigned at the request of the Board, after the original design was essentially complete which resulted in significant delays and cost increases.

- The alignment of the Red Line - Segment 3 East Side project was extensively modified to satisfy political demands. This resulted in an alignment which is longer and more costly to build than it needed to be, and which has substantially more turns than desired by the Operations group, thus affecting vehicle wear and maintenance costs.

This process also impacts the effectiveness of the MTA staff, its consultants and its contractors since they cannot be certain of what decision criteria will be used by the Board to evaluate their recommendations.

3.3 Today, the MTA and TEAMETRO frequently approach problem solving from a "fixing the blame versus fixing the problem" perspective

This approach often finds the MTA and TEAMETRO spending time to first determine who is to blame for the problem rather than working together as a true team to fix or minimize the problem and position the MTA positively regarding the remedial action they have taken. This practice has been detrimental to the projects, the program, and especially the staff, consultants, and the contractors. It has given rise to a risk adverse culture that fears retribution for mistakes or unsuccessful efforts. This behavior is especially detrimental to a construction organization that is dealing with the inherent risk associated with construction activity and making risk related decisions every day. If this issue is not addressed, it will lead to increasingly dysfunctional behavior among the MTA staff, consultants and contractors. This was not always the prevalent behavior among members of TEAMETRO. However, during recent events as significant as the Hollywood Boulevard incident or as minor as a small, routine change order, the Board *(and MTA top management)* has spent time on fixing the blame then on fixing the problem.

3.4 The Board is not supportive of its staff and spends a significant amount of its time (and of staff managers' time) second guessing and micro-managing many facets of the MTA's daily operations

On a comparative basis with five other transit properties visited during our review, the MTA Board is the least supportive of its staff and the most divisive among itself. At its worst, it is exemplified by personal attacks on MTA staff members regarding their abilities and professionalism in public forums like Board and committee meetings or inflammatory statements regarding the staff's performance to the media. This lack of mutual trust and respect is readily apparent to most observers and destroys public confidence in the Authority and the ability of the MTA staff and the Board to work together effectively.

The MTA Board has adopted a style of micro-managing the MTA staff. The impact of the Board's micro-managing style is in two major areas:

a. Recall, the Board members charter as envisioned by the legislature, which was presented in Chapter II above, was to lead the Authority by setting policy, strategy, long

term planning, and budgetary oversight. However, the MTA Board spends a significant amount of its time second guessing and micro-managing many facets of the MTA's daily operations. For example, it is not unusual for Board members to question staff about relatively small dollar items of a million dollar change order. While this may be a legitimate concern, it is better handled prior to the meeting or assumed to be correct because the Board has confidence in the staff. This style of micro-management leaves the Board little time to complete its broader level responsibilities. The result is increased uncertainty in an already uncertain environment of changing funding priorities in Washington DC and a challenging California economy. The situation is worsened by the fact that the Board is primarily composed of elected officials. The responsibilities required of their elected position will often limit the amount of time they have available to spend on MTA related matters. Hence, Board member time available to the MTA is limited to begin with and is not well invested when it is squandered on micro-managing and second guessing MTA staff efforts.

We recognize that many of the Board members believe this micro-management style is justified due to recent events and an erosion of their confidence in the MTA staff. Nevertheless, it will be up to the Board to demonstrate the essential true leadership that can begin the process of restoring mutual trust between the Board and the MTA staff and focus energy on the important Strategic issues confronting the MTA today.

b. The MTA Board's micro-managing style appears to be largely responsible for the staff's current low level of self esteem and morale. In lieu of support and appropriate constructive criticism, the staff is subject to second guessing which often results in substantial additional workload but rarely different decisions. The inefficiency of this process is causing significant delays, additional costs, and a continuing erosion in the capability of the staff, due to departures of employees resulting from performance frustrations and the appearance of more supportive environments at other properties.

3.5 The Board's lack of a "big picture" perspective has been detrimental to the Board's time utilization and the decision-making process

The Board's charter is to lead the Authority by setting policy, strategy, long term planning and budgetary oversight. This requires the Board to step back and view the "big picture"

which includes:

- Defining its role and its relationship to the MTA staff,
- Approving the Authority's long term plan which includes a clear vision of an integrated transportation network for Los Angeles County,
- Identifying and procuring sources of funds for future transportation projects,
- Understanding the transportation expectations of the residents of Los Angeles County and providing guidelines to the MTA staff to meet those expectations,
- Understanding the progress of each of Construction's major projects including accurate estimates to complete, and securing additional funds for ongoing projects as necessary,
- Assessing the performance of itself and the staff in accomplishing the MTA's goals and taking corrective action as necessary.

An informal survey of Board members indicates that few, if any, are satisfied with the time they have spent on these responsibilities. Instead, they find their time consumed by many of the issues discussed earlier in this chapter. Consequently, the quality of their decision-making in these important areas is diminished.

3.6 Our recommendations

Recommendation #21: One of the biggest needs of the MTA is leadership. The MTA's top priority must be the hiring of a strong, experienced construction executive to lead the Construction Division. Due to the importance of filling the position of the Construction Division Executive Officer, it is suggested that a task force of selected Board members with construction experience be formed immediately to expedite the recruiting process.

Recommendation #22: Recognize leadership responsibilities and take the first steps. Initiatives might include off-site training. Consider a two to three day session. Begin with Board members only to establish goals and objectives. MTA staff can meet separately and do the same. Then invite MTA staff to participate with Board members and finally invite consultants to participate. Another alternative step is to visit other transit properties together with MTA staff to learn how other authorities deal with similar problems.

Recommendation #23: To increase construction experience and continuity on the Board consider several alternatives to the current approach to filling the Board: (a) a Board that represents various regions of the County, appointed by the Governor. (b) a Board whose members are directly elected as advocated by a bill recently introduced by State Senator Richard Polanco. If these alternatives are not feasible, especially in the short term, consider other steps to improve continuity: (c) a longer term for the chairperson, thereby potentially reducing the shuffling of committee members; (d) select alternates, where the current rules allow, on the basis of prior experience on other Boards and/or familiarity with the construction industry; (e) appoint additional non-voting, ex-officio members, who have significant construction industry experience, to every committee.

Recommendation #24: Work with staff to understand and solve problems together. Approach problems with a different attitude borne out of realization that Board is in this together with the staff. Revitalize the TEAMETRO concept updated to reflect the MTA's need for a stronger oversight position.

Recommendation #25: Change the Board "Rules and Procedures" to eliminate the alternate members participation in meeting discussions when their respective member is present. If alternates have a point to make they should make their position known to the member who can choose to add that point to the discussion. This process would shorten meetings by reducing discussions while still enabling alternates to make valuable contributions through their respective members.

Recommendation #26: Manage by facts. Take steps to limit the political influence in Board decisions.

Recommendation #27: Add the strong support of the MTA Board to the efforts of the Construction Division to elevate the priority of quality and safety by including these two factors along with cost and schedule in every Board decision to fully understand the impact and tradeoffs of the outcome.

Recommendation #28: Encourage and let staff do their job. Work with staff in between Board meetings to understand issues and regain confidence in staff judgment. Failing that, have CEO take action to improve quality of staff. Offsite meeting with staff could play a

major role here. Continue to challenge staff but do it in constructive and positive manner recognizing they are part of the team.

4 OFFICE OF THE CEO

4.1 In light of the breadth of issues confronting the MTA, the absence of people in the Office of the CEO, with significant hands on experience in rail construction, is a great handicap to effective leadership and proper decision making.

The MTA's Office of the CEO is stretched too thin to provide effective leadership to the Construction Division. During the first two years of the MTA's existence the CEO has had to address issues which included (a) a bus strike, (b) a fare increase dispute, (c) developing working relationships with a new Board and staff, and (d) several major incidents involving rail construction. In the midst of these issues the CEO was also trying to build the MTA from the ground up and integrate two very dissimilar existing organizations with strong cultures and a history of not working effectively together (i.e., SCRTD and LACTC). Exacerbating this situation was the absence of people in the Office of the CEO with significant hands-on experience with rail construction, particularly in tunneling. This environment made it very challenging for the Construction Division to obtain the attention, leadership and council of top management to confront tough issues like capital budget shortfalls, difficulty in hiring critical construction management positions and dealing with several very visible tunnel incidents. MTA's top management was often selectively focused on the other prime concerns discussed earlier. The impact to the MTA was that at certain critical times in the life of the construction program, the organization was unable to deal with situations in an effective manner, which lead to bigger problems with serious consequences (i.e., the temporary withholding of federal funding for the Red Line).

4.2 All four divisions of the MTA, (i.e., Planning and Programming, Construction, Operations, and Administration) are treated as one homogeneous entity, without adequate attention to the specific needs of Construction

The MTA was established by merging together the SCRTD and the LACTC, two very different organizations with significantly different needs. Nevertheless, MTA's top

management often treats the entire organization as one homogeneous division prescribing the same treatment for everyone. To effectively discuss this issue, it will be useful to recall the discussion in Chapter II of this Volume A describing the differences between Construction and Operations. Basically, we described Operations as a process or transaction oriented business that manages repetitious tasks like scheduling and operating bus and train lines. In contrast to this, Construction is project oriented, performing , for the most part, large, complex, yet different rail projects that take years to complete. On the basis of these descriptions, one would expect these two divisions of the MTA to have substantially different needs and support requirements from top management and therefore, decisions would be made reflecting differences.

However, in certain critical areas, MTA management treats these two divisions exactly the same. For example, in December 1993 the MTA proposed an across the board cost reduction review of twenty percent. This ultimately forced Construction to further reduce headcount during a period of increasing construction activity even though it already had 38 approved, open positions in its management ranks.. This action further eroded the ability of Construction to manage its projects since the alternative of extending the project schedule was not an option.

4.3 Significant need exists for improvement in cooperation among the MTA's four divisions

Despite the progress made since the MTA was established, there is still significant opportunity to improve how the Planning and Programming, Construction, Operations and Administration divisions work together to deliver a safe, reliable, affordable and efficient transportation system.

Since the establishment of the MTA there has been some improvement in the cooperation and teamwork of the four operating divisions of the MTA. This has been achieved primarily by (a) bringing these divisions together under the same Authority and (b) establishing the new Construction Division of the MTA. However, despite the progress made to date, when considering how far apart these organizations were two years ago, there is still significant room for improvement.

Furthermore, it is a widely accepted principle today, that up to 80% of the cost, reliability, safety and efficiency of a rail system is determined during the planning and design phases of a project. Without the active participation of Planning, Construction and Operations through the process from inception to completion it is very unlikely that the MTA can achieve its mission without significant construction cost increases, delays and potential reliability and maintenance problems. Examples of these problems vary, from major issues like excessive wheel wear on the Red Line primarily caused by Operations' inability to influence the amount and severity of curves in the alignment to relatively minor, although very practical issues, like the need to modify stations at each end of the Green Line to include restrooms not included in the original design for the train operator's convenience.

4.4 Our recommendations

Recommendation #29: The biggest need of the Construction Division is leadership. The MTA's top priority related to Construction, and therefore the CEO's, must be the hiring of a strong, experienced rail construction executive to lead the Construction unit.

Recommendation #30: The MTA must add a strong executive with significant experience in rail construction and tunneling, as soon as possible, to augment the Office of the CEO's skills and experience. Such a person, perhaps a senior executive functioning as a Chief Operating Officer (COO, a position currently under consideration by the MTA) could share responsibility for MTA leadership and provide construction focus previously missing in the MTA. In addition to overseeing the Construction Division, the new COO could also provide a big assist in integrating the MTA's four divisions.

Recommendation #31: Develop an understanding of the differences among divisions. Charge the COO to make the tough tradeoffs that balance individual division needs and interests of the entire MTA organization.

Recommendation #32: Accept the CEO's responsibility to ensure that the Divisions are working together and be prepared to take strong action with those who refuse to cooperate.

Recommendation #33: Continue championing efforts in total quality management (TQM) to help the organization develop understanding of quality concepts, especially the importance

of serving the internal customer. Also stress crossfunctional teams as the accepted way of developing a project from conceptual to operational stage and as the way the organization will approach problem solving.

Recommendation #34: Work with the Board to improve the MTA's performance in several areas discussed in the previous section:

⇒ Manage by facts. Take steps to limit the political influence in MTA decisions.

⇒ Add the strong support of the Office of the CEO to the MTA Board and Construction Division's efforts to elevate the priority of quality and safety by including these two factors along with cost and schedule in every top management decision to fully understand the impact and tradeoffs of the outcome.

⇒ Encourage and let staff do their job. Work with staff in between Board meetings to understand issues and regain confidence in staff judgment. Consider instituting regularly scheduled meetings with the staff to review project progress and discuss important issues. Offsite meetings with staff could play a major role here. Continue to challenge staff but do it in a constructive and positive manner recognizing they are part of the team. If required performance isn't forthcoming, take action to improve quality of staff as necessary.

⇒ Work with staff to understand and solve problems together. Approach problems with different attitude borne out of realization that top management is in this together with the Board and staff. Revitalize the TEAMETRO concept updated to reflect the MTA's need for a stronger oversight position.

CHAPTER V
Volume A

MTA'S CONSTRUCTION ORGANIZATION (INCLUDING CM)
Our recommendations - Tasks No. 3 and 5

Task No. 3 states: Review the current responsibilities of the Construction Management (CM) firm and make recommendations on which functions, if any, should be transferred to MTA staff.

Task No. 5 states: Review the MTA's construction organization and the decision-making process and make recommendations for improvements.

SUMMARY

Before presenting our recommendations for restructuring the Construction Division it will be helpful to recall the baseline organization structure discussed earlier in Chapter II which is reproduced here for the reader's convenience (exhibit 1). The organization is structured around the MTA's choice of the "oversee" role as its owner's preference management style. Construction executes its project management responsibilities through the contractual services provided by a separate Engineering Management Consultant (EMC) and Construction Management (CM) firm.

With the Construction Division's baseline established, we can now address seven important questions regarding Tasks No. 3 and 5. *(Note: A detailed review of the EMC was not a specific task of our engagement. We did evaluate certain aspects of the EMC function where it interfaced or impacted our eight tasks. In that limited review we did not identify any functions which should be transferred between the EMC and the MTA.)*

These questions, their rationale, together with our answers, are presented below. After such a summary, each of the questions will then be addressed in detail in the following sections 1 to 7.

