CITY OF ALEXANDRIA
Project Implementation

WATERFRONT COMMISSION PROJECT BRIEFING

Alexandria Waterfront Implementation: Flood Mitigation Project

April 21, 2026

T&ES - Project Implementation

Draft, Deliberative, Pre-Decisional

Waterfront Briefing

- Key Issues
  - NPS Update
  - Cost Estimate Update
  - Alternate Pump Location: 1 Prince Cost Estimate
- Options & Associated Costs
- Next Steps

NPS Update: Deed Modification

- **Interior Department & NPS changed position and intent:**
  - Deed modification required to build pump station as planned.
  - NPS has stated support for the flood mitigation project since 2017.
  - Deed modification and NEPA process were underway.

- **Changes in position:**
  - Pump station considered an “impermissible use.”
  - Will not change current height restriction (15’).
  - Do not consent to modification.

Cost Estimate Update

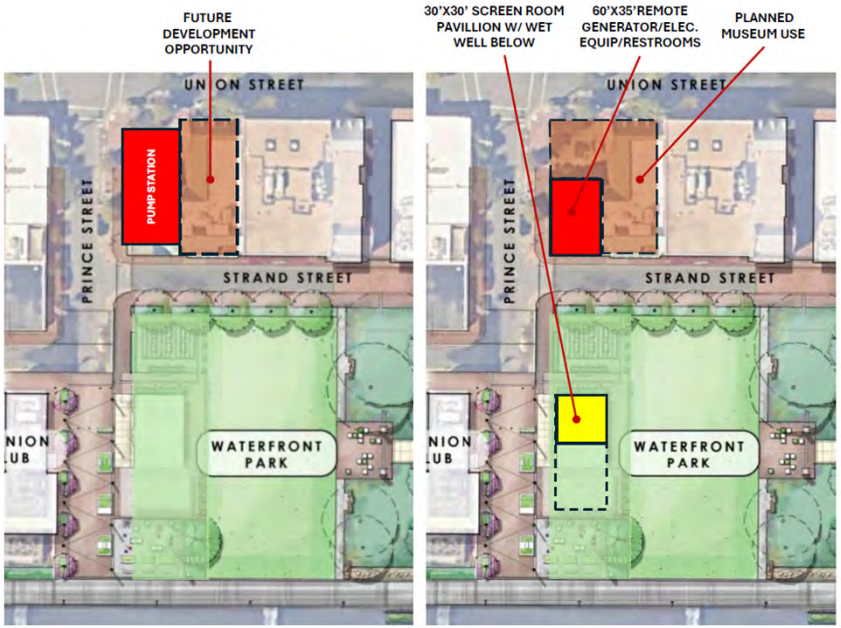
- **Based on recent cost estimates, project costs have increased:**
  - Phase 2 estimated cost increased from $118M to $189M
- **Major Cost Drivers:**
  - Market and price impacts from tariffs and inflation
  - Increasing labor costs over time
  - Delays & added costs associated for alternative analyses
  - Greater understanding of construction risks & environmental conditions

Individual Scopes	30% Estimate Values
Pump Station -	$ 62,408,175
Pump Station Outlet -	$ 8,719,852
Bulkhead -	$ 38,765,062
Promenade -	$ 5,432,339
Storm Sewer -	$ 37,955,401
Street Improvements -	$ 3,621,474
King Street -	$ 6,044,528
Point Lumley Park -	$ 7,686,427
Waterfront Park -	$ 18,846,574
30% Estimate Total -	$ 189,470,831

- **Total estimated project costs exceed current funding by $60M - $80M**

1 Prince Street Alternatives

- Validated City's initial cost estimate ($25M - $46M)
- Evaluated full relocation and a "split station" concept
- AWA Stakeholders reviewed draft
- Final Report anticipated by end of March
- NPS reversal may preclude split-station concept



Full Relocation
+ $22.5M - $53.3M*

Split Station
+ $23.3M - $51.7M*

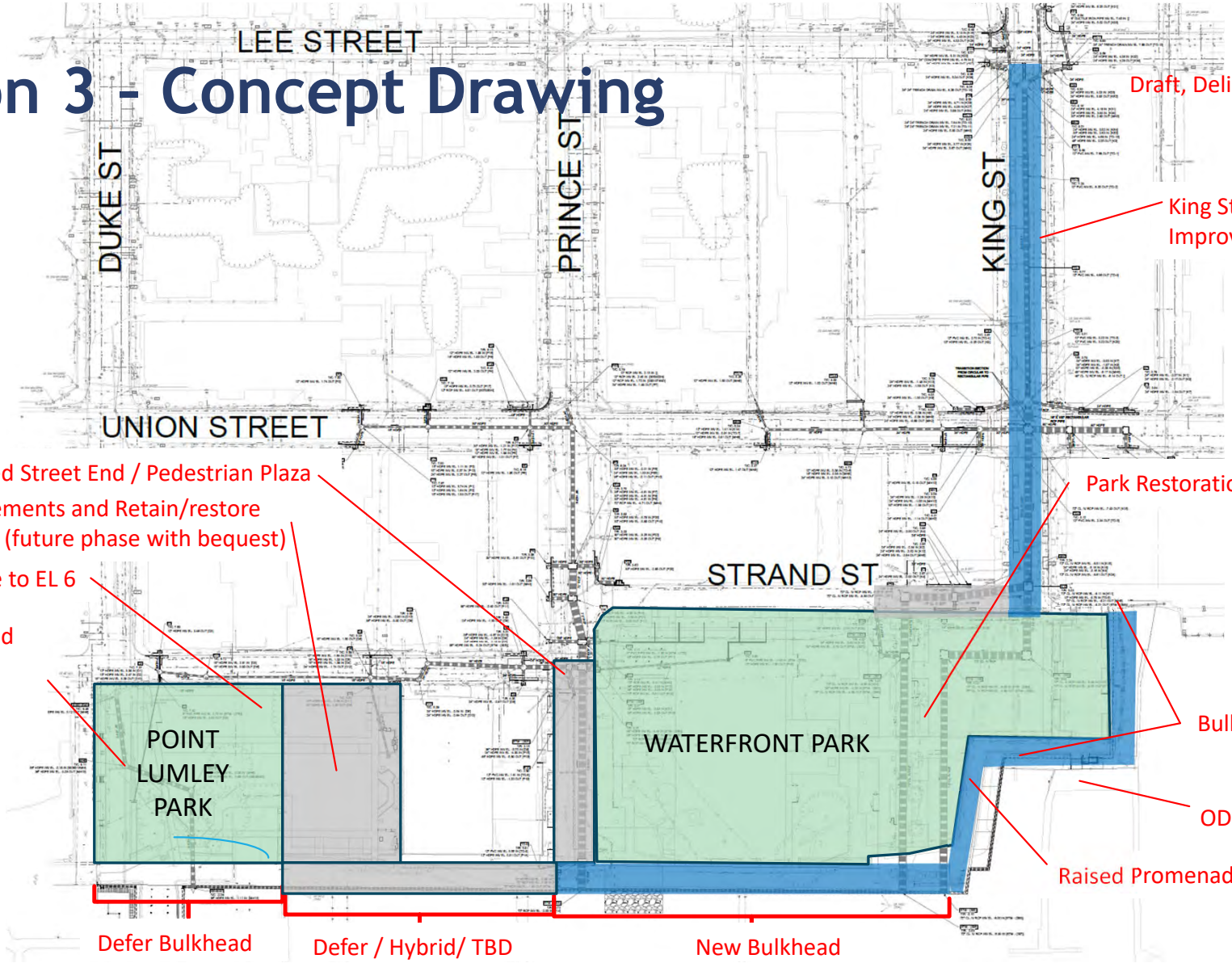
***DRAFT FIGURES**
(pending collaboration with AWA)

Project Design Alternatives

- **Concept & Additional Cost:**
  - **Option 1A – Deliver current project concept. ($60M - $80M) – Precluded by NPS**
  - **Option 1B – Option 1A plus 1 Prince. ($80M - $130M)**
  - **Option 2 – Defer bulkhead and park improvements. ($20M - $30M) – Precluded by NPS**
  - **Option 3 – Enhanced Gravity-storm sewer system (within budget*)**
    - Eliminate pump station & defer improvements to Point Lumley Park & Bulkhead
  - **Option 4 – Minimal infrastructure improvements (within budget)**
    - Repair/replace limited portion of existing system and address sunny day flooding
    - Limited pipe upsizing
    - No bulkhead improvements or increase in height

*Independent cost verification required if option selected.

Option 3 - Concept Drawing



Draft, Deliberative, Pre-Decisional

King Street Pedestrian Improvements

Regraded/Repaved Street End / Pedestrian Plaza

Defer Park Improvements and Retain/restore existing parking lot (future phase with bequest)

Re-grade to EL 6

Restore Park In Kind (phase additional improvements as feasible)

Park Restoration (in kind)

