

# HOWARD TEMIN LAKESHORE PATH PAVING & LIGHTING STUDY: WILLOW CREEK TO LIMNOLOGY BLDG.

DFD PROJECT # 23K1W

DF/ DAMON FARBER RING & DUCHATEAU

OCTOBER 24, 2024

## JOINT CAMPUS AREA COMMITTEE



# AGENDA

- 1 PROJECT BRIEF AND TEAM INTRODUCTIONS
- 2 PROJECT SCHEDULE
- 3 PROJECT ANALYSIS OVERVIEW
- 4 ENGAGEMENT ROUND 1 SUMMARY
- 5 RESEARCH FINDINGS AND EVALUATION
- 6 SURFACING AND LIGHTING OPTIONS
- 7 NEXT STEPS





SCOPE OF STUDY AREA





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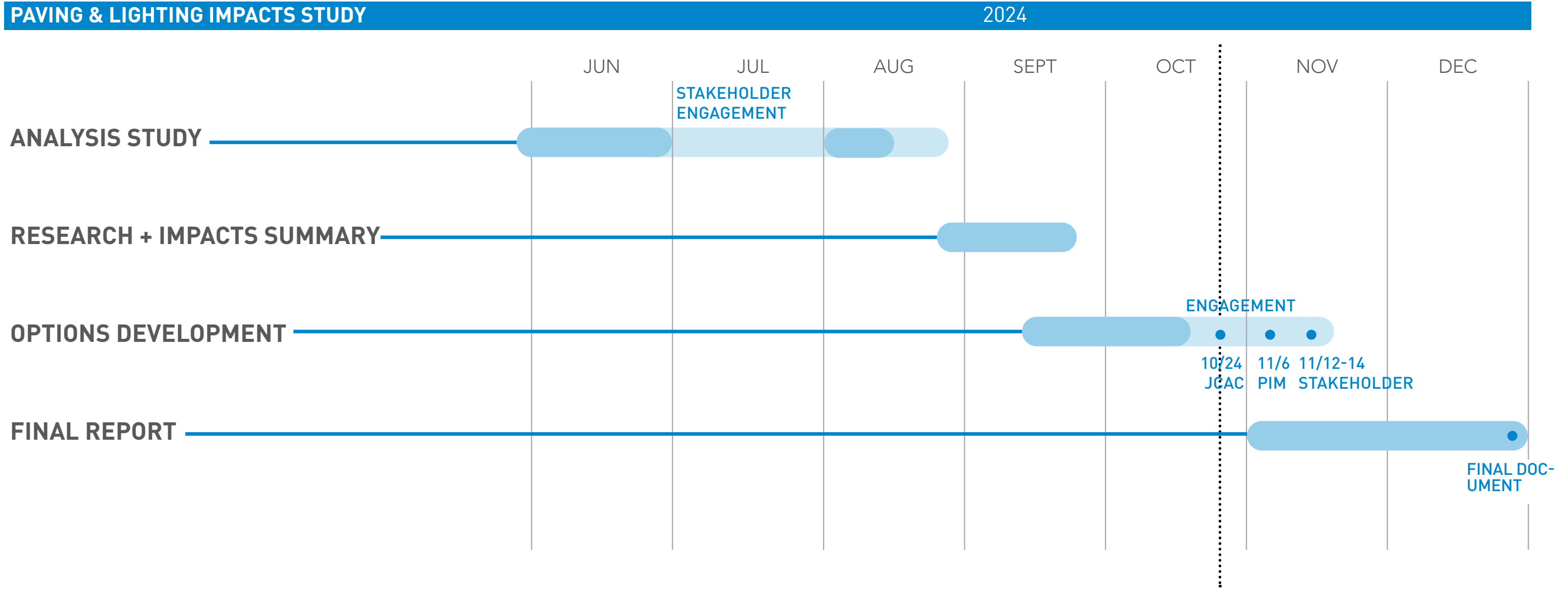
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SCHEDULE OVERVIEW

