

**THE NORTHWEST SEAPORT ALLIANCE**  
**MEMORANDUM**

**MANAGING MEMBERS**  
**ACTION ITEM**

**Item No.** 9A  
**Date of Meeting** November 7, 2023

**DATE:** October 30, 2023

**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 - Construction Authorization

**A. ACTION REQUESTED**

Request project authorization in the amount \$7,220,000, for a total authorized amount of \$7,850,000, 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 2024 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 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 layouts and electrical routing. A major benefit of steel poles on drilled shafts 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 included as Attachment 2 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.

## **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 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 infrastructure is typically original and will be replaced with Light Emitting Diodes (LEDs) 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 construction, staff time for construction support and consultant construction support.

### ***Schedule***

The public work bid package is planned to be advertised shortly after construction authorization.

Advertise for Bid	November 2023
Open Bids	December 2023
Notice of Award	December 2023
Substantial Completion	March 2025
Final Completion	April 2025

## **F. FINANCIAL IMPLICATIONS**

### ***Current Project Cost Details***

The current budget based on 100% 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
Procurement	\$700,000	\$700,000	\$0	\$700,000
Pre-Design	\$0	\$210,000	\$177,000	\$33,000
Design		\$420,000	\$201,000	\$219,000
Construction	\$6,520,000	\$6,520,000	\$0	\$6,520,000
<b>Total</b>	<b>\$7,220,000</b>	<b>\$7,850,000</b>	<b>\$378,000</b>	<b>\$7,472,000</b>

**Previous Project Cost Details**

The project budget from the March 7<sup>th</sup> design authorization is presented in the following table to highlight a notable increase in stated project costs. Staff estimated project costs have more than doubled since the Opportunity Assessment (OA) process. The primary factor in the cost increase is the addition of LED lighting systems. The project was originally scoped to be removal and reattachment of existing lighting hardware. The current budget and authorization request includes new LED fixtures, raceways, conductors, and miscellaneous hardware. Costs also increased with scope refinement and greater understanding of the construction process.

	This Request	Total Project Cost	Cost to Date	Remaining Cost
Procurement				\$ -
Pre-Design		\$ 210,000.00	\$ 101,000.00	\$ 109,000
Design	\$ 420,000.00	\$ 420,000.00	\$ -	\$ 420,000
Construction		\$ 2,590,000.00		\$ 2,590,000
<b>Total</b>	<b>\$ 420,000</b>	<b>\$ 3,220,000</b>	<b>\$ 101,000</b>	<b>\$ 3,119,000</b>

**Source of Funds**

The proposed 2024-2028 Capital Investment Plan (CIP) Budget allocates \$7.85 million for this project. These poles and lights are essential infrastructure and will be paid for through normal operating income. Staff will 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. Depreciation is expected to start in April of 2025 and the

annual depreciation expense will be approximately \$390,000 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
<b>TOTAL</b>		<b>\$630,000</b>

Table 1: Summary of Alternatives

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

<sup>1</sup> 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.

<sup>2</sup> Anticipated service life is based on industry guidelines indicated.

<sup>3</sup> North American Wood Pole Council. (2023). Retrieved from <https://woodpoles.org/>

<sup>4</sup> Ultrapole NXT. (2019). *The Perfect Treated Wood Pole*. Retrieved from [https://www.treatedwood.com/assets/uploads/documents/Ultrapole-Viance-\\_042019.pdf](https://www.treatedwood.com/assets/uploads/documents/Ultrapole-Viance-_042019.pdf)

<sup>5</sup> American Galvanizers Association. (2016). *Hot-Dip Galvanized Steel Distribution Poles*.

<sup>6</sup> Total service life depends on how well the poles are maintained

<sup>7</sup> Thomas E.Rodgers, J. (1984, Sept-Oct). *PCI Journal*, 62.

Item No.: 9A  
Date of Meeting: November 7, 2023

# Wooden Light Pole Replacement Program



**THE NORTHWEST**  
SEAPORT ALLIANCE  
SEATTLE + TACOMA

Brett Ozolin  
Engineering Project Manager II

November 7, 2023



# ACTION REQUESTED

Request project authorization from the NWSA Managing Members in the amount of \$7,220,000, for a total authorized amount of \$7,850,000, for the Wooden Light Pole Replacement Program project, Master Identification No. 201148.01.

# Background



# Alternatives Analysis

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

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

# 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
- Staff time

# Project Schedule

Activity	Timeframe
Advertise Bids	November 2023
Bid Opening	December 2023
Contract Award	January 2024
Contract Completion	March 2025

# Source of Funds

- The estimated cost of the Construction for this project is \$7,220,000
- The estimated budget for this project is \$7,850,000
- The 2024-2028 Capital Investment Plan (CIP) allocates \$7,850,000 for this project
- 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	\$700,000	\$0	\$700,000
Pre-Design	\$210,000	\$177,000	\$33,000
Design	\$420,000	\$201,000	\$308,000
Construction	\$6,520,000	\$0	\$6,520,000
<b>Project Total:</b>	<b>\$7,850,000</b>	<b>\$378,000</b>	<b>\$7,561,000</b>



# ACTION REQUESTED

Request project authorization from the NWSA Managing Members in the amount of \$7,220,000, for a total authorized amount of \$7,850,000, for the Wooden Light Pole Replacement Program project, Master Identification No. 201148.01.