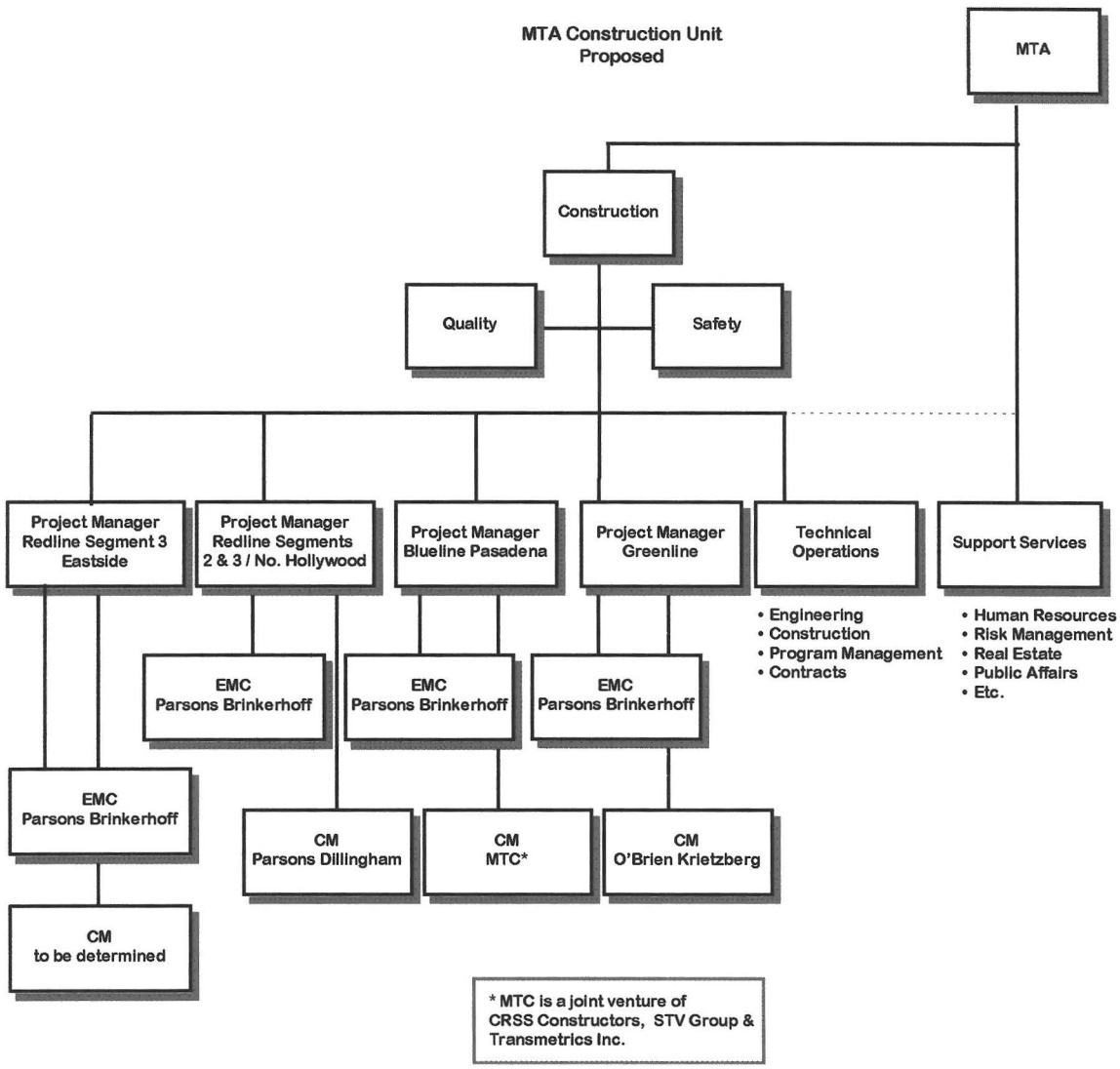

MTA Construction Unit
Proposed
MTA
Construction
Quality
Safety
Project Manager
Redline Segment 3
Eastside
Project Manager
Redline Segments
2 & 3 / No. Hollywood
Project Manager
Blueline Pasadena
Project Manager
Greenline
Technical
Operations
Support Services
• Engineering
• Construction
• Program Management
• Contracts
• Human Resources
• Risk Management
• Real Estate
• Public Affairs
• Etc.
EMC
Parsons Brinkerhoff
EMC
Parsons Brinkerhoff
EMC
Parsons Brinkerhoff
EMC
Parsons Brinkerhoff
CM
Parsons Dillingham
CM
MTC*
CM
O'Brien Krietzberg
CM
to be determined
* MTC is a joint venture of
CRSS Constructors, STV Group &
Transmetrics Inc.

Exhibit 1

Our approach to the review of the current responsibility of the Construction Management (CM) firm required to address 4 questions, in order to develop recommendations for Task No. 3.

Those 4 questions, their rationale and our answers, follow.

Question 1: ***Did recent responsibilities of the CM include any function(s) which, in any situation, must be transferred to the MTA staff?***

Cases addressed here would be functions which would put the owner at great risk if not performed in-house (e.g., cash payments with owner's cash processed by the CM)

Answer : **The answer is "yes" for two functions: The quality assurance and safety functions must, in any case, be transferred from the CM to the MTA staff.**

The answer is "no", for all other functions, including the quality control function.

Question 2: ***Do the current responsibilities of the MTA include any function(s) which, in any situation, must be transferred back to the CM?***

Cases here would be functions which would put the owner at greater risk if performed in house by the MTA in lieu of a CM (e.g. Resident Engineer, Quality Control)

Answer : **The answer is "yes" for one function: The quality control function, in any case, should be transferred back to the CM.**

Recommendation #1: The quality control function should be transferred back to the CM.

Question 3: ***Based on its' current management performance, is the MTA staff capable of absorbing additional CM functions and responsibilities?***

As we have seen earlier in Chapter II of this Volume A (section 3), there exists various possible levels of owner's involvement. But is this owner, the MTA staff, effectively managing its' current responsibilities, thus capable and ready to move to a level of increased involvement without putting the projects at great risk?

Answer : **The answer is "no": The MTA is not currently fulfilling its oversight management role and is therefore not capable of absorbing additional CM functions.**

Question 4: ***Does the LACMTA's rail construction program have sufficient credibility today to justify an owner's preference, if chosen, for developing an in-house organization, and then to attract, hire, and retain a large number of qualified, skilled staff to fill the additional staff positions required to assume more CM functions?***

Is a 10 year or more construction program sufficient and certain in all its aspects, including financing to justify a massive investment in hiring a significant number of new permanent staff? Once hired, the new staff will have to be kept busy for a large number of years!

Then, assuming the owner's decision is to develop an in-house organization, is the long term construction program discussed above sufficiently attractive to enable the owner to attract, hire and retain the necessary significant number of qualified, skilled new permanent staff?

Answer : **The answer is probably "no".**

The answers to both questions 3 and 4 should have been a clear "yes" before any owner should recommend transferring any additional CM functions beyond those required by the answer to question 1.

Our approach to reviewing the MTA's construction organization further required addressing 3 more questions, in order to develop recommendations for Task No. 5.

Those further 3 questions, their rationale and answers, follow.

Question 5: ***Do the current responsibilities of the MTA Construction Division include any function(s) which, in any situation, must be transferred to other MTA Divisions?***

Cases here would be functions which, from both efficiency and cost perspective, should be consolidated at the Agency's level rather than maintained separately within the Construction Division.

Answer : **The answer is "no", for each of the functions, including contract administration function.**

Question 6: ***Do the current responsibilities of other MTA Divisions include any function(s) which, in any situation, must be transferred to the MTA Construction Division?***

Cases here would be functions which, from either efficiency or cost perspective, should be an integral part of the Construction Division since they would need to be very tailored to construction constraints.

Answer : **The answer is "yes" for one function: The construction related segments of the Risk Management function must be transferred to the Construction Division.**

For three other identified critical functions - construction related segments of Public Affairs, Human Resources and Real Estate - we do not recommend they be transferred to Construction. We suggest, instead, a "contractual" relationship be established between them and Construction regarding the services to be provided.

Recommendation #2: The construction related segments of the Risk Management function must be transferred to the Construction Division.

Recommendation #3: For construction related segments of Public Affairs, Human Resources and Real Estate, we recommend a "contractual" relationship be established between them and Construction regarding the services to be provided.

Question 7: ***After successful implementation of the recommendations covered in answering questions 1 through 6 above, would the organization of the MTA's Construction Division become a functional organization?***

Would all the changes proposed in addressing earlier questions - with respect to (a) allocation of functions and responsibilities between the MTA and its Construction Management (CM) consultants, and (b) solid reporting relationship for functions critical to the specific characteristics of construction - fix the problem of a currently dysfunctional Authority with respect to its construction activity?

Answer : **The answer is "yes".**

However, implementing our organizational structure recommendations alone is not sufficient to make the Construction Division a functional organization. Unless the nine critical issues raised in Chapter I of this Volume A are also successfully resolved, the organizational structure changes discussed in this Chapter V would not be sufficient by themselves to create a functional Construction Division.

Each of the foregoing 7 questions is now addressed in detail in the following 7 sections.

1 ANSWER TO QUESTION 1: DID RECENT RESPONSIBILITIES OF THE CM INCLUDE ANY FUNCTION(S) WHICH, IN ANY SITUATION, MUST BE TRANSFERRED TO THE MTA CONSTRUCTION DIVISION?

The answer is "yes" for two functions: The quality assurance and safety functions must, in any case, be transferred from the CM to the MTA staff.

The answer is "no", for all other functions, including the quality control function.

Prior to discussing our response further it should be noted that in November 1994, following the Hollywood Boulevard incident and subsequent discussions with the FTA, the MTA agreed to transfer the functions of quality assurance, quality control, and safety from the CM to the MTA. These functions had previously been provided to the MTA by the Red Line - Segment 2 CM, Parsons - Dillingham. Our response does not agree with the aforementioned MTA/FTA agreement which transferred quality control to the MTA. We will discuss this in detail in our response to question 2. However, we do concur with the agreement between the MTA and FTA to transfer quality assurance and safety from the CM to the MTA. Our rationale for this opinion follows.

For the purpose of answering the previous question, we grouped the various tasks involving the CM into thirteen (13) functions which are required for the proper execution of any MTA rail construction project. *(Note: This list does not include the four functions of Engineering, Real Estate, Risk Management, and Human Resources which are not CM functions. However, these four functions are included in our earlier list of seventeen functions.)*

For those 13 functions we performed a review and evaluation of the respective current responsibilities of the CM and the MTA, as they were in place in October 1994 on the Red Line - Segment 2 project (i.e. prior to the change occurred in November 1994, just described above) and we selected Red Line - Segment 2 from among the five active construction projects of the current LAC Metro Rail System program (Green Line, Blue Line - Pasadena, Red Line - Segments 2, 3 and the Eastside Extension), because it is the most active, about 50% completed, and the most representative of the current allocation of responsibilities.

Applying the definitions developed in Chapter II (section 3), the respective responsibilities in October 1994 may be summarized as follows:

- The CM had a "*PERFORM*" responsibility on eleven (11) out of the thirteen (13) functions, and had only an assist role to the MTA for the remaining two (2) functions;

- The MTA staff had an "*OVERSEE*" responsibility on the eleven (11) functions performed by the CM, and had a "*PERFORM*" responsibility on two (2) functions, namely "Contract Award" and "Community Relations".

The list of the functions and the respective responsibilities of the CM and the MTA, for the Red Line - Segment 2 in October 1994, are detailed in the tabulation shown in Exhibit 2, where "O" means *OVERSEE* and "P" means *PERFORM*:

CM FUNCTIONS

FUNCTION	RESPONSIBILITY IN OCTOBER 1994			FUNCTION WHICH MUST BE TRANSFERRED TO THE MTA STAFF
	CM	MTA	Note	
Cost Estimating	P	O	(b)	
Contract Awards		P	(a)	
Contract Administration	P	O	(b)	
Billings and Payment Applications	P	O	(b)	
Resident Engineer	P	O		
Change orders and claims	P	O	(b)	
Project Control - Schedule	P	O		
Project Control - Cost (Cost Control)	P	O	(b)	
Project Control - Reporting	P	O		
Safety	P	O		✓
Quality Assurance	P	O		✓
Quality Control	P	O		
Public Affairs		P	(a)	

Exhibit 2

(a) The CM has only an assistance role

(b) The MTA has a "*PERFORM*" responsibility for all professional services contracts

Volume B of our report describes in greater detail what these functions include. As disclosed at the beginning of this chapter, our recommendations can be summarized as follows:

a. **Quality assurance function**: This function must be transferred to the MTA staff. We understand that, since October 1994 and at the request of the FTA, this function has been transferred to the MTA. This has been accomplished by seconding the CM consultant's staff to the MTA.

   To assure an independent assessment of quality activities, the quality assurance function must be completely independent of the individuals or groups directly responsible for performing the work. Consequently, this function must be performed by MTA staff and not consultant's staff seconded to the MTA.

   Also, a very clear definition of this function's scope of work and all of its interfaces with other functions or responsibilities must be prepared and implemented. This must be done to avoid any confusion of responsibilities with other functions such as quality control.

   Both matters - the independence of the staff and the scope of responsibility - require the MTA's immediate attention and action. We will discuss these and other quality assurance issues in greater detail in Chapter VI of this Volume A.

b. **Safety function**: We understand that the MTA is committed, by an explicit FTA requirement, to have this function transferred from the CM to its own staff. This transfer was implemented since October 1994, by seconding CM consultant's staff to the MTA.

   To assure an independent assessment of safety activities, the safety function must be completely independent of the individuals or groups directly responsible for performing

the work. Consequently, this function must be performed by MTA staff and not consultant's staff seconded to the MTA.

Also, a very clear definition of this function's scope of work and all of its interfaces with other functions or responsibilities must be prepared and implemented. This is particularly important regarding Construction Safety's working relationship with Construction Risk Management. These steps must be taken to avoid any confusion of responsibilities with other parties such as the CM or the contractors.

Both matters - the independence of the staff and the scope of responsibility of Construction's safety function - require the MTA's immediate attention and action. We will discuss these and other safety issues in greater detail in Chapter VII of this Volume A.

c. **Remaining nine (9) functions**: As described in Volume B of this report, none of the other functions (including quality control) are of a nature which would require them to be performed by the MTA staff. The performance of such functions by a CM is not in itself putting the MTA at risk, if the CM's performance is adequate and if the MTA staff efficiently executes its oversight responsibility. As a reminder, these nine functions are listed below:

Cost Estimating	Project Control - Schedule
Contract Administration	Project Control - Cost
Billings and Payment Applications	Project Control - Reporting
Resident Engineer	Quality Control
Change Orders and Claims	

d. **Overall allocation of responsibilities**: We would like to comment on the general issue of allocation of responsibilities between an owner and a CM. No one best practice model exists. Some owners, in your business and in other businesses, delegate most of the functions to a CM. These owners play only an efficient oversight role and speak out with credibility about their cost effective and accountable organization. Other owners do not delegate at all, have no CM and perform all functions in-house, yet also state

with credibility that their organization is cost effective and accountable. Finally, other owners are somewhere in between the two extremes just described.

