



U.S. Department
of Transportation
**Federal Transit
Administration**

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New Mexico Oklahoma
Texas

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March 24, 2008

Mr. Frank J. Wilson
President and Chief Executive Officer
Metropolitan Transit Authority
of Harris County
P.O. Box 61429
Houston, Texas 77208-1429

Re: Preliminary Engineering Approval for the Southeast Corridor Light Rail Transit Project

Dear Mr. Wilson:

The Federal Transit Administration (FTA) is pleased to inform you that the Metropolitan Transit Authority of Harris County's (METRO) light rail transit (LRT) project for the Southeast Corridor has been approved into Preliminary Engineering (PE). This approval of the initiation of PE is a requirement of Federal transit laws governing the New Starts program (49 U.S.C. Section 5309(e)(6)).

With this approval METRO has pre-award authority to incur costs for PE activities prior to grant approval while retaining eligibility for future FTA grant assistance for the incurred costs. This pre-award authority does not constitute an FTA commitment that future Federal funds will be approved for the project. As with all pre-award authority, all Federal requirements must be met prior to incurring costs in order to retain eligibility of the costs for future FTA grant assistance. FTA's approval to initiate PE is not a commitment to approve or fund any final design or construction activities. Such a decision must await the outcome of the analyses to be performed during PE, including completion of the NEPA process.

FTA is required by law to evaluate a proposed project against a number of New Starts criteria and ensure that prospective grant recipients demonstrate the technical, legal, and financial capability to implement the project. As a result of FTA's evaluation of the project, the Southeast Corridor LRT project has received an overall rating of *Medium* under the New Starts criteria. The project's current total capital cost estimate is \$663.6 million (year of expenditure dollars). Of this amount, METRO is seeking \$325.1 million (49 percent) in Section 5309 New Starts funds.

The Southeast Corridor LRT project is a 6.14-mile, double track, 10-station, LRT line. It would connect with the existing METRO Rail Red Line in the Houston central business district and

would serve predominantly inner urban, highly transit-dependent residential areas, three academic institutions (Texas Southern University, University of Houston-Central Campus, and Houston Community College-Central Campus), and a community hub (Palm Center). The project is a minimum operable segment of an LRT line that METRO plans to eventually extend to Houston's Hobby Airport. The LRT line would operate in an exclusive guideway with limited mixed traffic operation. The majority of the LRT line would operate at-grade (6.07 miles), while the remaining 0.07 miles would be elevated to minimize impacts to a natural area (Brays Bayou). A light rail vehicle (LRV) maintenance facility would also be built. METRO would procure 29 LRVs. Property acquisition is required for street widening, off-street station facilities, and the maintenance facility.

METRO must refine and update the project's cost estimate during PE, as well as meet other critical project development milestones that will minimize risks, provide sufficient information on the project's costs and merits for future New Starts evaluations, and ensure the delivery of a cost effective New Starts investment. METRO must also address the following during PE:

- Complete the National Environmental Policy Act (NEPA) review that requires the engineering, technical work, and interagency coordination necessary to support decisions on the scope of the preferred alternative, evaluation and mitigation of adverse impacts, environmental permits and agreements, and responses to comments on draft NEPA documents;
- In the event that any additional travel forecasts are developed for the project, please ensure that they adhere to FTA requirements and the state of the practice, and reflect the transportation network assumed for the appropriate design year in the region's financially constrained long range plan;
- Further develop the Project Management Plan (PMP) to include final design and construction; coordinate the PMP with the section of the supplemental final Environmental Impact Statement on construction impacts and provide for mitigation monitoring during final design and construction phases in the PMP;
- Refine the financial plan, as needed, based on further negotiations with METRO's private concessionaire regarding the private sector's financial participation in the project;
- Update METRO's fleet management plans, as needed;
- Revise the project's Real Estate Acquisition Management Plan (RAMP) to address FTA's previous comments that were submitted to METRO under separate cover in February 2008. Prior to restarting the real estate acquisition program, METRO must complete the NEPA review and receive a Record of Decision from FTA; and
- Address other project-readiness issues identified by FTA as PE progresses.

In January 2008 FTA initiated an assessment of the scope, schedule and costs for the Southeast Corridor LRT project based on the METRO Board of Director's October 2007 decision to implement LRT. The review was completed in February 2008, and is included as an attachment to this letter. Based on the review's findings, please be cognizant of the following concerns:

Annual Escalation Rate: While METRO's current annual escalation rate of 3.25 percent is consistent with the Engineering News Record forecast for 2008, consideration must be given to

recent market volatility for construction commodities that may result in an understatement of year of expenditure market costs

Utility Work: Interfaces with the City of Houston, utilities associated with street work, relocations of existing private utilities, and the associated costs and time associated with these activities present some uncertainties. While METRO continues to develop a Consent Agreement with the City, both parties are assuming, on the basis of verbal agreements that the project will be able utilize design variations from Houston's codes. Until these negotiations are concluded, consideration is necessary of the potential costs and delays that may adversely impact the project's budget and schedule if the design variations are not permitted.

