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**36**

**BOARD MEETING  
FEBRUARY 28, 2008**

**SUBJECT: METRO RAIL GATING**

**ACTION: APPROVE CONTRACT ACTIONS**

**RECOMMENDATIONS**

It is staff's recommendation that in consideration of the array of new revenue collection equipment, cost recovery and enhanced safety and security opportunities offered by the recommended gating program, as presented in the comprehensive analysis submitted to this Board, approval of this project represents a prudent long-term investment and sound public policy.

In addition, a positive business case for cost recovery through increased fare collection and reductions in contracted fare checking personnel has also been demonstrated. The recommended gating alternative facilitates the continued successful operation and expansion of the Metro heavy and light rail system and plays an integral role in the anticipated success of the Universal Fare System and TAP smart card implementation. The Board is therefore requested to:

- A. Authorize the Chief Executive Officer to:
  - 1. Execute a Lease Agreement with Cubic Transportation Systems, Inc. in an amount not to exceed \$46,467,840 (\$387,232 per month for 120 months, includes Metro Gold Line Eastside Extension Mariachi, Soto and Atlantic stations);
  - 2. Execute Amendment No.1 to Contract No. OP-02-4610-Maintenance with Cubic Transportation Systems, Inc. in an amount not to exceed \$12,240,000 (\$102,000 per month for 120 months) increasing the total maintenance contract value from \$12,359,257 to \$24,599,257; and,
  - 3. Execute Amendment No.50 to Contract No. OP-02-4610-10 with Cubic Transportation Systems, Inc. in an amount not to exceed \$10 million to design and build station modifications for relocation of existing stand alone validators and perform associated civil engineering work for gating Metro Rail stations increasing the total capital cost and contract value from \$96,035,101 to \$106,035,101.
  
- B. Authorize the Chief Executive Officer to execute Amendment No.10 to Contract No. PS-4210-1026 with Booz Allen Hamilton for a period of twenty-four (24) months in an amount not to exceed \$1 million increasing the total contract value from \$9,425,250 to \$10,425,250.
  
- C. Authorize the Chief Executive Officer to increase the life of project budget of CP# 210094, Metro Rail Gating, from \$999,663 to \$21 million for Metro Rail station modifications.
  
- D. Amend the FY08 budget to add \$5 million of expenditures and revenues for the gating project.

## RATIONALE

At the November 2007 meeting, the Board approved Option 2 as presented by the Booz Allen Hamilton Gating Study and directed staff to:

1. Implement gating the Metro Red Line and strategic Light Rail stations by working with the current TAP equipment contractor and,
2. Work with the current TAP consultant to provide technical oversight for design, testing and installation oversight and ensure TAP integration of Metro Rail gates with all regional participant Municipal Operators

During the January 2008 Board meeting, as discussion on Metro Rail Gating (Item 30) was in process, a letter from Mr. Richard Stanger was circulated to the Board, raising questions to the Booz Allen Gating Feasibility Study that had served as the basis for Metro gating considerations. The Board directed staff to investigate the basis of the assertions contained in the Stanger letter, and return to the February Board. A response to the Stanger letter was sent to the Board on February 1, 2008 in the form of a Board Box (a bullet-formatted synopsis is provided as *Attachment A1*). A further letter from Mr. Stanger, dated February 12, 2008, was also received and circulated to the Board. A response to that letter as well as a response from Booz Allen Hamilton to Mr. Stanger's original letter is being sent separately to the Board. In addition, *Attachment A2* provides a listing of transit properties with published data on increased revenue recovery as a result of implementing new fare gates. Staff believes that the responses to Mr. Stanger's letters are fully dispositive of the issues raised by his comments.

Additional discussions with interested Board members which ensued following the January Board meeting also resulted in consideration for the potential option of phased construction of the proposed gates, executing the amendments in phases. Estimated details and impacts of a phased implementation approach are provided under "Alternatives Considered". However, please note that recent discussions with other transit operators with gated systems and with fare experts, suppliers and consultants, there is unanimity that any bifurcation/phasing with the required multiple "start-ups" would pose significant additive cost to Metro. **The majority of costs associated with a rail gating project are in the initial design, engineering, and start-up costs.** Manufacturing of the equipment presents significant cost risk unless there are sufficient established quantities, since pricing is based on volume. Without assurance of total quantities to be built, multiple separate set-up costs and incremental purchasing of materials and supplies will greatly impact pricing. In addition to equipment production, mobilizing human resources is the second greatest consideration of a project of this magnitude – again presenting significant additive costs. Without certainty of the entire scope of work, economies for staffing and administrative costs are jeopardized, creating redundant or duplicative efforts with each remobilization and start up.

Another important consideration is the increase to operational costs associated with additional cost of manpower that must be maintained in the absence of gates. Less gating requires more human resources to conduct manual fare inspection.

### Tenets for Gating Metro Rail

Recent documents, such as the referenced Stanger letter which used incorrect data and misinterpreted proposed gating measures emphasize the need for factual presentation of the most vital and important tenets for gating which, which matters are shown below:

1. **Public safety is improved by gating:** Gating busy, congested underground subway systems are common worldwide. It is the norm, *not* the exception, because it is unsafe to allow unconstrained, undirected human stampeding in tunnels, station platforms, and common areas of rail stations.
  - Metro will be opening 2 additional rail lines over the next 2 years with long range goals to expand more rail service. Metro's current monthly rail boardings exceed 7.7 million. Additionally, Metrolink's Strategic Assessment forecasts 120% growth in their ridership by 2020, to a total of 97,000 daily riders. With population growth and transit service expansion county-wide it is impractical and imprudent to ignore the issue of public safety presented by growing numbers of rail riders who will converge onto Metro rail stations during peak hours of the day.
  - Future safety considerations have been obfuscated by the unfounded fear that patrons will be "inconvenienced" by queuing at rail gates. The actual data demonstrates that both regular and peak passenger loads are easily accommodated at gates, as further demonstrated by the experience of other extremely busy gated facilities such as London, New York, Chicago and countless others, In fact, it is the chaos caused by surge loads of patrons converging onto paid areas of station platforms that is being underestimated. Metrolink reports in excess of 2,500 passengers from five Metrolink trains over a 12 minute duration. Combined with Metro Red, Gold Line, Amtrak, FlyAway and bus customers also entering Union Station at the same time, Metro must ensure safe passage of patrons *within* our stations as much as when riding *on* Metro rail. I
  - ***Attachment C presents comments*** from Transit Security officials from major transit authorities, including, as one example, that of Mr. Tom Savage, current Chief of the New York MTA and former MTA Chief of Police:

"...turnstiles assist transit police and subway operations staff in eliminating an 'out-of-control' environment...The turnstile area allows for full enforcement of rules and regulations to maintain an orderly subway environment providing a clear line of in-system management (also known as paid area) that limits the opportunity for crime."
2. Gating improves rail station security and is a deterrent to crime.

While the focus has been largely on fare evasion and the savings generated by re-directing and right-sizing security forces which make the positive business case for gating, other mature, gated transit systems have established protocols for correlating fare evaders to wanted persons and common criminals. Electronic trip data can be retrieved and provides evidence of where and when the offender entered the system.