In the last instance, the "in between" situation is the most uncomfortable and risky one for the owner. In substance, by transferring only some of the important functions from the CM to the owner but not all of them, the overall responsibility of the CM would be greatly reduced. Consequently, the owner's responsibility and risk would be greatly increased without being in a position to fulfill those responsibilities in the most efficient way. That is, unless the owner brings in all functions discussed earlier and takes the sole responsibility for these functions thus eliminating the CM completely.

For example, if only the function of Resident Engineer, which is the primary function of a CM, was to be transferred to the owner, the essence of the CM overall responsibility on a project would be passed on to the owner, without putting the owner in a position to execute this new responsibility. The overall responsibility of the CM on the project would significantly decrease and the owner's overall risk would increase much more than the potential benefits generated by this shift.

As a second example, consider not having the functions of Resident Engineer (RE) and Quality Control (QC) performed by the same entity (i.e., both by the CM or both by the owner). For instance, the RE is performed by the CM and QC is performed by the owner. Again, the overall responsibility of the CM on the project would significantly decrease and the owner's overall risk would increase much more than the potential benefits generated by this shift.

Consequently, we believe that the current overall responsibility of the CM which includes performing the nine (9) functions referred to earlier, is a cohesive "package" which should not be significantly altered or dismantled unless the MTA has the willingness and ability to simply cancel the CM role. However, this would also require a clear "yes" answer to both questions no. 3 and 4 discussed in the following respective sections.

In the instance of the Red Line - Segment 3 project, the Request For Proposal (RFP) for CM services includes the possibility for the authority to reduce the CM's scope of work.

The covering letter of the subject RFP states, "Functions that the Authority may take over, include but are not limited to, Resident Engineer, Project Controls, Testing and Start-up functions". For the reasons described in the preceding three paragraphs, we strongly disagree with such possible action. On the contrary, for the Red Line - Segment 3 project we recommend that it would be advantageous to the MTA to use the breadth of the CM's scope of work to emphasize in the CM's contract the overall responsibility the CM has for the project, wherever and however legally possible.

2 ANSWER TO QUESTION 2: DO THE CURRENT RESPONSIBILITIES OF THE MTA INCLUDE ANY FUNCTION(S) WHICH, IN ANY SITUATION, MUST BE TRANSFERRED BACK TO THE CM?

The answer is "yes" for one function: The quality control function, in any case, should be transferred back to the CM.

As described in Chapter XIV of Volume B, we believe that this function should not be taken out of the CM scope of work. Since quality control is a production step to be performed by those who are responsible for managing the whole production process (i.e. tunneling, building a station), namely the CM in the present case, we are of the opinion that this function should not be taken out of the CM scope of work.

We understand however that, since October 1994 and at the request of the FTA, the MTA has taken some steps to progressively transfer this function from the CM to its own staff. We do not concur with this evolution and recommend that the quality control function stay with the CM. This would allow it to be performed in an efficient manner by the CM and to avoid a significant reduction in the overall responsibility of the CM which would put the MTA at greater risk.

3 ANSWER TO QUESTION 3: BASED ON ITS CURRENT MANAGEMENT PERFORMANCE, IS THE MTA STAFF CAPABLE OF ABSORBING ADDITIONAL CM FUNCTIONS AND RESPONSIBILITIES?

The answer is "no": The MTA is not currently fulfilling its oversight management role and is therefore not capable of absorbing additional CM functions.

On the basis of our review, we are concerned that the MTA does not currently have the capability to fulfill its oversight role. Contributing to this concern regarding the MTA's current performance are some factors that appear to be beyond the control of the Construction Division. These include an insufficient number of technically skilled and experienced resources to execute their oversight role and the MTA's inability to fill open, approved positions. This appears to have directly impacted the MTA's ability to perform its oversight role. Consequently, there are instances where the MTA is reduced to an administrative role, with little or no review of CM activities. For example, in the Red Line - Segment 2 the critical position of Deputy Project Manager - Construction had been vacant for about 4 months until January 1995 and had been previously occupied by three different people over the last two years including a seconded CM employee.

Other examples of the MTA's inability to fulfill its oversight role include:

- Regarding the MTA staff's attitudes on project control:

  ⇒ Inadequate embracing of the ownership concept to control project cost - "spending as if it were your own money"

  ⇒ Inadequate attention to project cost and schedule issues - inadequate levels of "skepticism" regarding project data provided

  ⇒ Over reliance on the oversight activities of <u>other</u> MTA employees - many layers of review providing a false sense of oversight

- Regarding the MTA staff's relationship to their consultants (e.g. CM):

⇒ Lack of aggressive attitude, skills or resources to challenge consultants

⇒ Over reliance on the consultants to perform project activities correctly, resulting in reduced MTA oversight activities

⇒ Lack of involvement in day-to-day activities with the consultants

- Regarding the MTA's staff relationship with the MTA Board and top leadership (i.e. management):

⇒ Misdirected focus of MTA personnel - emphasis on responding/preparing for Board inquiries to the detriment (lack of attention) of project control

⇒ Attitude of frustration with leadership - a growing lack of trust and teamwork

⇒ Lack of desire to make decisions and stand in support of them when challenged

There are many other examples covered in Volume B of our report.

Based on our assessment of the MTA's performance of its oversight management role, we recommend against transferring any additional CM functions into the MTA.

This recommendation is based on several factors:

⇒ The MTA is not currently performing its oversight role at an appropriate level

⇒ The MTA needs to focus its energy on improving its performance for its current responsibilities including quality assurance and safety before it considers adding additional CM functions

⇒ The addition of other functions at this time would further burden an already over-burdened staff. It would distract the MTA staff from focusing their efforts on improving their current functional skills to acceptable levels and would slow them

from selectively increasing the number of skilled personnel in current key functional areas that are understaffed.

We do recognize the challenges facing the Board and the desire to make substantial changes to demonstrate to the public and other stakeholders that the MTA has taken the necessary steps to strengthen the organization and its accountability. We believe these steps have been identified: transferring responsibility for quality assurance and safety to the MTA and correcting existing deficiencies.

Transferring additional functions is not necessary to achieve the MTA's goals. Furthermore, the conditions which impact the MTA's credibility to justify developing an in-house organization and to attract acquire and retain the best people, must be reviewed to determine if such expansion of MTA responsibilities is even practical. This brings us to our answer for question 4.

4 ANSWER TO QUESTION 4: DOES THE LACMTA'S RAIL CONSTRUCTION PROGRAM HAVE SUFFICIENT CREDIBILITY TODAY TO JUSTIFY AN OWNER'S PREFERENCE, IF CHOSEN, FOR DEVELOPING AN IN-HOUSE ORGANIZATION, AND THEN TO ATTRACT, HIRE, AND RETAIN THE NUMBER OF QUALIFIED, SKILLED STAFF TO FILL THE ADDITIONAL STAFF POSITIONS REQUIRED TO ASSUME MORE CM FUNCTIONS?

The answer is probably "no": We state this with less certainty than the previous answers because in analyzing the factors which impact the MTA credibility the outcomes are mixed and subject to interpretation.

Earlier in this report, we covered two of the five factors which we believe impact an owner's ability to build an in-house capability to assume more or all CM functions: MTA's preference for the oversee vs. perform role and the skills, capabilities and size of the current MTA Construction Group staff.

The last three factors are: construction **program schedule and economics** which determines the programs credibility to justify building an in-house organization; **geographic location**

and program reputation which together establish the credibility of the MTA to attract, hire, and retain for the next 20 years the skilled, experienced people necessary to assume additional CM functions. We will define each of the factors first, then discuss their impact on the MTA's preference, if chosen, to develop an in-house organization and attract and retain the "best and brightest".

a. **Program schedule and economics**: Defined as the number of funded projects over a given length of time. Determines the attractiveness to the owner of investing in developing these employees vs. contracting to a CM for assistance, and the owner's ability to attract and retain skilled employees.

   The MTA recently previewed a $60 billion, 20 year transportation plan. While characterized as more realistic, it did differ significantly from the prior 1992 $183 billion, 30 year plan. There appears to be some uncertainty regarding availability of funding and if funding is available how much will ultimately be directed toward rail vs. bus or other alternatives. While a step forward in realism, the new plan reduces the scope of the rail construction program and still leaves some uncertainty regarding its long term future. This reduces the ability of the MTA to justify the investment for an owner preference to build an in-house organization.

   This limitation may be offset by comparing the MTA's 20 year $60 billion plan to many other U.S. property owners. Most either have smaller, short-term programs like BART in San Francisco or large programs that are nearing completion such as MARTA in Atlanta or WAMTA in Washington, DC. The recent defeat of the bond issue to fund Seattle's transit rail system should also help the MTA's recruiting and retention efforts. Overall, the size and length of LACMTA's construction program despite uncertainties cited above, may look better when compared to other properties.

b. **Geographic location**: Defined by issues such as cost of living, climate, lifestyle and related topics. Will impact the ability of the owner to attract and retain the best people.

   Los Angeles County and California's image as the "Golden State" and land of opportunity has diminished in recent years. The area has been slow in coming out of the recession and has been plagued by a series of natural and man-made problems.

Add the relative cost of living, real estate prices, etc., and the MTA has a challenge attracting the "best and brightest" to its program.

The establishment of the MTA and the growing construction program has been one of the positive events offsetting these problems. Nevertheless, the areas attractiveness to construction professionals is an issue today and a hindrance to hiring skilled resources. However, when compared to other areas, Los Angeles may become attractive to workers who are faced with diminishing alternatives as other programs end.

c. **Program Reputation**: Defined by issues such compensation, career opportunity, prior successful projects, degree of employee empowerment, contractor relationships, Board relationship, community relationship, leadership. Will be clearly perceived by the tightly networked rail construction industry and will impact the ability of the owner to attract and retain the best people.

The reputation of the LACMTA's rail construction program appears to have suffered recently. This can be attributed to: recent events involving Hollywood Boulevard, FTA funding, departure of RCC President and the abolishment of the RCC; employee related issues such as wage freeze, uncertainty regarding benefits, job classification and job security; the current level of mutual trust and support within the MTA team among the Board, MTA top executives, MTA staff, and its consultants like the CM; and finally the MTA team's image and reputation with the public. We have not seen evidence that this situation is improving. As such it represents the strongest obstacle to attracting the "best and brightest".

d. **In summary**, we did not find clear indications that the MTA's construction program has yet established the necessary long term credibility to justify investing and assembling a large in-house organization. Furthermore, both the Los Angeles area's current level of attractiveness and the program's current reputation make hiring the "best and the brightest" a difficult challenge.

5 ANSWER TO QUESTION 5: DO THE CURRENT RESPONSIBILITIES OF THE MTA CONSTRUCTION DIVISION INCLUDE ANY FUNCTION(S) WHICH, IN ANY SITUATION, MUST BE TRANSFERRED TO OTHER MTA DIVISIONS?

The answer is "no", for each of the functions, including contract administration function.

The different departments of the MTA Construction Division were presented in the organization chart included in Chapter II (Section 8) of Volume A. All such departments have their normal place within a rail construction division, including the contracts department which is responsible for the contract administration function for all construction activities. Our rationale is based on the fact that they all are very tailored to construction challenges and constraints which (as was described in Chapter II of this volume A) are very specific and different from those facing other operating Divisions in the MTA.

The contracts department is discussed here in our report because there has been internal discussions at the MTA regarding possibly transferring Contracts direct reporting relationships from the Construction division to the new position of Director of Procurement in the Administration division. We do not agree with this possible transfer for reasons stated below:

- Construction Contracts staff have a unique set of skills that are essential to Construction because of the project type of work that they perform.

- The project based work performed by the Contracts staff is very schedule sensitive. For example, the contract award process, if not performed in a time sensitive manner, can cause delays resulting in significant cost increases. This level of performance can be achieved only through "onsite", rapid response, with direct, frequent communication. In our experience, this requires a shared mindset that comes from being physically co-located and member of the Construction organization.

- The dotted line relationship that would exist between Construction Contracts and MTA's centralized Procurement should be sufficient to provide consistency across the

MTA and the appropriate level of oversight and checks and balances.

- MTA's centralized Procurement can be very effective in setting and enforcing procurement policy and guidelines through its dotted line relationship, particularly if it is enforced by periodic compliance audits.

Since we are addressing contracts department issues here, let us state that we recommend another reporting relationship change within the Construction division related to the Contracts department.

Contract administrators are members of contracts department but work on specific projects with project managers. As of today, within the matrix organization of the Construction Division, contract administrators have a dotted line relationship with the contracts department manager and have a solid line relationship with the project managers.

We concur with the matrix organization principles, which best suit the characteristics of rail construction. The change, which we propose, is for the contracts administrators to have a solid line relationship with the contracts department manager, and a dotted line only with the project managers. Such a change would provide the necessary independence of contracts administrators from the predominant project focus and pressure. We are making other recommendations with respect to the contracts department, which are covered in Chapter VI of Volume B.

We have an additional recommendation regarding the matrix organization of the Construction Division related to project assignments and responsibilities. As the summer of 1995 arrives and the Green line begins operation, the MTA construction efforts will consist of the Blue Line-Pasadena, Red Line Segment 2, Segment 3-North Hollywood, Segment 3-Eastside and the potential for Segment 3-Mid-Cities. We recommend that these five segments remain separate within the Construction Division. Each Line Segment should have a Project Manager, because each has its own unique schedule and budget and it currently appears the four segments of Red Line will potentially each have a separate CM organization. Separating the segments within the MTA will facilitate communication and control. We recommend that the MTA leadership within the Construction Division be separated between Red Line Segments. For certain purposes, the same individual may

perform the same functions as it relates to different Red Line Segments. What is important, is that no two individuals be assigned one functional position within the Construction Division and that clear dilineations of reporting between functional positions exist. Once the MTA establishes their reporting structure, direct counterparts should be identified within the CM and EMC organizations so that communication among the entities would flow cleanly and directly across the organizations.

6 ANSWER TO QUESTION 6: DO THE CURRENT RESPONSIBILITIES OF OTHER MTA DIVISIONS INCLUDE ANY FUNCTION(S) WHICH, IN ANY SITUATION, MUST BE TRANSFERRED TO THE MTA CONSTRUCTION DIVISION?

The answer is "yes" for one function: The construction related segments of the Risk Management function must be transferred to the Construction Division.

We have also identified three other critical functions : These functions are the construction related segments of Public Affairs, Human Resources and Real Estate. However, we are not recommending they be transferred to Construction. We suggest instead a "contractual" relationship be established between them and Construction regarding the services to be provided.

We will discuss our rationale for transferring the construction related segments of the Risk Management function to the Construction Division first, followed by the "contracting" concept for Public Affairs, Human Resources and Real Estate.