Actual Costs for Allowances: Actual costs for estimate line item allowances are based on an uncertain scope of work. Consideration is necessary of potential impacts if the scope of work changes significantly as the project's design is developed further

METRO must work with FTA during PE to address the issues identified above, along with any others that are identified in FTA's assessment of scope, schedule, and costs, as well as any concerns that are identified as project development progresses. The objectives are to ensure that:

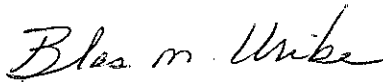
- All environmental impacts are identified and adequate provisions made for their mitigation in accordance with the requirements of 49 USC 5324(b);
- All major or critical project elements are designed to a level that no significant unknown impacts relative to their costs will result; and
- All cost estimating is complete to the level of confidence necessary for METRO to effectively implement the financing strategy including establishing the maximum dollar amount of the requested New Starts financial contribution needed to implement the Southeast Corridor LRT project

FTA understands that METRO plans to use a design-finance-build-operate-maintain project delivery method. A Facility Provider (FP) – comprised of a team of engineering, construction, construction management, financial advisors and vehicle firms - would design and construct the project, help to finance, and have an equity stake in the project. Final design and construction would be merged into a single contract. The FP would also operate the proposed LRT line and would be responsible for the first five years of LRT revenue service.

As indicated in our March 5, 2008 letter to METRO, FTA will need to analyze the terms of METRO's agreement(s) with its FP before making any definitive decisions affording METRO the benefits available under the U.S. Department of Transportation's Public-Private Partnership Pilot Program (Pilot Program). METRO has agreed to provide FTA with drafts of the agreement(s) as they are developed to allow FTA to expedite its analysis of the documents. If the agreements do not adequately transfer risks to the private sector, and therefore do not meet the objectives of the Pilot Program, FTA will apply its normal oversight and risk management processes to the project.

FTA will continue to work with METRO during the development of the Southeast Corridor LRT project. If you have any questions regarding this letter please contact me at (817) 978-0550.

Sincerely,


for Robert C. Patrick
Regional Administrator

Enclosure: FTA's Scope, Schedule and Cost Review Report, February 2008

cc: David Wolff, Chairman, METRO Board of Directors

FEDERAL TRANSIT ADMINISTRATION
PROJECT MANAGEMENT OVERSIGHT PROGRAM

Contract No. DTFT60-04-D-00006
Project No. DC-27-5010-00
Task Order No. 7

**Grantee: METROPOLITAN TRANSIT AUTHORITY OF
HARRIS COUNTY
(HOUSTON-METRO)**

**Annual PMOC Review of the FY09 New Starts Submittal Updated
on January 31, 2008 For PE Re-Entry Readiness**

SOUTHEAST CORRIDOR LRT PROJECT

CLIN 0005
PG 19, Subtask 19

February 2008

Shaw Infrastructure, Inc.
3 Executive Campus
Cherry Hill, NJ 08002

Kal Krishnan Consulting Services
344 Thomas L. Berkley Way
Oakland, CA 94612

Updated Annual Review of the FY09 New Starts Submittal

SOUTHEAST CORRIDOR LRT PROJECT

1) Project Data:

- a) Date of your report: *February 19, 2008*
- b) Project name and location: *Southeast Corridor LRT Project, Houston, TX*
- c) Project sponsor: *Metropolitan Transit Authority of Harris County, Texas (Houston – METRO)*
- d) PMOC firm: *Shaw Infrastructure, Inc*
- e) Person (and affiliation if different from PMOC firm) providing this report: *Jim Gleckler*
- f) Length of time PMOC firm and person have been assigned to this project: *The PMOC has been assigned to METRO Capital Projects since 1993 Mr Gleckler has been assigned to the project since 2006.*

The PMOC notes that METRO's updated January 31, 2008 Southeast Corridor FY09 New Starts report is based on current cost data developed in concert between METRO and the Facility Provider 1 (FP1) team during the New Starts PE phase of the Development Agreement for the Southeast Corridor Project. On September 28, 2007 PMOC submitted a Spot Report for the September 7, 2007 FY09 New Starts report, which METRO had based on Conceptual Cost Data for Bus Rapid Transit – Convertible (BRT-C) technology that was utilized in the previous FY08 and FY07 reports. On October 18, 2007 METRO's Board of Directors adopted Light Rail Transit (LRT) as the LPA technology, replacing BRT-C.

PMOC further notes that, in keeping with the objective to assist METRO in a timely re-entry to Preliminary Engineering (PE), PMOC has previously communicated its observations, comments, and recommendations on the December 20, 2007 FY09 New Starts report to METRO staff. METRO has incorporated PMOC recommendations into the January 31, 2008 FY09 New Starts report and the SCC workbook for the Southeast Corridor project. PMOC is of the opinion that the January 31, 2008 updated FY09 New Starts cost estimate is adequate for entry of the Southeast Corridor project into PE, and further that METRO must continue to advance the development of scope and cost with its Facility Provider 1 contractor to solidify the cost prior to entry into Final Design.