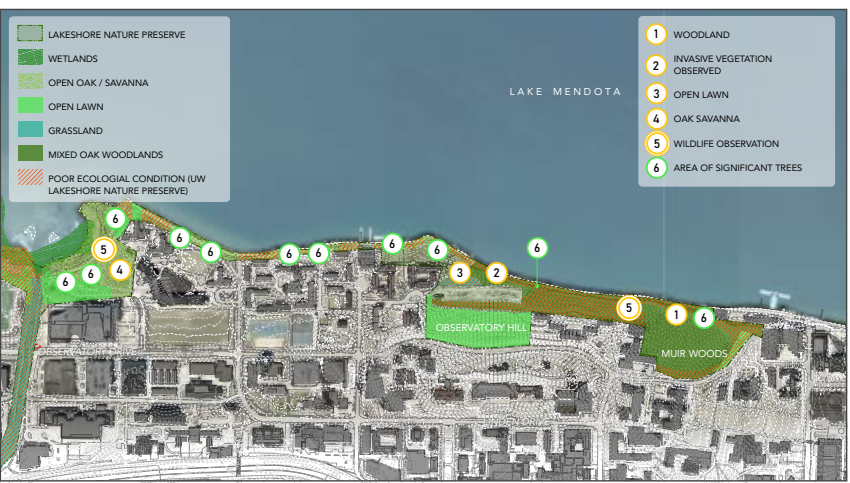
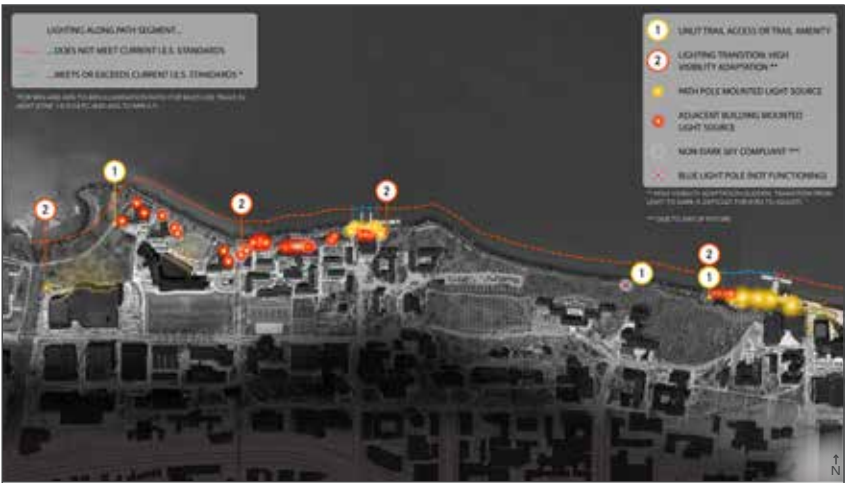
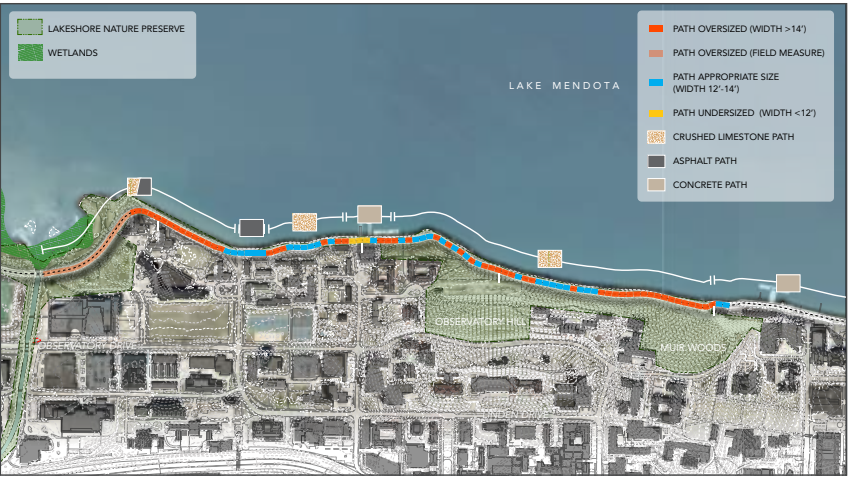
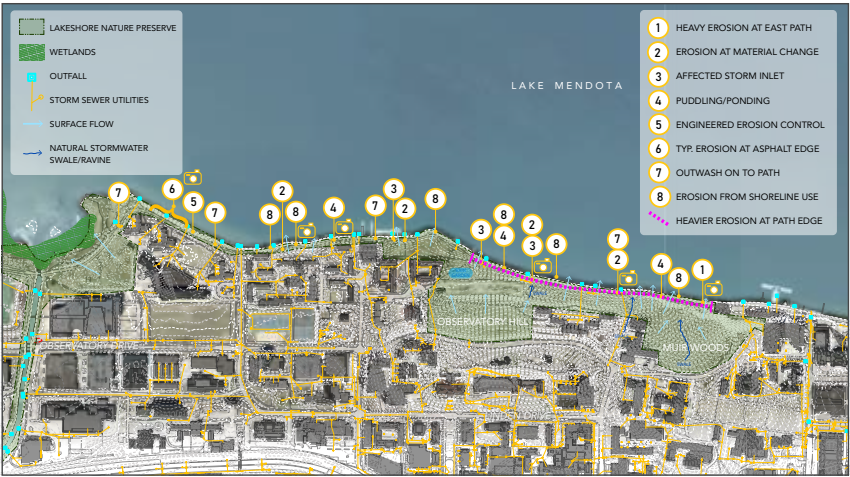
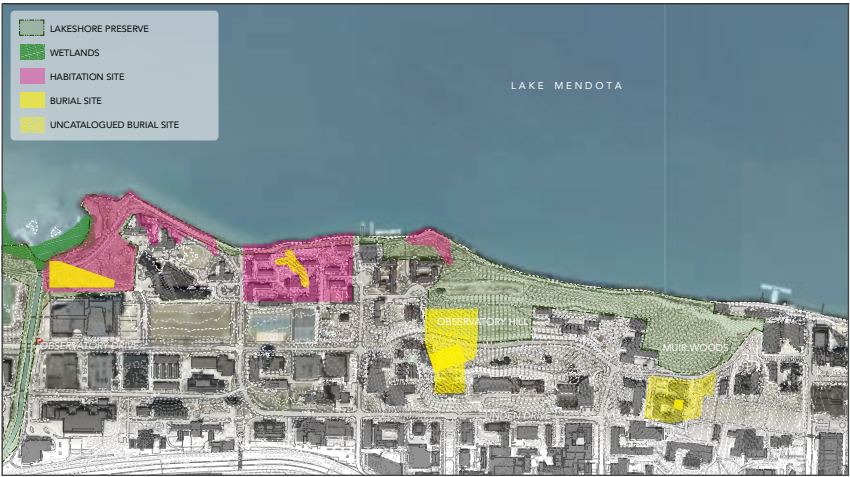