- Fare evasion tactics and police sweeps help apprehend criminals wanted on warrants for serious crimes, as evidenced in New York, as one example. According the former MTA Chief of Police, New York MTA, “It is well understood in the industry that minimizing fare evasion directly correlates to a reduction associated with in-system criminal activity including graffiti.”
- There is also an exaggerated perception that rail riders may frequently “jump” turnstiles and thus evade fare payment. However, in LA Metro’s proposed “tap in / tap out” system, an evader will not only have to jump IN to the paid area, but also jump OUT. When an evader jumps into the gated area, CCTV cameras will capture the incident, allowing time to inform transit security to allow apprehension of the evader at subsequent stations and if not apprehended, the offender will be captured a second time on CCTV when leaving the station enabling fare enforcement to establish a database with photos of recurring violators.
- Homeland Security explosives detection and early warning signal features currently being tested in the industry, allow the ticket vending machine and the barrier gate housings to both provide the equipment to associate an individual perpetrator carrying explosives and other chemicals to the precise location and time of the intrusion. This is a very significant departure from systems being tested for chemical and explosive detection in ambient space. Gating is required to link the intrusion immediately to an individual, at the exact time and place of the detected harmful materials..

Explosives are considered to be the primary terrorist threat to public rail systems, as evidenced by Madrid (2004), Moscow (2004 and 2005), London (2005) and India (2006) incidents. Therefore, as such security features become available to transit agencies, those with gating infrastructures will more easily be enabled to implement these detection and preventive features.

### **3. Gating is not a deterrent to the cash paying public.**

The perception that the TAP system is a closed system and is thus, unavailable to a cash rider is simply not accurate. Gated systems all over the world must, and do, accommodate the cash paying rider through a variety of technology and fare policy options. Metro, as well as Municipal operators and Metrolink have riders that are infrequent patrons, tourists, or are Using cash instead of pre-paid passes. Metro intends to implement limited use, paper smart cards to accommodate these riders. With their successful deployment and implementation of this product on various modern transportation systems, such as Atlanta’s Metropolitan Transit Authority (“MARTA”) and others, a viable, technically proven strategy for use in automated fare systems has been presented, Metro is exploring the opportunity for utilizing such limited use smart cards

to overcome challenges presented by interagency transfers and to provide alternatives to the magnetic stripe cards vended from fare boxes used by Municipal operators and to enable the efficient and easy entry of cash riders who have not pre-purchased a plastic TAP card.

As one such example, Metro staff is also currently working with Metrolink which, no differently than Metro or Municipal operators, is required to address the needs of its cash paying customers. Both technology options and changes to fare policies are being considered so that Metrolink can efficiently become TAP compatible.

#### **4. The proposed gating alternative presents a positive business case:**

As detailed in prior presentations, the increase in fare collection combined with the savings generated by reduced contracted services for fare checking result in long term savings that more than cover the costs associated with installation, maintenance and operation of gates

These factors, combined with the other manifest gating benefits (accurate, exact time boarding/disembarkation data; facilitation of fully functional distance based-fare programs; facilitation of new programs and revenue opportunities in combination with national credit card issuers, etc.), are believed to clearly demonstrate the positive case for gating.

### **IMPACTS TO OTHER CONTRACTS**

Metro's forthcoming new transit security contract may potentially be impacted, based on the significantly lower staffing requirements for fare the inspection activities currently being provided by the LASD, thus allowing law enforcement personnel to concentrate on their primary duties. Due to the scope of work being developed for our "in house" Transit Security activities, the impact cannot be determined at this time as new roles and responsibilities may be expanded from the current activity of the contracted fare inspectors whose sole responsibility is fare enforcement.

### **FINANCIAL IMPACTS**

The funding of \$5 million for the Gating project will be added to the FY08 budget in cost center 3020, TAP Operations under project number CP210094, Metro Rail Gating. The source of funds for the project will be Prop A 35% funds. Since this is a multi-year contract, the cost center manager and Executive Officer will be accountable for budgeting the cost, lease and maintenance, in future years, including any option exercised.

### **ALTERNATIVES CONSIDERED**

As earlier indicated, staff considered implementation of gates on a phased basis. However, the alternative of splitting the contract amendments into phases would require the contractor to reallocate all of the general project costs, such as design and engineering to the first phase and would also likely significantly raise both hardware unit costs as well as

require increased staging and manpower costs . The tables below are estimates of cost redistribution if a phased approach were adopted:

	Equipment Lease	Maintenance Contract	Civil Work	Phase Totals
Phase I (Red Line)	\$34.9M (75%)	\$9.2M (75%)	\$3.5M (35%)	\$47.6M (69%)
Phase II (Green)	\$7.0M (15%)	\$1.8M (15%)	\$4.5M (45%)	\$13.3M (19%)
Phase III (Gold)	\$2.3M (5%)	\$612K (5%)	\$1.0M (10%)	\$3.9M (6%)
Phase IV (Blue)	\$2.3M (5%)	\$612K (5%)	\$1.0M (10%)	\$3.9M (6%)
<b>Totals</b>	<b>\$46.5M (100%)</b>	<b>\$12.2M (100%)</b>	<b>\$10.0M (100%)</b>	<b>\$68.7M (100%)</b>

However, the table above does not take into consideration the loss of economies for labor and hardware or the expanded costs caused by repeated demobilization / remobilization efforts, which may add as much as 20% to the costs of equipment and maintenance and an increase of up to 35% for the necessary civil work. Additionally, adjustments and increases would also need to be made to the Booz Allen Hamilton contract (PS-4210-1026), as well as the life of project budget (CP#210094) per the following table:

	Booz Allen Hamilton	Life of Project Budget	Phase Totals
Phase I (Red Line)	\$850K	\$15.0M	\$15.8M
Phase II (Green)	\$500K	\$6.0M	\$6.5M
Phase III (Gold)	\$500K	\$5.0M	\$5.5M
Phase IV (Blue)	\$500K	\$5.0M	\$5.5M
<b>Totals</b>	<b>\$2.35M</b>	<b>\$31.0M</b>	

As discussed in last month's gating report, an option to purchase the gates was also considered. The opportunity to use the private sector financing for these shorter term capital assets preserves our internal capital capacity for other infrastructure projects which may not have the flexibility or option for lease agreements. In addition, under a lease agreement, the contractor is the owner of the equipment and has greater motivation to maintain the operational state of their equipment. This in turn, shifts the responsibility for optimum performance of the equipment from us to the supplier therefore reducing our manpower and maintenance costs similar to a public private partnership arrangement.