The January 31, 2008 New Starts SCC cost estimate does not include any finance costs. A review of the METRO Financial Plan by the Financial Management Oversight Contractor to confirm the overall project financing strategy and acceptability is in order.

- 2) Describe the history and basis of the *actual cost estimate* for the project. Include the names of the firm/s that prepared the estimate. Verify that the SCC worksheets reflect the current estimate; indicate the date of the SCC worksheets (in the space marked "Today's Date."). Attach the Excel file of SCC worksheets to your email with the draft report.

Project Estimate History

The Southeast Corridor Project is currently in the New Starts PE stage and METRO is under contract with the Facility Provider 1 team led by Washington Group Transit Management Company (WGTMC) to complete the development of the PE documents and a firm fixed price for the final design, construction, and start-up of the project by February 2008. While New Starts PE data has not been incorporated into METRO's updated FY09 New Starts submittals, the current cost estimate includes a majority of unit costs and quantity calculations that have been developed by FP1. The Southeast Corridor Project was previously selected as a project in the FTA Public Private Partnership Pilot Program. The change from BRT-C to LRT technology will require a new Memorandum of Understanding between METRO and FTA if the project is to continue in the program

METRO originally estimated project capital costs by developing a Unit Cost Library and a standardized project estimate spreadsheet. HDR / SR Beard & Associates (METRO's General Planning Consultant) prepared the library and spreadsheet. Adjustments in the spreadsheet were made to more accurately reflect the conditions within the Southeast Corridor Minimum Operable Segment (MOS). The capital cost estimates were based on METRO experience from actual costs of the already constructed Main Street LRT (i.e., locally funded Initial segment of METRO Rail on the Main Street Corridor). This information was supplemented with national cost data, when applicable. Master spreadsheets were developed for each definable element (i.e., guideway / track, stations, transit centers, park & ride lots, roadway improvements, vehicles, etc.), to develop the unit cost of each element. Quantities were estimated for each element for the Southeast Corridor Build Alternative. The quantities were aligned to SCC descriptions. Capital costs for each of the Southeast Corridor elements were calculated, from which an overall LRT conceptual capital cost was estimated and the cost per mile was established. The result was a project estimate that is best characterized as a parametric product

METRO and FP1 have been undertaking the development of the actual project cost estimate for the past eight (8) months. A number of developmental estimates have been submitted by the FP1 team to date, which METRO has been generally critical of. Following numerous discussions between METRO and FP1, METRO has determined that the Rough Order of Magnitude (ROM) estimate, submitted by FP1 on July 18, 2007 and Revised on August 27, 2007, is the best statement of project scope and cost for the LRT technology.

METRO has based its current cost estimate update on the Revised ROM, and has amended the Revised ROM to include allowances for work not estimated by FP1 and to add scope for which METRO is responsible. The FP1 team presented its Updated Estimate on February 4, 2008. METRO's review of the updated estimate is on-going, but none of the February 4, 2008 data has been incorporated in METRO's current New Starts submittals.

An updated FY09 Southeast Corridor New Starts report was previously submitted electronically to FTA and the PMOC on December 14, 21, and 28, 2007. Documents submitted include the following:

- FY2009 Section 5309 New Starts Report*
- FY2009 Section 5309 New Starts Baseline Report*
- Southeast Corridor SCC workbook dated 12-20-07*
- METRO Financial Model (Sources and Uses of Funds) dated 12-28-07*

Subsequent to the above submittals, METRO re-submitted all FY2009 Section 5309 New Starts Report documents, including the Financial Plan, on January 14, 2008, however the date of the SCC workbook remained December 20, 2007

The PMOC met with METRO staff on January 23 and 24, 2008 to review backup for the updated SCC workbook. PMOC provided observations to METRO on January 30, 2008, and METRO updated the FY09 New Starts report on January 31, 2008, including the SCC workbook dated January 31, 2008.

The PMOC identified the following as major changes from the FY09 report submitted in September 2007 to the current FY09 report submitted in January 2008.

- The YOE project cost estimate has risen from \$157,783 million to \$663,641 million, or an increase of \$505,858 million. The increase in YOE cost results mainly from the technology change from BRT-C to LRT, and the additional vehicles and infrastructure associated with the 2030 ridership projections. The current SCC cost estimate includes input from both FP1 and METRO.*
- The Revenue Operations Date (ROD) has changed from August 2011 to July 2012.*
- The Local / Federal share of funding sources remains 51.0% Local / 49.0% Federal. METRO continues this share basis to strengthen their local financial commitment to the project.*
- METRO has escalated base year 2007 costs by an annual rate of 3.25% to determine the YOE costs.*
- The current SCC estimate includes a total of twenty-nine (29) new vehicles. METRO has stated that they intend to procure Light Rail Vehicles on a phased approach (13 now and 16 later), and has accordingly escalated the base year 2007 LRV costs to year 2018 when the last of the Southeast Corridor LRVs are required to meet ridership projections.*

Consistent with METRO's objective to enter into a Public / Private Partnership for a Design Build Operate and Maintain program, the FP1 New Starts PE and Design-Build team recently finalized its Firm-Fixed-Price (FFP) cost estimate, which was submitted to METRO on February 4, 2008. The FFP is based on New Starts PE drawings and documents dated December 14, 2007.