6.1 Risk Management

To execute an effective safety program it is necessary to leverage all safety related elements of the Authority's project team. One of the most underutilized safety resources in the MTA is Construction Risk Management (CRM). Other authorities have successfully teamed risk management with construction safety to achieve results that exceed even MTA's success in this area.

Currently, CRM reports to the Chief Financial Officer of the Administration unit. In our opinion, if the MTA is serious about increasing the emphasis it places on safety and fully exploiting the safety related resources available inside the MTA, it must transfer Construction Risk Management into Construction. This will facilitate the close working relationship required between these two groups to improve the existing safety program. We are also recommending that the MTA create a new centralized risk management function under Administration to set policy and guidelines for both Construction and Operations Risk Management. This will allow the MTA to leverage the existing synergy between the two groups and to reap the potential savings related to insurance coverage cost reductions. We discuss these and other related issues in greater detail in Chapter VII of this Volume A.

6.2 Public Affairs

The Public Affairs function plays a critical role in the success of a Construction project. It serves as the liaison between the MTA and the public. Public Affairs role is to establish and maintain an active and consistent MTA presence to foster continued acceptance for rail projects; keep residents, business owners and commuters adequately informed about MTA construction projects and their resulting impacts; and minimize any disruptive impacts resulting from MTA construction activities. The success of the community relations program can mean the difference between a small, quickly forgotten incident or one that is inflated beyond its original dimensions by a fearful, uninformed, unfriendly, unsupportive public. Top quality, responsive community relations service is in everyone in the MTA's best interest.

Currently, this function reports to the CEO through the Director of External Affairs. We are not recommending any change to the reporting relationship despite its importance to Construction because Public Affairs also play a critical role in supporting the CEO's responsibility to represent the MTA to the public. However, we are recommending that the Office of the CEO implement a new approach to providing these important services to Construction and other parts of the MTA.

The new approach we are recommending is a "contract" or "letter of agreement" which defines the nature of the relationship between Public Affairs and its internal customers, one

of which is Construction:

- Internal Customer's Perspective: The internal customer (e.g. Construction, Operations) will want to define the following items in its contract with Public Affairs:

⇒ Description of services to be provided including the specified level of quality and responsiveness

⇒ Length of service - typically one year with renewal to coincide with the annual budget process

⇒ Cost of service

⇒ Skills and experience required of the specific service provider

⇒ **Requirement to co-locate the service providers with the Construction Division**

⇒ Right to approve and accept specific person who will provide the service selection based on criteria defined above

⇒ Cancellation policy

⇒ Options to procure additional services during the contract period

⇒ Specific performance measures to be used to measure internal customer's level of satisfaction with services provided

⇒ Right to evaluate service providers assigned to Construction and significantly influence their annual performance reviews

- Service provider's Perspective: Not surprisingly, the service provider has many of the same types of contractual requirements as the internal customer:

⇒ Description of services to be provided including the specified level of quality and responsiveness

⇒ Length of service - typically one year with renewal to coincide with the annual budget process.

⇒ Price of service

⇒ Skills and experience of the specific service that will be provided

⇒ Cancellation policy

⇒ Options to provide additional services during the contract period

⇒ Support requirements to be provided by the internal customer (e.g. office space within the Construction Division's area, secretarial support, telephone and fax service)

⇒ Specific feedback based on agreed upon performance measures at agreed upon time intervals

⇒ Opportunity to earn "bonus" dollars based on meeting and/or exceeding the internal customer's expectations as defined by agreed upon performance measures.

The "contract" would usually be signed by both parties. Subsequent disputes, if any, would be subject to arbitration provided by the COO or the CEO, as appropriate. This approach is successfully used by other authorities and companies in other industries. It offers the MTA a unique way of fostering a spirit of cooperation and teamwork between internal service providers and customers. In our opinion, it is an important step to be taken to insure that Construction can be certain of the quality and level of service it will receive, especially for critical functions, like Public Affairs.

6.3 Human Resources

Currently, all MTA human resource (HR) related functions are centralized under the Administration unit. It is a critical function for the Construction Division. The Division depends on HR to assist in recruiting, hiring, and retaining the skilled personnel absolutely essential to the successful execution of its responsibilities. As discussed earlier in Chapter III of this Volume A, this is a critical time for Construction regarding human resources, over 60 positions are currently open and require immediate filling. Successfully completing this task will require a close, cooperative working relationship between HR and the Construction Division.

We are not recommending creating a direct reporting relationship for the construction related segment of Human Resources to the Construction Divsion. Instead, we propose a slight variation of the "contract" approach discussed in the previous paragraph 6.2 because of the critical situation facing Construction today. In addition to the normal contract "terms and conditions" outlined earlier, we recommend a 'tiger team' or task force be established immediately to service Construction's HR needs. This task force would include additional HR personnel beyond the usual complement that currently serves the Division. These additional people would also be co-located for the duration of the task force which would end when Construction's HR crisis has passed. At that time, the task force would disband and the HR service would return to normal levels. We believe this variation on the "contract" concept is justified to meet Construction's immediate needs and a means of accelerating the establishment of improved communications and understanding of each others needs to prevent a similar occurrence in the future.

6.4 Real Estate

The real estate function plays a critical role in the success of a Construction project. Their role is to ensure that necessary property is obtained in a timely and cost effective manner in order to facilitate rail construction activities. This function involves identification of properties for acquisition required by Construction; determination of the nature of the acquisition (e.g. full-take or easement);negotiations with affected property owners and, if necessary, relocation of occupants. The timely completion of these activities provides

Construction with the "right of way" to proceed with construction. The success of the Real Estate function is therefore critical to construction's ability to meet its objectives.

Currently, the real estate function reports to Administration through the Deputy CAO, General services, Procurement & Real Estate. We are not recommending any change to the reporting relationship despite its importance to Construction because we believe any change would undermine the current effectiveness of the department and increase the cost of providing this valuable service. We base this conclusion on the realization that Construction uses only about half of the total hours expended by the real estate department. Since the department is comprised of many different sub-functions (e.g. appraisal, acquisition, relocation, property management) any splitting of the department would introduce inefficiencies in the form of duplicated positions and underutilized resources. This is obviously not in the best interest of the MTA. Furthermore, the service provided to Construction has met or exceeded their expectations.

However, since this service is very critical to Construction and both parties want to improve their team performance, we strongly recommend that Real Estate and Construction execute a "contract" similar to the type described above in section 6.3. This will provide the basis for increased communication and understanding of each others needs which appears to be desired by both parties.

7 ANSWER TO QUESTION 7: AFTER SUCCESSFUL IMPLEMENTATION OF THE RECOMMENDATIONS COVERED IN ANSWERING QUESTIONS 1 THROUGH 6 ABOVE, WOULD THE ORGANIZATION OF THE MTA'S CONSTRUCTION DIVISION BECOME A FUNCTIONAL STRUCTURE?

The answer is "yes".

The organizational structure resulting from the successful implementation of our recommendations would create a functional structure that would support the execution of the Construction Division's mission as follows:

- All of the activities necessary to successfully execute the Construction Division's chosen "oversight" management role would be found within the organizational responsibilities of the MTA

- All of the activities necessary to succesfully execute the CM 's and EMC's "perform" management roles would be found within the organizatioal responsibilities of the consultants

- All of the internal services provided by other organizational units of the MTA that are critical to the successful execution of the Construction Division's "oversight" role would either be under the Division's direct control or strongly influenced through the new "contract" process for providing internal services to MTA's Construction Divisions.

However, implementing our organizational structure recommendations alone is not sufficient to make the Construction Division a functional organization. Unless the nine critical issues raised in Chapter I of this Volume A are also successfully resolved, the organizational structure changes discussed in this Chapter V would not be sufficient by themselves to create a functional Construction Division.

CHAPTER VI
Volume A

QUALITY ASSURANCE PROCEDURES
Our Recommendations - Task No. 7

Task No. 7 states: Review existing safety and quality assurance procedures and make recommendations on how to improve and upgrade them. Proven practices in the urban rail construction industry shall be used.

1 OVERVIEW OF THE QUALITY FUNCTION

Quality in construction is a structure of interrelated, supporting elements all working together to constantly encourage and verify quality. These elements are policy, management, system, assurance, and control.

The process begins with top management, who sets overall quality **policy** and communicates its importance throughout the organization in a consistent manner. The responsibility for and commitment to the quality policy belongs to the highest level of management.

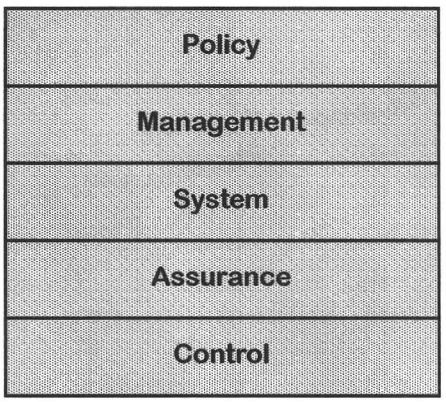
The quality process is implemented by Quality **management**. The Quality department has the responsibility and the authority to ensure that quality policy is implemented and maintained.

The Quality department designs and executes an overall quality **system** encompassing organization structure, processes, procedures, and resources working together to ensure quality in all aspects of design, construction, fabrication and installation. The quality system includes quality standards and appropriate checks and balances.

The quality functions are Quality Assurance and Quality Control. Quality **Assurance** designs the appropriate checks and balances into specific processes and procedures, verifies that developed processes and procedures have, in fact, incorporated these design elements, and ensures that processes and procedures are being followed as intended. Quality **Control** provides the continual inspection of completed or partially completed work to confirm the quality standards have been met.

Each element of the quality process builds on the previous one. This supportive relationship is shown below:

Quality Process



2 OVERALL CONCLUSIONS

Policy and Management: Top management has not been firmly supportive of quality policy as demonstrated by their actions. The Director of Quality reported lower in the organization than Project Managers responsible for cost and schedule. Stop Work Orders are seen to be "negotiable" at times. Quality staffing was reduced even as construction activity was increasing. The MTA must send out a consistent message that quality is vitally important. Management support of those individuals who issue Stop Work Orders, support of appropriate levels of quality staffing, and advertising of such support throughout the construction organization (MTA, consultants and contractors), is needed to demonstrate management commitment.

System: The system in place to manage quality must be improved. Issues and information are resolved or received very slowly at times, hindering the ability of the construction and quality groups to make decisions quickly and efficiently. Additionally, the MTA has not taken an active enough role in resolving critical issues and reviewing key contractor procedures and documentation.

Assurance: The effectiveness of Quality Assurance must be improved. Quality Assurance does not have sufficient presence on job sites to ensure critical procedures are being followed. Additionally, the quality assurance audits of the design process have been deficient.

Control: The responsibilities between Quality Control and Quality Assurance have been vague. There has been overlaps in responsibilities as well as some that neither group has fully assumed. Each quality activity must have a clearly defined organization, scope, and lead person.

Shortcomings in quality policy, management, system, assurance and control must be addressed. The MTA has made recent changes in the policy and management areas. We believe most of these changes are positive but we differ in some as to the direction or implementation of the proposed change. Additionally, we believe changes in system, assurance and control must be made in order for the quality function to become truly effective.

3 RECENT MTA CHANGES WE AGREE WITH

a. We concur with the recent change to have the Director of Quality report to the Executive Officer of Construction. This structure is consistent with other properties surveyed and provides the necessary influence needed with project functions. We believe the elevation in quality reporting has already brought greater attention to quality issues.

b. We concur with the latest targets for increasing staff of the quality assurance audit function. In light of recent quality problems, the MTA should be absolutely certain the Quality Assurance function is running smoothly and effectively. Adding resources at this time gives the MTA the opportunity to make this happen.

c. The MTA has documented procedures outlining the conditions under which a Stop Work Order can be written. A new Suspension of Work Notice procedure was issued in December, 1994 and revised on February 20, 1995. This new procedure appears to be effective in dealing with contractors who resist complying with Stop Work Orders.

4 RECENT MTA CHANGES WE DO NOT AGREE WITH

Recommendation #1: The MTA should not assume responsibility for Quality Control from the CM. Quality Control is a production function that strongly impacts the overall project schedule and cost. The organization primarily responsible for the control of production should have control over Quality Control. Splitting these responsibilities may lead to adverse consequences for the MTA such as potential increases in change orders or claims.

Recommendation #2: Although the MTA has transferred responsibility for Quality Assurance from the CM to the MTA, this was accomplished by seconding employees of the CM to the MTA. This situation would not be acceptable beyond a very short transition period. **To assure an independent assessment of quality activities, Quality Assurance must be fully independent of the individuals or groups directly responsible for performance of work. Consequently, this function must be performed by MTA staff, not consultant's staff seconded to the MTA.**

5 ADDITIONAL RECOMMENDATIONS

Recommendation #3: Budget Quality Assurance through the Executive Officer of Construction, not as a part of individual project budgets: Quality must not be treated as a discretionary support function, but as a critical, integral part of construction.

Recommendation #4: Assume responsibility for performing quality assurance audits of engineering design and rolling stock manufacturing: As with construction, Quality Assurance must be fully independent of the individuals or groups directly responsible for performance of work. Ensuring the quality of the design process and rolling stock manufacturing is crucial to minimizing more costly construction and operations problems later on.

Recommendation #5: Significantly increase the frequency of quality assurance surveillances of job sites: Quality Assurance should target to visit each site weekly. This additional visibility will allow Quality Assurance to better understand how critical processes are actually being performed in the field and to identify quality issues more quickly.

Recommendation #6: Refocus the scope of formal quality assurance audits to provide more time to audit product quality: At a minimum the responsibility for auditing cost and

scheduling processes should be transferred to another department, such as Internal Audit. This will allow Quality Assurance to focus on those processes critical to product quality.

Recommendation #7: Modify quality support processes to enforce the correction of nonconformances faster: The current time required to resolve issues or receive information is not acceptable and must be addressed.

Recommendation #8: Take a more active role in reviewing and approving procedures and documentation important to quality: Identifying shortcomings early is critical when identification and correction is easier and less costly.

Recommendation #9: Clarify individual responsibilities between Quality Assurance and Quality Control: When both functions resided in the CM, this was less of an issue. Now that the MTA is responsible for Quality Assurance and the CM is responsible for Quality Control, this distinction is more important.

Recommendation #10: Implement a written tunnel subsidence specification for all tunneling activities immediately: Quality Control inspectors cannot control this process without an appropriate specification. The MTA faces exposure with the public when guidelines for alleviating subsidence appear to be discretionary. Additionally, the MTA is exposed to greater risk of a harmful accident or costly repairs without clear-cut guidelines.

This chapter in Volume A has only addressed the most critical recommendations for this process. Chapter XIV of Volume B addresses the Quality Assurance and Quality Control functions in greater depth and includes the entire compliment of our recommendations. In addition, Chapter XIV of Volume B discusses our detailed findings, analysis and justifications in support of all our Recommendations.