Bulkhead to Remain

ODBC Piers Remain

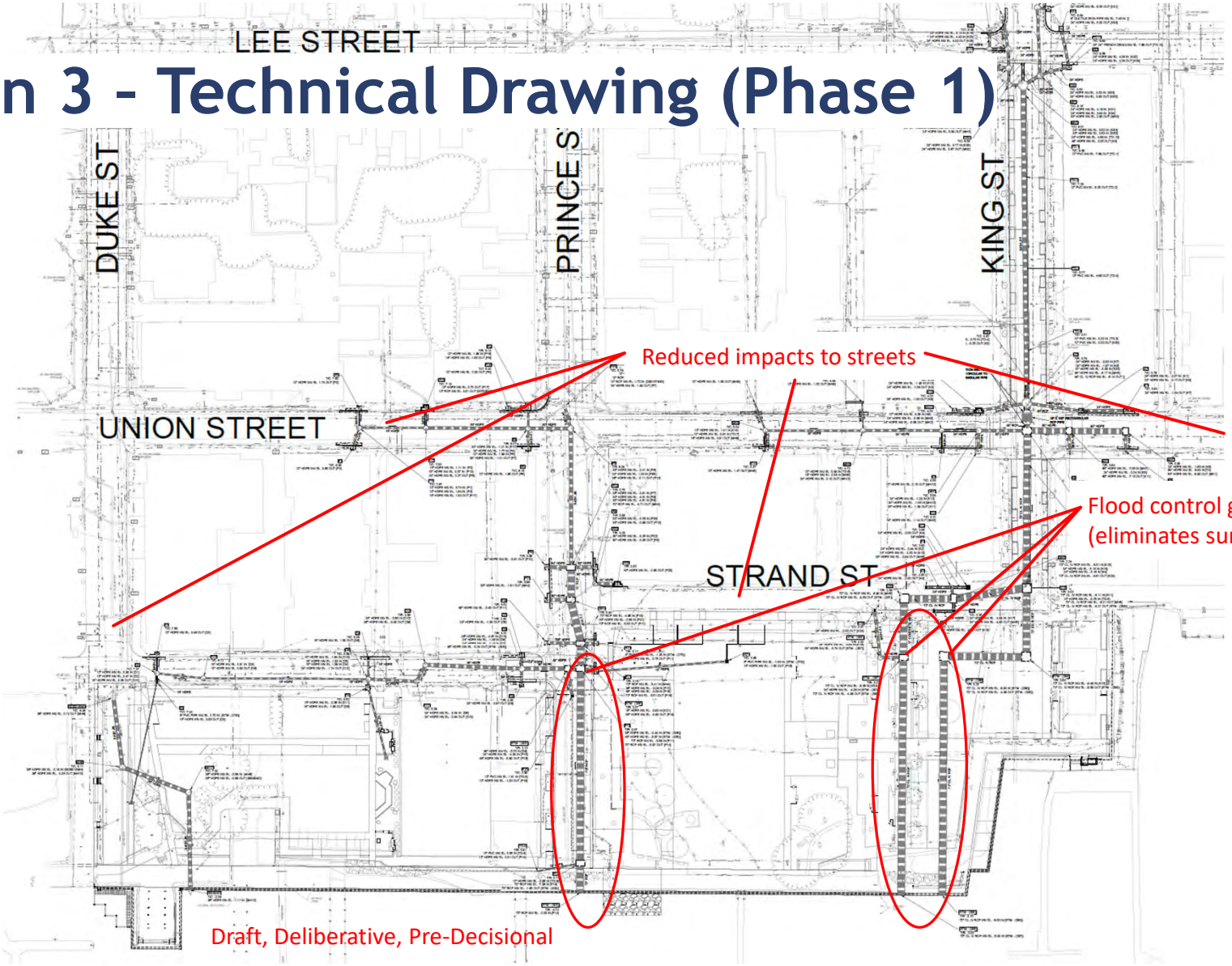
Raised Promenade

Defer Bulkhead

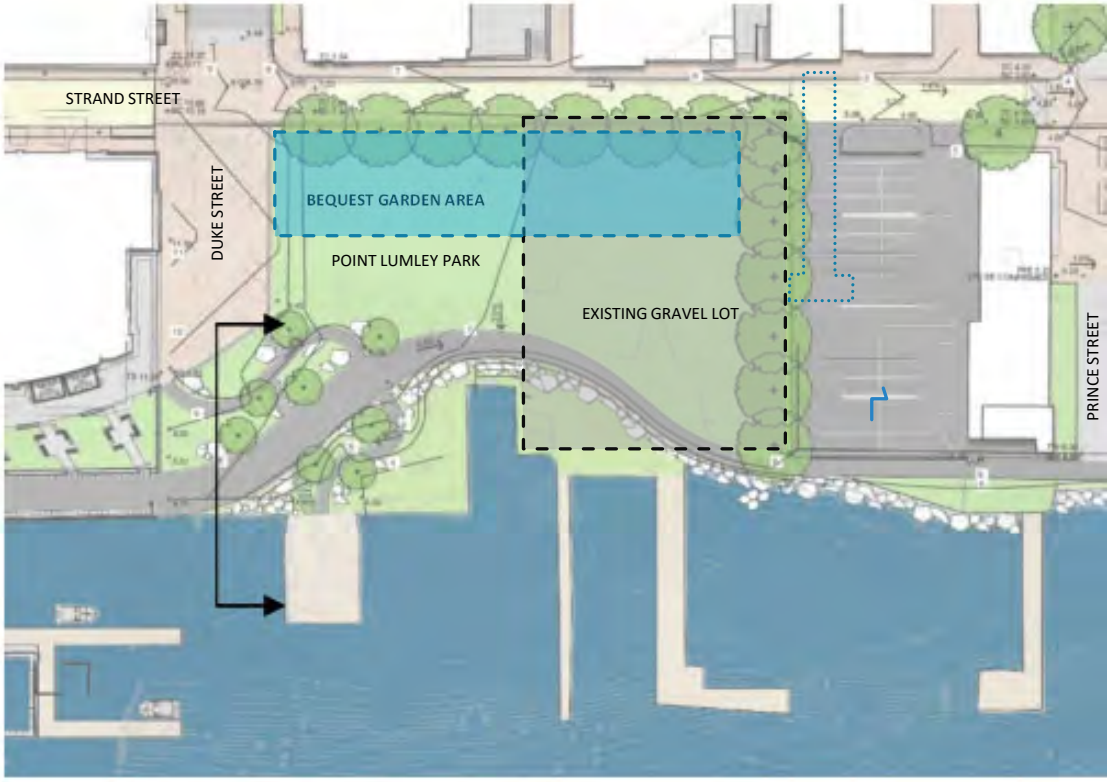
Defer / Hybrid/ TBD

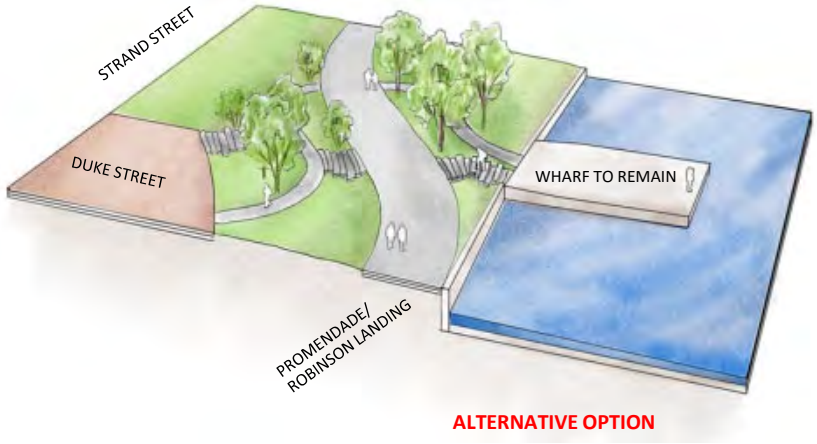
New Bulkhead

Option 3 - Technical Drawing (Phase 1)



Point Lumley Shoreline Alternate





ALTERNATIVE OPTION

Performance & Benefits

NPS ELMINATED OPTION 1A AND 2

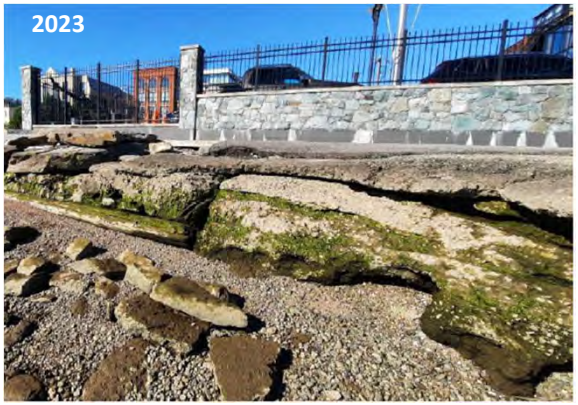
	Option 1A & 1B	Option 2	Option 3	Option 4
OPTION'S BENEFITS	**CURRENT PROJECT CONCEPT**	**PUMP STATION ONLY - DEFER PT. LUMLEY (BULKHEAD/PARK)**	**ENHANCED GRAVITY SYSTEM DEFER PT. LUMLEY (BULKHEAD/PARK)**	**OUTFALL REPLACEMENT & BACKFLOW PREVENTERS**
ELIMINATE SUNNY DAY FLOODING	YES	YES	YES	YES
RIVER FLOOD PROTECTION (TO EL. 6.0)	YES	YES	YES	NO
IMPROVE STREET FLOODING	YES	YES	YES	LIMITED
ELIMINATE TIDAL INFLUENCE ON STORM SEWER	YES*	YES*	NO. Improved.	NO
PREVENTS STORM SEWER IMPACT (1-2' SEA LEVEL RISE)	YES	YES	NO. Adaptable with future station.	NO

*When Potomac River is below proposed bulkhead elevation – no impact.

Performance & Benefits

	Option 1	Option 3
OPTION'S PERFORMANCE / BENEFITS	**CURRENT PROJECT CONCEPT**	**ENHANCED GRAVITY SYSTEM DEFER LUMLEY BULKHEAD/PARK**
OPTION'S PERFORMANCE		
ELIMINATE SUNNY DAY FLOODING	YES - 100%	YES - 100%
RIVERINE FLOOD PROTECT(TO EL. 6.0)	YES	YES - with alternative hybrid shoreline along Pt. Lumley shore
IMPROVE STREET FLOODING/PONDING	YES - Major Improvement -Manages City Standard Design Storm Event: 10yr - 2hr - 2.5inch depth	YES - Major Improvement - Due to Tidal Influence, perfomance ranges from: 1 yr 1.5" depth to Design Storm
ELIMINATES TIDAL INFLUENCE ON STORM SEWER	YES. As long as river below E.L. 6 - no impact.	Partial - *Yes, when Potomac River is <+1.5' above sea level (EL. 1.5). *No, when Potomac River elevation is > el.1.5, similar to existing. *Pump Station required to prevent tidal influence.
PREVENTS IMPACT TO SWM SYSTEM FUNTION WITH 1-2' SEA LEVEL RISE?	YES. As long as river below E.L. 6 - no impact.	NO. Anticipated 1-2' of sea level rise will significantly impact performance of storm sewer system. *Pump Station will be required in response to sea level rise.

