

THE NORTHWEST SEAPORT ALLIANCE
MEMORANDUM

MANAGING MEMBERS
ACTION ITEM

Item No. 9A
Date of Meeting August 6, 2024

DATE: July 29, 2024
TO: Managing Members
FROM: John Wolfe, CEO
Sponsor: Tong Zhu, Chief Commercial & Strategy Officer
Project Manager: Brett Ozolin, Project Manager II
SUBJECT: Wooden Light Pole Replacement Program Project Authorization

A. ACTION REQUESTED

Request project authorization in the amount \$10,270,000, for a total authorized amount of \$10,900,000, for the Wooden Light Pole Replacement Program project Master Identification No. 201148.01.

B. SYNOPSIS

Multiple NWSA licensed properties throughout the South Harbor are illuminated by sodium lamp fixtures mounted on wooden high mast utility poles. Forty-seven (47) poles spread between seven (7) locations need to be replaced due to an average loss of 50% of structural capacity. If the poles are not replaced, the risk is that they will fail and fall over.

C. BACKGROUND

On behalf of the NWSA, in August 2021, the Port of Tacoma (Port) hired an inspection company to investigate all the known wooden pole assets within the NWSA licensed properties. The assessment found that 47 timber poles at various locations needed to be replaced. The maintenance and replacement of these poles are an NWSA obligation per the leases.

The pole survey included all known wooden poles within NWSA licensed properties. A total of 223 wooden poles were inspected. The poles identified for replacement are typically about 40 years old and installed circa 1980. Poles at an individual facility are of generally the same age.

The poles host a variety of fiber and security attachments in addition to light fixtures. The following table identifies the location and quantify of poles to be replaced.

Facility	Tenant	# of Poles (Each)
Terminal 7/East Sitcum	Husky, NWSA, various	13
North Intermodal Yard (NIM)	NWSA	11
UP Yard	Union Pacific	4
South Intermodal Yard (SIM)	NWSA	2
TOTE	TOTE	9
East Blair 1	NWSA	5
West Hylebos Terminal	PCMC	3

This round of replacements should be considered the first phase of a two to three phase project to replace wooden poles that are 40 years or older. Staff will develop a proposal for additional inspection in 2025 as part of establishing an overall light pole maintenance program.

D. ALTERNATIVES ANALYSIS AND DESIGN UPDATE

Staff and the project team completed an alternatives analysis shortly after project authorization was granted for final design. The alternative analysis considered various pole materials, foundation types, light fixtures, and other considerations. Based on this analysis staff have selected replacing the wooden poles in-kind and upgrading to Light Emitting Diodes (LED) fixtures. The identified alternative provides substantial service life at a lower capital cost, imposes less impact on tenants, and reuses most of the existing mounting hardware.

The proposed work will be completed in existing facilities with established pole spacing, pole heights, and electrical routing. The work also only considers replacement of select poles. These conditions favor in-kind replacement with timber poles to cost effectively match existing pole height and location. While not selected as the preferred alternative, steel poles are an option in lieu of timber poles. One benefit to the less preferred steel poles on drilled shafts option is that a larger pole and more lights can be used at a greater spacing, reducing the total number of steel poles that would be needed for an equivalent timber layout. Due to the established pole grids in the work locations, this increased spacing benefit could not be realized. Concrete foundations also require time to cure before pole mounting, increasing service

disruptions. The direct construction costs for the steel/concrete shaft system would be approximately twice the construction cost of the staff recommended solution.

The Alternatives Analysis Report is attached to this memorandum. Additional points of consideration include the following:

- Cross laminated timbers are generally used in special circumstances or for specific purposes for utility mounting. Natural wood is optimized for all wind directions.
- Mounting additional attachments, such as 5G hardware, is beyond the scope of this project. Secondary attachments to the poles are relatively easy to mount at the time they are needed.
- Proposed lighting systems are state of the art and are designed to modern standards by lighting professionals. Rebates will be coordinated based on anticipated power consumption.
- LED lighting significantly reduces electricity consumption, utility bills, and maintenance costs, and produces better, safer lighting.
- Staff frequently work and coordinate with other public agencies such as Tacoma Power, so projects move forward efficiently.

The recommended solution is to remove the existing timber poles and light fixtures and replace them with new foundations, timber poles, electrical hardware, and LED fixtures.