CHAPTER VII
Volume A

SAFETY PROCEDURES
Our Recommendations - Task No. 7

Task No. 7 states: Review existing safety and quality assurance procedures and make recommendations on how to improve and upgrade them. Proven practices in the urban rail construction industry shall be used.

1 OVERVIEW OF THE SAFETY FUNCTION

The objective of a safety program is to ensure the safety of employees, contractors, the riding public, and the public at large during the construction and operation of the transit rail system. To be effective safety must have the complete support of top management. Field supervisors will sometimes neglect safety in their haste to complete their work on time and within budget. Only when supervisors are convinced by top management that safety is equally important as production will the benefits of an effective safety program be achieved. An effective safety program must instill a sense of safety consciousness in every project participant.

The primary responsibility for construction safety rests with the contractors. Significant contracts, primarily tunnels and stations, include an incentive clause to reduce the incident rate.

Since November 1994 the MTA has assumed the CM safety functions which include:

- On-site safety inspections and documentation
- Monthly contractor safety audits
- Contractor safety program review

CM employees have been seconded to the MTA to provide the necessary resources. The MTA is currently recruiting to permanently fill these positions.

2 OVERALL CONCLUSION

Based on the standard measure of incident rate chosen by the MTA, its safety program appears successful.

However, other properties have achieved greater success at lower cost, WMATA in particular which yet is using approximately 50% less resources than the MTA. Incident rate comparisons are shown below:

	Incident Rate (IR)
National Average	6.1
Red Line - Segment 1	10.4
Red Line - Segment 2 (as of September, 1994)	3.1
WMATA (since SAP)	2.8

IR = lost time accidents per 200,000 hours of worker involvement.

Our review identified three primary factors which account for why the MTA has not been as successful as is WMATA at a significantly lower cost:

a. **Top Management Support:** MTA top management has not shown clear evidence of its support for the safety program as demonstrated by its actions.

b. **Roles and Responsibilities:** Roles and responsibilities of agency staff, consultants, and contractors are unclear, resulting in disagreements in safety philosophy, objectives and execution.

c. **Resource Leverage:** The Safety group has not sufficiently leveraged its responsibilities through agency staff (e.g., construction risk management), consultants (e.g. REs, QC) and contractors (e.g., safety engineers) in a collaborative fashion.

Additionally, a broader set of **performance incentives and measures** could be used to enhance the safety program further.

Our major recommendations on each of these four matters are covered in the following sections 3 to 6.

3 TOP MANAGEMENT SUPPORT

Top management support can be demonstrated by several factors including reporting, independence, budgeting, and support of Stop Work Orders. By these measures, top Management has not demonstrated strong support for safety.

The importance of any function within an organization is determined in part by where the function reports in the organization. The System Safety Program Plan acknowledges this fact by stating in Section 3.0: "Safety functions are to report to a level of management which provides sufficient authority and organizational freedom to assure that appropriate action is taken to resolve conditions adverse to safety."

However, until recently, the MTA had not followed the stated policy as intended, which is illustrated as follows:

- The Director of Safety reported to the Executive Vice President of Technical Operations who reported to the Executive Officer of Construction. Safety had less clout than Project Managers who report directly to the Executive Officer of Construction and have primary responsibility for cost and schedule. Therefore, sufficient authority was questionable.

- Additionally, since the CM was responsible for both managing the performance of the work as well as monitoring safety, independence of the safety function was questionable. To assure an independent assessment of work practices, the organization monitoring safety performance must be fully independent of the CM.

As part of the October 1994 agreement with the FTA to restore funding, the MTA elevated reporting of the Director of Safety directly to the Executive Officer of Construction and assumed the CM safety functions. We concur with these changes. This level of reporting

gives the safety group sufficient clout to be able to influence MTA project personnel, consultants and contractors and the independence of safety is restored.

However, the budget to support safety staffing is still controlled by project management. Therefore, project management exerts an inordinate amount of influence over safety. With limited resources, project management makes tradeoffs in staffing between safety and other project areas, such as construction management, project control, and engineering. Anecdotal evidence exists to suggest that management has not always firmly supported Stop Work Orders issued for safety reasons. During interviews, MTA and CM employees stated verbally that Stop Work Orders have been ignored in the past by contractors focused on maintaining project schedule. If the MTA does not deal firmly with such infractions, make its position known and enforce it, then its credibility with its consultants and contractors will be undermined. Even if a Stop Work Order has questionable merit, construction management must support them unequivocably until a final determination of merit is made and a release can be issued. Contractors must understand that Stop Work Orders are not negotiable.

Each of these factors, reporting, safety independence and budgeting, and support of Stop Work Orders, are indicators of top management's commitment to safety. Sending strong signals to consultants, contractors and MTA personnel is critical to making the safety program effective. Therefore, we offer the following recommendations:

Recommendation #1: The MTA should complete the transfer of Safety to the MTA. To ensure an independent assessment of safety practices, the Safety function needs to be fully independent of the individuals or groups directly responsible for performance of the construction work. Consequently, this function must be performed by the MTA staff, not consultant's staff seconded to the MTA.

Recommendation #2: The MTA should take advantage of the recent assumption of construction safety to assess the skills and capabilities of the MTA safety function. Strong leadership of the Safety organization will be critical to its continued success.

Recommendation #3: Budgeting for the safety function should be done by the Executive Officer of Construction, independent of individual project budgets. Staffing for safety

should be based on the number of people required to adequately perform the responsibilities of the function, and not viewed as discretionary support. Fiscal independence is as important as the reporting independence recently addressed by the MTA. Additionally, this change in budgeting responsibility is consistent with the changes in reporting responsibilities already noted.

Recommendation #4: The MTA must firmly enforce all Stop Work Orders issued for safety reasons. The MTA must send out a consistent message that lapses in safe work practices will not be tolerated. Management support of those individuals who issue Stop Work Orders, and advertising of such support throughout the construction organization (MTA, consultants and contractors), is the evidence required to demonstrate management commitment.

4 ROLES AND RESPONSIBILITIES

The roles and responsibilities of the safety function are not clear. Some within the MTA believe the role of safety should be enforcement, issuing citations to contractors violating safety rules. Others believe safety should work in an environment of safety awareness through collaboration with contractors to assist them in their safety efforts and monitor their performance.

Recommendation #5: The MTA must develop a comprehensive safety program plan. The plan should outline specific roles and responsibilities of safety personnel, the contractor, the CM and in particular their resident engineers, the MTA Construction management, and other important positions involved in the safety effort. Additionally, guidelines for issuing safety violations (CS-50s) and Stop Work Orders must be defined. Finally, the safety philosophy, enforcement versus awareness, must be articulated and MTA top management must be actively involved in implementing all of the above when reviewing and approving the draft safety program plan available.

5 RESOURCE LEVERAGE

a. The overall construction safety organization (MTA plus CM seconded employees) has a disproportionate number of managers compared to field safety inspectors, those who spend most of their time on job sites.

b. The MTA has not taken advantage of other MTA personnel, consultants, or contractors to make the program cost effective.

By leveraging all resources available, other properties have been able to rely on fewer dedicated safety personnel. This is made possible from the strong management support establishing a well entrenched safety mindset. As more personnel from the agency, consultants and contractors reinforce the safety message, fewer dedicated safety personnel are required. Again, management commitment and an organizational safety mindset must be in place before performing the safety function with the fewest people possible.

6 PERFORMANCE INCENTIVES AND MEASURES

The current SAP incentive has no contractual requirement for contractors to share a percentage of the final award with the workers whose safe performance made the award possible. The sole incentive is for contractor management who will be rewarded for the overall safety of the contract. Therefore, the program does not provide incentives to individual workers.

With respect to individual workers, another important safety measure, the recordables index shows the MTA still needs to improve significantly since it is almost double the national average:

	Recordables Index (RI)	
National Average	13	
Red Line - Segment 1	42	RI = number of doctor cases per 200,000 hours of worker involvement
Red Line - Segment 2 (as of September, 1994)	23	

Consequently, we made two recommendation, developed in Chapter XIII of Volume B, to improve the safety performance incentives, which are aimed to further improve safety.

This chapter in Volume A has only addressed the most critical recommendations for this process. Chapter XIII of Volume B addresses the Safety function in greater depth and includes the entire compliment of our recommendations. In addition, Chapter XIII of Volume B discusses our detailed findings, analysis and justifications in support of all our Recommendations.

Chapter VIII
Volume A

COST CONTROL
Our Recommendations - Task No. 2

Task 2 states: Review the cost control process to determine who has responsibility at present for control from project inception to completion. "Inception" includes preliminary design and other factors associated with project start-up. Recommend changes to present system to strengthen cost control.

1 OVERVIEW OF THE COST CONTROL FUNCTION

The term Cost Control, as it is treated in this chapter, refers to the management of rail construction project costs for all phases of the project life cycle. Stated simply, the measure of cost control employed for a given rail project is the total cost growth incurred, relative to the original plan.

An important aspect of cost control to consider is the variation in the effect of cost control depending on the stage of the project. It is possible to exert a far greater influence on total costs early in the project life cycle than late in construction. Another important consideration is the effect of changes introduced to the project. Refer to Exhibit 1.

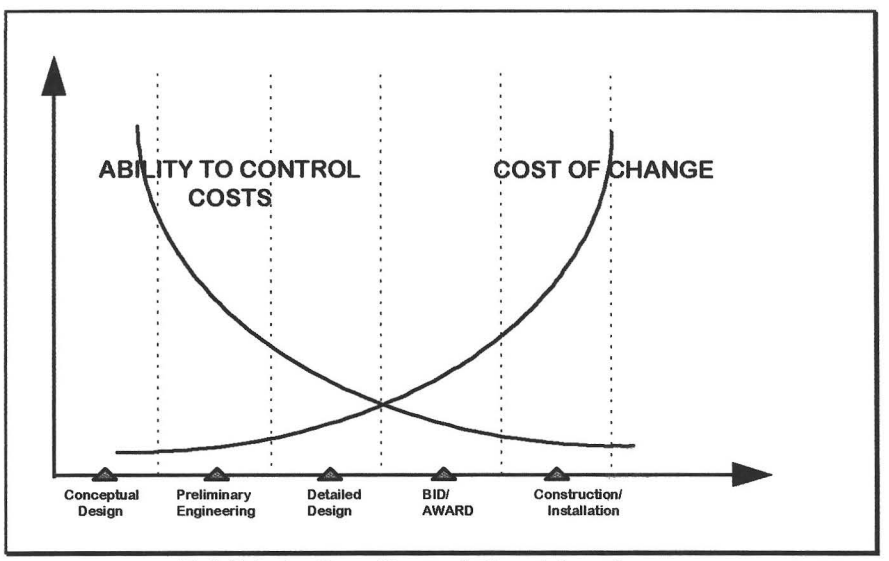


Exhibit 1. Cost Control Considerations

A strong cost control effort begins with an appropriate design, meeting the needs of the rail system envisioned within a limited budget. Strong cost control also results from a realistic project budget reflecting the likely costs to design and construct the rail transit project. Such a budget would also incorporate an adequate contingency based on a critical review of risk factors.

Other aspects of strong cost control include facility, tunnel and systems designs that are truly constructable to the target cost. This is accomplished with talented design resources guided by timely and reliable cost estimates. Incorporation of past lessons and value engineering allow engineers to design the most "bang for the buck" into a rail system. Of course, strong cost control requires that designs be complete and fully incorporate site conditions, thereby greatly reducing the potential for design-related changes during construction. It also requires tight control of design and other professional services costs.

During construction, a strong cost control function prevents the approval of unnecessary contract changes and limits the cost of those changes which are required. Strong cost control also limits excessive fees for Construction Management and EMC design support for construction.

Critical Success Factors for Achieving Strong Cost Control

a. Organizational Capability: An organization capable of providing strong cost control must (a) have aligned cost-control objectives and motivations; (b) possess the proper resources (i.e., headcount), (c) have clearly delineated roles and responsibilities, and (d) possess the right cost management skills.

b. Realistic Budget Commitments: A project adoption process that develops and commits to budgets that are based firmly on a completed preliminary design effort. Realistic budgets must also incorporate adequate risk-based contingencies.

c. Stable Project Designs: A stable design will help remove management uncertainties and greatly reduce design-related changes during construction.

d. Effective Consultant Oversight: Cost control also requires effective oversight of design and construction consultants with the aid of quality professional services contracts.

e. Thorough Construction Contract Control: Cost control during construction requires constructable designs, reliable and complete cost forecast information and a sound contract change approval process.

2 FINDINGS OF COST CONTROL

Organizational Capability

A risk averse climate has created impediments to communication. Through its actions the MTA has cultivated an unforgiving work environment and significantly hampered the free flow of cost-relevant information. Fear of retribution has added to the reluctance of resident engineers to share the full status of construction contracts until they have time to "work the problem". Risk aversion discourages cost estimators from issuing "back of the envelop" calculations to support a pressing decision.

The MTA and, to a lesser extent, their consultants place too little emphasis on cost. Organizational friction, leadership change, unfavorable media coverage and frequent MTA Board-mandated project changes have all seriously impacted the initiatives of managers to contain costs.

Shortages exist in staffing required for the cost oversight role. The MTA has not staffed the appropriate resources to fulfill the cost oversight role. Senior-level project control and other manager vacancies have existed for over two years, and the current staffing is insufficient to properly oversee costs during peak construction activities.

Insufficient Financial/Accounting Experience and Practical Business Decision-Making exist. An overemphasis on technical design and construction disciplines relegates control of costs to a lower priority. The MTA bases too few decisions on factual cost/benefit analysis.

Realistic Budget Commitments

Premature Commitments to Budgets and Schedules. Project budgets and schedules have been established without the full knowledge benefits of preliminary engineering. Consequently, budgets are not based on the true scope and risks associated with the project,

as is the case for the Red Line Segment 2 project. Unrealistic budgets provide poor cost control tracking mechanisms and undermine cost control resolve.

Inadequate Risk Analysis. The MTA has neglected to base project contingencies on quantified risk factors. Rail construction budgets have been understated with respect to the level of risk present. Significant risk factors have not been identified in advance for increased management attention.

Stable Project Designs

Changes in Owner Preference. Alterations and additions to construction projects authorized by the MTA after preliminary engineering have generated increased cost, absorbed required project contingencies, rendered professional services contracts obsolete and invalidated previously established budgets. With respect to Red Line - Segment 2, the MTA has experienced the following impacts from project alterations:

a. **Costly rework.** Designs for several stations repeated the submittal process multiple times. The EMC and Section Designers were required to significantly alter drawings and specifications, all at a considerable cost.
b. **Competitive Disadvantages.** Many of the design changes may not have been totally refined prior to contract award. Consequently, design changes during construction were priced without the benefit of competition.
c. **Disruptive Control Environment.** The EMC contract to provide design services for Segment 2 did not include provision for the changes introduced, since changes in owner preference are difficult to plan. MTA managers responsible for design costs had a more difficult time monitoring progress without suitable baseline.
d. **Reputation for Change.** The number and magnitude of Segment 2 project alterations may drive up future design services contracts.
e. **Demoralizing Effects.** The MTA Segment 2 project team developed a "Tiger Team" initiative to drive down total project costs. Cost impacts of these MTA-mandated design changes rendered their efforts irrelevant.