- 3) For the Build Alternative, review the following SCC worksheets: Main Worksheet, Project Description, Inflation Worksheet, and Project Schedule. On the Inflation Worksheet, verify that "base year" costs (or in this case, 2007 year dollars) have been spread across the top part of the worksheet in accordance with the project schedule. The base year cost is in 2007 year dollars -- as if the project was planned, designed and implemented entirely in 2007. Verify that a rate of inflation has been inserted by the project sponsor for each year of the project. For years 2000 through 2006, verify that the actual amounts expended have been inserted in the YOE (bottom) section of the worksheet and are inflated to 2007 base year dollars (in the top section).

The PMOC reviewed the FY09 SCC worksheets and verified that.

- The 2007 base year costs have been spread accurately across the current project schedule on the inflation worksheet,*

- *A rate of inflation (3.25%) has been entered into each year of the inflation worksheet,*
- *Actual amounts expended in 2006 have been entered in the lower section of the inflation worksheet, and the expended value has been escalated to 2007 dollars in the upper section of the inflation worksheet.*

4) Cost estimate in 2007 Base Year Dollars. Refer to the cost estimate in its original and SCC formats as well as project narratives and drawings.

- a) Characterize the scope and level of scope definition that formed the basis for the project sponsor's current capital cost estimate.

The Base Year 2007 cost estimate data developed by the FPI team (unit costs, quantities, and allowances) is for LRT technology based on the 30% Selected Civil Engineers PE drawings and documents provided to FPI on the New Starts PE Award Date. METRO has adjusted scope so that quantities agree with scope in the Final Environmental Impact Statement and has added allowances to complete the estimate where the 30% PE package is deficient. The project estimate includes quantities which are not yet totally consistent with the LRT alignment adopted by the Board of Directors on October 18, 2007. PMOC expects that the quantities have recently been aligned in the FFP proposal effort since the current New Starts PE drawings (dated December 14, 2007) were to be used as the basis for quantity take-offs feeding into the FFP estimate.

- b) Assess and evaluate the capital cost estimate. Make recommendations where appropriate for change of approach or additional work.

- i) Check the estimate's internal consistency (does it add up?)

The PMOC performed a mechanical check of the FY09 SCC work book to verify that it is internally consistent and mathematically correct. PMOC found that the SCC line items were appropriate for the adopted LRT alignment, the unit costs were consistent with the level of detail provided by the FPI team, and that sampled quantities are consistent with the project scope. Based on PMOC observations and recommendations, METRO has adjusted vehicle and infrastructure quantities and cost in the SCC workbook to be consistent with the 2030 ridership forecast. Therefore, PMOC is of the opinion that the FY09 estimate is internally consistent.

- ii) Check the estimated quantities through comparison with drawings

Estimated quantities are limited to guideway length, number of stations, and vehicles. PMOC has verified from the FEIS, adopted alignment data, and the Rail Fleet Management Plan that these quantities are correct for the scope. PMOC utilized street maps to cross-verify guideway length.

- iii) Check the unit costs through comparison with recent similar bid prices

PMOC reviewed unit cost information supplied by METRO and the FPI team (the New Starts PE firms and the Design-Build team firms). Following lengthy review with METRO, PMOC reports that the majority of unit cost data was provided by the Design-Build team, and as such the unit costs constitute bids to be negotiated by METRO. PMOC is also of the opinion that the unit costs supplied by the FPI team

are conservative since FPI expects METRO to aggressively negotiate to the lowest unit cost.

- iv) Check the reasonableness of pricing escalation for specific construction elements and commodities

METRO is utilizing an average annual inflation rate of 3.25% to calculate escalation, based on the Engineering News Record forecast that the National Construction Cost Index will rise by 3.2% in 2008. PMOC is of the opinion that this inflation rate is optimistic at this time.

At this point in the project cost development process, the FPI team has not proposed YOE unit costs to METRO. METRO expected the February 4, 2008 FFP to include YOE pricing however.

- v) Check the reasonableness of the cost estimate for and assumptions behind the General Conditions of the Contract in terms of allocation of risk to the project sponsor, the construction contractors, etc

The scope of work for FPI includes the obligation to estimate and provide all General Conditions aspects. The Revised ROM estimate includes cost estimates from both members of the FPI team (the Facility Provider and the Design Build contractors) for General Conditions. These estimated costs were to be confirmed in the FFP proposal on February 4, 2008. PMOC is of the opinion that the FPI team has estimated the General Conditions costs on a conservative basis and further that the FPI team will be held accountable for their General Conditions cost estimate, since the scope of the project and the project schedule have been developed by the FPI team during the New Starts PE phase.