### **ATTACHMENTS**

- A. Cubic Statement of Work
- B. Booz Allen Statement of Work
- C. Funding Plan
- D. Procurement Summary

Prepared by: Jane Matsumoto, DEO Regional TAP

  
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Roger Moliere  
Chief, Real Property Management & Development

  
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Roger Snoble  
Chief Executive Officer



# ATTACHMENT A1

Richard Stanger Letter, February 12, 2008			
ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
1	Pg 1 Para 1	Metro's decision to install gates needs to be based on clear evidence that the change will be economically and operationally superior	Economical and operational impacts are included in the Booz Allen Faregating Analysis report
2		The issue before the [Metro] Board is whether it makes sense to, "attempt to capture a marginal loss of revenue by spending a large amount to buy, operate and maintain fare gates."	The report articulates a business case that considers both the costs and savings as well as additional benefits such as safety, security and the support for changes in fare policy.
3	Pg 1 Para 2	Estimates of costs continue to be uncertain	The report was authored with the best information available from the industry and Metro staff
4		If 6% is the agreed upon fare evasion rate and \$40M is the annual rail revenue why is the estimated loss listed as \$5.6M, which is 14% of \$40M	While the TMD report estimated revenue losses at \$5.6M the Booz Allen report used \$3.8M as a fare evasion credit.
5		Which gate is being procured?	Turnstile and bi-parting leaf gates are staff's recommendation
6		Why isn't fare media being listed as a cost within the Feasibility Report?	Regardless of gates, fare media is required to support UFS in the station ticket vending machines (TVMs) stand alone validators (SAVs) and on the buses (Fareboxes).
7	Pg 1 Para 3	Unlike any other American subway system, the Red Line connects directly with eight light rail and commuter rail lines using proof-of-payment fare collection. These lines will remain proof-of-payment.	The issue is not the amount of lines that intersect on a "proof of payment" system, but rather the number of riders that pass through a station that must get through the gates. There is no requirement that only one fare media is used by multiple connecting systems, and in fact, multiple fare media co-exist with barrier and proof of payment systems across the nation.
8		Adding fare gates to a key link of such an integrated network is unprecedented.	Metro Red Line stations were all designed with gates in mind and are constructed to accommodate gates. Gates are installed at other agencies that interface with light rail, commuter rail, buses, BRTs.

9		Is it clear how the two fare systems [Metrolink and Metro] will work together?	UFS was designed to be a regional system and Metrolink is a TAP participant who received regional funding to become compatible. How the systems will work together is based on business rules and fare policies.
10		What will be the fare media costs and passenger inconvenience to Metrolink riders.	Fare media costs were not considered as part of the Faregating Analysis since smartcard fare media will be required regardless of fare gates. Fare media is not a deterrent to patron convenience. Metro pass riders transferring to Muni operators must carry a separate interagency transfer today, and vice versa.
11	Pg 1 Para 4	No new rail system built after 1985 has ordered fare gates nor has any system built before 1985 converted to gates.	No new subway system beside LA has been built since 1985. Subways built before 1985 are gated.
12	Pg 2 Para 1	The most cost-effective strategy is to concentrate enforcement for a while on groups that are committing higher rates of fraud.	Profiling any one group of the public is not recommended

## Richard Stanger Letter, January 15, 2008

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
<b>Cover Letter (page 1 of 5)</b>			
1	Pg 1 Para 3	Faregating Analysis report isn't an acceptable document to base decision for adding fare gates	The DRAFT Faregating Analysis (Analysis) was prepared to evaluate the feasibility of faregates on Metro Rail. The Analysis reviewed faregate types, configurations by station, quantities, fare media options, passenger impacts, fare evasion impact and provided cost estimates.
2		Faregating Analysis is flawed and estimates are too preliminary	We believe Analysis is accurate responsible information relevant to automated fare systems using current technology in the environment that Metro must operate today. Cost Estimates used a pool of pricing data based on recent procurements in North America. In addition, two sets of station surveys were conducted jointly by Metro, Booz Allen and Cubic.
3		Fare evasion is a direct function of the level of inspection	While we agree inspection level is one important factor in fare evasion, there are a number of other factors affecting fare evasion such as the enforcement of the fines by the courts when tickets are issued. Based on peer testimony by MARTA at the December Board meeting, MARTA has documented the reduction of fare evasion due to gating.
4		Sworn officers do not check fares because it's beneath them	The Analysis did not include an evaluation of current staff roles and responsibilities.
5		Fare evasion can be reduced without having to add faregates	We concur that given unlimited inspection personnel, evasion can be reduced. However, fare evasion was not the only reason to gate; implementation of gates address security, safety, patron data-gathering, flow control and fare policies.
<b>Comments on Metro's Draft Faregating Analysis Report (page 2 of 5)</b>			
<b>Introduction</b>			
6	Pg 2 Para 1	There are number of misleading assumptions and incomplete cost analyses in report	We believe Analysis is accurate responsible information relevant to automated fare systems using current technology in the environment that Metro must operate today. Cost Estimates used a pool of pricing data based on recent procurements in North America. In addition, two sets of station surveys were conducted jointly by Metro, Booz Allen and Cubic.
7		Revenue loss through fare evasion is estimated too high	A TMD Fare Evasion Study commissioned by Metro estimated the cost of fare evasion at \$5.6 million. However, cost model in Analysis used a fare evasion credit of \$3.8 million.

# ATTACHMENT A1

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
8		Costs for fare gate equipment and operations are estimated too low	Equipment Cost Estimates were the product of detailed cost analysis based on recent procurements in North America. Operations Cost estimates addressed station attendants, fare media, and fare inspections were developed based on data provided by Metro. Operating costs assume that Metro Transit Security staff will continue to perform patrol duties, combined with CCTV support and PTEL customer phones.
9		Stated benefits of gated system and drawbacks of proof-of-payment (POP) system are questionable.	<p>The Analysis was prepared to evaluate the feasibility of faregates on Metro Rail. The Analysis reviewed faregate types, configurations by station, quantities, fare media options, passenger impacts, fare evasion impact and provided cost estimates. The scope of the Analysis did not include a comparison with POP systems.</p> <p>Metro's decision to examine gating the subway and light-rail systems is consistent with other global transit agencies, both greater and smaller in operational capacity when compared to Metro. Atlanta, San Francisco, Boston, Baltimore, New York and London have all seen revenue improvements and reduced evasion following gating.</p>
<b>Section: Overall</b>			
10	Pg 2 Para 2	November 15 draft analysis is misleading when it states, "Los Angeles Metro remains the only non-barrier" subway system in North America."	The Analysis never stated this fact. This statement was contained in the November Committee Report.
11		No other non-barrier subway system has ever existed in North American	See Item #10 above.
12		Los Angeles is the only North American line designed/built after POP systems were introduced in the late 1970s	Although not part of the Analysis, we concur with this statement.
13		Los Angeles is the only subway line integrated with POP light/commuter rail	Although not part of our Analysis, the statement is incorrect. Philadelphia, San Francisco, Boston, Baltimore, New York and London are all cities with transit agencies that have significant integration between gated subway systems and POP rail services.
14		All new light/commuter rails systems in the U.S. are POP because:	The scope of the Analysis did not include a comparison with POP systems
15		a) POP cost is an effective means of enforcing fares as proven by Western European rail systems	See Item #14 above.