Aging & Failing Infrastructure



Riverine Protection and Benefits

OPTIONS 1-3 ELIMINATE 100% OF SUNNY-DAY FLOODING AND RIVER OVERTOPPING TO ELEVATION 6

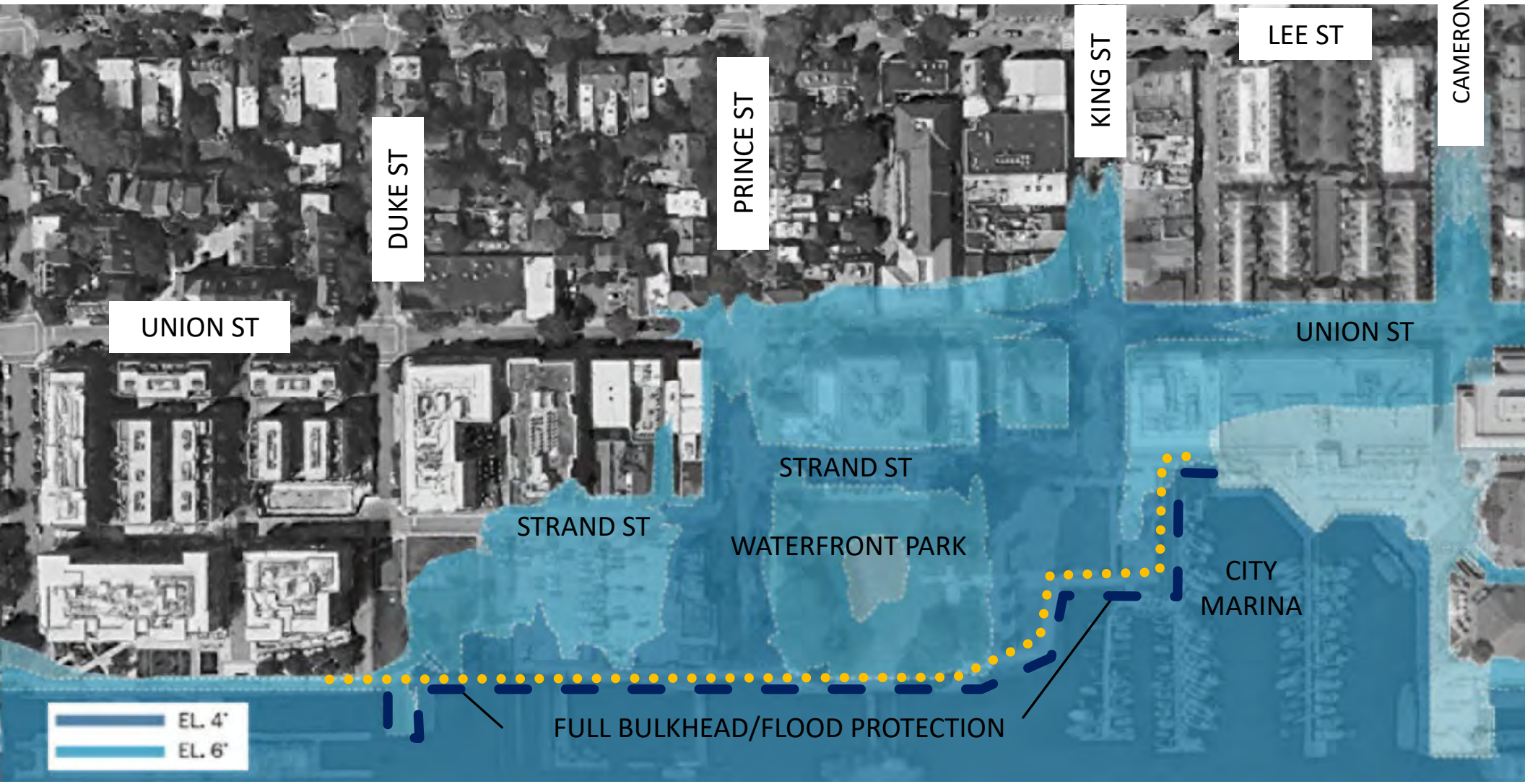
	Sunny-Day Flooding	River Overtopping Bulkhead
In the Last 20 Years, we've seen an average of	145 events/yr	37 events/yr
In the Last 5 Years, we've seen an average of	185 events/yr	48 events/yr
In the Last 2 Years, we've seen an average of	194 events/yr	54 events/yr
In the Last 1 Year, we've seen...	227 events/yr	93 events/yr
Between now and Year 2100, we anticipate...	353 events/yr	341 events/yr

Potomac River Surface Elevation

Flooding Analysis Over Time At Prince Street/Waterfront

Riverine Overtopping & Flooding

Draft, Deliberative, Pre-Decisional



Recommendation

- **Further evaluate Option 3 Enhanced Gravity System:**
  - Further develop design for improved gravity-system and backflow.
    - Remove pump station & defer majority of Point Lumley Park/Bulkhead
    - Determine construction means and methods
  - Validate construction costs (vs funding).
  - Stakeholder Outreach and Public Engagement
  - Update project schedule

- **Benefits:**
  - Addresses sources of most frequent and severe flooding
    - “Sunny day flooding” from river backflow
    - Replaces & raises a critical bulkhead segment
  - Anticipated to be within existing funding
  - Construction team can proceed with design & construction with limited further delay
  - Many stakeholder concerns addressed

Next Steps

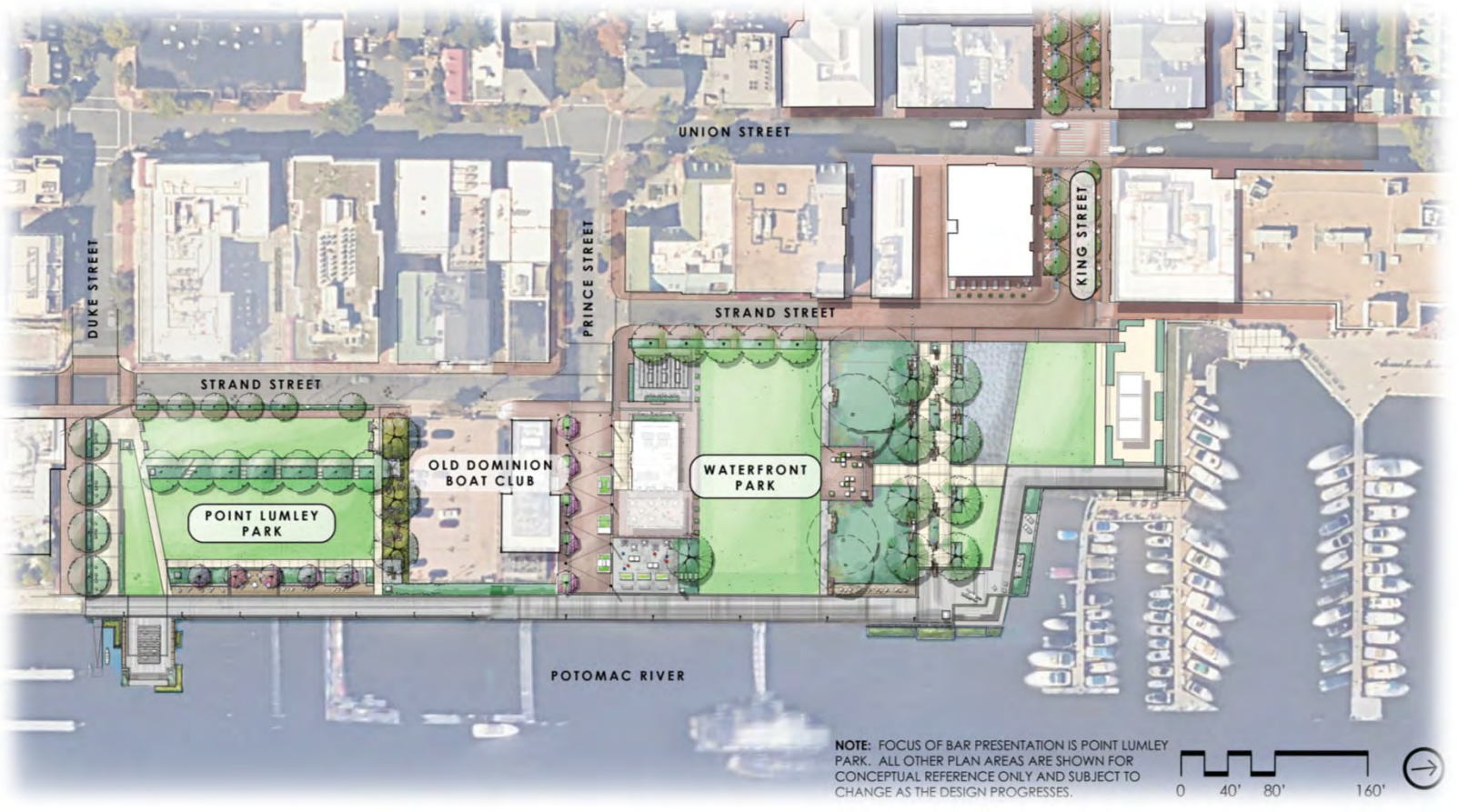
- Council Feedback & Guidance on Options
- Stakeholder Outreach & Community Engagement
- Design Development
  - Cost update
  - Schedule update
- Council Concurrence on Scope (~June)
- Advance Design & Development Review Process
- Development of Guaranteed Maximum Price (GMP)

Stakeholder Outreach & Community Engagement

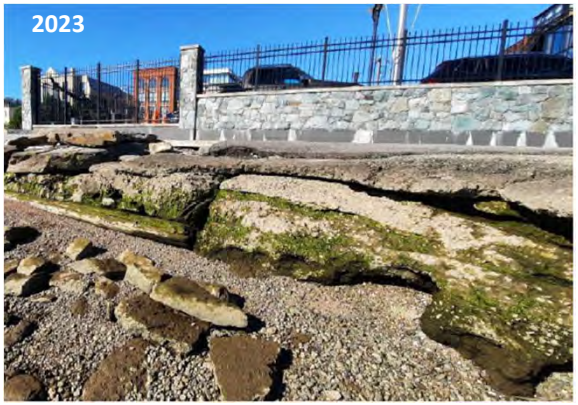
- 1 Prince Stakeholder Representatives
- Commission Updates – Waterfront, Parks and Recreation, Environmental Policy
- Community Meeting
- Alexandria Waterfront Alliance & Old Dominion Boat Club
- Old Town Civic Association
- Neighboring Business Stakeholders Meeting