- vi) Have important changes occurred since the project sponsor's actual cost estimate was prepared that would render the estimate less valid? How does the project compare with the project reviewed by the PMOC in the fall of 2006?

While no significant project configuration changes have occurred since January 31, 2008, it can be expected that some project costs have changed in the February 4, 2008 FFP proposal. METRO has recently characterized the FFP data received on February 4, 2008 to be "slightly higher" than the Revised ROM data previously received.

The project reviewed in the fall of 2006 was BRT-C, while the current project is for LRT technology with significant attendant changes.

- vii) Identify sources of uncertainty and related potential for cost increase. Estimate the cost and time impact of these uncertainties. Uncertainties may include unresolved issues or inadequate project definition associated with the design and construction scope; the political, institutional and project management context of the project; procurement conditions, contracting methodology, bid climate; methodology of developing the capital cost estimate itself; perceived biases in the estimate; funding sources / financing mechanisms; cost of inflation or change in the value of the dollar over time.

PMOC identified the following uncertainties during its previous reviews of the METRO New Starts reports, and, while the estimate has moved from conceptual to 30% design basis, the uncertainties still apply.

- Although the scope of the project has been better defined during the New Starts PE phase, any further revisions to the current alignment and station locations could significantly impact costs
- A significant amount of cost in the updated January 31, 2008 FY09 New Starts SCC cost estimate does not have sufficient detail to elicit unit cost multiplied by quantity estimate development by the FPI team or by METRO. As such, Allowances have been placed within the current cost estimate. Current Allowances include.

Maintenance Facilities (prorated)	\$ 24 Million
I-45 Overpass Modification	\$ 5 Million
Light rail vehicles (unit cost \$3.2 M each)	<u>\$92.8 Million</u>
Total	\$121.8 Million

The actual cost for work currently based on an Allowance may vary considerably in the final FFP proposal. The total value of Allowances identified in the SCC cost estimate (\$121.8 Million), includes the 11.6% Allocated Contingency implied on the Build Main SCC worksheet, which corresponds to a base cost of \$109.1 Million. During discussions with METRO on January 23 and 24, 2008, METRO provided additional backup that had either been provided by FPI or developed from METRO experience that characterized the basis of the Allowances. The Allowances are legitimate place holders for work that will be required on the corridor, even though the work may not be shown on the 30% PE drawings. Firm fixed prices for some of the work currently covered by the Allowances may have been proposed on February 4, 2008.

- As described in Item 3 e, titled "Real Estate Acquisition Businesses", of the March 2007 PMOC spot report on the Southeast Corridor FY08 NS report, the potential changes discussed therein could affect real estate costs. An 11.6% allocated contingency has been applied to the real estate base cost estimate in the current FY09 NS report. The PMOC is of the opinion that a 20-30% contingency is more appropriate for real estate, and that an additional \$5.5 Million contingency is recommended for real estate acquisition.
- The January 31, 2008 New Starts SCC cost estimate includes cost for vehicles needed to meet the 2030 ridership projections. METRO and WGTMC are currently soliciting proposals for Light Rail Vehicles (LRV), and the solicitation issued in September 2007 (which includes vehicles for the existing Red Line as well as for the FPI Southeast and other METRO Solutions expansion corridors) does not require that the supply of LRVs be in accordance with all Federal requirements. As such, the eligibility of LRV costs for federal support funding is questionable.
- METRO is putting into place an Owner's Controlled Insurance Program for the project that obligates METRO to pay premiums for the Builders Risk, Workers Compensation (WC) and Employer General Liability (GL), and Railroad Protective insurances as well as to pay the deductible for WC and GL losses.

During its review of the December 20, 2007 estimate, PMOC was of the opinion that METRO had undervalued the cost of insurances and the losses that can be expected for the above insurance coverage. PMOC's previous experience indicates that additional costs of \$10 Million may be incurred by the project. PMOC informed METRO of this matter, and METRO has added approximately \$10 Million for this item in the January 31, 2008 SCC workbook.

- *Specific environmental mitigation issues have been identified and included in the FEIS. Additional environmental mitigation may be required for issues that may be identified during New Starts PE and the supplemental FEIS review. Therefore, there is a potential of cost impact to address additional environmental issues.*
- *With the current alignment no agreement with FRA is anticipated. However, agreements will be needed with the railroads to cross over their tracks in an aerial configuration in selected locations of the revised LRT alignment, which could impact costs. Changes in alignment could require agreements with FRA and/or railroads, which could impact costs.*
- *Interfaces with the City of Houston, utilities associated with street work, relocations of existing private utilities, and the associated costs and time present uncertainty in the project scope and cost. METRO continues to develop a Consent Agreement with the City of Houston, but at this time both parties are working under verbal agreements for design variations from Houston codes.*

viii) List the top three risks that have been identified. Comment on these in relation to your discussion of uncertainties in the item above.