# ATTACHMENT A1

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
16		b) it would be nearly impossible/too costly to enclose light rail/commuter rail stations with gates	Three Options for gating the LA Metro System were developed; (1) Red Line only; (2) Green Line & selected Blue/Gold Line; and (3) Majority of Rail Lines. Each Option identified the increased percentage of passengers required to pass through a faregate at one end of the journey versus the increased total direct capital cost for for gating. The report listed Option 3 as "Very Difficult" in terms of Difficulty of Implementation with Option 2 listed as Moderate.
17		c) no existing LRV/Commuter POP system anywhere has it found POP to be unworkable / undesirable	The scope of the Analysis did not include an evaluation of the desirability of POP systems in either light rail or commuter rail.
18		All other Southern California rail systems use POP	Although not part of the Analysis, we concur with this statement.
19	Pg 2 Para 3	Report implies that gates are needed to collect distance-based fares	The Analysis states that Smartcard "Tap-on/Tap off" capabilities will enable implementation of distance-based fares in the future. As riders enter and exit the system, both points will be captured making it possible to calculate number of zones or distance traveled. The alternative, e.g. the use of inspectors with validators on mass transit, was deemed impractical given the number of passengers and the frequency of station stops.
20		Blue Line fare equipment was specified to handle zone-based fares.	Although not part of the Analysis, we concur that the technology of the original non-automated, cash/token Metro Blue Line ticket vending machines could have accommodated zone-based fare structures.
<b>Section: Cost of Fare Evasion</b>			
21	Pg 2 Para 4	Faregating Analysis Report estimates revenue loss from the current POP implementation at up to 10 times higher than it should be	See Item #7 above. The Analysis used an average fare of \$1.02 to more accurately reflect a weighted average for a mix of fare products at the current fare structure to account for regular, children, disabled, senior cash and pre-paid riders. The model also presumed a certain percentage of intercepted riders (84% using gates/validators) and 90% gate effectiveness factor.
22	Pg 2 Para 5	No reason to question the fare evasion rate indicated in the TMD Report, but how the rate is applied to revenues should is being questioned	See item #21 above.
<b>Comments on Metro's Draft Faregating Analysis Report (page 3 of 5)</b>			
23	Pg 3 Para 5 cont.	\$5.6M revenue loss (6% fare evasions x 74.3M riders x \$1.25) is incorrect because \$.60 should be used instead of \$1.25	A TMD Fare Evasion Study commissioned by Metro estimated annual revenue loss due to fare evasion at \$5.6 million. However, Analysis used a fare evasion credit of \$3.8 million.

# ATTACHMENT A1

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
24		2005 National Transit Database indicates \$.60 is average Metro Fare.	The \$.60 value is based upon an old report, does not include Metro's recent fare increase and the \$.60 value is a blended average of all Metro fare products including passes. The probability of fare evasion for monthly passes is very low.
25		\$.60 may be high estimate of fare loss because many fare evaders would not otherwise be riding.	See items #21, 23 and 24 above.
26		It is incorrect to assume that fare evaders would otherwise purchase Metro's highest fare.	See Item #24 above.
27	Pg 3 Para 1	Faregating Analysis Report correctly notes that barrier systems still have fare evasion	We concur with this statement.
28		Report uses an anecdotal barrier fare evasion rate of 1%-2%	We concur with this statement
29		Report uses 1% to calculate "net" fare evasion	The Analysis suggests anecdotally that 1-2% of passengers are likely to evade fares. However, as indicated above, the model presumed a certain percentage of intercepted riders and gate effectiveness factor in calculation fare evasion credit
30		Own estimates for barrier fare evasion is more like 2%-4%	See item #29 above.
31		Two reasons why 1% is too low:	
32		a) The tripod gate is given 0 points in the "resistance to fare evasion" category	The Analysis used a comparison table (Most Desirable to Least Desirable) of fare gate configurations. A "0" rating is based on a comparison to other fare gates and does not represent a score. It also has no association to the 1% evasion rate. The values were never meant to provide a quantitative measurement of effectiveness but rather a qualitative comparison between different fare gate types.
33		b) the stations with these gates will be unmanned	The Analysis assumes that presence of Metro Transit Officers at gated stations is included in the operating costs to reduce gate jumping and provide customer service. Metro is reviewing the required staffing levels and the operating costs will be adjusted in response to need. For the purpose of the Analysis, we have assumed one Officer for every five gated stations during all operating hours. Additional CCTV cameras will also be installed at gate arrays to prevent fare evasion, and this cost is also included in the cost calculation.
34		If 2% barrier fare evasion is used the net revenue loss becomes \$1.78M	See Item #23 above.

# ATTACHMENT A1

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
35	Pg 3 Para 2	Fundamental part of a POP system is to get back lost revenue through fines	We did not include any revenue recovery associated with fines. The distribution of fine revenue varies by legal jurisdiction and the established arrangements. Fine revenue is also used to pay for the administration of the adjudication process.
36		Fines are set high to compensate for the known fact that agencies cannot check everyone	Fine levels are set as one means of a deterrent for evading fares.
37		Barrier systems have no fare inspectors, no fare citations, no fare evasion court enforcement, and no fine revenue	See Item #33 above. This statement is incorrect; for example at New York MTA and BART, fare jumpers are pursued by the transit police and appropriate measures are applied once apprehended.
38		The Faregating Analysis report does not state annual total fine revenue	See Item #35 above.
39		Additional revenue of \$1.33M could be accounted for if 1% of barrier fare evaders (6%) are fined \$30 each	If the business case is marginal, then fine revenue recovery may be included in the cost model.
40		If 2% of barrier fare evaders are fined the revenue would equal fare evasion losses	See Item #39 above.
41	Pg 3 Para 3	Net revenue loss will become \$0.45M after adding back fine revenue of \$1.33M (one-tenth the \$5.6M used within the report)	<p>The Analysis used a fare evasion credit of \$3.8 million.</p> <p>The Analysis used an average fare of \$1.02 to more accurately reflect the mix of fare products and current fare structure to account for regular, children, disabled, senior cash and pre-paid riders.</p> <p>The Analysis Operating Cost estimates indicate that regardless of the fare value, fine revenue or fare evasion credit applied; there is still an annual net decrease in operating cost for each of the three options. Once faregates are implemented, the level of additional patrolling required by Metro will determine overall operating costs.</p>
<b>Section: Analysis of Fare Gates</b>			
42	Pg 3 Para 4	Analysis of fare gates excludes a fair comparison with a no-barrier system	The Analysis was prepared to evaluate the feasibility of faregates on Metro Rail. The Analysis reviewed faregate types, configurations by station, quantities, fare media options, passenger impacts, fare evasion impact and provided cost estimates. The scope of the Analysis did not include a comparison with no-barrier systems
43		The fare gate chosen is the worst of the gated alternatives	Analysis did not recommend a single fare gate option. The Analysis indicated key features of service proven tripod gates including simplicity, high reliability, low cost and low maintenance. Disadvantages included resistance to fare evasion and ADA access.

# ATTACHMENT A1

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
44		The fare gate chosen has the least resistance to fare evasion	See item #43 above.
45		Discussion of Homeland Security issues have nothing to do with fare gates and is misleading	One of Metro's objectives of gating is the potential for future implementation of screening systems that would be capable of capturing threats and projecting a security image. The scope of the Analysis includes the identification of various screening technologies that respond to potential threats. Current fare collection technology, ticket vending machines and barrier gates, may be used to detect trace elements of explosives and other chemicals carried by individuals into the system.
<b>Comments on Metro's Draft Faregating Analysis Report (page 4 of 5)</b>			
46	Pg 4 Para 4 Cont.	Table from Faregating Analysis report has been reproduced with modifications ("No Barriers" column and "Totals" row	See Item #42 above.
47	Pg 4 Para 1	Adding the "No Barrier" column to the table shows its overall superiority as compared with the fare gates and fare gate criteria values	The intent of the original table was to show a comparison between the differing gate barrier types and not to compare gated against non-gated systems. The intent of the table was not to create a quantitative score. The table is a tool to provide a graphic view of selected criteria for each fare gate barrier designs. .
48		In every attribute but "security and resistance to fare evasion" the no barrier system is far superior to any other	See Item #42 above.
49	Pg 4 Para 2	Metro staff instructed the consultant to cost only the least expensive tripod turnstile	We concur with this statement.
50		One bi-parting leaf gate will have to be included for ADA requirements	We concur with this statement. The Analysis concludes this as well.
51		No add fare machines were included in the estimates	We concur with this statement. The Analysis identifies approaches for negating the use of add-fare machines including developing policies for insufficient card funds.
52		Its not clear what a patron is the paid area is to do when addition value is needed	See Item #51 above.
53	Pg 4 Para 3	Report has lengthy descriptions of features thought to be needed for Homeland Security reasons	See Item #45 above.
54		None of the Homeland Security features have anything to do with gates since they can't be added to the gate housing.	See Item #45 above.