E. PROJECT DESCRIPTION AND DETAILS

The project consists of removing old timber poles and light fixtures and replacing them with new foundations, poles, electrical hardware, and LED fixtures. Engineering design and public works bid documents are nearly complete. This request is to fund additional design work, construction, and construction support. Pole replacement divides into five primary work components: pole foundations, lighting fixtures and hardware, miscellaneous attachments, pole protection, and pole location considerations.

The existing pole foundations typically consists of a Corrugated Metal Pipe (CMP) sleeve with a fifteen-foot embedment. These foundations are planned to be removed and replaced in-kind.

The wood poles exist to create attachment points for lighting as well as other hardware. The poles can support up to sixteen lighting fixtures. The lighting fixture infrastructure is typically original and will be replaced with LED light fixtures. Existing High-Intensity Discharge (HID) light fixtures are obsolete and sourcing parts and components is difficult, if even feasible. The poles are also used to support electrical distribution, communication, environmental sampling, and security infrastructure.

Shorter, mobile, and temporary poles will be used during construction for temporary support and lighting.

Pole traffic protection varies from none to concrete encasement five feet high. Poles are also protected by curbs, bollards, and fencing. Pole protection is generally proportionate to pole exposure to traffic.

The pole replacement program as currently envisioned will replace poles in the existing locations to match existing condition, including protection.

Pole location, access and operational environment are highly variable. Poles are in container yards, chassis yards, rail yards, adjacent to buildings, in open areas, and along fence lines. Pole replacement will require careful planning with logistical, coordination, operational, and constructability considerations given constrained access.

Project Objectives

The primary project objective is to replace structurally compromised poles with new structurally safe poles while minimizing the impacts to tenants. Old and obsolete existing HID lighting and hardware will be removed and replaced with LED light fixtures and new hardware. The construction process includes a commissioning process to either maintain or improve existing levels of lighting.

Scope of Work

The scope of work for this authorization request is to fund final design, construction, staff time, and consultant construction support.

Schedule

The public works bid package is planned to be advertised shortly after final design is complete and all permits (if needed) are received.

Advertise for Bid	January 2025
Open Bids	February 2025
Notice of Award	February 2025
Substantial Completion	January 2027
Final Completion	February 2027

F. FINANCIAL IMPLICATIONS

Current Project Cost Details

The current budget based on 90% design is presented in the following table. The project team plans on pre-procuring specific LED lighting fixtures to align with ongoing LED replacement planning by Port of Tacoma maintenance.

This procurement will also use the same fixtures as previously completed work in the North Intermodal (NIM) yard. Standardizing the light fixtures reduces material and experience demands on maintenance. Transition to LED lighting will be eligible for rebates from Tacoma Power.

Rebates will be pursued through Tacoma Power after installation but are not anticipated to be significant with respect to overall project cost.

Costs were independently confirmed by a cost estimating consultant at the 60% design level.

	This Request	Total Project Cost	Cost to Date	Remaining Cost
Pre-Design	\$0	\$177,000	\$177,000	\$0
Design	\$598,000	\$1,051,000	\$453,000	\$598,000
Construction	\$9,672,000	\$9,672,000	\$0	\$9,672,000
Total	\$10,270,000	\$10,900,000	\$630,000	\$10,270,000

Source of Funds

The 2024-2028 Capital Investment Plan (CIP) Budget allocates \$7.85 million for this project. The 2025-2029 CIP will reflect the updated cost. These poles and lights are essential infrastructure and will be paid for through normal operating income. Staff will continue to pursue any grant funding available for the LED lighting, including funds from Tacoma Power or Washington State Department of Ecology.

Financial Impact

The cost to replace the poles will be capitalized and depreciated over the estimated 20-year life of the poles. The commencement of depreciation will coincide with the completion of each light pole installation at different locations, resulting in varying start dates for depreciation at each site. The annual depreciation expense will be approximately \$545,000 per year when all poles within this scope are replaced.

G. ENVIRONMENTAL IMPACTS/REVIEW

Permitting:

Work within 200' of the water is covered under the Port of Tacoma's existing Shoreline Substantial Development Permit Exemption.

Remediation:

Consult with the Port of Tacoma's Remediation team about requirements around potential contamination at individual pole locations. Export soil must be sampled and tested, and a suitable disposal site approved by the Port prior to leaving Port property.