PMOC considers the top three risks to be:

- *While METRO's current escalation annual rate of 3.25% is consistent with the ENR forecast for 2008, market volatility for construction commodities may exceed the forecast, resulting in an understatement of YOY market costs.*
- *Interfaces with the City of Houston, utilities associated with street work, relocations of existing private utilities, and the associated costs and time.*
- *Actual costs for estimate line item Allowances, which are based on uncertain scope of work, may change significantly when the design is developed.*

ix) Check the amount of allocated contingency for specific line items. Has allocated contingency been used to target perceived uncertainties in scope, schedule or cost in a specific line item – for a segment, station, or other element, in both the design and construction phases? In addition, comment on the total allocated contingency as a percentage of total base year dollars. In your opinion, is the allocated contingency adequate?

Allocated contingency on the overall cost estimate is 11.6% of the total Base Cost. Overall, given the uncertainty that is inherent in the developmental nature of the project cost estimate base costs and given that a significant portion of the cost estimate is based on data developed by the FPI team, PMOC is of the opinion that the 11.6% allocated contingency may be nominally appropriate at this point in the project, as long as it contributes to an overall combined Allocated and Unallocated

Contingency of 20% of the project costs. As noted in Section vii) above, PMOC is of the opinion that 11.6% contingency is not adequate for SCC Category 60 ROW.

As can be seen in the Build Main SCC worksheet, individual contingency allowances are consistent by SCC category, and are rounded as follows.

• 10 Guideway & Track elements	\$7.179 M / 11.6%
• 20 Stations, Stops, Terminals, Intermodal	\$2.064 M / 11.6%
• 30 Support Facilities, Yards, Shops, Admin	\$2.492 M / 11.6%
• 40 Sitework & Special Conditions	\$11.912 M / 11.6%
• 50 Systems	\$5.360 M / 11.6%
• 60 ROW, Land, Existing Improvements	\$4.812 M / 11.6%
• 70 Vehicles	\$9.637 M / 11.6%
• 80 Professional Services	\$15.523 M / 11.6%

Allocated contingency in the estimate is shared between METRO and FP1, with the majority of the contingency allocated to FP1 work. Approximately eighty-six (86) percent of the base year 2007 cost estimate is based on unit cost data developed and provided by the FP1 team, which includes equipment, materials of construction, and professional services categories. Accordingly, 86% of the 11.6% Allocated Contingency value at this point in time in the estimate is to the benefit of FP1, since the risk of cost, production, and quantity will eventually be borne by FP1.

Monetarily, the share of base year 2007 Allocated Contingency is as follows:

METRO	\$ 8.17 M
FP1	<u>\$ 50.81 M</u>
Total	\$ 58.98 M

- x) Check the amount of unallocated contingency. In your opinion, is it adequate to cover unforeseen conditions in all project areas and remain in reserve until construction is well underway?

Unallocated contingency in the Southeast Corridor estimate totals \$22.548 million Base Year and \$25.228 million YOE. These values represent 4.43% of the Base Costs in 2007 dollars, and 4% in YOE dollars. The use of roughly 4 - 4.5% as the expected Unallocated Contingency value compares somewhat below the norm for projects in Preliminary Engineering. In comparison, FTA's May 2007 Reporting Instructions for Section 5309 New Starts Criteria proposes that a baseline 5% Unallocated Contingency be included.

However, the Unallocated Contingency is being shared by METRO and the FP1 contractor Washington Group Transit Management Co. METRO scope has included Unallocated Contingency in the estimate as \$5.1 M base year 2007 dollars. This equates to 7.0% of the \$72.4 Million METRO estimated scope to be expended for the rest of the project.

WGTMC has \$17.46 Million of Unallocated Contingency against \$495.54 Million of estimated scope, or 3.5%. Absent the final Design-Build Phase contract terms and conditions, it is unclear why WGTMC included the Unallocated Contingency. It is

possible that this contingency has been included so that WGTMC's estimate can "absorb" unit cost, quantity, and scope changes that may be identified by the Design-Build team during the development of the final FFP proposal.

METRO currently acknowledges that the WGTMC Unallocated Contingency is for the use and benefit of WGTMC while the final pricing for the FPI scope is developed

While the Southeast Corridor project has been proceeding quickly through the New Starts PE phase and more project specific information is now on the project drawings, the current New Starts submittal cost estimate is based on the 30% PE package from early 2007. METRO is essentially carrying no Unallocated Contingency on the FPI scope of work (New Starts PE and the Design-Build work). Considering that the METRO estimate is now bearing a significant portion of "market" pricing from the contractor, PMOC is of the opinion that METRO should include an allowance of 3% – 5% of the total project (METRO and FPI) costs for unexpected changes. A 4% allowance on the project costs would total \$22.7 Million as an alternate Unallocated Contingency estimate, which would correspond to a \$17.6 Million understatement (\$22.7 M minus \$5.1 M) in the estimate for Unallocated Contingency.