# ATTACHMENT A1

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
55		The Homeland Security features would have to be additional equipment	We concur with this statement.
56		The Homeland Security features can be added regardless of whether Metro gates or not.	The scope Analysis did not include evaluation of Homeland Security features independent of faregating systems.
<b>Section: Cost of Retrofitting Stations</b>			
57	Pg 4 Para 4	Costs to retrofit light rail stations appear low compared to costs associated with Red Line stations	Equipment Cost Estimates were the product of detailed cost analysis based on recent procurements in North America. The detailed cost analysis took into account variations in constructability and retrofit. In addition, two sets of station surveys conducted jointly by Metro, Booz Allen and Cubic. The Analysis concludes that the costs to retrofit light rail stations, including Engineering, Civil Construction and Site Prep, are in fact higher than Red Line. Red Line stations were designed to accommodate future faregates.
58		Subway station mezzanines are primarily needed for fare collection	The scope of the Analysis did not include the elimination of station mezzanines, future potential utilization of mezzanines and cost estimates for savings in future station construction.
59		There are large cost benefits to eliminating subway station mezzanines	See Item #58 above.
60		Report includes a cost of adding fare gates	We concur with this statement.
61		Report points out that existing Red Line stations already have provisions for fare gates.	We concur with this statement.
62		Primary reason for the mezzanine level in the Red Line stations is for fare gate arrays	See Item #58 above.
63		A POP system doesn't require gates and thus wouldn't require a mezzanine level	See Item #9 above.
<b>Comments on Metro's Draft Faregating Analysis Report (page 5 of 5)</b>			
64	Pg 5 Para 4 Cont.	If fare gates weren't required the station box could be raised 30 feet in future stations for a cost savings of at least 33%	See Item #58 above
65		Stations account for 50% of the cost of a mile of subway	See Item #64 above.
66		There is one station per mile of subway	The scope of the Analysis did not include an evaluation of stations distances or subway construction costs.

# ATTACHMENT A1

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
67		Each mile of subway costs \$200M	See Item #66 above.
68		The savings would be \$67M over 10 stations, which is almost \$700M	See Item #66 above.
69	Pg 5 Para 1	24 Red Line entrances have already been designed and built with fare gates in mind	We concur with this statement.
70		24 Red Line entrances already have the conduits in place for fare gates	We concur with this statement.
71		The [retrofit] work is estimated to cost \$16.5M, or \$700k / entrance	<p>Equipment Cost Estimates were the product of detailed cost analysis based on recent procurements in North America. The retrofit costs, including engineering, site preparation and civil construction were developed based on unit costs on a per station basis.</p> <p>The Analysis estimates \$16.51M as the entire cost for Option, 1 including the faregate equipment. Retrofit work for Red Line Stations is estimated at \$2.8M or \$116,666/entrance.</p>
72		The light rail stations were not designed to accommodate fare gates thus have no conduits already in place like the Red Line stations	We concur with this statement.
73		The cost estimate to retrofit 40 light rail entrances is \$19M, or \$475k / entrance	<p>Equipment Cost Estimates were the product of detailed cost analysis based on recent procurements in North America. The retrofit costs, including engineering, site preparation and civil construction were developed based on unit costs on a per station basis.</p> <p>The Analysis identifies \$10.4M as the Option 2 cost for retrofit work (see Item #71). The light rail only portion of retrofit work is \$7.6M. Divided by 40 entrances, the cost per entrance is actually \$190,750.</p>
74		The expectation is more effort will be required at light rail stations	We concur with this statement.
75		The difference between the Red Line and light rail station costs does not appear logical	See Items #71 and #73
76		The expectation is that the costs will end up much higher than indicated in the report	The Analysis includes a 30% contingency of Total Direct Capital Costs.
<b>Section: Operating Costs</b>			
77	Pg 5 Para 2	Costs may have been underestimated on three items:	See Items #78, #79 and #80

# ATTACHMENT A1

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
78		1) Stations Attendants may have been underestimated by \$15.4M	The Analysis estimates 52,000 hours (\$1.4M) of inspection/station attendants for Option 1 and 89,000 (\$2.4M) for Option 2. This assumption is based on mobile attendants and Metro Transit Police shared at a rate of one/five stations. The Analysis also states that Metro is currently reviewing staffing levels.
79		2) Fare Media may have been underestimated by an unknown amount, but in the millions of dollars	Fare Media costs were not included in the Cost Estimate portion of the Analysis as gating does not alter the need for smart card fare media. Whether gated or not, the business case to replace paper media was made with the award of the original UFS contract.
80		3) On-going, adequate fare inspection may have been underestimated by perhaps \$3.5M	See Item #78 above.
81	Pg 5 Para 3	The report states that "mobile station attendants are shared at the rate of one for every five stations."	We concur with this statement.
82		It is not clear how one attendant for every five stations will work when response times could be as much as 20 minutes or more	With modern, current fare gate technology, transit agencies in general are moving away from assigned "fixed post" attendants. Turnstile fare gates have a reliability metrics of 99% availability. Metro Transit Security will continue to perform patrol duties, combined with CCTV support and PTEL customer phones.
83		More permanent station staffing may be necessary.	See Items #78 and #82 above.
84		Staffing an entrance will require at least 3 shifts per week, or roughly \$240,000 per year.	See Items #78 and #82 above.
85		At \$240k / year it would require \$5.8M to staff the 24 Red Line entrances	See Items #78 and #82 above.
86		At \$240k / year it would require an additional \$9.6M to staff the 40 light rail stations	See items #78 and #82 above.
87	Pg 5 Para 4	Cost of expensive fare media has been excluded from the cost analysis	See Item #79 above.
88		Fare media is clearly crucial	We concur with this statement.
89		Limited Use, one of the expected fare media types, costs \$.20 each for an estimate annual cost of \$8M	We concur with this statement.

# ATTACHMENT A1

ID	Section	Stanger Comment (Summarized)	Booz Allen Hamilton Response
90		Long-life plastic type fare media costs \$5 each with the costs to be bourn by each rider	We concur with this statement.
91		The report does not give a cost estimate for these long-life cards	See Item #79 above.
92		The author estimates an additional \$3.7M for long-life plastic smart cards (74.3M annual riders ÷ 100 trips x \$5)	See Item #79 above.
93	Pg 5 Para 5	The report states an annual savings of \$7.03M after cancelling the "civilian" fare inspector contract	We concur with this statement.
94		The report further indicates that the light rail will have fare inspectors and gated stations will use Metro's mobile Security Force	See Items #78 and #82 above.
95		It is questioned as to how the cost of inspecting all light rail, including the Orange line, and adding mobile attendants at Red Line entrances will only cost \$1.4M	See Item #94 above. The cost for inspector/customer support for Red Line only (Option 1) was \$1.4M. Option 2, including gating select light rail stations increases to \$2.4M.
96		The author asserts that to maintain the same level of fare inspection on light rail that the cost could assumed to be \$3.5M since the Red Line and light rail ridership is equal.	See Items #94 and #95 above.

