



Board Report

File #: 2023-0200, **File Type:** Contract

Agenda Number: 16.

CONSTRUCTION COMMITTEE MAY 18, 2023

SUBJECT: TUNNEL ADVISORY PANEL

ACTION: APPROVE RECOMMENDATIONS

RECOMMENDATION

AUTHORIZE the Chief Executive Officer to execute:

- A. Contract Modification No. 12 to Contract No. PS-2020-1055 with Dr. Geoffrey R. Martin for the continuation of Tunnel Advisory Panel Services, in an amount not-to-exceed \$712,000, increasing the total contract value from \$3,000,481 to \$3,712,481 and extend the contract from June 30, 2023 to June 30, 2026;
- B. Contract Modification No. 7 to Contract No. PS-8510-2493 with Dr. Edward J. Cording, for the continuation of Tunnel Advisory Panel Services, in an amount not-to-exceed \$672,000, increasing the total contract value from \$2,999,235 to \$3,671,235 and extend the contract from June 30, 2023 to June 30, 2026; and
- C. Contract Modification No. 1 to Contract No. PS-1620-80000, with Dr. Thomas O'Rourke, for the continuation of Tunnel Advisory Panel Services, in an amount not-to-exceed \$639,000, increasing the total contract value from \$947,457 to \$1,586,457 and extend the contract from June 30, 2023 to June 30, 2026.

ISSUE

Metro is currently planning, designing, and constructing rail transit projects with extensive underground engineering and construction that involve complex geotechnical and tunneling conditions. Current active projects with tunnel segments include the Westside Purple Line Extension Section 2 and Section 3 Projects, Eastside Transit Corridor Phase 2 Project, Sepulveda Transit Corridor Project, West Santa Ana Branch Transit Corridor Project, Green Line Extension to Torrance, and Vermont Transit Corridor. Los Angeles County has challenging geologic, seismic and tunneling conditions and deep underground station construction, with some through fault rupture zones, tar impregnated soil, toxic gases, and high concentration of methane. While Metro has extensive experience from both staff and engineering consultants, there is the need for a Tunnel Advisory Panel (TAP) to provide expert advice and review of this engineering work. The Tunnel Advisory Panel, comprised of Dr. Geoffrey Martin, Dr. Edward Cording, and Dr. Thomas O'Rourke, are recognized in

the industry and worldwide as engineering/construction experts in geotechnical analyses, tunneling, deep excavation, earthquake engineering, and building settlements.

BACKGROUND

The TAP convened in August 1995 in response to questions posed by the Board regarding the feasibility of tunneling in Los Angeles ground conditions. Metro contracted with Drs. Dan Eisenstein, Geoffrey Martin and Harvey Parker to determine the feasibility of tunneling in Los Angeles, to assess the effectiveness of Metro's construction program to date, and to recommend any modifications to the current construction program deemed appropriate.

In June 2001, the Board approved two, five-year contracts to the members of the TAP in the amount not-to-exceed \$1,167,826 and directed staff to return each year for funding approval. Since then, the Board has approved funding and extensions to the TAP contracts. Due to Dr. Eisenstein's untimely death in April 2009, Metro management staff decided to procure an additional member for the TAP, Dr. Edward Cording, to provide expert technical services. With Dr. Harvey Parker passing away in May 2020, Metro staff procured an additional member for the TAP, Dr. Thomas O'Rourke, to provide expert technical services.

DISCUSSION

The TAP members, Drs. Martin, Cording, and O'Rourke have been providing advice on all Metro projects with underground construction elements. The projects that TAP has been involved with include extensive underground engineering and construction that involve complex geotechnical and tunneling issues for which the TAP members are uniquely qualified.

The status of each project and the TAP members' involvement in them is as follows:

Westside Purple Line (D Line) Extension Project

The Westside Purple Line (D Line) Extension Project was adopted by the Board and the Final Environmental Impact Report (EIR) was certified in 2012. The project is being designed and constructed in three sections. The entire 9-mile project consists of twin-bored tunnels with 7 subway stations which are primarily under Wilshire Boulevard.

Metro has retained the services of the TAP to provide independent review and monitoring of the following work that is being performed by Metro's engineering consultants and contractors:

- Section 1 Wilshire/Western Station to Wilshire/La Cienega Station (3.92 miles of twin-bored tunnels, 3 subway stations) - Since the tunneling and underground construction activities for this section of the project is complete, the TAP has concluded providing expert advice on a regular basis to this section of the project. The project will, however, seek TAP expert advice on an as-needed basis with issues pertaining to claim resolutions.
- Section 2 - Wilshire/La Cienega to Century City Constellation Station (2.59 miles of twin-bored tunnels, 2 subway stations) - The Design/Build Contract (Tunnels, Stations, Systems and Trackwork) Notice-To-Proceed (NTP) was issued in April 2017. Final Design is expected to be

completed in July 2023. Construction of the Century City/Constellation Station and the Wilshire Rodeo Station began in the 3rd Quarter of 2018 and is anticipated to be completed by the 2nd Quarter of 2025. Tunnel construction began in the 2nd Quarter of 2020 and was completed in January 2023. Construction of the cross passages within tunnels is currently underway. The construction of underground stations and tunnel related activities is anticipated to continue until the 1st Quarter of 2024. The TAP will be required to continue providing expert advice on the tunnel and station construction-related activities, geotechnical conditions encountered, potential ground movements and mitigations for gassy ground conditions.

