

MOTION NO. M2017-83
Vibration Attenuation Estimates for the Northgate Link Extension

MEETING:	DATE:	TYPE OF ACTION:	STAFF CONTACT:
Capital Committee	06/08/2017	Final Action	Ahmad Fazel, DECM Executive Director Don Davis, Executive Project Director – Northgate Link Extension Shankar Rajaram, Senior Noise and Vibration Engineer

PROPOSED ACTION

Authorizes the chief executive officer to execute a contract with Acoustic Strategies, Inc. (dba ATS Consulting) to collect data and develop mathematical functions necessary to monitor groundborne vibrations attributable to light rail operations under the University of Washington campus as part of the Northgate Link Extension project in the amount of \$1,547,538, with a 10% contingency of \$154,754, for a total authorized contract amount not to exceed \$1,702,292.

KEY FEATURES SUMMARY

- The 2007 Master Implementation Agreement (MIA) between Sound Transit and the University of Washington (UW) requires installation of equipment that will monitor vibrations that could impact UW facilities, particularly those that house vibration-sensitive research activities. The proposed action will allow for the development of the Northgate Link Extension vibration monitoring system to comply with the MIA.
- The scope of work includes collecting data along the new transit tunnel alignment and at potential vibration receptor points on the UW campus. From this data, the consultant will develop formulas to calibrate the monitoring equipment so that it captures the attenuation of vibrations from the light rail vehicles over various distances and ground conditions between the trackway and the receptor points.
- The vibration attenuation estimates (VAE) developed will be provided to the vibration monitoring equipment manufacturer to program vibration monitors to accurately reflect actual light rail car vibrations during normal operations.
- The work will be performed in three phases in accordance with the MIA:
 - Phase 1 – equipment selection; Phase 2 – vibration testing; and Phase 3 – pre-operational testing.

BACKGROUND

Northgate Link extends light rail 4.3-miles from the University of Washington Station north under the campus via twin bored tunnels to an underground U District Station along Brooklyn Avenue NE between NE 43rd and NE 45th Streets, an underground Roosevelt Station along 12th Avenue NE between NE 65th Street and NE 67th Street, and continuing to an elevated station in Northgate Motion No. M2017-74 Page 2 of 6 Staff Report along 1st Avenue NE spanning NE 103rd Street. The Northgate Link Extension is scheduled to be completed in September 2021 and will provide an interim terminus for Link at Northgate until the Lynnwood Link Extension is in service, currently anticipated in 2023. On June 28, 2012, the Sound Transit Board baselined the Northgate Link Extension's schedule and budget.

The MIA between Sound Transit and the UW requires Sound Transit to monitor vibration levels generated by light rail operations in the tunnels under UW campus. Sound Transit installed nine

permanent vibration monitors during construction of the University Link Extension. An additional 28 permanent vibration monitors will be installed during Northgate Link construction.

Because the vibration monitors are located in the tunnels and the MIA vibration limits are for indoor spaces at sensitive buildings, the MIA requires Sound Transit to develop vibration attenuation estimates (VAE) between the monitor locations and the buildings. The VAE provide an estimate of how much of the train vibration energy will dissipate between the tunnels and the buildings. The VAE would then be pre-programmed in each vibration monitor. The VAE are estimated by generating a loud vibration signal in the tunnel and measuring its response at the sensitive buildings. The estimation is complex because of challenges in generating signals that will replicate light rail vehicles and that can travel through variable soil conditions over large distances.

The work will be performed in three phases:

- Phase 1 – will explore the appropriate equipment to be used to generate strong enough vibration signal between the Northgate Link tunnels and the UW sensitive buildings.
- Phase 2 – will perform the detailed vibration testing in coordination with the tunnel contractors and UW. Field testing for this phase will be finished before the installation of floating slab tracks in the tunnels.
- Phase 3 – testing will occur during pre-operational testing to reflect actual operating conditions

PROCUREMENT INFORMATION

Prior to issuing the solicitation for the Northgate Link Vibration Attenuation Estimates, Sound Transit considered the project scope, the determining factors for contract award, and the need for proposal discussions and revisions, and determined that a Request for Proposals procurement method was the most advantageous.

Sound Transit advertised Request for Proposals No. RTA/RP 0033-17 in March 2017. One firm submitted a Proposal. Sound Transit determined that competition was adequate after a brief survey of potential sources that chose not to submit a proposal informing that the reasons for a single response were caused by conditions outside of Sound Transit's control. The firm that submitted the single response did so under the assumption that there would be multiple responses.

Sound Transit evaluated the proposal based on the advertised evaluation criteria including: project approach and capacity; knowledge and current, relevant experience of key individuals; relevant firm experience and history; price; and commitment to and compliance with equal employment opportunity law. Sound Transit determined that ATS Consulting submitted a proposal that reflects good qualifications and value, and meets Sound Transit's needs.