Effective Consultant Oversight

Drafting Insufficient Professional Services Contracts. The MTA adopted, in certain instances, Professional services contracts which lacked the detail of scope sufficient to track performance and control costs. Design services contracts have lacked the appropriate mechanisms to effectively control design costs. MTA project engineering managers do not have an adequate baseline to judge design progress between design review milestones

Thorough Construction Contract Control

Not Performing Periodic Construction Cost Audits. Differences in the level and thoroughness of cost forecasting for construction contracts exist. The MTA has not performed sufficient audit work to ensure that all potential contract change information is correctly incorporated in cost forecasts issued by Construction Managers

3 COST CONTROL RECOMMENDATIONS

Organizational Capability

Recommendation #1: **Develop an integrated team approach to staffing a Project Control organization for each project.** The Project Control Team should be lead by experienced MTA managers and comprised of a selected group of individuals from the MTA, Construction Management firms, the EMC or other consultants. The MTA must also amend the CM scope of services to eliminate the requirement for a full project controls capability, but require that the CM provide quality candidates to fill available Project Control Engineer or Lead Cost/Schedule positions when requested by the Project Control Committee.

Realistic Budget Commitments

Recommendation #2: **Refine the piloted Project Adoption process** which establishes a project budget and contingency only after concluding preliminary engineering. In this way, the MTA can commit to budgets and schedules that fully incorporate the likely design parameters and risks of the project.

Recommendation #3: **Adopt a full risk assessment approach to determining project contingency** by identifying all risks associated with each element of the project and (a) assigning a probability of occurrence; and (b) quantifying the likely cost impact of the occurrence. The total project contingency should be the sum of the individual contingencies required to address each risk identified. The MTA has accumulated a rich set of experiences from each of its past projects to assist it in identifying and quantifying risks. Many of the categories already in use to track construction contract changes in the Change Control System offer excellent starting points. A few examples include extra scope of work (e.g., work required of the contractor but not specified in the contract), differing site conditions (e.g., soil or environmental conditions not discussed in the contract) and designer-initiated changes.

Recommendation #4: **Track project contingencies for each major risk identified.** Throughout a rail transit project, the MTA project team should attribute cost increases to one of the risk factors identified during budget adoption. By drawing down the associated risk-related contingency, changes to the total remaining contingency would be directly attributable to cause. Likewise, the MTA project team could judge more precisely the adequacy of reserves.

Stable Project Designs

Recommendation #5: **Strongly resist altering any rail construction project after the conclusion of preliminary engineering.** The MTA can achieve this objective by implementing the recommendations pertaining to Realistic Budget Commitments in this chapter. While we recognize that complete stability of the design is not always possible due to a variety of circumstances, the MTA Board and staff should take every effort to review the impacts of a proposed project alteration and delineate the expected costs as well as benefits. This will prevent misunderstandings and distrust from clouding management decisions.

Effective Consultant Oversight

Recommendation #6: **Negotiate the final detailed design contract during total project budget formation in order to best reflect the required design budget elements.** The MTA can implement this recommendation only if preliminary engineering activities have concluded prior to budget adoption.

Recommendation #7: **Perform a review of EMC contract changes to determine any or all applicable changes that may be incorporated within the original scope of work for future preliminary engineering or detailed design services.** Using the latest Project Implementation Plan negotiations experience for Red Line Segment 3 - Eastside, further refine requirements including the definition of specific design work elements, the number of drawings per element, the number of hours per discipline per drawing and any other quantifications of baseline scope.

Thorough Construction Contract Control

Recommendation #8: **Assign specific project contingencies to potential changes in designer contracts.** Utilize existing analyses of Engineering Change Request classifications performed for contracts B271 and B281 as a guide for selecting preliminary risk factors.

Recommendation #9: **Establish a regular status report to the MTA Construction Committee of all contracts with commitments likely to exceed the Authorization for Expenditure. Utilize closed sessions of the Committee whenever sensitive issues (such as possible claims settlements) preclude public access.** For this to work, the MTA Board must strive for open communication between itself and MTA staff. Above all, the Board must create an environment that will allow the free flow of information about problem contracts. This can only be achieved when the aim of Board inquiry is problem resolution rather than fault finding.

Recommendation #10: **Establish a program-wide set of potential change tracking procedures that will apply to each MTA project control team.** This will provide a more reliable cost forecast by incorporating all potential change information. These procedures should include the following:

a. Contractor requirements for submitting Potential Change Order log information in computerized form each month

b. Methods required for project control engineers to reconcile the MTA's Change Control System and the contractor's Potential Change Order information

c. Requirements and methodologies for project control engineers to supply an independent assessment of potential change values whenever the contractor and resident engineer differ greatly in their assessment. Quantitative probability methods are preferable

Recommendation #11: **Expedite efforts to integrate the Change Control System and the Cost Management System applications.** Eliminate the majority of duplicate data entry and the use of supplemental spreadsheets to free up field cost/schedulers for added cost trend analysis.

This chapter in volume A has only addressed the most critical recommendations for this process. Chapter XI of Volume B addresses the Cost Control function in greater depth and includes the entire compliment of our recommendations. In addition, Chapter XI of volume B discusses our detailed findings, analysis and justifications in support of all our recommendations.

Chapter IX
Volume A

CHANGE ORDERS AND CLAIMS
Our Recommendations - Task No. 6

Task No. 6 states: Review the existing change order and claims process and make recommendations to strengthen the process to insure that the best interests of the MTA are secured.

1 OVERVIEW OF THE CHANGE ORDERS AND CLAIMS FUNCTION

The Change Orders and Claims function is a process of one or more parties determining that a change in the anticipated scope of work has resulted which will require a modification to the contract's cost and/or schedule terms. The MTA's objectives for the Change Order and Claim function are to approve only those changes and claims that have been determined to have merit, at a cost-effective but equitable level, after they have been evaluated for program and project impacts.

Changes are a major element in the successful management of a construction project. All parties involved must be keenly aware of the change process and its ramifications, and dedicate the necessary resources to properly manage changes in a timely and cost effective manner. The MTA staff must be properly trained and alert for changes and be dedicated to the pursuit of resolving them as quickly and as cost effectively as possible. The failure to have an attitude focused on resolving and controlling changes can lead to significant cost and schedule problems and disputes. This failure can impact the parties involved in the program and the quality of the transit rail project being delivered to Los Angeles County. By properly managing the change order process, risks related to cost, schedule and quality can be controlled within a well established budget of cost and time. Mis-administration of the change process can and will result in unnecessary additional cost, impacts to the quality of the program and potential delays to the ultimate operation of the rail transit lines.

Through the change order and claims process, the MTA should be striving to ensure themselves that the following elements exist within their process and that they are all well documented:

a. Legally valid merit determinations
b. Fair and equitable cost determinations
c. Accurate schedule determinations
d. Arms length negotiations
e. Full disclosure of the change process end results (cost and schedule)
f. Open communication between the MTA and the CM
g. Timely processing of changes to maintain project schedule
h. Consistency of performance in the change order process from day one of a contract until the final day of contract close-out

The end result should be a change order file that can stand on its own to explain why the change was necessary and beneficial to the project, why it is legally meritted and how it was successfully costed and negotiated.

2 OVERALL CONCLUSIONS

a. Direct involvement with the change order and claims process would facilitate the MTA performing its oversight role. However, the MTA staff tends to have little day to day involvement in the process. The performance of the change order activities is being handled and controlled primarily by the CM. As a result, the MTA has not been performing a sufficient oversight role to ensure that the MTA is paying the appropriate amount for changes to the contractor's base contract. The MTA is involved in the change process as the change moves through the approval process. The MTA staff are involved with performing Change Technical Evaluations (CTE) and attending Change Control Board meetings which provide a level of oversight, but it is during the approval stage, rather that during the upfront merit and cost determination stages.

b. The MTA has been performing a largely <u>administrative</u> function as it relates to changes and claims rather than an adequate assurance/oversight function. There are numerous reasons that have contributed to the change in performance levels, the primary being inadequate numbers of MTA contracts administrators and other key staff positions, a

lack of estimator involvement in the change order process and a propensity to rely on the CM to do the job correctly.

c. Exhibit 1 reflects the amount of construction and system contracts changes and their stratified levels during the life of the MRL - Segment 2 project.

MTA
Change Notice Breakdown
Redline Segment 2
Executed Changes from inception to 3/2/95

Range		Number of CNs	%	Dollar Volume	%	Averages CN Size
< $100,000	(1)	812	92%	$8,102,399	28%	$ 9,978
$100,-$200,000		51	6%	$6,357,898	22%	124,665
$200,-$500,000		12	1%	$2,927,920	10%	243,993
> $500,000		12	1%	$11,120,066	39%	926,672
Totals		887	100%	$28,508,283	100%	$ 32,140

Note 1> Changes greater than $50,000 comprise approximately $6 million (21%) of the change volume

Exhibit 1

d. The current levels of approval necessary to authorize a change order are as follows:

Contract Change	Resident Engineer	Construction Manager	MTA Project Manager	MTA Board
Cost Change	Up to $25,000	Up to $50,000	Up to $200,000	Over $200,000
Schedule Impact	No Authority	No Authority	Contract Schedule only	All Changes Affecting ROD
Design Impact	Contract Baseline Only	Contract Baseline Only	Project Baseline Only	All Changes Affecting ROD
Cumulative Cost	Up to AFE Limit Only	Up to AFE Limit Only	Up to AFE Limit Only	All Increases to the AFE Limit
Contract Scope	In General Scope of Contract	In General Scope of Contract	In General Scope of Contract	Out of Scope

e. The current change order processing timeframe continues to be an extended process due to the intense interest in all change orders by the public, the contractors and the Board. The Construction unit spends a significant amount of time preparing to respond to the Board. As a result of the in-depth involvement of the Board members in the process of approving changes, the Board's time available to address the "big picture" i.e. MTA policy and its global mission, is diminished.

f. The logistics of bringing a change to the Board for approval can be a difficult task. For the change to be approved by the Board prior to the contractor beginning its work, it is necessary for the negotiations to be completed between the contractor and CM 4 to 12 weeks before the change approval is actually needed from the Board. It can take 1 to 3 months to move the change through the Committee and the Board, because of their single meeting time during the month, their advance time requirements to place an item on the agenda and the occurances of change orders being on the agenda late in the meeting when a bare quorum of members is present, which would require a 7 of 7 vote to approve the change.

g. The volume of Change Notices (both in-process and executed) has continued to rise during the life of MRL Segment 2 as the volume of active contracts has increased. The MTA's Project Reporting has consistently provided an aging report of these open CNs. The aging as of December 1994 is reflected in Exhibit 2 and identifies (1) that there are a significant number of in-process changes to the construction and system contracts and (2) that more than 50% of these CNs have been in existence for more than 90 days.

MTA- MRL-2
Active Change Notice Aging - December 1994

Time	0-30 days	30-60 days	61-90 days	Over 90 days	Total Active
Volume	161	48	57	286	552
Percent	29%	9%	10%	52%	100%

Exhibit 2

h. The current time frame to move a change from the end of negotiations to Board approval has been estimated at between 4 and 12 weeks. This time frame delay is significantly greater than the process should require. The lack of timely review and approval by each of the MTA staff members required to sign a change order does contribute to this delay. It is imperative that each staff member realize the importance of his or her signature and the importance of processing the change in the most expeditious means possible.

i. Based on a review of change order files, the level of documentation being prepared by the CMs and approved by the MTA is not as complete as is necessary. Two primary areas where documentation generally is insufficient are the areas of (1) justification for the determination that merit exists regarding the change and (2) the documentation regarding the process of negotiation that took place between the RE and the contractor to reconcile the change orders cost and schedule components.

j. As has been evidenced by the Inspector General's report and other Construction Management Consultants' reports, the potential exists for disputes regarding the validity and accuracy of a change when one tries to assess the propriety of a change strictly from the documentation that exists This is especially compounded when the documentation regarding merit determination, cost determination, Change Technical Evaluations, Fair Cost Estimates and final settlement negotiations does not completely describe the steps and the processes that transpired to determine the final change amount. Because of this difficulty, it is essential for the documentation practices of the CM and the MTA construction division to be enhanced.

k. Due to numerous issues and events that have transpired over the last two to three years, an attitude has developed among the staff members reflecting a reluctance to make decisions and take responsibility for those decisions. There is an overriding attitude of "hands-off" of the program activities and the decision -making process. There is an excessive level of delegation to the consultants, fostered by the "Partnering-Concept" and the punishment inflicted on staff for errors by the MTA Board and Top Management.

1. The MTA has experienced a significant amount of contract changes during the life of the Metro Rail Program. Many of the contracts have incurred costs in excess of their original budget/AFE. This indicates that changes are exceeding 10% of contract award value on average. This is true on a number of MRL contracts. For example, as the MRL - Segment 2 program moves to being 50% complete many of the tunnel and station contracts are forecast to exceed their AFE. The overall Metro Rail Program has experienced the following levels of changes for construction and system contracts since inception (Exhibit 3):

MTA- Total Program
Change Notice Basis Analysis
Executed Changes from Inception to February 15, 1995

Change Type	Number	Dollar Value	Average Dollar Value Per Change	Percent of Dollar Volume
Work Scope	2,512	$75,796,741	$30,174	28%
Design Changes	2,608	59,227,905	22,710	22%
Management Issues	61	43,636,144	715,347	16%
Schedule Changes	279	40,164,802	143,960	15%
Differing Conditions	892	28,580,870	32,041	11%
Contract Options	28	14,375,511	513,411	5%
Outside Agency Requests	170	5,027,151	29,571	2%
Other	105	1,932,564	18,405	1%
Terms and Conditions	292	1,897,099	6,497	1%
	6,947	$270,638,787	$38,958	100%

Exhibit 3

Exhibit 3 identifies the type of changes that have plagued the MTA since inception, sorted by dollar volume. The top two change types have amounted to 50% of the total changes. These two (Work Scope and Design Changes) are changes indicative of a program that is suffering from continuing changes to the direction and scope of the program. The work scope is additional work that often comes from additional work or re-performing work based on a change of direction or desires. The design change costs are another indicator of a program that has a history of evolving or meandering in different directions. High quality, well controlled Board managed programs are able to limit these "preference" or

"incomplete planning" driven changes. The third largest type of change is "Management Issues". There have been only 61 of these changes, but they have averaged over $700,000 per change. These top three areas indicate a program that is unsure of where it is heading, and until the program's "Big Picture", Mission and Vision are clear, limiting and controlling changes will be a difficult process.