Adding \$17.6 Million of additional base year Unallocated Contingency would contribute to a Total Base Year Project Contingency value of \$99.1 Million, which represents 19.5% of project base costs.

- 5) Cost estimate in year-of-expenditure (YOE) dollars. Refer to the cost estimate in its original and SCC formats, as well as project narratives and drawings.
- a) Comment on the fit between the YOE schedule for expenditures compared with the project schedule for design and construction.

Based on comments from PMOC, the YOE schedule in the Inflation Worksheet has been accurately adjusted by METRO to be consistent with the expected LRT scope of work, FPI FD and construction schedule, and vehicle procurement. METRO's updated schedule, submitted on January 28, 2008, indicates that entry into Final Design will be approved by FTA on September 8, 2008.

The overall FPI Phase 2 (FD/Construction/Start-up) schedule in the updated January 31, 2008 FY09 New Starts report is a 46 month window between NTP2 (Phase 2 - FD and construction) and Ready for Revenue Service. 46 months may be an appropriate time period but it also needs to be confirmed by the FPI team in its FFP proposal schedule. By comparison, the current METRO Southeast Corridor schedule update also allows 46 months for the FPI Phase 2 work.

PMOC is of the opinion that the schedule and inflation calculations are accurate in METRO's updated FY09 Southeast Corridor New Starts report. METRO has adjusted the cash flow and expenditure forecasts to be in line with the current project schedule so that appropriate YOE estimate values are represented in the New Starts report

[Editorial note: the start date of the "Final Design duration" is incorrectly stated in the Project Description Template to be March 27, 2008, when it should be September 8, 2008]

- b) Comment on the reasonableness of construction escalation for specific commodities that may be included in the YOE cost.

METRO has applied uniform escalation factors to all project components in its FY09 New Starts report. METRO has based the escalation factor on the current Engineering News Record (ENR) forecast for the change to the National Construction Cost Index (CCI) for the period December 2007 to December 2008, which is 3.2%. It remains to be seen if the volatility in commodity escalation (especially in the cement bearing components, steel and other metal components, and fuels) that has occurred over the past several years has been abated by the recent economic downturn and the forecasts for a slowing economy. However, PMOC is of the opinion that METRO's uniform escalation factor application is consistent with industry forecast for at least the near term.

- c) Comment on the assumed rates of inflation used for each year of the project.

The FY09 New Starts report assumes that the rate of inflation for each year of the project schedule is 3.25%. As stated in b) above, this annual escalation rate is in accordance with ENR's 2008 projection for the 2008 National CCI. Conversely, the parametric estimate developed by the PMOC team utilized escalation factors varying from 3.5% to 4% per year.

- d) Identify uncertainties that have been introduced through the development of the YOE cost estimate.

- The current alignment and station locations reflect the development of information in the New Starts PE phase work and are consistent with the expected LRT operational expectations. Final pricing has yet to be confirmed in the FP1 proposal due on February 4, 2008.*
- As described in Item 3 e, titled "Real Estate Acquisition..... Businesses", of the March 2007 PMOC spot report on the Southeast Corridor FY08 NS report, the potential changes discussed therein could affect real estate costs. An 11.6% allocated contingency has been applied to the real estate base cost estimate in the current FY09 NS report. The PMOC is of the opinion that a 20-30% contingency is more appropriate for real estate, and that an additional \$5.5 Million may be needed for real estate acquisition.*
- Specific environmental mitigation issues have been identified and included in the FEIS. Additional environmental mitigation may be required for issues that may be identified during New Starts PE and the supplemental FEIS review. Therefore, there is a potential of cost impact to address additional environmental issues.*
- With the current alignment no agreement with FRA is anticipated. However, agreements will be needed with the railroads to cross over their tracks in an aerial configuration in selected locations, which could impact costs. Changes in alignment, if required due to design development, could require agreements with FRA and/or railroads, which could impact costs.*
- Unallocated Contingency recommendations as noted above will yield higher YOE values as well.*

- 6) Project Schedule. Comment on the overall reasonableness of the project schedule. Assess the proposed durations for each phase, giving consideration to the national, local, and

agency-specific track records for implementation of similar projects. Identify sources of uncertainty.

The latest schedule from METRO is a Master Program Schedule for all METRO Solutions Corridor and Intermodal Terminal projects updated as of December 31, 2007. This schedule identifies milestone activities, including the completed activities such as DEIS, selection of LPA, PE, FEIS, as well as the pending Supplemental FEIS and the issuance of a new Record of Decision. Award of the FP contract, PE continuation, project development (i.e., New Starts PE) and other future activities are also identified. The updated FY09 New Starts Report, dated January 31, 2008, also provides milestone dates as part of "Project Description Template" and is used herein, as applicable. The current schedule is developed to support the schedule commitment for the METRO Solutions program made in the public referendum that was passed in November 2003. The current schedule also has been updated with the intention to address the federal process of FTA/PMOC readiness reviews, and FTA/Congressional approvals to be performed prior to the project's entry into Final Design and Full Funding Grant Agreement (FFGA) stages, which has been an on-going concern on the part of the PMOC and FTA. However, the project was previously selected as part of FTA's Public Private Partnership Pilot Program and may, if a new FTA/METRO MOU for the LRT project is executed, receive certain streamlining of processes. As such, the overall Master Program Schedule is appropriate for re-entry into PE, but additional detail is needed prior to entry into FD. PMOC has provided comments to METRO to facilitate the additional detail for FD entry.