Stormwater:

Obtain stormwater construction permits, if required.

Air Quality:

Upgrade existing lighting with LED lighting at suitable locations.

H. ATTACHMENTS TO THIS REQUEST

- Attachment – Alternatives Analysis Report Table 1: Summary of Alternatives

I. PREVIOUS ACTIONS OR BRIEFINGS

<u>Date</u>	<u>Action</u>	<u>Amount</u>
April 22, 2022	Executive Authorization for Design	\$25,000
October 5, 2022	Executive Authorization for Design	\$185,000
March 7, 2023	Managing Member Authorization for Design	\$420,000
TOTAL		\$630,000

Table 1: Summary of Alternatives

Pole Type	Foundation Type	Unit Cost per Pole ¹	Pros	Cons	Anticipated Maintenance	Anticipated Service Life ²
Timber	Existing CMP Sleeve	\$53,800	<ul style="list-style-type: none"> Cheapest pole and foundation option Less site impact Existing fixtures readily transferable to the new pole Less install time 	<ul style="list-style-type: none"> Condition of existing CMP sleeves unknown Top of sleeve likely to be damaged during concrete cap removal Reusing existing CMP sleeves is untested Low timber availability Shortest service life Poles must be supplied in one piece Longer downtime for cutover 	Inspect poles every 8-10 years ³ and periodically inspect attachments	50 years ⁴
	New CMP Sleeve in Existing Location	\$62,900	<ul style="list-style-type: none"> Cheapest pole option Less site impact Existing fixtures readily transferable to the new pole Less install time 	<ul style="list-style-type: none"> Low timber availability Shortest service life Poles must be supplied in one piece Longer downtime for cutover 	Inspect poles every 8-10 years ³ and periodically inspect attachments	50 years ⁴
	New CMP Sleeve in New Location	\$72,500	<ul style="list-style-type: none"> Cheapest pole option Minimal downtime for cutover Existing fixtures readily transferable to the new pole Less install time Longer pole service life Poles available in sections requiring less work area Less site impact 	<ul style="list-style-type: none"> Low timber availability Increase in site impacts Shortest service life Poles must be supplied in one piece Condition of existing CMP sleeves unknown Top of sleeve likely to be damaged during concrete cap removal Reusing existing CMP sleeves is untested More expensive pole and foundation Existing fixtures not readily transferable to a steel pole Longer downtime for cutover More install time 	Inspect poles every 8-10 years ³ and periodically inspect attachments	50 years ⁴
Steel	Concrete Shaft in Existing Location	\$140,800	<ul style="list-style-type: none"> Poles available in sections requiring less work area Less site impact 	<ul style="list-style-type: none"> Condition of existing CMP sleeves unknown Top of sleeve likely to be damaged during concrete cap removal Reusing existing CMP sleeves is untested More expensive pole and foundation Existing fixtures not readily transferable to a steel pole Longer downtime for cutover More install time 	Periodically inspect pole, attachments, and anchor bolts	55-65 years to first maintenance ^{5,6}
	Concrete Shaft in New Location	\$144,400	<ul style="list-style-type: none"> Longer pole service life Poles available in sections requiring less work area Minimal downtime to cutover 	<ul style="list-style-type: none"> More expensive pole and foundation Increase in site impact for new foundation location Existing fixtures are not readily transferable to a steel pole More install time 	Periodically inspect pole, attachments, and anchor bolts	55-65 years to first maintenance ^{5,6}
	Concrete Spread Footing	\$150,300	<ul style="list-style-type: none"> Longer pole service life Poles available in sections requiring less work area Minimal downtime to cutover 	<ul style="list-style-type: none"> More expensive pole and foundation Largest foundation footprint and site impact Risk of differential settlement leading to leaning poles Existing fixtures are not readily transferable to a steel pole More install time 	Periodically inspect pole, attachments, and anchor bolts	55-65 years to first maintenance ^{5,6}
Concrete	Existing CMP Sleeve	\$96,000	<ul style="list-style-type: none"> Longest pole service life Less site impact Less install time 	<ul style="list-style-type: none"> Unknown condition of existing CMP Reusing existing CMP sleeves is untested Limited pole availability Poles must be supplied in one piece Existing fixtures are not readily transferable to a concrete pole Longer downtime for cutover 	Periodically inspect pole and attachments	60 years ⁷
	New CMP Sleeve in Existing Location	\$103,500	<ul style="list-style-type: none"> Longest pole service life Less site impact Less install time 	<ul style="list-style-type: none"> Limited pole availability Poles must be supplied in one piece Existing fixtures are not readily transferable to a concrete pole Longer downtime for cutover 	Periodically inspect pole and attachments	60 years ⁷
	New CMP Sleeve in New Location	\$114,200	<ul style="list-style-type: none"> Longest pole service life Minimal downtime to cutover Less install time 	<ul style="list-style-type: none"> Limited pole availability Poles must be supplied in one piece Increase in site impacts Existing fixtures not readily transferable to concrete pole 	Periodically inspect pole and attachments	60 years ⁷