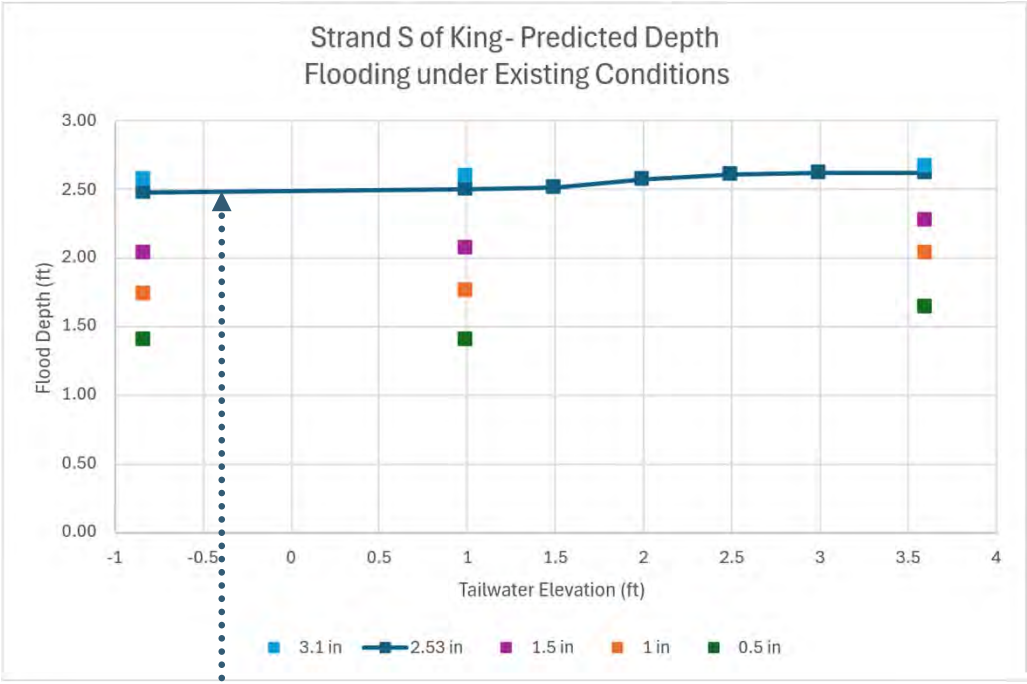
Reference Slides

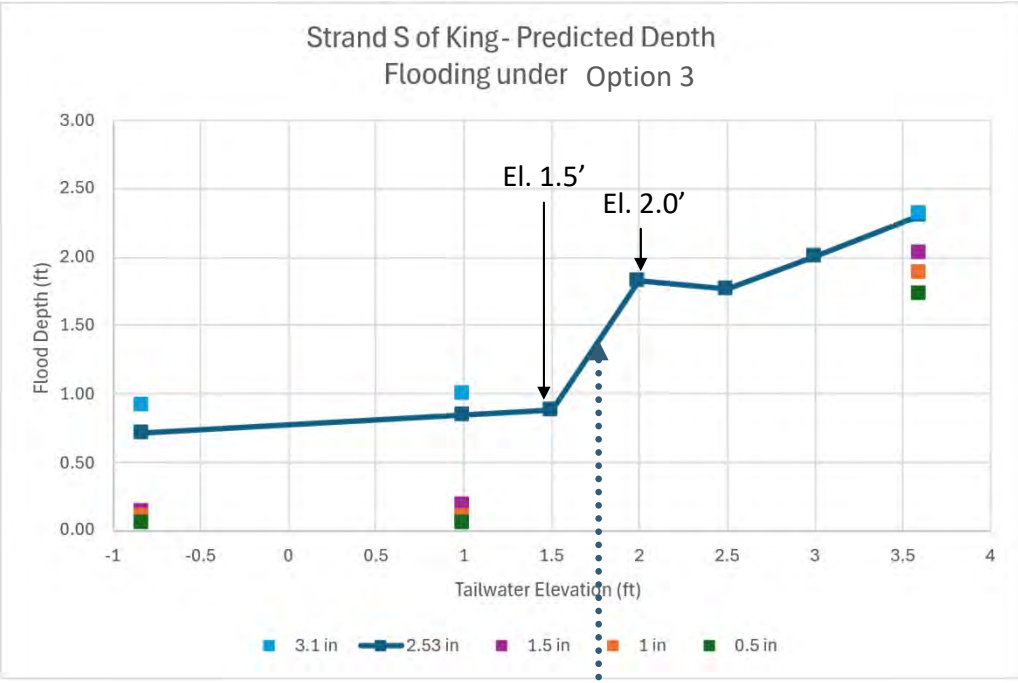
Public Space and Amenities



Aging & Failing Infrastructure



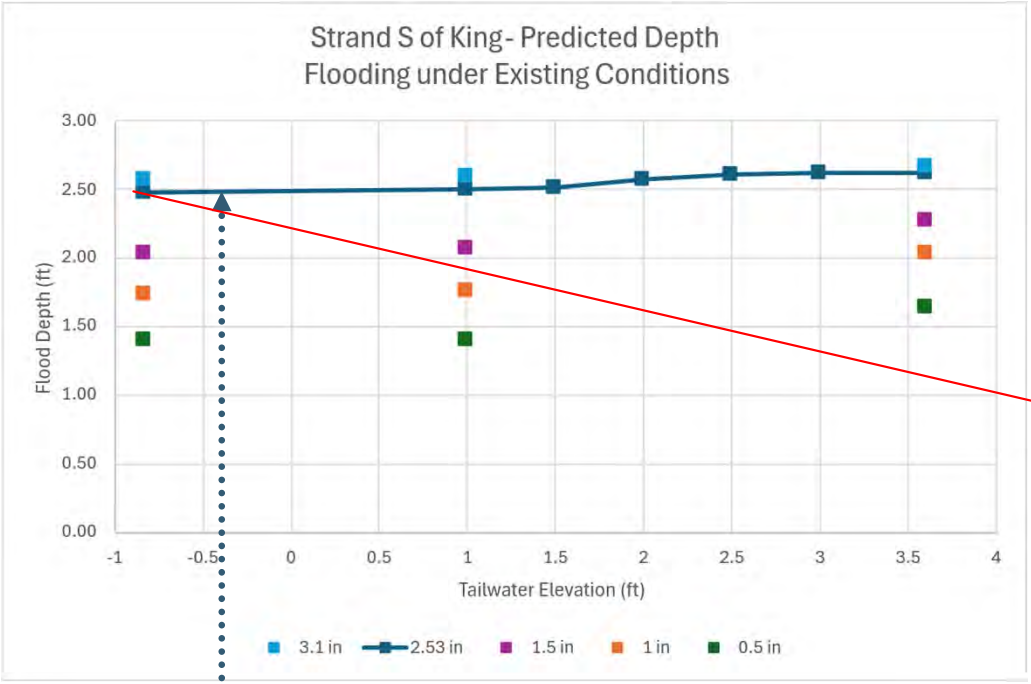


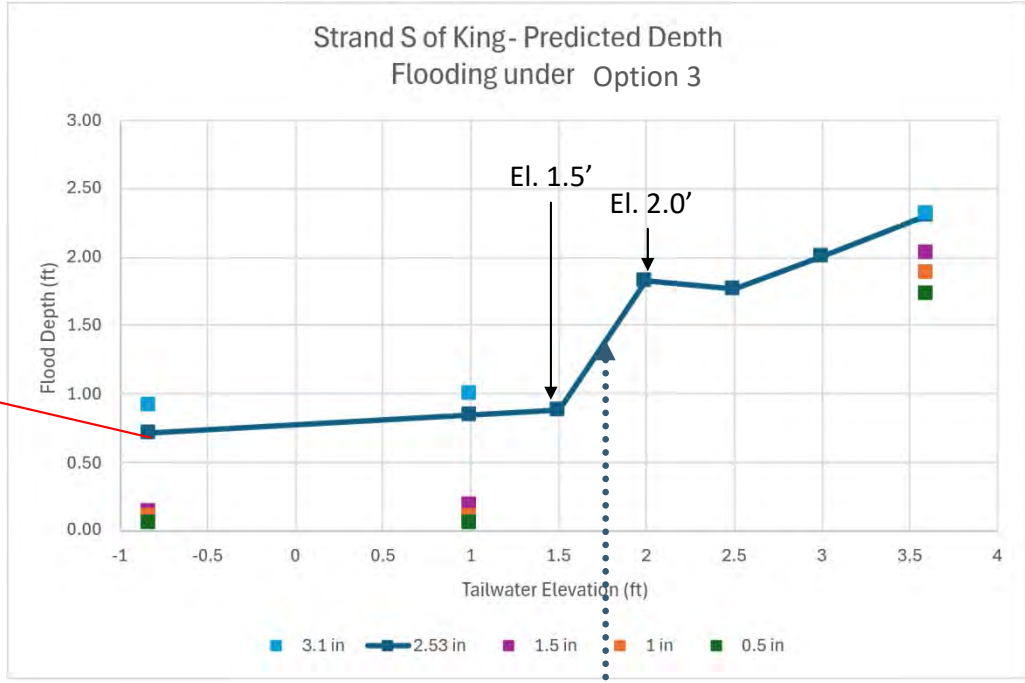


Under Existing Conditions, the flood depth does not generally change as the Potomac River elevation changes.

Under Option 3 – Gravity Only Solution

- If the Potomac River elevation is less than +1.5ft, the flood depth is driven by the new infrastructure.
- If the Potomac River elevation is greater than +2.0ft, the flood depth is driven by the river.
- A pump station is required to eliminate the tidal influence. This will be needed as the average or typical river elevations are between +1.5ft and +2.0ft.





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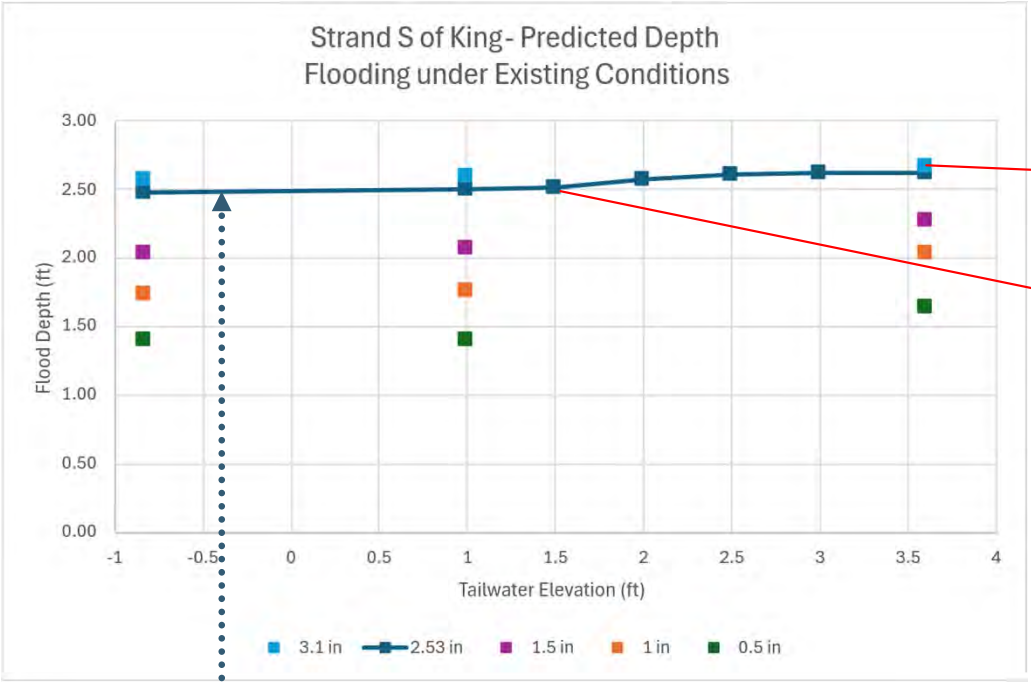