- Section 3 - Century City/Constellation Station to Westwood/VA Hospital Station (2.56 miles of twin-bored tunnels, 2 subway stations) - The Notice-To-Proceed (NTP) for the Design/Build Contract (Tunnels, Stations, Systems and Trackwork) Tunnel was issued on January 2019 and the NTP for Station was issued in May 2019. Final Design is nearly complete. Tunnel Construction began in the 2nd Quarter of 2020. Station Construction began in the 4th Quarter of 2020 and is expected to be completed by 2025. The TAP will be required to provide expert advice on the tunnel and station design and construction, especially in the potential fault rupture zones and gassy ground conditions, geotechnical conditions encountered, the daily tunneling reports to monitor progress, potential ground movements associated with tunnel and station construction.

Eastside Transit Corridor Project - Phase 2

The Eastside Transit Corridor Phase 2 Project will extend the existing Metro L (Gold) Line from the existing terminus station at Atlantic Boulevard and Pomona Boulevard in East Los Angeles to Lambert Road in Whittier in eastern Los Angeles County. The Board adopted the Locally Preferred Alternative (LPA) as Pomona/Atlantic Station to Greenwood at the December 2022 Board meeting. About 3 miles of this alternative is an underground configuration along Atlantic Boulevard in unincorporated East Los Angeles. TAP will be providing expert advice for following topics:

- Tunnel alignment design
- Ground movements and changes of the groundwater table associated with proposed methods of excavation and support for cut and cover structures.
- Ground movements and changes to the groundwater table associated with proposed tunneling methods.

It is anticipated that advanced conceptual engineering and additional engineering activities to identify high-risk items such as geotechnical, utility identification and tunneling will continue through Summer 2024. The project is a priority project for the Metro Board. Measure M allocates \$3 billion (2015\$) in 2029 for construction with expected project delivery by 2035.

West Santa Ana Branch (WSAB) Transit Corridor Project

The WSAB project proposes a new light rail transit (LRT) line to southeast LA County, connecting Artesia, Cerritos, Bellflower, Paramount, Downey, South Gate, Cudahy, Bell, Huntington Park, Vernon, unincorporated Florence-Firestone and downtown Los Angeles.

In January 2022, the Board approved Los Angeles Union Station as the northern terminus. The

Board also approved the 14.8-mile Slauson/A Line to Pioneer route as the LPA for the final EIS/R clearance. A separate study is underway to evaluate the alignment type(s) along Alameda Blvd from the Slauson/A Line to Union Station. Tunneling work is expected in the northern segment to Union Station of the alignment, at least for a portion depending on alignment selection after completion of the Downtown study.

TAP will be providing expert advice for the underground portions of the WSAB Project on the following topics:

- Tunnel alignment design
- Tunnel Portal Locations
- Ground movements and changes of the groundwater table associated with proposed methods of excavation and support for cut and cover structures.
- Ground movements and changes to the groundwater table associated with proposed tunneling methods.

Sepulveda Transit Corridor Project

The Sepulveda Transit Corridor Project is currently in the planning phase. An environmental review is underway analyzing six alternatives with varying potential routes and modes. Metro is working with two private sector proposers, LA SkyRail Express (monorail) and Sepulveda Transit Corridor Partners (heavy rail), under a first-of-its-kind pre-development agreement to potentially accelerate delivery of this project. Several of the alternatives under consideration require geotechnical considerations for design and construction of aerial guideways, tunnels and underground stations. TAP will be providing expert advice for following topics:

- Tunneling through hard rocks
- Tunneling through alluvial soils
- Tunneling through fault zones
- Tunneling with relatively high groundwater pressures
- Mixed face tunneling with rocks with contrasting strengths (low to very high abrasive, weak to very strong rocks)
- Extensive amount of piling in the median of I-405

Environmental review is anticipated to be completed in 2024.

In addition to the above Projects, TAP may be asked to provide Ad-Hoc services to other projects as needed by Metro Staff.

TAP members are involved with on-going support relating to third party and project stakeholders' issues, which will require continuation of their services for the future. They have unique knowledge and background on Los Angeles County's underground conditions and intimate knowledge of Metro's past and current engineering and construction projects. Board approval and execution of the Contract Modifications will allow continuation of these services.

Board approval of the recommendations will allow the continuation of services of the three Tunnel Advisory Panel members to support Metro on the Westside Purple Line Extension Section 2 and Section 3 Projects, Eastside Transit Corridor Phase 2 Project, Sepulveda Transit Corridor Project, West Santa Ana Branch Transit Corridor Project, and the Green Line Extension to Torrance. In addition, Board approval of the recommendations will also allow the TAP to provide Ad-Hoc services to other projects as needed by Metro staff.