- 7) Concluding statement in 500 words or less. Synthesize your findings on scope, schedule, and cost. Provide a professional opinion regarding the reliability of the project scope, schedule and cost. Make a statement of potential range of cost (lower, upper bound and most likely). Characterize significant uncertainties in terms of likelihood (probable, remote, improbable) and their consequence (catastrophic, critical, serious, moderate, marginal.) Where it could reduce important uncertainties, recommend additional work of any kind including but not limited to investigation, planning or design work by the project sponsor or other party with a schedule for its performance to optimize benefit to the project.

PMOC's findings on the updated (January 2008) Southeast Corridor FY09 New Starts report are that significant changes have occurred since the September 2007 annual New Starts report from METRO that reflect the change from the BRT-C project to the LRT project and that reflect cost and schedule input from the FPI team (program management, design, construction, and start-up scope). METRO awarded the New Starts PE Phase Development Agreement with FPI for the Southeast Corridor in May 2007, and New Starts PE work has been proceeding for the past eight months. Significant cost and schedule information has been supplied by FPI and has been included in METRO's updated FY09 New Starts report submittals. Going forward, the FPI team has utilized the New Starts PE package as of December 14, 2007 to develop the final Design-Build Phase proposal, which METRO is currently reviewing.

METRO currently has two teams in place who are developing "Cost Confidence" reports so that METRO management has a defensible position as to the fair cost of the project. One team is comprised of METRO estimating staff, and the other team is Arup, Inc. which is an independent third party approved by the FPI financial partners. Both teams will use the

December 14, 2007 New Starts PE package and will develop unit costs and quantities for the project components that contribute the most significant cost to the estimate (20% of the scope that contributes 80% of the cost)

At this point in time, PMOC is of the opinion that cost and scope data provided by the FP1 team is very likely on a conservative basis so that further cost increases are minimized as the final fixed price is formulated. In contrast, PMOC is also of the opinion that numerous uncertainties still exist in the cost estimate for scope that METRO has estimated (allowances for work that has not been advanced on the drawings, right of way contingency, and Unallocated Contingency). PMOC characterizes the accuracy of the estimate and the possible range of uncertainty as follows:

- 1. Assuming that the cost information supplied by FP1 is conservative and that METRO will be successful in negotiating the prices down by 5%, the current FP1 base cost estimate of \$488 Million has approximately \$24.4 Million of latent contingency. This is sufficient contingency to address the uncertainties identified above (\$5.5 M for ROW contingency, and \$17.6 M for Unallocated Contingency totaling \$23.1 M).*
- 2. Assuming that the cost information supplied by FP1 proves to be accurate for the scope in the December 14, 2007 New Starts PE package, the updated cost estimate uncertainties noted above are not adequately protected by the base cost estimate and the project contingencies. Accordingly, additional base cost, including allocated contingency, would be recommended for the project totaling \$5.5 Million. Another \$17.6 Million of Unallocated Contingency would also be recommended.*

In addition to reviewing the Southeast Corridor SCC estimate, PMOC's transit cost consultant (Kal Krishnan Consulting Services, Inc.) developed a parametric estimate for the Southeast Corridor project. Results of the parametric effort indicate that the likely Base Year 2007 Cost without contingency is \$479 Million, that \$100 Million of Allocated and Unallocated contingency is recommended, that the likely total base cost including contingencies is \$580 Million, and that the likely YOE total cost for the project is \$639 Million [Editorial note. The KKCS calculations do not escalate the second phase of LRV procurement to the later date of 2018]

In summary, for the Southeast Corridor LRT project, in Houston, Texas:

It is the Contractor's, Shaw Infrastructure, Inc., professional opinion that the following statements are accurate for the Southeast Corridor FY09 New Starts report updated on January 31, 2008:

- ◆ the capital cost estimate of \$508,972 Million in 2007 base year dollars, including a 11.6% percent contingency of the total capital project base cost, is somewhat optimistic and the base cost is more likely to be \$515 Million (2007\$),*
- ◆ the capital cost estimate of \$663,031 Million in year-of-expenditure dollars reflects an average projected inflation rate that may be optimistic (a likely YOE cost ranges to \$686 Million) and a project schedule with durations for each phase that is currently consistent with the Program Master Schedule.*

Jim Gleckler
PMO contractor Project Manager

February 19, 2008
Date