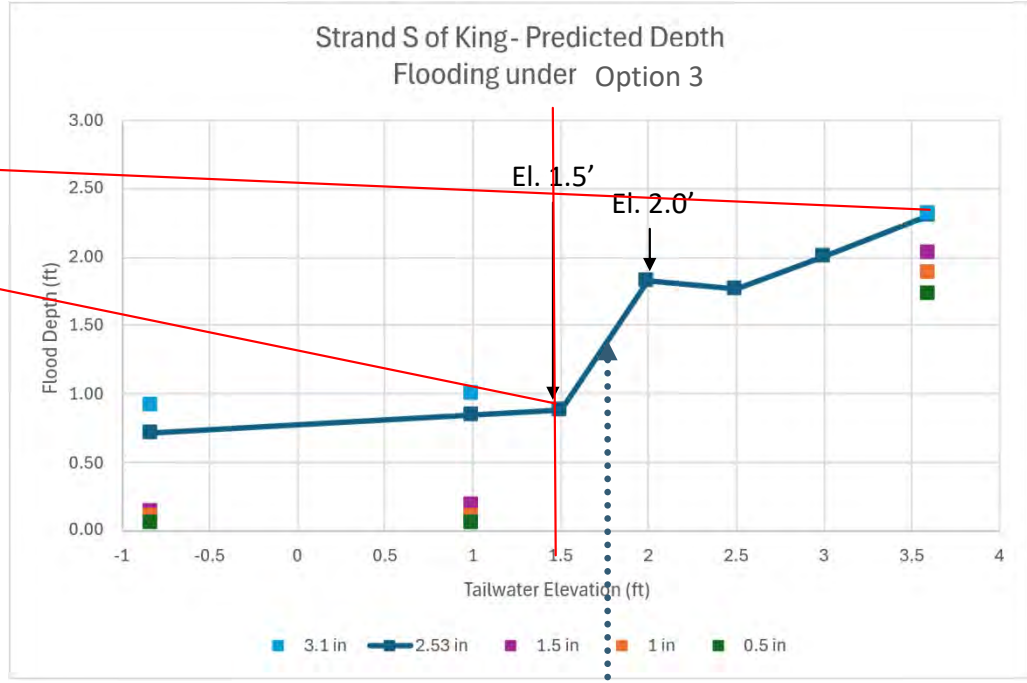

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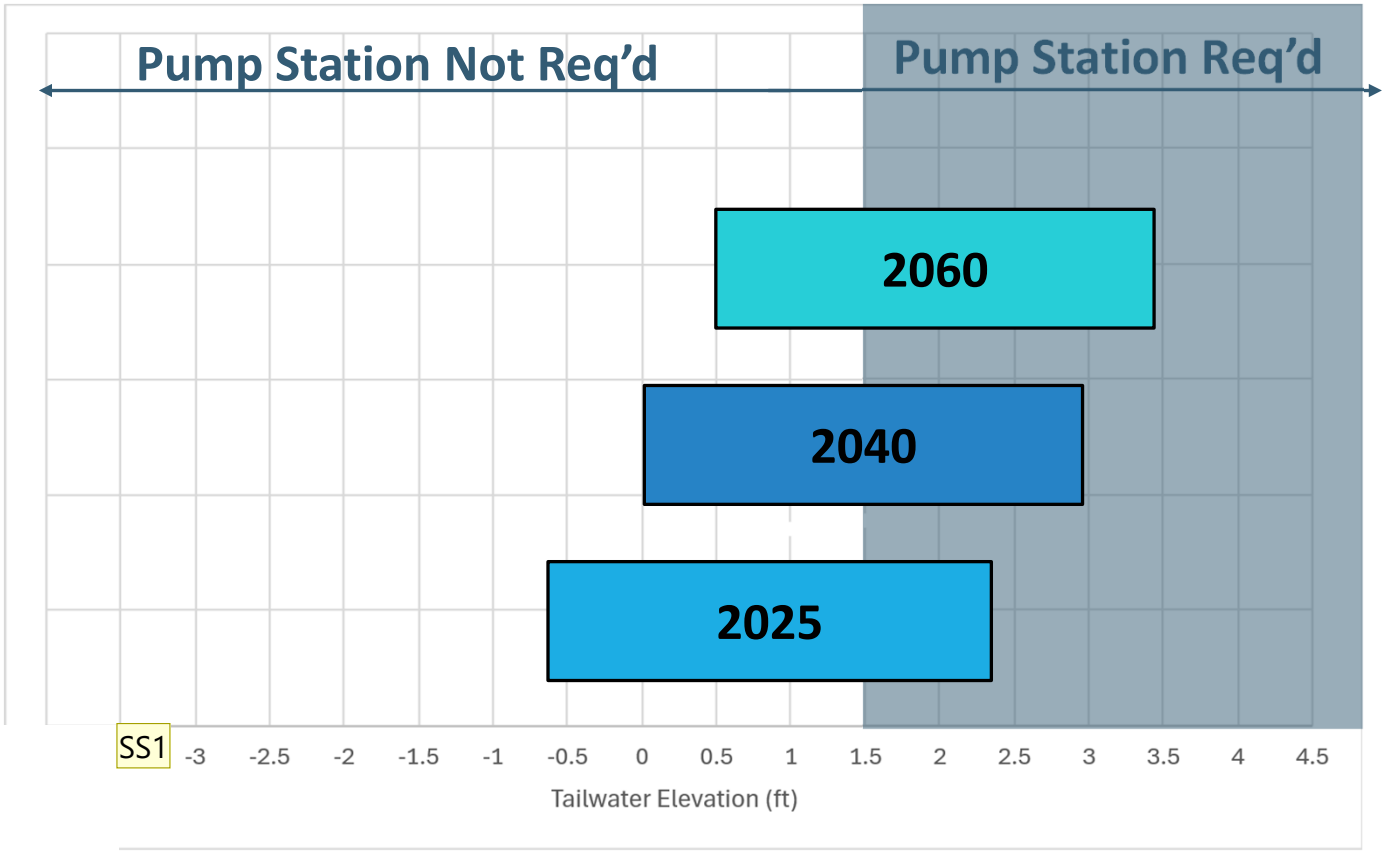
- A pump station is required to eliminate the tidal influence. This will be needed as the average or typical river elevations are between +1.5ft and +2.0ft.

A pump station would help with flooding conditions now, especially at high tide, but it will become increasingly important as mean sea level increases, where most, if not all, storm events will require pumping.



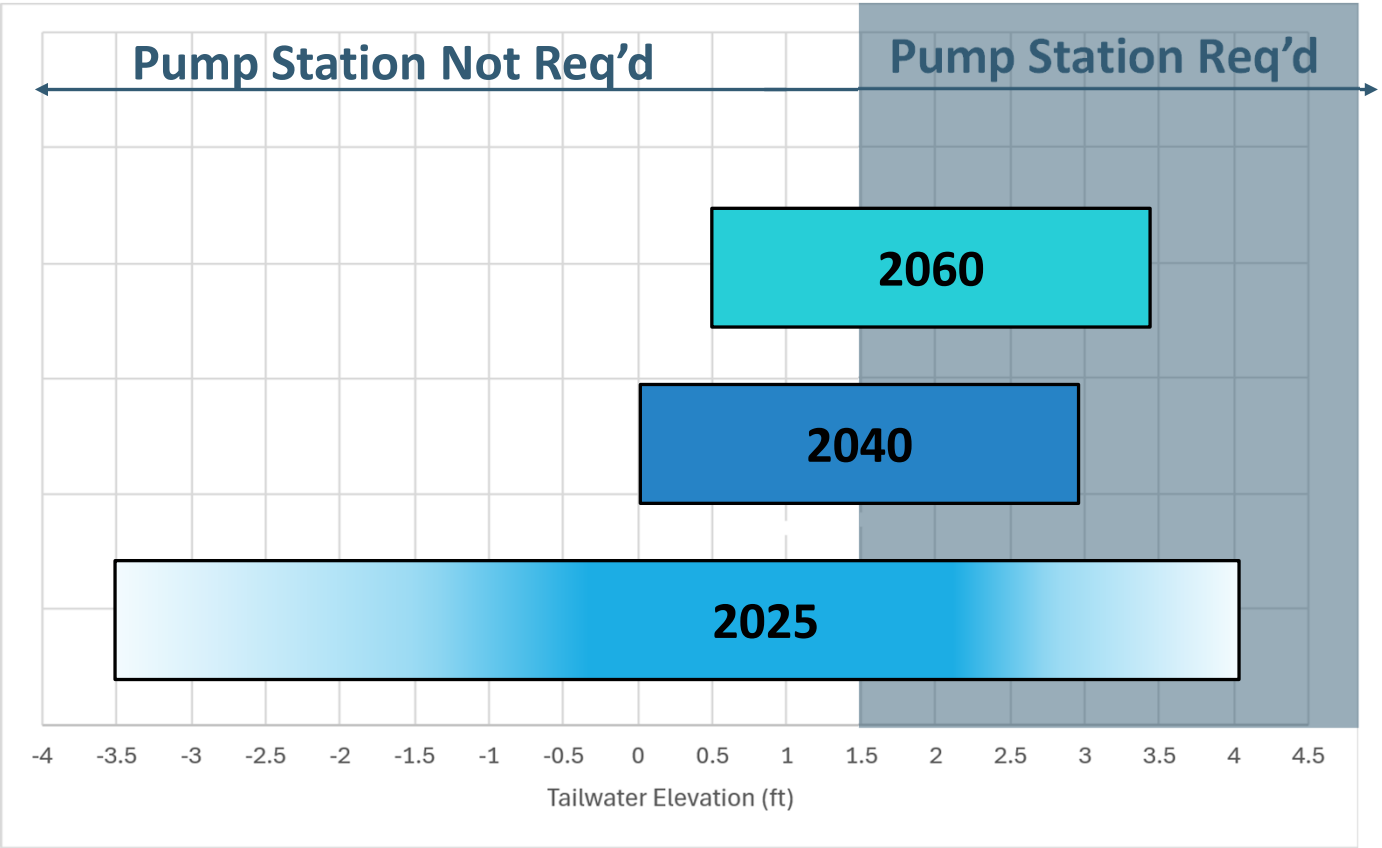
<u>Potomac River Mean Sea Level</u>
2025: El. +0.81'
2040: El. +1.5'
2060: El. +2.0'
Actual storm events could happen when the Potomac is higher or lower (min. ±1.5') than Mean Sea Level.

Slide 24

SS1 Matt, here is a second option showing you 2025 tidal conditions. Here we are only accounting for the typical river fluctuations. We are not showing the more extreme conditions.

Sara Sepulveres, 2026-01-15T23:12:42.369

A pump station would help with flooding conditions now, especially at high tide, but it will become increasingly important as mean sea level increases, where most, if not all, storm events will require pumping.



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Actual storm events could happen when the Potomac is higher or lower (min. ±1.5') than Mean Sea Level.

SS1

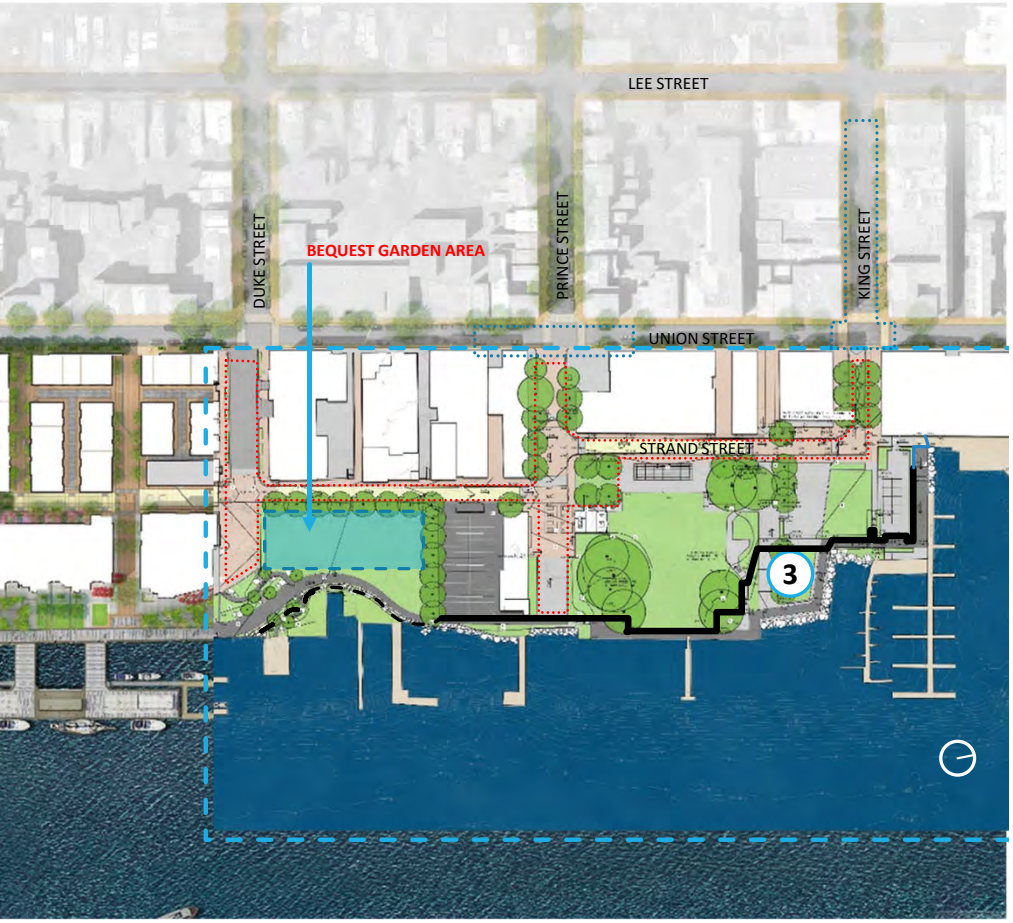
Slide 25

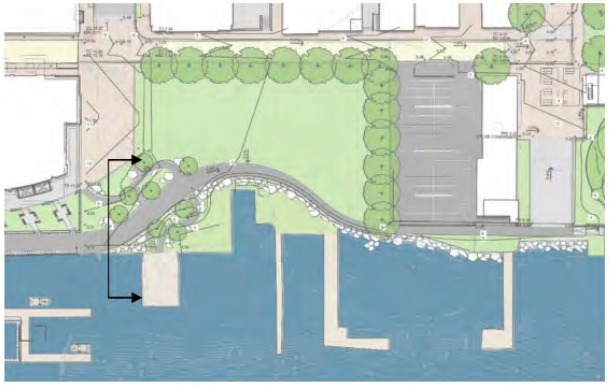
SS1 Matt, here is 1 option showing you 2025 tidal conditions. You can add/delete text as you want on the slide but the idea is that the blue shading gives you an indication of how frequent that tidal condition happened over the year. The most regular and daily fluctuations are solid, and less frequent are more white.