3 RECOMMENDATIONS

Recommendation #1: **As the change order process moves forward (from change identification through cost negotiations) the MTA must assume more responsibility to review and evaluate changes, prior to providing their approvals.** The Change Order and Claim process for construction and systems contracts is a function that is primarily performed by the CM. However, the CM still has the responsibility to perform the tasks within the Change Order and Claim function, which includes evaluating and negotiating the cost of the change or claim. It is important for the MTA as they execute their oversight role, to monitor the actions on a day-to-day basis with an attitude of healthy skepticism regarding the performance of their EMC, CMs and their contractors. However, to perform this adequate oversight it will require additional construction staff. The cost associated with the new staff should be recovered from the benefits of "enhanced oversight". With this monitoring comes the attitude to probe and verify that the service being provided is beneficial to the MTA. With an attitude evolving of healthy skepticism the MTA construction division will be exercising its fiduciary duty to provide the highest quality transit program possible.

Recommendation #2: **We recommend through our discussion of the contract administration function (Volume B Chapter VI) that additional contract administrators should be employed by the MTA and staffed in the field offices of the major, active contracts.**

These individuals would:

a. Be involved in the oversight of the RE activities related to the major changes
b. Observe and contribute to the activities of merit determination, cost quantification and change negotiation by utilizing their skills related to understanding the terms and conditions of the contract written between the contractor and the owner for selected, major changes
c. Involve MTA legal in the review of the merit determination of certain complex contracts, as necessary
d. Draw upon the recommended increased MTA estimating department to facilitate an independent determination of cost and schedule impacts of selected large/critical changes
e. Escalate challenging cost issues to the qualified cost individuals within the MTA
f. Participate as an observer and as a contributor in the negotiations, to the extent their skills could benefit timely negotiation of changes

Recommendation #3: **We recommend that the contract administrators monitor the sufficiency of the change documentation on a regular basis in conjunction with resources drawn from internal audit, the estimating department of the MTA and the MTA Construction staff.** It is essential for the documentation practices of the CM and the MTA construction unit to be enhanced. With the contract administrators more involved with the change negotiation and documentation phase of the function, if the documentation does not accurately reflect the observations of the contract administrator they will be able to involve the appropriate level of the MTA staff to address the issue.

Recommendation #4: **Each participant in the approval process of changes must take ownership of the responsibility associated with recommending and approving the change orders.** The MTA staff must take an ownership role in the change order and authorization process by reviewing and processing the change in a timely fashion so that schedule is not impacted by inaction, while still maintaining an eye toward fair and equitable pricing of changes and thorough arms-length negotiations.

Recommendation #5: **We recommend the MTA Staff must be required to identify alternatives for the Board related to the changes that are being taken to the Board for approval.** When the staff offer the Board the option of approving the change or suffer the potential consequences of a lawsuit, there generally is no option for the Board. The Board has its hands tied because of the limited options. The staff and the CM/EMC needs to identify cost mitigating changes that could be enacted to offset the cost of those essential changes.

Recommendation #6: **To enhance and expedite the change order process we recommend that the approval levels for change orders be modified such that the Construction Committee of the Board has the authorization to approve changes up to $500,000. In addition, we recommend that the top MTA staff level be reduced to $100,000.** The majority of the dollars remain with the Board and large changes are controlled by the Board. However, by separating a segment of the change order process and the associated volume (approximately 20 to 30 percent of the volume) the Board will have more critical time available so they may deal with policy and vision issues. The Construction Committee has non-voting members who are experienced in construction , and it is already trained in the process of change order approval, so there would not be a need for detailed, time-consuming training for the Committee.

The summary of approval level changes is listed below:

Contract Change Approval	Resident Engineer	Construction Manager	MTA Project Manager	Construction Committee	MTA Board
Cost Change	No Change	No Change	Up to $100,000	$100,000 to $500,000	Over $500,000

Recommendation #7: **There needs to be a cultural shift within the actions and perceptions of the MTA Board.** They have to establish trust of their Committees and their staff. The staff and the committees need to take ownership for their actions. When the MTA approves an item they are to stand behind that approval. Without this cultural shift and development of trust, the desired benefits from modifying the change order process will not be as readily achieved.

This chapter in Volume A has only addressed the most critical recommendations for this function. Chapter IX of Volume B addresses the Change Orders and Claims function in greater depth and includes the entire compliment of our recommendations. In addition, Chapter IX of Volume B discusses our detailed findings, analysis and justifications in support of all our Recommendations.

X. Reporting to the MTA Board

Chapter X
Volume A

REPORTING TO THE MTA BOARD
Our Recommendations - Task No. 4

Task No. 4 states: Make recommendations on a set of progress reports to the Board that will provide the status of each project and highlight issues with each construction project.

1 OVERVIEW OF THE PROGRESS REPORTING FUNCTION

Progress Reporting (also referred to as "Board Reporting" or "Management Reporting") should be tailored to meet the needs and objectives of its users. Progress Reports must provide an overview of the Transit Rail program's construction progress with an emphasis on cost and schedule issues requiring the Board's attention. Reports used by top management will differ significantly from reports used by those responsible for day to day construction activities and decision making. Progress Reports must identify the key monitoring elements (identified in Exhibit 1) of a Rail Transit program, because progress reporting plays a critical role in enabling the MTA Board to effectively meet its program responsibilities. While knowledge and understanding of project history are essential to these efforts, in and of themselves, they are not sufficient. To be effective, Progress Reporting must also provide the primary characteristics of the program to facilitate project planning, monitoring and analysis.

2 PROGRESS REPORT CHARACTERISTICS

Cost Characteristics	Schedule Characteristics
1. Costs committed	1. Original Program Baseline or schedule
2. Costs incurred	2. Current Program Baseline or schedule
3. Original budgeted contingency	3. Original float (available time in the schedule)
4. Budgeted contingency utilized	4. Current float
5. Budgeted contingency available - allocated to specific contracts	5. Pending schedule issues and float impact estimates
6. Budget contingency available - unallocated (general owner's contingency)	6. Probable schedule issues and float impact estimates
7. Pending cost issues, their probability and their cost estimates	7. Potential schedule issues and range of float impact estimates
8. Probable cost issues, their probability and their cost estimates	
9. Potential cost issues, their probability and their range of cost estimates	

Exhibit 1

These Progress Report characteristics must be reported as trended information with the historical information and future projected or forecasted information provided. This complete (trended) presentation will allow comparisons and analysis by the Board (top management) that will facilitate accurate decision making. Overall, a valuable set of Progress Reports must be written and organized in a concise, clearly understandable fashion that reflects the true reality of the Program's status, so that open and honest discussions can ensue to resolve critical issues in a timely and cost-effective manner. Our general recommendations related to the concept of Board progress reporting are listed in Section 4.

3 MTA'S CURRENT PROGRESS REPORTING

Full Disclosure and Exception Reporting

The current MTA Progress Reporting does not embrace the concepts of high quality Management Reporting. The current Board report titled Executive Report Rail Program Status is a compilation from the individual Project Manager's Status Reports (PMSR). The PMSR is a detailed compilation of management information for those individuals controlling the daily construction activities. Extracts from this very detailed report do not, and will not, provide the correct level of management information to the Board. Board progress reports should focus on the issues that are diverging or varying from their planned cost, schedule or progress baselines. The MTA progress report focuses on the current status of some key elements, but it lacks the variance analysis that facilitates management understanding and problem solving. The Current Board Progress Report is not sufficient to focus the Board's attention on the Program's areas of concern.

The current Board Progress Report should provide accurate and timely information, summarized for ease of review and understanding. However, the current MTA report does not show the true and full cost picture for each project. For example, in the Board Report for MRL - Segment 2 the reader is presented with a graphic that shows the cost growth trend for construction and systems contracts over the last eight months, currently stated to be 5.2 percent. This growth percentage is classified as "obligated and pending" cost growth. This trended graphic could be interpreted by the Board to be the cost growth anticipated for the project, because no additional cost growth information is summarized within the progress report presented. However, when one analyses the full compliment of cost data available, the true forecasted cost growth percentage of construction and systems contracts is 16 to 17 percent not 5.2 percent. A Board member reviewing their progress reports would not receive that important piece of information.

Contingency Reporting

A crucial monitoring instrument for the Board is the level of contingency that exists in the project. Contingency, in its purest form is the difference between a contract's budget and its awarded amount. Contingency has two classifications - Allocated and Unallocated. Allocated contingency is the amount ear-marked to fund projected cost growth for a specific purpose or contract. Unallocated contingency is the remaining amount of contingency not ear-marked for a specific

purpose. The MTA established a segment of allocated contingency for each project as part of the contract set-up procedure. Generally this segment of contingency is set at 10 percent of the contract award amount - no matter the type of contract. Change orders to a contract are then charged against the specific contract's contingency amount.

The Board progress report reflects the current unallocated contingency, but not the remaining allocated contingency. The progress report also does not list the contingency trends over time, showing how it has been utilized or how its utilization relates to project progress. By reviewing and performing data analysis of the monthly detailed cost reports for MRL - Segment 2, it is possible to determine the unallocated contingency trend, but not the total contingency trend. The unallocated contingency has decreased to 10 percent of its original amount, while the project has only been half completed.

Risk Assessment and Reporting

The concept of risk assessment is identifying what cost growth items can be forecast for a specific type of contract. Certain contracts such as tunnels have a different risk exposure than do systems contracts. The timing of risk events occurring is also different between contract types. For example, a tunnel may experience a Differing Site Condition (DSC) at any time during the tunnelling which may result in a change order, while a station contract may only be exposed to the risk of a DSC while excavation is on-going. These factors should all be considered when setting the allocated contingency for a contract - not just accepting a 10 percent allocated contingency.

The current Board progress report does not provide ample summarized information to assess the risk differences that exist within contracts. If the monthly detailed cost data is analyzed, it is possible to determine the forecasted cost growth for the different types of contracts. This forecast cost growth would then be evaluated against the 10 percent contingency established for the contracts to determine if the contracts were forecast to exceed their budgets - called AFE or Authorized for Expenditure amounts. Exhibit 2 reflects the forecasted cost growth for MRL Segment 2 construction and systems contracts, stratified by contract type. Recall, the true forecasted cost growth percentage of construction and systems contracts is 16 to 17 percent not 5.2 percent as currently stated.

Estimate at Completion (EAC)
As of 1/31/1995
Dollars in 000's

	Tunnels	Facilities	Systems	Total
Award Value	$ 236	$ 379	$ 94	$ 709
Current EAC	$ 292	$ 431	$ 103	$ 826
Percentage Growth	24%	14%	10%	17%

Note 1> Tunnel contracts: ALL THREE CONTRACTS are forecast to exceed their AFE
Note 2> Facilities contracts: 4of 10 contracts are forecast to exceed the AFE
Note 3> Systems contracts: 3 of 20 are forecast to exceed their AFE

Exhibit 2

Exhibit 2 shows some distinct cost growth differences for Tunnel and Facilities contracts. Both types are forecast to exceed their 10 percent contingency, and therefore their AFE. This type of information would be beneficial for the Board progress reports (when trends are reported and variances explained), but it currently is not presented. The detailed calculations of the EAC must include the following data inputs:

- What risks are included
- What amounts are forecast
- What is the probability these risks occur for the forecast amounts

These are all valuable pieces of information to be presented to the Board. It is understood that some of this information should be kept confidential so the contractors are not aware of the MTA's estimates of particular risks, but a vehicle to pass the message appropriately is necessary. Our specific recommendations regarding a set of Board progress reports are listed in Section 5.

4 GENERAL BOARD PROGRESS REPORTING RECOMMENDATIONS

Recommendation #1: **The Management of the MTA must show willingness and conviction to have the full and true cost picture of each project depicted in confidential periodic reporting to the CEO.** The CEO should then report to the Board on such critical but sensitive issues, in a manner feasible to protect MTA's interest in its relations with its contractors and consultants.

Recommendation #2: **We recommend that Management Reporting be refocused and oriented toward Exception / Variance reporting.** Reporting that highlights risk areas as well as unfavourable variances and trends will greatly enhance the value of the reported information. Exception-oriented reporting provides greater visibility of potential risks and problems. When too much information is presented, important areas lack necessary visibility and potential problems can go unnoticed and therefore unresolved. It is also important to put these variances from plan in perspective, so some general progress data should also be reported.

Recommendation #3: **Enhance the report by transforming the contents of the report from a compilation of data, to valuable information useable for decision making, through data analysis.** Data analysis is the process of taking the raw historical facts of the project and comparing and contrasting this data to the future forecasts and historical results of similar projects, to identify trends, to anticipate problems and to develop information to assist in decision making. The information created from the data analysis process will facilitate early identification of problems and viable alternatives. The problems identified may have cost, schedule or technical impacts which require special resources to resolve. Enabling the early identification of problems and their causes, as well as the needed resources and actions to resolve them, is an essential element for the Board

Recommendation #4: **Once potential problems have been identified, an action plan should be developed by the CMs, EMC and the MTA Staff that proposes solution options, assigns action steps and timetable requirements to specific individuals to carry out the options.** Proper Board Reporting requires documentation of necessary actions, and once determined, they must be communicated to the CEO, Construction Committee and the Board for their determination of what is the correct action step to execute, to meet the global needs of the program. The reporting should provide a mechanism for monitoring the performance of the action steps and their effectiveness.

Recommendation #5: **The Progress Report (Executive Report Rail Program Status) should be inclusive of narratives and schedules that identify program issues that are not proceeding according to their planned requirements.** The information presented should "segment" the construction data into valuable elements (cost, schedule, quality, safety, public affairs) to educate and inform the Board of the Program's current and near-term critical issues. The information included in these "Progress Reports" should facilitate the MTA Board with their decision making processes.

5 SPECIFIC RECOMMENDATIONS FOR A SET OF BOARD PROGRESS REPORTS

Recommendation #6: **We recommend the progress reports reflect trend data for each of the cost and schedule characteristics identified in Exhibit 1, both numerically and graphically.** By tracking the developments of these project control characteristics initially in the reports by Project and subsequently by contract, the Board will be able to adequately monitor progress. For pending, probable and potential cost and schedule issues it is important to identify the probability associated with the event occurring (e.g. the likelihood of a change order for the DSC is 40%) and the cost magnitude or range for the risk (e.g. the DSC change order will be for $250,000 to $400,000). The basis for these estimates of probability and value should be communicated as well, so they can be monitored over time to assess the process validity. However, some information should be kept confidential so relations with contractors and consultants are not jeopardized. The use of oral reports and summary schedules may assist.