FISCAL INFORMATION

The baseline budget for the Northgate Link Extension is \$1,899,755,500. Within the construction phase, \$3,806,000 has been allocated to the budget line item for EMI/Vibration Monitoring. The proposed action would commit \$1,702,292 to this line item and leave a remaining budget balance of \$2,103,708.

Northgate Link Extension

(in thousands)

	Baseline Budget	Board Approvals	This Action	Board Approved Plus Action	Uncommitted / (Shortfall)
Agency Administration	\$147,879	\$68,091	\$	\$68,091	\$79,788
Preliminary Engineering	15,077	15,077		15,077	
Final Design	129,167	121,256		121,256	7,912
Right of Way	112,300	103,892		103,892	8,408
Construction	1,343,023	1,259,068	1,702	1,260,770	82,252
Construction Services	118,310	103,352		103,352	14,957
Third Party Agreements	11,800	9,994		9,994	1,806
Vehicles					
Contingency	22,200				22,200
Total Current Budget	\$1,899,756	\$1,680,730	\$1,702	\$1,682,432	\$217,323

Phase Detail

Construction

N835 EMI/Vibration Monitoring	\$3,806	\$	\$1,702	\$1,702	\$2,104
Other Construction	1,339,217	1,259,068		1,259,068	80,149
Total Phase	\$1,343,023	\$1,259,068	\$1,702	\$1,260,770	\$82,252

Contract Detail

Acoustic Strategies, Inc. (DBA ATS Consulting)

	Board Approvals to Date	Current Approved Contract Status	Proposed Action	Proposed Total for Board Approval
Contract Amount	\$	\$	\$1,548	\$1,548
Contingency			155	155
Total	\$	\$	\$1,702	\$1,702
Percent Contingency	0%	0%	10%	10%

Notes:

Amounts are expressed in Year of Expenditure

Board Approvals = Committed To-Date + Contingency as of April 2017 and includes pending Board actions.

For detailed project information, see page 23 of the Adopted 2017 Transit Improvement Plan.

SMALL BUSINESS/DBE PARTICIPATION

Sound Transit promotes and encourages small business participation, which also includes Disadvantaged Business Enterprises (DBEs). Small Business and DBE goals are based upon an examination of subcontracting opportunities contained in the work of this contract and the number of Small Businesses/DBEs available to perform such subcontracting work.

Sound Transit determined that there were few Small Business and DBE subcontracting opportunities based upon the work described in this contract. Therefore, Small Business/DBE goals were not established.

For this contract, ATS Consulting is a small business that anticipates 100% Small Business and Disadvantaged Business Enterprise participation. The approximate estimate for the contractor/subcontractor are:

Small Business and Disadvantaged Business Enterprise Goals

Sound Transit Goal:

Small Business: 0%

DBE: 0%

Commitment:

Small Business: 100%

DBE: 7%

Contractor/Subcontractor	Business Type	% of Work	Amount
ATS Consulting	Small Business	57.8%	\$ 983,925
Wilson Ihrig	Small Business	35.3%	\$ 600,909
Michael Minor and Associates	DBE	5.8%	\$ 98,733
Sanchez Industrial	DBE	1.1%	\$ 18,725
Total		100%	\$ 1,702,292

PUBLIC INVOLVEMENT

Not applicable to this action.

TIME CONSTRAINTS

A one-month delay would not have a significant impact to this project.

PRIOR BOARD/COMMITTEE ACTIONS

Not applicable to this action.

ENVIRONMENTAL REVIEW

JI 6/2/17

LEGAL REVIEW

JW 6/2/17

MOTION NO. M2017-83

A motion of the Capital Committee of the Central Puget Sound Regional Transit Authority authorizing the chief executive officer to execute a contract with Acoustic Strategies, Inc. (dba ATS Consulting) to collect data and develop mathematical functions necessary to monitor groundborne vibrations attributable to light rail operations under the University of Washington campus as part of the Northgate Link Extension project in the amount of \$1,547,538, with a 10% contingency of \$154,754, for a total authorized contract amount not to exceed \$1,702,292.

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MOTION:

It is hereby moved by the Capital Committee of the Central Puget Sound Regional Transit Authority that the chief executive officer is authorized to execute a contract with Acoustic Strategies, Inc. (dba ATS Consulting) to collect data and develop mathematical functions necessary to monitor groundborne vibrations attributable to light rail operations under the University of Washington campus as part of the Northgate Link Extension project in the amount of \$1,547,538, with a 10% contingency of \$154,754, for a total authorized contract amount not to exceed \$1,702,292.

APPROVED by the Capital Committee of the Central Puget Sound Regional Transit Authority at a regular meeting thereof held on June 8, 2017.



Fred Butler
Capital Committee Chair

ATTEST:



Kathryn Flores
Board Administrator