¹ Unit costs assume minimal site improvements. For medium site improvements, increase unit cost by approximately \$5,000 per pole. For moderate site improvements, increase unit cost by approximately \$10,000 per pole.
² Anticipated service life is based on industry guidelines indicated.
³ North American Wood Pole Council. (2023). Retrieved from <https://woodpoles.org/>
⁴ Ultrapole NXT. (2019). *The Perfect Treated Wood Pole*. Retrieved from https://www.treatedwood.com/assets/uploads/documents/Ultrapole-Vance_042019.pdf
⁵ American Galvanizers Association. (2016). *Hot-Dip Galvanized Steel Distribution Poles*.
⁶ Total service life depends on how well the poles are maintained
⁷ Thomas E. Rodgers, J. (1984, Sept-Oct). *PCI Journal*, 62.

Item No.: 9A
Date of Meeting: August 6, 2024

Wooden Light Pole Replacement Program



THE NORTHWEST
SEAPORT ALLIANCE
SEATTLE + TACOMA

Brett Ozolin
Engineering Project Manager II

August 6, 2024

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ACTION REQUESTED

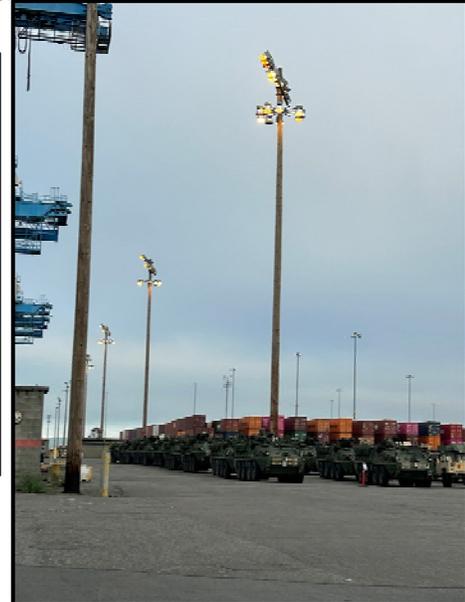
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Background