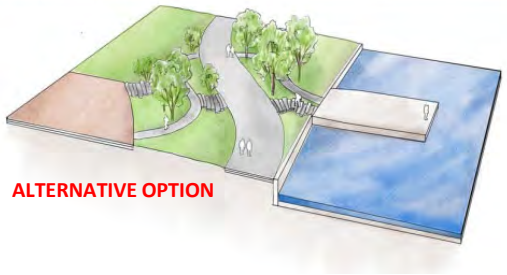
The 2025 shows the actual range of tide conditions with darker blue representing higher frequency conditions. On average, the river fluctuates ±1.5′ from Mean Sea Level which is shown for 2040 and 2060. The actual range of tidal conditions could be higher.

Sara Sepulveres, 2026-01-15T23:11:48.706

// Phase 1 – Point Lumley Shoreline Alternate







ALTERNATIVE OPTION

LEGEND

1 PUMP STATION

2 UNDERGROUND STORMWATER DETENTION CHAMBERS

3 RETAIN WATERFRONT PARK AT KING STREET

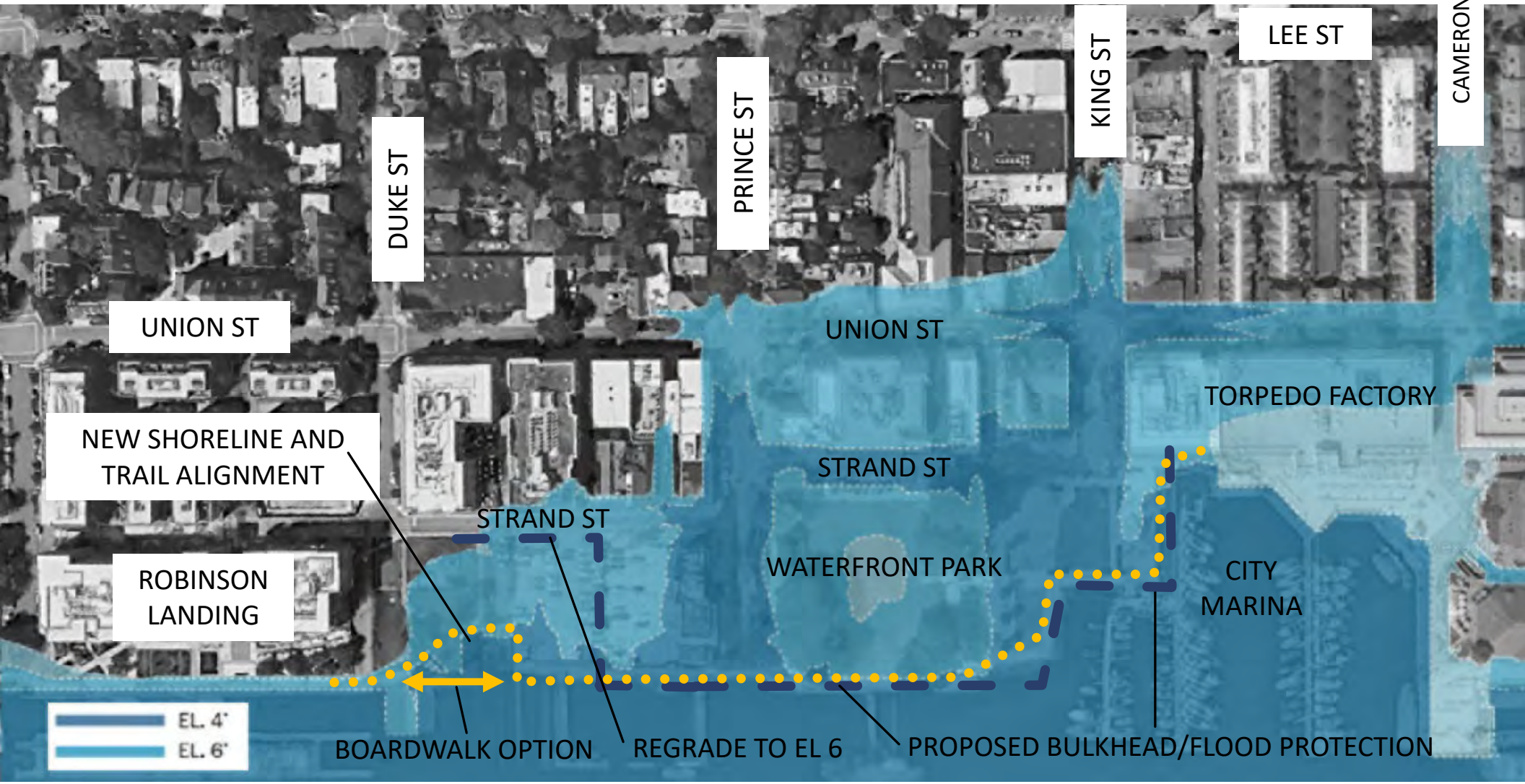
····· STREETSCAPE AND STORMWATER INFRASTRUCTURE IMPROVEMENTS (**STANDARD ASPHALT PAVING**)

····· STREETSCAPE STORMWATER INFRASTRUCTURE IMPROVEMENTS (MATERIALS TO MATCH EXISTING)

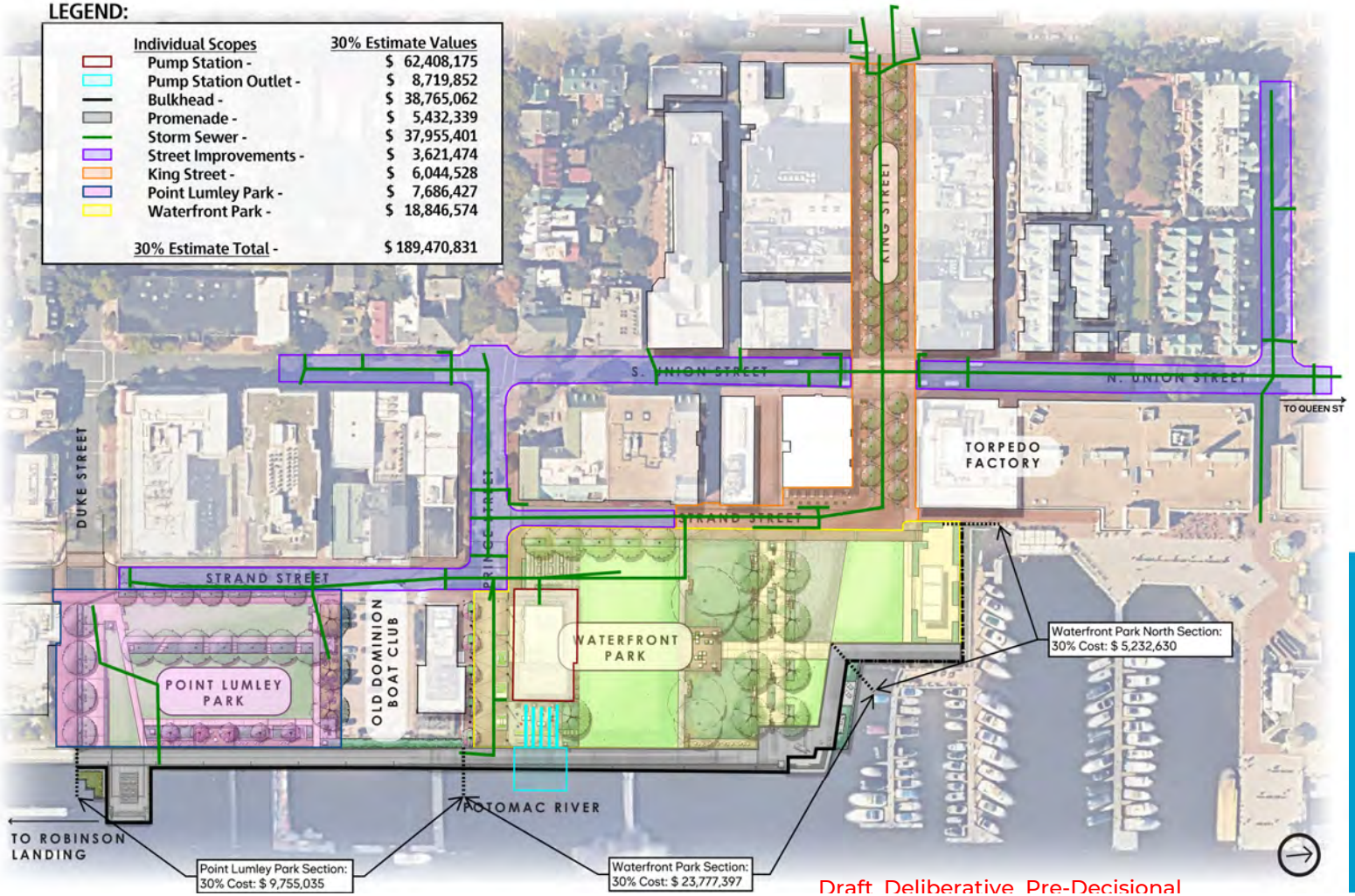
FLOOD PROTECTION AT ELEVATION 6
(Stabilized Shoreline-no bulkhead Duke to Prince St)