Recommendation #7: **The set of Progress Reports received by the Board should provide a broad overview of construction activities to date and for the current period.** Emphasis should be placed on those items representing current or potential problems or concerns. While concise, the report should identify:

- Progress expected for the previous period
- Progress accomplished during that previous period
- The variance of progress should be explained and action steps identified to mitigate the unfavourable variances identified. Included in the action steps are to be proposed solution

alternatives that include assignments and timelines to accomplish the variance mitigation necessary

- The progress expected for the next period
- A discussion of "problems or concerns" that are pending or probable and the proposed action steps or alternatives to combat those problems [with assignments and timetables]
- A discussion of the "problems or concerns" that are potentially going to impact the MTA (not as definitive as the pending or probable items) and the proposed action steps or alternatives to combat those problems

Recommendation #8: **The Executive Report Rail Program Status (Board Progress Report) should identify critical issues with short narratives and summarized schedules. Graphical presentations should be used to facilitate presentation to the reader.** The information included should address:

- Cost Growth: current level, pending and probable additions, potential additions-exclusive of the unallocated contingency and a narrative of those items "possible, but remote"
- Schedule Constraints: those project schedules near the critical path and/or having an effect on the critical path, and proposed alternatives to mitigate
- Significant Change Orders and Claims: their current status, what alternatives exist to resolve the change or what alternatives exist to mitigate their impacts
- Public Affairs: current actions, planned actions and previous period results
- Other Current High Priority or High Visibility Issues: the nature of the issue, the action items necessary to address the issue, etc.

Recommendation #9: **The Progress Reports should also address the variances and exceptions from the plan through "oral presentations" by the Executive Officer - Construction and the PMs from the MTA.** The EOC and PMs should be providing this report to the Board, the Construction Committee, the CEO and his designees. The PMs will provide a written summary describing the key management issues, listed above for the Board and the Committee at the presentation. We recommend that these meetings take place at each Board and Committee meeting and once a week for the CEO to keep the parties informed of the progress and problem status of the Program.

This chapter in Volume A has only addressed the most critical recommendations for Board Progress Reporting. Chapter XII of Volume B addresses the Project Control - Reporting (Management Reporting) function in greater depth and includes the entire compliment of our recommendations. In addition, Chapter XII of Volume B discusses our detailed findings, analysis and justifications in support of all our Recommendations.

Chapter XI
Volume A

CONTRACT AWARD APPROVAL PROCESS
Our Recommendations - Task No. 1

Task No. 1 states: Review the contract award process along with other transit properties who have rail construction programs and make recommendations on possible delegation of approval authority to the Construction Committee of the Board.

1 CONTRACT AWARD PROCESS

Contract Awards is the process of contractually obtaining a Contractor or Professional Service Provider (consultant) through a formal selection process to perform for the MTA, a specific scope of work at a fair and reasonable price.

2 AWARD PROCESS PERFORMANCE

Historically, the Contract Award Process has performed well utilizing the MTA Construction unit's Contracts department. Based on our interviews and reviews of data, the Contract Award process has withstood the scrutiny of the Board and the dispute/appeal process on a consistent basis - only 2 of 86 contract awards reviewed were re-bid due to bid disputes determined to have merit. The recommendations for Professional Service firms and construction and systems contractors appear to have been determined based on sound procedures being followed by the Contract Administrators (CA), their supervisors, and the evaluation teams established. We are currently aware of a confidential report issued by the MTA Inspector General that identified a number of concerns regarding the recent contract award process for the CM contract on Red Line - Segment 3. The final determination of the Inspector General and the Board's decisions regarding the award of the CM contract are very relevant issues to the evaluation of the Contracts department recent performance, and should be considered in conjunction with this report. Regardless of the outcome of this incident, it is critical that this function remain within the Construction Division for reasons identified in Chapter V of Volume B. If corrective actions are deemed necessary they should be confined to personnel, policies and procedures.

3 FINDINGS REGARDING AWARD DELEGATION

The current delegation of construction contract award approvals is as follows:

Approving Party	Approving Level
Construction EO	Up to $25,000
MTA CEO	Up to $100,000
MTA Board	Above $100,000

Arthur Andersen was asked to recommend an appropriate level of contract award delegation to the Construction Committee. To assess the propriety of any delegation it was necessary to (1) assess the historical levels of contract award activity within the MTA, (2) determine the future level of contract awards and (3) compare the MTA process to other rail transit properties.

Exhibit 1 details the contract awards issued during the last two years, stratified by dollar amount while Exhibit 2 reflects the future anticipated transit awards currently programmed in the MTA.

Contract Award Analysis (1993-1994)

Range	Number of Awards	Percentage of Total Awards	Award Value	Percent of Award Value	Approval Level
< $100,000	2	4.0%	$ 164,478	0.0%	CEO
$100,001-$500,000	5	10.0%	1,036,717	0.1%	MTA Board
$500,001-$1,000,000	4	8.0%	3,216,344	0.4%	MTA Board
$1,000,001- $5,000,000	16	32.0%	43,831,218	4.8%	MTA Board
> $5,000,000	23	46.0%	865,419,864	94.7%	MTA Board
Total	50	100.0%	$ 913,668,621	100.0%	

Exhibit 1

Exhibit 1 reflects the awarding of 50 construction and system contracts for the Rail Program during the last two years and the dollar volume of over $900 million. Board approval was required for over 99% of the total award dollars.

Anticipated Future Contract Award Analysis - Stratified by Award Size
As of March 1995

Range	Number of Awards	Percentage of Total Awards	Anticipated Award Value	Percent of Total Award Value	Recommended Approval Levels
< $100,000	12	10.5%	$ 637,000	0.0%	CEO
$100,001-$500,000	13	11.4%	3,024,500	0.2%	Construction Committee
$500,001-$1,000,000	11	9.6%	8,555,400	0.6%	Construction Committee
$ 1,000,001- $5,000,000	39	34.2%	95,725,300	6.8%	MTA Board
> $5,000,000	39	34.2%	1,292,690,700	92.3%	MTA Board
Total	114	100.0%	$ 1,400,632,900	100.0%	

Source: Per MTA system output report "Projected Award Value Cost Level Breakdown" of project lines (R05, R23, R81, R82, R83, R84) for all future years.

Exhibit 2

Exhibit 2 reflects that the contract award volume will continue to be very significant for the MTA. The vast majority of the contracts identified in Exhibit 2 are programmed to be awarded during the next five years. The volume of contract awards has previously been averaging about 25 contracts per year, and the future award rate is very similar. The value of awards issued during the previous two years was approximately $450 million per year, while the anticipated future award value is approximately $280 million per year. The reduced annual value is still very significant, because there are 39 major contract awards anticipated to account for over $1.3 billion

Our review of other transit properties reflected that their Boards were generally awarding all contracts that exceeded the $200,000 to $250,000 amount. However, the data did not reflect if they were utilizing committees to facilitate their award process. We were informed that one transit property was considering the option of delegating all contract award activities to their Construction staff.

4 OUR AWARD DELEGATION RECOMMENDATION (SINGLE RECOMMENDATION)

Based on the anticipated contract awards during the next 5 years, we recommend that the following approval levels be established:

Approving Party	Approving Level
Construction EO	Up to $25,000
MTA CEO	Up to $100,000
MTA Construction Committee	Up to $500,000
MTA Board	Above $500,000

We recommend that the approval levels for Contract Awards be modified such that the Construction Committee of the Board has the authorization to issue contracts with award levels up to $500,000. Approval of Contract Awards in excess of $500,000, which are projected to constitute approximately 99% of the Contract Awards in dollars, but only 78% of the total number of contracts, would remain the sole responsibility of the MTA Board. This recommendation will reduce the physical volume of contract awards approved by the Board by approximately 20%, while not reducing their control or involvement in the dollar value volume.

The award process is currently impacted with delays, conflicts and contract procurement interruptions. A contract award delay can potentially cause significant adverse consequences to the MTA. Potential results of delaying the contract award authorization are: (1) the contract schedule could fall behind the critical path, (2) resulting contractor delay claims could arise, or (3) claims for additional costs resulting from co-ordination efforts between other contractors could result. The above recommendation modifying the contract award approval levels will facilitate expediting the Contract Award process, without increasing the risks of the process to the MTA.

The approval levels recommended are higher than the levels at the transit properties surveyed. However, the MTA has advantageously structured their Construction Committee with four additional Ex-Officio, non-voting members that have relevant construction qualifications to assist the other Committee members. This structure should allow the Board to leverage their responsibility to the Construction Committee, while remaining confident that their actions will represent the desired results of the full Board.

To ensure that all Board members are informed of the specific contracts being awarded, the Construction Committee will formally notify the Board of their award actions after Committee approval. The benefits to the Board of this change in authority are as follows: (1) the Board still retains control over the vast majority of award dollars with reduced efforts, (2) the Board obtains additional time that will be available to focus on the "big picture" - addressing the Rail Transit Program's Vision and Policy for the future, (3) the Board will continue to develop and demonstrate an increasing environment of trust and confidence in the Construction Committee and Construction Staff and (4) the Board will still be cognizant of all contract awards through the status report provided by the Construction Committee.

This chapter in Volume A has only addressed the most critical recommendations for this function. Chapter V of Volume B addresses the Contract Award function in greater depth and includes the entire compliment of our recommendations. In addition, Chapter V of Volume B discusses our detailed findings, analysis and justifications in support of all our Recommendations.

CHAPTER XII
Volume A

RISK MANAGEMENT PROGRAM
Our Recommendations - Task No. 8

Task No. 8 states: Review the current risk management program and ensure that the level of reserves is sufficient to cover current claims. Further, review future claims reserves planning and make recommendations concerning sufficiency for future claims.

1 OVERVIEW OF THE RISK MANAGEMENT FUNCTION

Risk Management is the method in which an entity chooses to manage the risks it has for financial loss and how it chooses to pay for losses as they occur. Examples of typical losses are employee injuries, vehicle damage, general liability (slips and falls), products liability, professional liability for doctors, lawyers, architects, engineers and environmental/pollution liability.

Risk Management is a continuous four step process. These steps are outlined below:

a. Identification of an entity's exposure to financial loss based on both the frequency and severity of an event (often referred to as the risk assessment step of the process).

b. Consideration of various alternatives to managing these exposures commonly called the selection of the treatment method. There are four basic alternatives to managing these exposures:

- Transfer of risk to another entity through the purchase of insurance
- Assumption of the potential risk of loss either in part (through a deductible) or in total (self-insurance)
- Reduction of the potential risk of loss by reducing the scope of a project, improving quality or implementing and enforcing stronger safety standards

- Elimination of risk. This step is usually considered only if the probability of loss is high, the severity of loss is extreme and risk transfer and/or risk reductions are impractical

c. Choosing the method, or methods, of managing the risks which have been identified. Most often, for large complex entities, two or more methods of treatment are chosen, e.g. self-insurance for some risks and transfer of risk for others

d. Implementation and management of the courses of action taken.

2 OVERALL CONCLUSIONS

The MTA has chosen several alternatives to effectively manage its risk. These include fixed premium Worker's Compensation coverage, a General Liability policy with a $500,000 per occurrence claim deductible, a Masters Professional Liability (Errors and Omissions) Policy and a Contractor's Pollution Liability policy developed for the MTA. In general, these programs are appropriate for the exposures they are designed to protect. However, more detailed program reviews such as coverage audits may identify specific issues which need special attention.

In formulating its approach to risk management, the MTA has opted to assume risks in the form of General Liability deductibles. Therefore, the MTA can potentially be obligated for payments related to claims that have occurred but have not been reported. Additionally, moneys received by the MTA as dividends under its Workers' Compensation policy are subject to being recalled by the insurance company, based on actual claims' experience. The MTA must adequately estimate its exposure (liability) for these amounts, document the liability and fund any incurred but not reported claims.

The MTA administers Risk Management through two departments, Construction Risk Management and Operations Risk Management. Both groups report to the Chief Financial Officer within the Administrative Division, but generally operate independently of one another. In addition to its own staff, the Construction Risk Management group is supported by outsourced risk management personnel, as well as its brokers and underwriters.

3 RECOMMENDATIONS

Recommendation #1: A detailed actuarial review should be conducted to determine the adequacy of reserves established for claims under MTA's General Liability policy. The review should also estimate the amount of dividends received by the MTA under its Worker's Compensation Policy which will likely have to be returned to its carrier. This assessment will allow MTA management to establish the appropriate reserves for these potential liabilities and provide adequate funding.

Recommendation #2: Based on our review of the Professional Liability Insurance Program we have four recommendations. The first and foremost of these is to communicate, or re-communicate how errors and omissions claims will be handled within the bigger "Catastrophe Management Plan". Secondly, steps must be taken to clarify the identification and administration of errors and omissions claims. Thirdly, information should be disseminated to all potentially affected parties, including contractors, as to the MTA's intentions regarding the potential renewal of coverage beyond October 31, 1999. And fourth, a comprehensive summary of the status of the Professional Liability Program should be provided to the Board, the CEO and Executive Officer- Construction stating the potential problems which could arise from the unresolved issues, including the non-initiated Alternative Dispute Resolution process.

Recommendation #3: A single individual should be appointed as the Director of Risk Management for the MTA. This individual should be responsible for developing a singular risk management philosophy, supported by one or more different programs. This individual would then be responsible for ensuring the programs are appropriate, i.e., financially and operationally efficient and effective. In addition, the duties would require the effective integration of current resources, and maximizing the utilization of personnel.

Recommendation #4: With the Director of Risk Management in place, transfer the Construction Risk Management Function from the Administration Unit to the Construction Division. Under the resulting organizational structure, the Director of Construction Risk Management services would have direct line reporting to the Executive Officer of Construction and dotted line reporting to the Administration Unit's Director of Risk

Management. This restructuring will provide the vehicle for communication between Risk Management - Construction and the Construction Division.

Recommendation #5: We recommend a cost benefit analysis be conducted, prior to extending the current contract with the Mass Transit Group (MTG), to determine the feasibility of increasing direct staff versus outsourcing. The basis of this recommendation is to (1) identify the potential cost benefit of altering the process and (2) to develop a broader, stronger MTA Risk Management team.

Recommendation #6: Finally, we recommend that an independent comprehensive communications audit be conducted within the construction unit to evaluate the general understanding and effectiveness of the administration of the construction risk management program(s). Numerous concerns have been expressed about the inability of construction to obtain information from the Director of Risk Management - Construction. The communications audit would determine why information is not flowing, what information is desired and necessary and how it can be communicated.

This chapter in Volume A has only addressed the most critical recommendations for this function. Chapter XVI of Volume B addresses the Risk Management function in greater depth and includes the entire compliment of our recommendations. In addition, Chapter XVI of Volume B discusses our detailed findings, analysis and justifications in support of all our Recommendations.