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Alternatives Analysis

Pole Type	Foundation Type	Unit Cost per Pole*	Pros	Cons	Anticipated Maintenance	Anticipated Service Life†
Existing CMP Sleeve		\$53,800	<ul style="list-style-type: none"> Cheapest pole and foundation option Less site impact Existing features readily transferable to the new pole Less install time 	<ul style="list-style-type: none"> Condition of existing CMP sleeves unknown Top of sleeve likely to be damaged during concrete cap removal Reusing existing CMP sleeves is untested Low timber availability Shortest service life Poles must be supplied in one piece Longer downtime for customer 	Inspect poles every 8-10 years* and periodically inspect attachments	50 years*
Timber	New CMP Sleeve In Existing Location	\$62,500	<ul style="list-style-type: none"> Cheapest pole option Less site impact Existing features readily transferable to the new pole Less install time 	<ul style="list-style-type: none"> Low timber availability Shortest service life Poles must be supplied in one piece Longer downtime for customer 	Inspect poles every 8-10 years* and periodically inspect attachments	50 years*
	New CMP Sleeve in New Location	\$72,500	<ul style="list-style-type: none"> Cheapest pole option Minimal downtime for customer Existing features readily transferable to the new pole Less install time Longer pole service life Poles available in sections requiring less work area Less site impact 	<ul style="list-style-type: none"> Low timber availability Increase in site impacts Shortest service life Poles must be supplied in one piece 	Inspect poles every 8-10 years* and periodically inspect attachments	50 years*
	Concrete Shaft in Existing Location	\$140,800	<ul style="list-style-type: none"> Longer pole service life Minimal downtime to customer 	<ul style="list-style-type: none"> Condition of existing CMP sleeves unknown Top of sleeve likely to be damaged during concrete cap removal Reusing existing CMP sleeves is untested More expensive pole and foundation Existing features not readily transferable to a steel pole Longer downtime for customer More install time 	Periodically inspect pole, attachments, and anchor bolts	55-65 years to first maintenance**
Steel	Concrete Shaft in New Location	\$144,400	<ul style="list-style-type: none"> Longer pole service life Poles available in sections requiring less work area Minimal downtime to customer 	<ul style="list-style-type: none"> More expensive pole and foundation Increase in site impact for new foundation location Existing features are not readily transferable to a steel pole More install time 	Periodically inspect pole, attachments, and anchor bolts	55-65 years to first maintenance**
	Concrete Served Footing	\$50,300	<ul style="list-style-type: none"> Longer pole service life Poles available in sections requiring less work area Minimal downtime to customer 	<ul style="list-style-type: none"> More expensive pole and foundation Largest foundation footprint and site impact Risk of differential settlement leading to leaning poles Existing features are not readily transferable to a steel pole More install time 	Periodically inspect pole, attachments, and anchor bolts	55-65 years to first maintenance**
	Existing CMP Sleeve	\$95,000	<ul style="list-style-type: none"> Longest pole service life Less site impact Less install time 	<ul style="list-style-type: none"> Unknown condition of existing CMP Reusing existing CMP sleeves is untested Limited pole availability Poles must be supplied in one piece Existing features are not readily transferable to a concrete pole Longer downtime for customer 	Periodically inspect pole and attachments	60 years*
Concrete	New CMP Sleeve in Existing Location	\$99,500	<ul style="list-style-type: none"> Longest pole service life Less site impact Less install time 	<ul style="list-style-type: none"> Limited pole availability Poles must be supplied in one piece Existing features are not readily transferable to a concrete pole Longer downtime for customer 	Periodically inspect pole and attachments	60 years*
	New CMP Sleeve in New Location	\$114,200	<ul style="list-style-type: none"> Longest pole service life Minimal downtime to customer Less install time 	<ul style="list-style-type: none"> Limited pole availability Poles must be supplied in one piece Increase in site impacts Existing features not readily transferable to concrete pole 	Periodically inspect pole and attachments	60 years*

Staff Recommendation:
Timber Poles, New In-Kind Foundation, Dispose of HID Lights, Install New LED Lights

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Alternatives Analysis

- Pole types: timber, steel, concrete
- Foundation types and locations:
 - Embedment
 - Drilled shaft
 - Same vs. relocated location
- Steel pole on drilled shaft benefits new construction
 - Pole grid optimization
 - No loss of service during concrete curing

Project Description and Details

- Demolish and reinstall (47) forty-seven wooden light poles
 - Demolition (civil, structural and electrical)
 - Install new foundation
 - Procure and install new pole
 - Provide temporary provisions
 - Install new electrical hardware and Port-provided LED fixtures
 - Electrical commissioning
 - Site civil restoration
- Consulting support
- Permitting
- Staff time

Project Schedule

Activity	Timeframe
Advertise Bids	January 2025
Bid Opening	February 2025
Contract Award	February 2025
Contract Completion	January 2027

Source of Funds

- The estimated cost of the Construction for this project is \$9,672,000.
- The estimated budget for this project is \$10,900,000.
- The 2024-2028 Capital Investment Plan (CIP) allocates \$7,850,000 for this project
 - The 2025-2028 CIP will be updated to reflect the authorized amount.
- This work and associated budget is consistent with the NWSA valuation.
- Work completed since 2022 was previously authorized and has been completed.

Financial Summary

Item	Budget Estimate	Cost to Date	Remaining Cost
Procurement	\$440,000	\$0	\$440,000
Pre-Design	\$177,000	\$177,000	\$0
Design	\$1,051,000	\$453,000	\$598,000
Construction	\$9,232,000	\$0	\$9,232,000
Project Total:	\$10,900,000	\$630,000	\$10,270,000

The cost of the poles will be capitalized and depreciated over 20 years resulting in depreciation expense of approximately \$545,000 per year when all work is completed.



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ACTION REQUESTED

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