Riverine Overtopping & Flooding

Draft, Deliberative, Pre-Decisional



Cost Update - Technically Preferred Project



Draft, Deliberative, Pre-Decisional

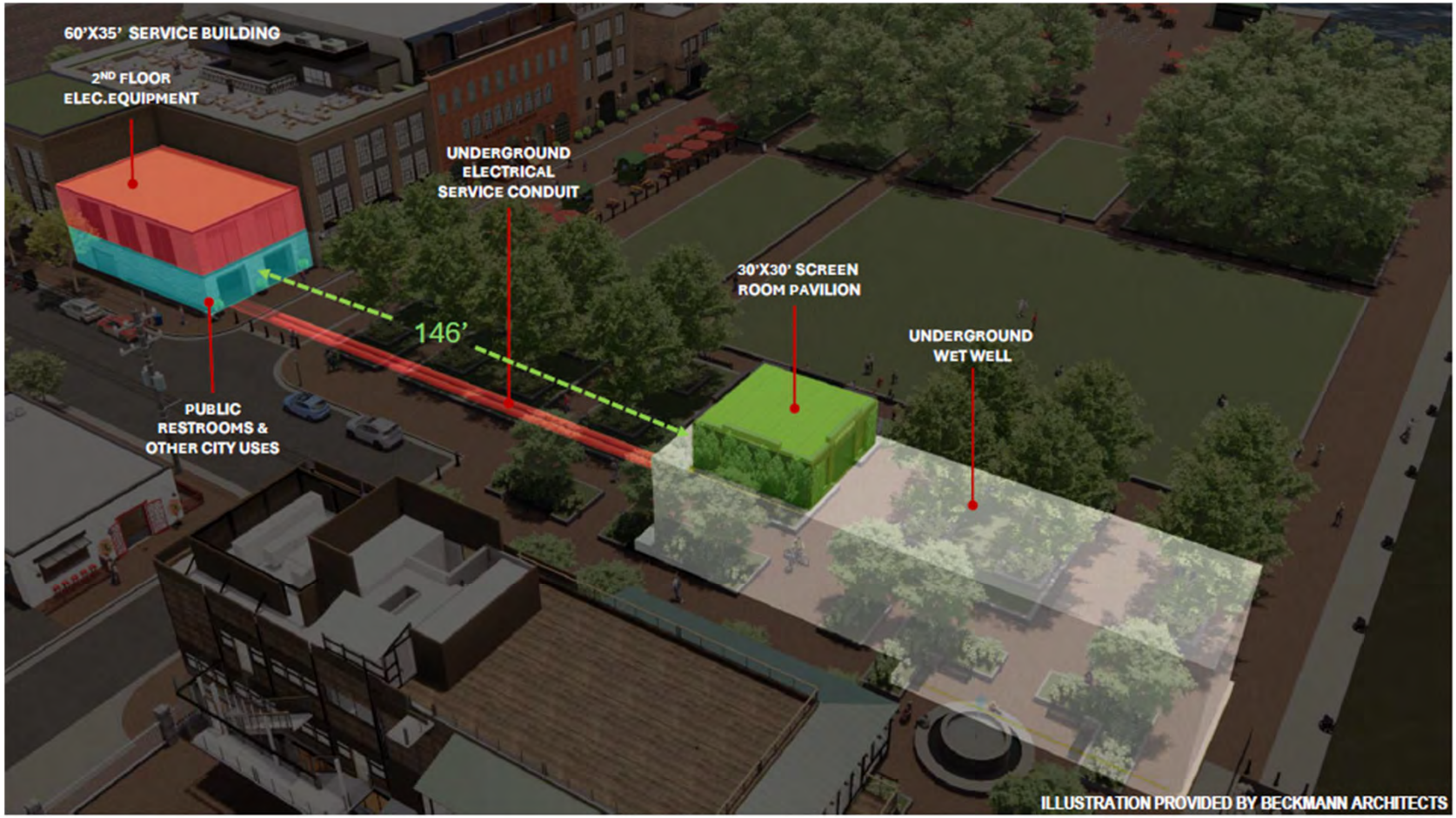
1 Prince Street – Full Relocation

DPI INITIAL ESTIMATE

+ $31M - $68M → $25M-$46M MOST PROBABLE

Cost item	Low End ($)	Notes/Assumptions	High End ($)	Notes/Assumptions
TOTAL ACQUISITION COST / TIME	**$ 7,720,808.00**		**$ 13,119,956.00**	
TOTAL ADDITIONAL DESIGN COST	**$ 3,650,000.00**		**$ 6,750,000.00**	days
				months
				years
CONSTRUCTION				
TOTAL ADDITIONAL COST OF CONSRUCTION	**$ 13,833,333.33**		**$ 24,266,666.67**	
TOTAL COSTS (PRIOR TO ESTIMATED INFLATION FOR PEROD OF DELAY)	**$ 25,204,141.33**		**$ 44,136,622.67**	
COST OF DELAY -INFLATION / LOSS OF PURCHASING POWER (DOES NOT INCLUDE INCREASED TARIFFS) ETC.	$ 5,944,261.90	2.5% @ 3.2 YEARS TO MIDPOINT OF CONSTRUCTION (DELAY OF ACQUISITION AND DESIGN PLUS 1 YEAR CONSTRUCTION). ASSUMES PV OF $105m (projected DB costs of construction only - assumes incresaed escalation already captured in re-design fees above)	$ 24,749,177.48	4.5% @ 5.63 YEARS TO MIDPOINT OF CONSTRUCTION (DELAY OF ACQUISITION AND DESIGN PLUS 1 YEAR CONSTRUCTION). ASSUMES PV OF $105m (projected DB costs of construction only - assumes incresaed escalation already captured in re-design fees above)
TOTAL WITH AVG ASSUMED ESCALATION TO MIDPOINT OF CONSTRUCTION, BASED ON PROJECTED DELAYS	**$ 31,148,403.24**		**$ 68,885,800.15**	
MOST PROBABLE / ANTICIPATED RANGE [ADJUSTED FOR POTENTIAL MANAGEMENT EFFICIENCY, COST REDUCTION STRATEGIES, TIME EFFICIENCIES THROUGH VE/ACCELERATION/CONCURRENT ACTIVITY]	**$ 25,509,605.62**	**Adjusted for efforts at minimization of PM activity/direct costs and schedule reduction/acceleration with DB.**	**$ 46,712,960.33**	**Adjusted for efforts at minimization of PM activity/direct costs and schedule reduction/acceleration with DB.**

1 Prince Street – Split Station



WATERFRONT PARK PUMP STATION – SPLIT CONFIGURATION STUDY

NOVEMBER 12, 2025

1 Prince Street – Full Relocation

Full Relocation

+ $22.5M - $53.3M*

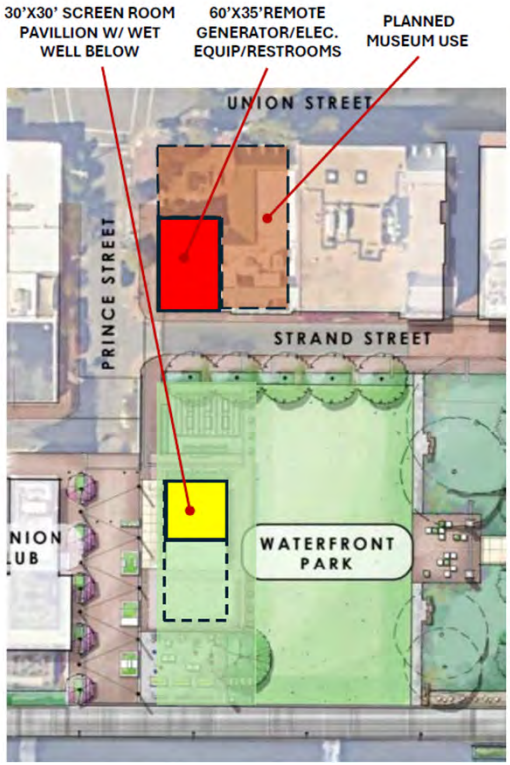
Client:	City of Alexandria, VA
Project Title:	Waterfront Implementation Project
Task:	1 Prince Street Alternative Site Analysis
Alternative:	Full Relocation of Pump Station to 1 Prince
Cost Category:	Alternative Summary
Date:	2/18/2026

Draft, Deliberative, Pre-Decisional

Additional Cost Summary				
Cost item		Low End ($)		High End ($)
Acquisition	$	1,533,300	$	8,372,700
Professional Services and Permitting	$	6,503,300	$	13,301,100
Construction	$	12,478,000	$	22,091,600
Inflationary Adjustment	$	2,010,600	$	9,535,300
Total Additional Cost	**$**	**22,525,200**	**$**	**53,300,700**

***DRAFT FIGURES**
(pending collaboration with AWA)

1 Prince Street – Split Concept



Split Station
+ $23.3M - $51.7M*

Client:	City of Alexandria, VA
Project Title:	Waterfront Implementation Project
Task:	1 Prince Street Alternative Site Analysis
Alternative:	Split System Between 1 Prince St. and Waterfront Park
Cost Category:	Alternative Summary
Date:	2/18/2026

Draft, Deliberative, Pre-Decisional

Additional Cost Summary		
Cost item	Low End ($)	High End ($)
Acquisition	$ 1,533,300	$ 8,372,700
Professional Services and Permitting	$ 8,960,100	$ 15,822,600
Construction	$ 10,768,900	$ 18,457,500
Inflationary Adjustment	$ 2,013,400	$ 9,085,400
TOTAL ADDITIONAL COST	**$ 23,275,700**	**$ 51,738,200**

***DRAFT FIGURES**
(pending collaboration with AWA)

Lower King Reference Slides

Existing Conditions

Draft, Deliberative, Pre-Decisional

Proposed Site Plan

Base – 30% Revised Scope

LEGEND:

1. Enhanced crosswalk
2. Sidewalk access zone
3. Commercial dining zone
4. Public amenity zone
5. 22' Pedestrian walkway (EVE)
6. Trench drain
7. Street tree
8. ~~Catenary lights~~
9. Mounting block
10. Expanded commercial dining zone

Note: All furnishings shown in the commercial dining zone will be privately maintained/operated and are shown for program/conceptual purposes only.