**ATTACHMENT A2**

**Fare Recovery Comparative Matrix**

The following articles reveal the impact that gate implementation has made for the following transit agencies, both in the U.S. and Europe

Transit Authority	Quote	Reference	Ridership <sup>1</sup> (000s) <b>LACMTA = 1,593.0</b>
<b>United States</b>			
<p><b>New York - MTA</b></p>	<ul style="list-style-type: none"> <li>New turnstiles were also expected to drastically reduce fare evasion that was draining the system of millions of dollars a year.</li> <li>Fare evasion fell to less than 1% of persons entering the subway system.</li> <li>Subway ridership grew by 3.6%, triple the previous growth rate of 1.3%.</li> </ul>	<p>NY Transportation Journal, Fall/Winter 1998 by Bruce Schaller</p>	<p><b>8,710.2</b></p>
<p><b>CTA (Chicago)</b></p>	<ul style="list-style-type: none"> <li>CTA expects to save \$12 million to \$22 million a year, mainly from reduced fare evasion at entry gates and reduced theft wherever cash has been changing hands</li> </ul>	<p><u>AFG, a fare deal for all (mass transit automatic fare collection systems) – Railway age, 1994, by Luther Miller</u></p>	<p><b>1623.9</b></p>
<p><b>MBTA (Boston)</b></p>	<ul style="list-style-type: none"> <li>The T, which previously projected that the new system would boost</li> </ul>	<p><u>T credits Charlie Card with halting fare jumpers</u></p>	<p><b>1,238.5</b></p>

	<p>revenues 3 percent, now expects a jump of 9 percent or about \$21 million – in fare collections by the end of this fiscal year, June 30.</p>	<p>By Mac Daniel, Globe Staff   February 9, 2007</p>	
<p><b>San Francisco Muni</b></p>	<ul style="list-style-type: none"> <li>• What is the estimated percent of fare evaders based on citations and warnings combined? Answer: Closer to 20% to 30%. Without sting operations was 15% to 20%.</li> <li>• WHEREAS, approximately 15% to 20% of Metro riders contacted by fare inspectors are without a valid fare instrument; and</li> <li>• There is some public confusion distinguishing Metro from the Bus system. Estimated revenue lost is 3 to 18%.</li> </ul>	<p>City and County of San Francisco Municipal Transportation Agency Citizens' Advisory Council Finance &amp; Administration Committee (FAC)<b>FINAL MINUTES of Regular Meeting Wednesday, May 18, 2005 at 3:00 p.m.</b></p>	<p>678.3</p>
<p><b>MARTA (Atlanta)</b></p>	<ul style="list-style-type: none"> <li>• The average weekday passenger count at the first 13 stations to get the new gates rose from 43,783 in April 2005 to more than 60,000 in April 2006, a 37 percent increase.</li> <li>• At Inman Park, the average weekday count tripled, to 2,908. The Garnett station saw its count jump from 443 in April 2005 to 1,909 last month, a 331 percent increase.</li> </ul>	<p><b>New MARTA fare gates show higher ridership</b> Associated Press State &amp; Local Wire May 29, 2006 Monday</p>	<p>464.6</p>
<b>United Kingdom</b>			
<p><b>London – SouthWest Trains</b></p>	<ul style="list-style-type: none"> <li>• Experience at these early sites indicated that revenue could be boosted by about 10%, more than double than expected.</li> </ul>	<p><b>Gates combat more than just fare dodgers – Rapid Transit review</b> International Railway Journal,</p>	<p>572.0</p>

	<ul style="list-style-type: none"> <li>British Transport Police reported a 14% fall in crime on the railway in south London in 1998, the year after South West Trains installed gates at Wimbledon and Clapham Junction.</li> <li>An added benefit of automatic ticket gates is their ability to record transaction details each time a passenger passes through. This provides the operator with real time information on passenger patterns and use. This allows the operator to adjust staff schedules to meet peak demand at their respected stations.</li> </ul>	<p><b>March 2001. by Mike Wood</b></p>	
<p><b>First Group (Scotland)</b></p>	<ul style="list-style-type: none"> <li><b>Firstgroup is planning a crackdown on fare evasion after finding that installing automatic barriers at London's City Thameslink station for its First Capital Connect produced a 52% jump in revenues.</b></li> </ul>	<p><u>FirstGroup Revenues leap after ticket barrier cut fare dodging.</u> Transport by Alistair Osborn, Business Editor</p>	<p><b>N/A</b></p>

**<sup>1</sup> APTA Transit Ridership Report – Second Quarter, 2007**

# ATTACHMENT A

## CUBIC Statement of Work Description and Task Assignment

Task	MTA BOOZ OVERSIGHT	Cubic and/or Cubic Sub	Payment Model
<b>FARE GATES</b>			
Project Management	✓	✓	Lease-base
Engineering /Design		✓	Lease-base
Test	✓	✓	Lease-base
Documentation		✓	Lease-base
Training		✓	Lease-base
Production/Equip		✓	Lease-base
Delivery		✓	Lease-base
Installation	✓	✓	Lease-base
Staging		✓	Lease-base
Maintenance		✓	Monthly payment
<b>SYSTEM DESIGN</b>			
Limited Use Cards	✓	✓	Capital cost
Bank Card Certification	✓	✓	Lease-option
Distance Based Fares	✓	✓	Lease-option
<b>CIVIL WORK</b>			
Project Management	✓	✓	Capital cost
AFC equip location	✓		Capital cost
Station design	✓	✓	Capital cost
Drawings		✓	Capital cost
Site Prep		✓	Capital cost
Conduit		✓	Capital cost
Electrical/Comms		✓	Capital cost
TVM relocation		✓	Capital cost
SAV relocation		✓	Capital cost
Railings		✓	Capital cost
Emergency Gates		✓	Capital cost
Station Structural Mods		✓	Capital cost
<b>OTHER</b>			
CCTV equipment/install	✓		
CCTV maintenance	✓		
PTEL equipment/install	✓		
PTEL maintenance	✓		
<b>OPERATIONS</b>			
CCTV Monitoring	✓		
PTEL Monitoring	✓		
Flow Control	✓		
Customer Service Agents	✓		

All activity is subject to Metro approval and Booz Allen Technical Oversight



# ATTACHMENT B

## GENERAL STATEMENT OF WORK

### 1. SCOPE OF SERVICES

The following scope of services describes the approach and sequence of work:

- ***Specification Development:*** Based upon the original work conducted by Booz Allen on a preliminary gating specification, formulate a detailed gating specification that will identify equipment performance and provide contract manageability. The specifications will be clear, concise, easily interpreted, enforceable. It will be written with the intent to minimize the risk to Metro. The specification will be provided to Metro and the supplier prior to finalization of the contractor's lease agreement. Specifications will have these key objectives:
  - Incorporate lessons learned from previous specifications
  - Incorporate the latest standards and technology (where appropriate)
  - Minimize the potential for additional change orders that increase the contract price or extend the schedule
  - Ensure that "work arising" from the implementation is manageable by Metro to a clearly defined process
  - Allow supplier(s) to propose existing, proven, reliable equipment designs with incremental advanced technology
- ***Mobilization:*** Upon receipt of supplier Lease Agreement for implementing faregates on the Metro System, Booz Allen will initiate the following:
  - Develop a technical and contractual modification (change order) to the supplier's current contract explicitly defining and specifying the desired scope of work
  - Conduct a site survey and a line-by-line analysis of equipment count, "ADA" accommodations, station civil modifications including infrastructure modifications. Provide an analysis of required civil work in order to effectively and accurately negotiate a contract change order with the equipment supplier.
  - Confirm that the selected gates are in conformance to Fire Life Safety codes and NFPA 130 regulations. Confirm the architectural configuration is reliant on expertise of station through-put for public safety.
- ***Modeling Analysis:*** Conduct a modeling analysis based on ridership numbers to confirm equipment quantities. Modeling will be used to help determine the UFS equipment count and appropriate devices needed to accommodate Metro's forecasted ridership. Booz Allen will consider the impact that the selected fare gates are likely to have on station throughput.