DETERMINATION OF SAFETY IMPACT

Underground construction is inherently one of the high-risk activities on projects. TAP provides independent reviews and imparts technical know-how and expertise for the safe construction of underground facilities. All services supported by this contract are centered on promoting safety, avoiding project delays, and promoting cost saving measures to effectively deliver the projects with minimal impacts to the adjacent communities.

FINANCIAL IMPACT

The funding for these services is included in the Proposed FY24 budget in various Capital Projects. Task Orders will be issued and funded from the associated project's fiscal year and Life-of-Project (LOP) budgets. The funding source differs depending on the individual project. These activities will remain within the approved LOP for each project.

Since this is a multi-year contract, the cost center managers, respective project managers and Chief Program Management Officer will be responsible for budgeting the cost of the annual work program for each fiscal year for the term of the contract.

Impact to Budget

The funding for these Contract Modifications is provided by the specific project requiring the services. The source for these funds is in line with the respective projects' funding plans and fund sources may consist of federal and/or state grants as well as local funds. These funds are not operating eligible funds.

EQUITY PLATFORM

The Tunnel Advisory Panel services provide technical advice and expertise for various Metro projects with underground design and construction components throughout the County of Los Angeles, including several which serve Equity Focus Communities. These services are essential for the support and safe delivery of Metro projects which run across the greater Los Angeles area. All services supported by this contract are centered on delivering the projects with minimal impacts on the communities and provide benefits of enhanced mobility and regional access to all populations within the respective project areas.

IMPLEMENTATION OF STRATEGIC PLAN GOALS

This recommendation supports the Strategic Plan Goal # 5, *“Provide responsive, accountable, and trustworthy governance within the Metro organization.”*

ALTERNATIVES CONSIDERED

Staff has considered the alternative of allowing the current contracts with Dr. Martin, Dr. Cording, and Dr. O’Rourke to expire and open a procurement notice to solicit applications from potential new members, but decided to execute the contract modification for the current TAP panel members for the following reasons:

- Current TAP members Drs. Martin’s and Cording’s long history and institutional knowledge of Metro together with Drs. Martin’s, Cording’s and O’Rourke’s knowledge of local soil conditions and technical understanding of specific tunnel related issues in general and those pertaining to local conditions in particular would require significant investment in time and resources to replicate even if other equally suitable candidates were found and used in this role. This would not only incur cost but would significantly reduce the benefit and validity of their advice, while this knowledge and understanding were obtained. This is not recommended as it will leave Metro without the benefit of their extensive local experience, knowledge and expertise and create a void in the required tunneling expertise for a considerable period, thereby creating the potential for delays and additional costs to ongoing Metro projects.
- Metro baseline documents include Design Criteria, Standard Drawings, Directive Drawings and Baseline Specifications. These baseline documents were adapted and updated from documents previously utilized for prior projects and are being continuously updated to incorporate the Lessons Learned from the past and current projects or to account for evolving technologies. Current TAP members have observed developments and successes on Metro’s current projects that need to be documented and be made available to both current and future Metro projects. Through their involvement with various Metro projects, TAP has also encountered technical and contractual issues that require improvements in Metro baseline documents. Currently, TAP is fully engaged in assisting Metro with this lessons-learned process and accordingly updating the Metro Baseline documents. Executing the contract modification with the current TAP members would enable Metro to continue seeking this valuable input from them to update the baseline documents with the lessons learned from their engagements from all the current large projects. This will make the Metro Baseline a set of industry leading document and capture the issues from Metro’s past and current Projects.
- All the projects listed above are at critical stages in their respective planning, engineering, and construction phases. Extension and additional funding for the TAP contracts are vital and essential to provide continuity that would otherwise be interrupted, should the Board decide to cancel and re-procure the TAP contracts (a 6 to 9-month process). Furthermore, the history and knowledge of the current designs, geotechnical conditions, and construction approaches will present a steep learning curve for a new team of TAP members, which could significantly delay the timely review and input necessary to provide this important layer of independent monitoring and oversight across these complex engineering and construction projects.

NEXT STEPS

After Board approval and execution of the Contract Modifications, staff will direct the Tunnel Advisory Panel to continue providing tunnel engineering advice to Metro including supporting the aforementioned projects.

ATTACHMENTS

Attachment A - Procurement Summary

Attachment B - Contract Modification Change Log

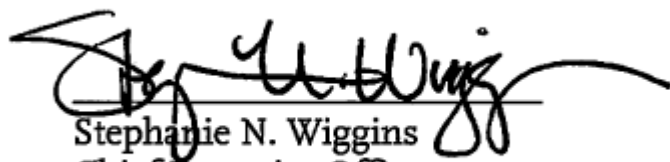
Attachment C - DEOD Summary (CONTRACT NO. PS-2020-1055)

Attachment D - DEOD Summary (CONTRACT NO. PS-8510-2493)

Attachment E - DEOD Summary (CONTRACT NO. PS-1620-8000)

Prepared by: Androush Danielians, Senior Executive Officer,
Project Management (213) 922-7598
Debra Avila, Deputy Chief Vendor/Contract Management Officer, (213) 418-3051

Reviewed by: Sameh Ghaly, Chief Program Management Officer (Interim), (213) 418-3369



Stephanie N. Wiggins
Chief Executive Officer