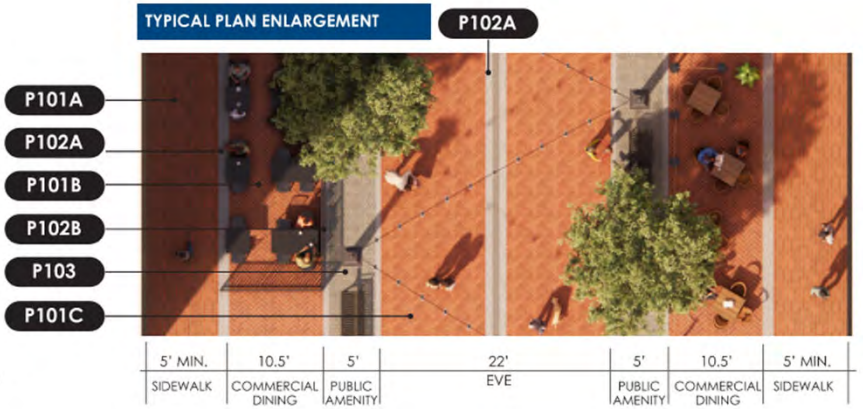
0 30' 60' 120'

Eliminate catenary lights – Typical
- GFCI at top of each pole to power tree lighting

Paving

TYPICAL SECTION PERSPECTIVE

TYPICAL PLAN ENLARGEMENT



P101A
BRICK PAVING TYPE 1
ALEXANDRIA STANDARD BRICK - 4" X 8" RUNNING BOND PATTERN, MORTAR SET
PEDESTRIAN-GRADE
FULL RANGE OF COLOR
COMMON ELEMENTS

P101B
BRICK PAVING TYPE 2
LARGE FORMAT BRICK – 4" X 12" HERRINGBONE PATTERN, MORTAR SET
PEDESTRIAN-GRADE
SINGLE COLOR

P101C
BRICK PAVING TYPE 3
ALEXANDRIA STANDARD BRICK – 4" X 8" HERRINGBONE PATTERN, MORTAR SET
VEHICULAR-GRADE
FULL RANGE OF COLOR
COMMON ELEMENTS

P102A/B
GRANITE BAND TYPE 1
12" WIDTH/6" WIDTH
COMMON ELEMENTS

P103
GRANITE COBBLE
4" X 4" MORTAR SET
COMMON ELEMENTS

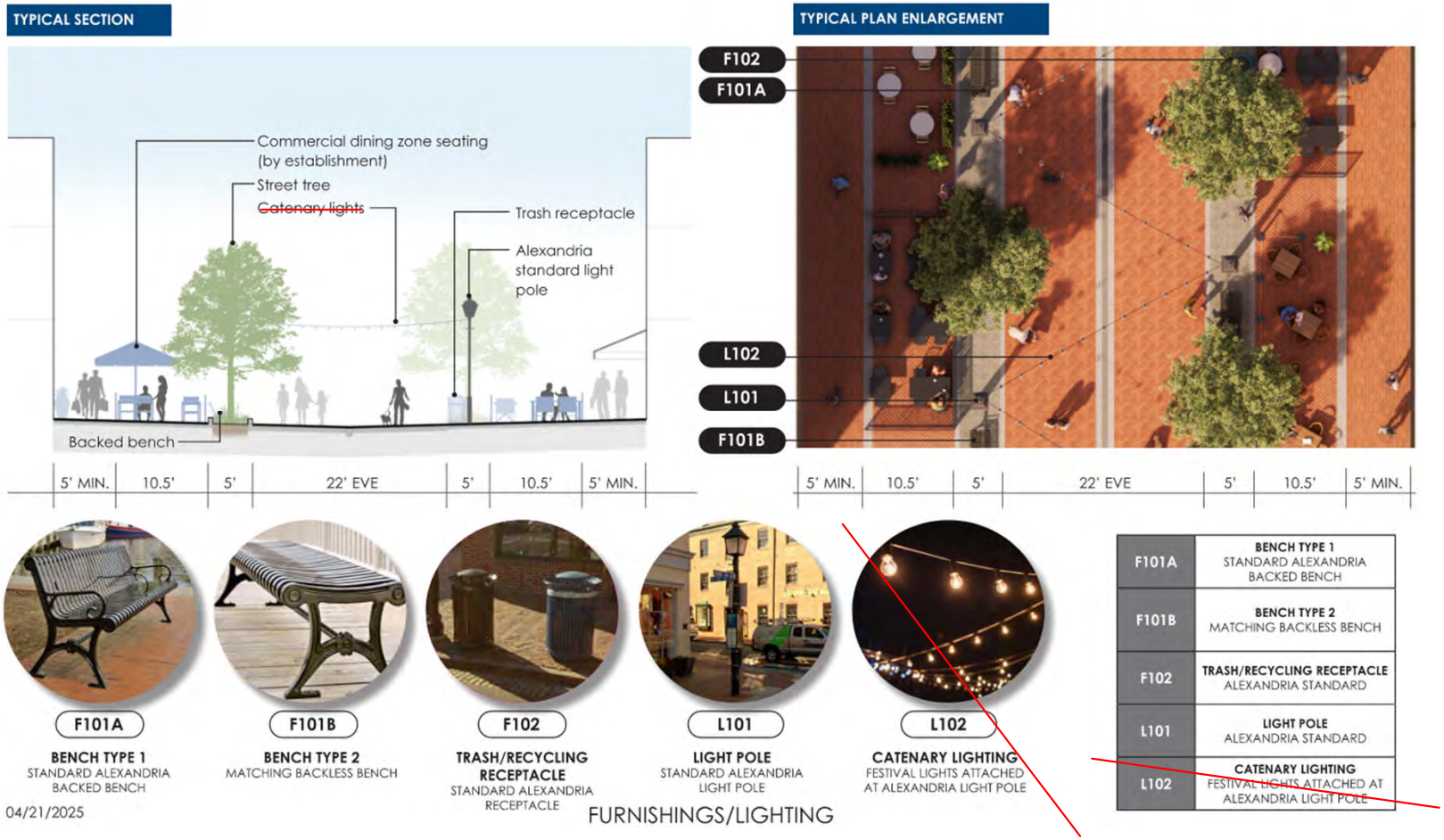
P101A	**BRICK PAVING TYPE 1** ALEXANDRIA STANDARD BRICK - RUNNING BOND PATTERN PEDESTRIAN-GRADE
P101B	**BRICK PAVING TYPE 2** LARGE FORMAT BRICK – HERRINGBONE PATTERN PEDESTRIAN-GRADE
P101C	**BRICK PAVING TYPE 3** ALEXANDRIA STANDARD BRICK – HERRINGBONE PATTERN VEHICULAR-GRADE
P102A	**GRANITE BAND TYPE 1** 12" WIDTH
P102B	**GRANITE BAND TYPE 2** 6" WIDTH
P103	**GRANITE COBBLE**

Note: Images are not exact representations of actual colors. Color of paving to be determined based on physical samples; images are for intent only. Mortar within bricks to be gray.

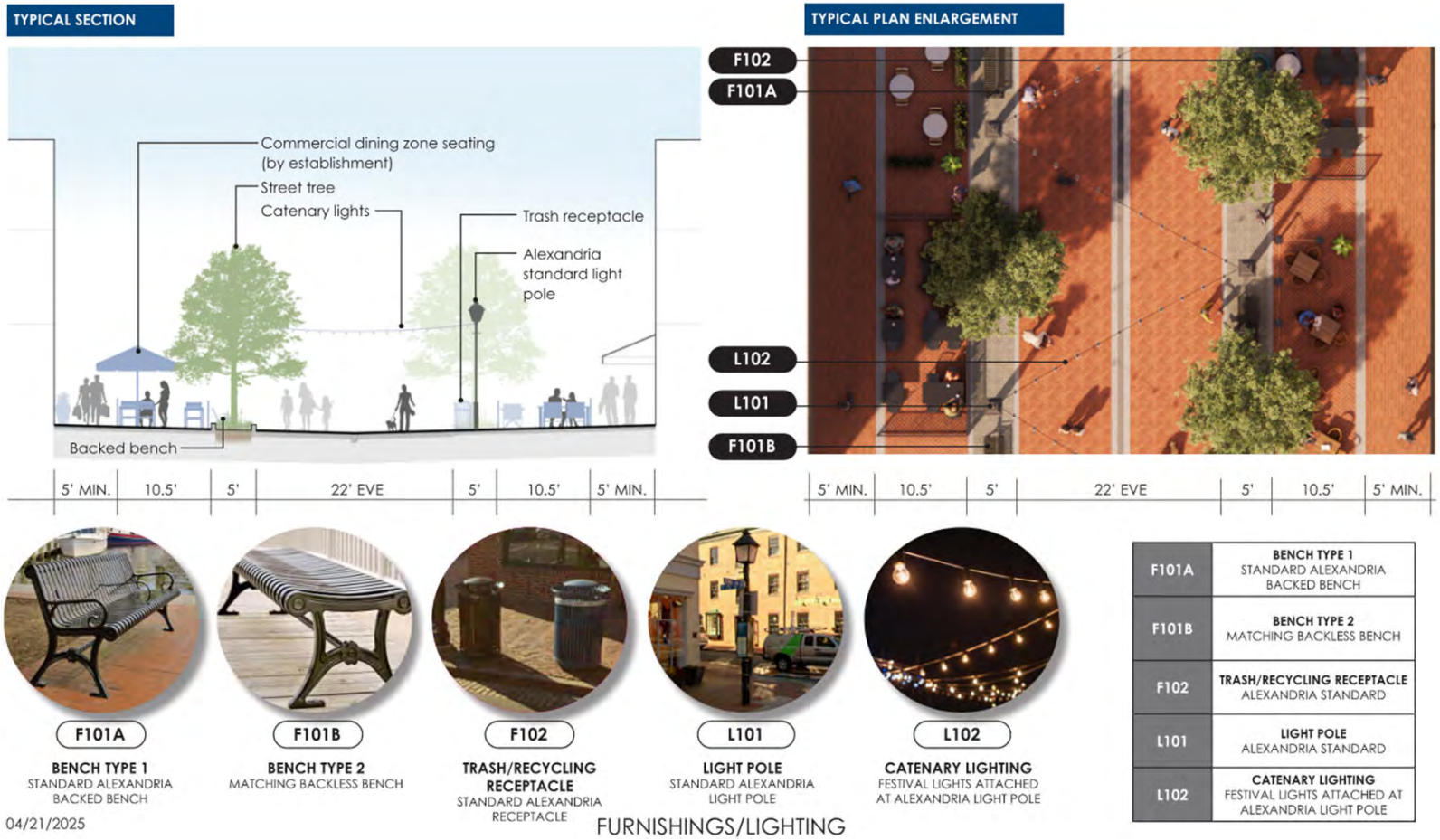
04/21/2025

PAVING

Furnishing & Lighting



Furnishing & Lighting



Intersection Improvements

UNION STREET INTERSECTION ENLARGEMENT PLAN

P101C	**BRICK PAVING TYPE 3** ALEXANDRIA STANDARD BRICK – HERRINGBONE PATTERN VEHICULAR-GRADE
P101D	**BRICK PAVING TYPE 4** ALEXANDRIA STANDARD BRICK – HERRINGBONE PATTERN VEHICULAR-GRADE
P103	**GRANITE COBBLE**
F105	**REMOVABLE BOLLARDS** MATCH EXISTING KING STREET COLUMNS
F106	**MOUNTING BLOCK** GRANITE OR CANAL STONE

Note: Images are not exact representations of actual colors. Color of paving to be determined based on physical samples; images are for intent only. Mortar within bricks to be gray.

P101C

BRICK PAVING TYPE 3
ALEXANDRIA STANDARD BRICK – 4" X 8" HERRINGBONE PATTERN, MORTAR SET
VEHICULAR-GRADE, RED
COMMON ELEMENTS

P101D

BRICK PAVING TYPE 4
ALEXANDRIA STANDARD BRICK – 4" X 8" HERRINGBONE PATTERN, MORTAR SET
VEHICULAR-GRADE, LIGHT GRAY TONES
COMMON ELEMENTS

P103

GRANITE COBBLE
4" X 4" MORTAR SET
COMMON ELEMENTS

F105

REMOVABLE BOLLARDS
TO MATCH EXISTING BOLLARDS AT KING AND STRAND STREETS

F106

MOUNTING BLOCK
GRANITE OR CANAL STONES
COMMON ELEMENTS

04/21/2025

INTERSECTION IMPROVEMENTS

Utilities & Drains