# ATTACHMENT B

This model requires input from Metro in the form of passenger projections by station entrance, service levels, likely fare policies and acceptable queuing times. The same model has been utilized at LACMTA in the past and has proven effective in optimizing the equipment required. It will consider accommodation of surges (such as Metrolink passengers), cash paying customers (non-TAP), impacts to disabled patrons, and emergency access and egress.

The model will not consider whether the recommended equipment quantities are physically feasible for the environment, only the number required to attain the specified level of service. Station Throughput Deliverable include equipment quantities recommendation memo.

- ***Design, Inspection and Testing Support Services:*** Once the contract has been negotiated and supplier has been provided Notice to Proceed, Booz Allen will perform the following engineering tasks that include:
  - **Engineering Design Reviews:** Booz Allen will conduct at least two design reviews with the supplier. Technical design submittals (CDRLs) will be reviewed and formal comments provided to Metro for submittal to the contractor. Booz Allen will oversee and coordinate the schedule of all design review meetings. We will prepare for the meetings by reviewing relevant correspondence, the status of action items, and pre-submitted review material. Booz Allen will also develop a set of tailored checklists to be used during reviews to make sure that agenda are complete and to see that all relevant topics are covered during the meetings. Booz Allen will produce concise minutes of meetings to be sure that decisions and actions are clearly documented. To maximize the value of the design review process, Booz Allen will identify which issues require early decisions by either Metro or the Contractor and which areas require a detailed progressive review.
  - **First Article Configuration Inspection(FACI):** Booz Allen will perform a full FACI of the first of completed faregates, as well as of critical major subassemblies. These FACIs will establish the design and quality baseline for the remainder of the faregates. During the FACI, Booz Allen will focus on quality and design issues that are not evident from drawings alone such as:
    - Reliability, Availability, Maintainability, and Safety
    - Conformance testing per approved procedures
    - Conformance to industry standards and regulations

# ATTACHMENT B

- Workmanship and quality of construction.
- Equipment Testing: Booz Allen will review and approve supplier developed Test Plan describing all required factory and Metro Facilities testing, acceptance parameters, test witnessing, record-keeping and reporting responsibilities. Test reporting documentation for all tests will be reviewed and approved to assure specification requirements are satisfied and adequate to verify faregate performance. The Booz Allen approach to acceptance inspection and testing at the Metro facility will be to:
  - Conduct a joint receiving inspection with the Contractor to assess any transit damage
  - Conduct a full inspection of faregate and equipment installation to verify that all components are securely mounted and proper electrical and mechanical connections have been made
  - Verify adjustments, repairs, or replacements required for reliable revenue operations are conducted prior to the acceptance testing
  - Witness System Testing of the gates and the performance of “all in” system to assure successful integration of the existing UFS-TAP infrastructures including both Metro and Regional Central computers and the interfaces to ACS’ Customer Service system – all transactions captured at the gates require reporting, and customer service – all of these systems must be engineered to perform to contractual specifications.
  - Verify acceptance tests are performed and witnessed at Metro stations
  - Review and modify contractor proposed “test scripts”. Retain a detailed engineering log of multiple versions of testing based on software changes and upgrades required during “build and test” phase of the project.
- Warranty Support: Booz Allen’s on-site inspection staff at Metro’s facility and Booz Allen project management staff will verify that the equipment supplier’s field organization establishes effective warranty procedures, completes any outstanding work on delivered equipment, and delivers spare parts as required by the contract.
- Systems Integration: Booz Allen will provide system integration support for installation of new CCTV cameras that will be integrated and interfaced to Metro’s Rail Operation Control Center, SCADA alarm systems, new customer service telephone integration and other Metro operating systems, including the UFS – TAP back office system.

# ATTACHMENT B

- ***Emergency Exiting Calculations:*** Booz Allen will perform emergency exiting calculations for all Metro Red Line passenger stations in accordance with National Fire Protection Association (NFPA) 130, Standard For Fixed Guideway Transit and Passenger Rail Systems, 2007 edition. The purpose is to identify any impacts to emergency egress due to the installation of fare gates. Refer to Section 5.5 Means of Egress. Metro will provide patronage information necessary to perform the calculations. Booz Allen presume technical direction will be provided by the Metro Fire Life Safety Committee Chair.
  
- ***Project Administration Support Services:*** Booz Allen will coordinate the administrative aspects of the faregate installation from Notice To Proceed until the warranty processes are completed. Booz Allen will assist in other administrative tasks including the review and preparation of correspondence and meeting minutes. Booz Allen will track submittals related to payment milestones to ensure they receive prompt review. Booz Allen will maintain a register of the status for all payment milestones. Booz Allen also track other contractor obligations such as spare parts, training, training aids, special tools and test equipment. As part of Booz Allen administrative and engineering support to Metro, Booz Allen will prepare sketches, drawings, perform calculations, draft correspondence and memorandum, and prepare other information as required.

Monthly reports will be provided that include a description of our activities during the preceding month and activities planned for the following month, our consultant budget and an update on our DBE participation goals. Booz Allen will summarize the supplier's progress and specifically identify open technical issues and major problem areas and concerns.

Booz Allen also uses project management software to track supplier schedules. Booz Allen will include a Gantt chart in the monthly report that will clearly show the supplier's progress against key milestones and highlights actual progress against their estimated schedule with respect to design, manufacturing, testing and delivery.

- ***Change Order Management Support:*** Similar to document management, change order management requires a disciplined, detail-focused approach. Booz Allen approach to change order management is to maintain a commercial awareness throughout all aspects of the project, and to protect Metro's rights while maintaining a reasonable attitude toward alternative technical proposals from the supplier. Booz Allen will make every effort to assist Metro in providing timely approvals and decisions, avoiding

# ATTACHMENT B

culpability for delays whenever possible. We will document any departure from full compliance with specification requirements as part of the normal design review process. We will provide engineering estimates to Metro and assist in change order negotiation as required.

- ***Contract Close Out Support:*** Booz Allen will contractually define in the Technical Specification and support final acceptance and contract close out. It is envisioned contract close out will require negotiation and contractual trade-offs based on performance and deliverables. Any outstanding claims for defects, delay claims and other contractually defined deliverables will be addressed, evaluated and if requested, negotiated by Booz Allen.
  
- ***Business Rules and Fare Policy Support:*** In addition, Booz Allen will evaluate and support development of new business rules, fare structures or policies potentially adopted to accommodate the faregates. Booz Allen will ensure the successful integration of Regional fare policies to the Municipal Operators' infrastructure and ensure interoperability among all regional participants through the new Metro Rail fare gates. Examples include:
  - Fare policies to accommodate low or insufficient value on the card
  - Fare policies to accommodate the cash paying customer without a smart card
  - Implementing distance based fares, or congesting pricing fares
  - Interagency transfers currently on paper or magnetic tickets from Munis
  - Metrolink patrons who must interface to the gates
  - Regional passes with Municipal entities such as LADOT, Foothill, and 10 other local operators whose ridership must also have business rules and policies embedded into their UFS –TAP systems to enable their patrons to pass through the gates during their transfer journeys.
  
- ***Bank Card and Near Field Communication Support:*** Booz Allen will support Metro's planning and implementation of bank card and cell phone technology integration to take advantage of the investment made in the complete "automated fare systems." These new technology are being tested in systems such as New York MTA, WMATA, MARTA and Chicago. Booz Allen will provide recommendations required to successfully implement such new technology into the UFS –TAP infrastructure that will include interface to gates.
  
- ***Qualitative Impacts on Passengers:*** Booz Allen will evaluate the impact of fare gates on the Metro customer population. Booz Allen will analyze and report on the possible impact on customer education and public outreach due to the introduction of several major changes (distance based

# ATTACHMENT B

fares, fare gates, and new fare media) at the same time. The impact of fare gates to the ADA population will also be evaluated.

- **Schedule:** Booz Allen will develop a projected schedule for designing, leasing, and implementing the new fare gate system

## 2.0 SCHEDULE AND DELIVERABLES

Booz Allen proposes to perform the bulk of the work in three phases:

The following deliverables are anticipated:

- Detailed Draft Specification to be completed approximately 30 days after Notice to Proceed (NTP). Final Specification to be completed approximately 30 days after receipt of Metro comments.
- Line-by-line Site Survey Report approximately 45 days after NTP
- Supplier Final Change Order to be completed approximately 15 days after Metro acceptance of Final Specification
- Modeling Analysis to be completed approximately 90 days after NTP.
- Emergency Exiting Calculation approximately 90 days after NTP.
- Design, Testing and Inspection Support will be concurrent with Supplier schedule
- Change Order Management and Contract Close Out current with Supplier schedule
- Qualitative Passenger Impact report approximately 150 days after NTP
- Bank Card and NFC Support approximately 180 days after NTP
- Schedule will be provided approximately 30 days after NTP

Total hours, including Booz Allen and all subcontractors: 6700 hours

Period of Performance: 24 months after NTP

Not to Exceed Cost: \$1 million

# ATTACHMENT C

## Metro Rail Gating - Funding Plan

### Projected Cash Flow

Expenditures	FY2008	FY2009	FY2010	Total
Wages for Metro project management and support functions	\$ 400,000	\$ 600,000	\$ 300,000	\$ 1,300,000
Professional & Tech Services (Booz Contract)	\$ 500,000	\$ 400,000	\$ 100,000	\$ 1,000,000
Acquisition of Equipment for Civil Work & Infrastructure - Modification of Cubic contract	\$ 4,000,000	\$ 5,000,000	\$ 1,000,000	\$ 10,000,000
Acquisitions of Equipment - purchases of CCTV, PTEL, and other NON-Cubic equipment and other NON-Cubic civil work	\$ 1,000,000	\$ 4,000,000	\$ 1,600,000	\$ 6,600,000
Contingency - Capital Project	\$ 100,000	\$ 1,000,000	\$ 1,000,000	\$ 2,100,000
<b>Total LOP</b>				<b>\$ 21,000,000</b>

Funding				
Prop A 35% Rail	\$ 6,000,000	\$ 11,000,000	\$ 4,000,000	\$ 21,000,000

**Note: Approved FY2008 budget includes \$999,663 for project 210094**

# ATTACHMENT D

## BOARD REPORT ATTACHMENT D PROCUREMENT SUMMARY

### METRO RAIL GATING

1.	Contract Number: Contract OP02461010, OP02461010-Maint., Lease		
2.	Recommended Vendor: Cubic Transportation Systems, Inc.		
3.	Cost/Price Analysis Information:		
	A. Bid/Proposed Price: NTE \$10,000,000 (Civil Work)	Recommended Price: NTE \$10,000,000	
	B. NTE \$46,467,840 (Equipment Lease)	NTE \$46,467,840	
	C. NTE \$12,240,000 (Equipment Maint.)	NTE \$12,240,000	
	B. Details of Significant Variances are in Attachment A-1.D		
4.	Contract Type: Firm Fixed Price		
5.	Procurement Dates:		
	A. Issued: N/A		
	B. Advertised: N/A		
	C. Pre-proposal Conference: N/A		
	D. Proposals Due: December 17, 2007		
	E. Pre-Qualification Completed: N/A		
	F. Conflict of Interest Form Submitted to Ethics: January 4, 2008		
6.	Small Business Participation:		
	A. Bid/Proposal Goal: 3% DBE	Date Small Business Evaluation Completed: N/A	
	C. Small Business Commitment: 5.65% Details are in Attachment A-2		
7.	Invitation for Bid/Request for Proposal Data:		
	Notifications Sent: N/A	Bids/Proposals Picked up: N/A	Bids/Proposals Received: N/A
8.	Evaluation Information:		
	A. Bidders/Proposers Names:  Cubic Transportation Systems, Inc.	<u>Bid/Proposal Amount:</u> NTE \$10,000,000 NTE \$46,468,840 NTE \$12,240,000	<u>Best and Final Offer Amount:</u> N/A N/A N/A
	B. Evaluation Methodology: N/A Details are in Attachment A-1.C		
9.	Protest Information:		
	A. Protest Period End Date: N/A		
	B. Protest Receipt Date: N/A		
	C. Disposition of Protest Date: N/A		
10.	Contract Administrator: Donald C. Dwyer	Telephone Number: 213-922-6387	
11.	Project Manager: Jane Matsumoto	Telephone Number: 213-922-3045	



# ATTACHMENT D

## BOARD REPORT ATTACHMENT D-1 PROCUREMENT HISTORY

### METRO RAIL GATING

#### A. Background on Contractor

Cubic Transportation Systems, Inc., a wholly owned subsidiary of Cubic Corporation, is located in San Diego, California. Cubic Transportation Systems, Inc. (Cubic) has been in the business since 1949. Cubic specializes in two areas of business: Defense and Transportation. Cubic is currently under contract with the LACMTA to complete the Universal Fare System of ticket vending machines and bus fareboxes. Cubic's performance under this contract has been satisfactory. Cubic has provided fare collection equipment to transit agencies throughout the United States and the World including New York Transit, Chicago Transit Authority, Washington Metropolitan Area and London Underground Limited.

#### B. Procurement Background

As the result of a Gating Analysis performed by Booz-Allen & Hamilton and by direction of Metro Board of Directors, Cubic Transportation Systems, Inc. was asked to provide a proposal for the gating of Metro Red Line and selected Blue, Green and Gold Line stations. On December 17, 2007 a proposal was received from Cubic providing pricing for three distinct requirements: Station Civil Work, Equipment Leasing, and Equipment Maintenance. Pricing received is on a Not-To-Exceed basis with detailed pricing to follow.

#### C. Evaluation of Proposals

Cost proposal and Not-To-Exceed amounts are subject to audit by Management Audit Services and resolution of any audit findings.

#### D. Cost/Price Analysis Explanation of Variances

The recommended price has been determined to be fair and reasonable based upon resolution of audit findings.