ANALYSIS

ANALYSIS MAPS

- » CULTURAL RESOURCES
- » PATH CIRCULATION
- » PATH EROSION
- » PATH SURFACING AND WIDTH
- » LIGHTING QUALITY
- » VEGETATIVE QUALITY





ONLINE SURVEY  
+ PUBLIC  
INFORMATION  
MEETING  
  
+ STAKEHOLDER  
MEETINGS

1,912 ONLINE SURVEY RESPONSES  
1,325 SURVEY COMMENTS  
  
127 GEOLOCATED COMMENTS  
  
~40 ATTENDEES  
18 COMMENT CARDS

COMBINED  
11,049  
INSIGHTS

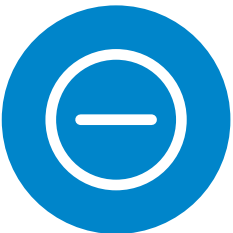
Insights counted as individual answers and comments across all survey responses and geo-located comments, and public information comments



No Concerns/  
Keep As-Is



General Safety



Feeling of  
Safety



Unsafe Trail  
Condition



User Conflicts



Inclusivity/  
Accessibility



Natural  
Resource/  
Ecosystem



Wildlife



Natural  
Aesthetic/  
Experience



Cost/  
Maintenance/  
Construction

User-ship

Nature and Aesthetic

Maintenance

COMMON THEMES/ KEY TAKEAWAYS



ENGAGEMENT SUMMARY

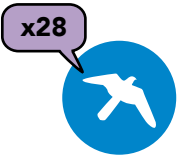
127  
GEO-LOCATED  
COMMENTS

July 16, 2024 Project  
Information Meeting  
+ Online Map Survey  
Comments



Safety Issue  
or Observation

Takeaways: Safety observations  
concentrated around **eastern**  
end of trail and at entrance



Wildlife / Natural  
Resource Feature

Takeaways: Wildlife sightings  
focus on **land and water**  
around wooded trail sections



Other

Takeaways: Misc. observations  
throughout the trail focus on  
how the trail is used, including



Lighting Issue  
/ Observation

Takeaways: Comments split  
between **desire to maintain**  
darkness, and a fear of it



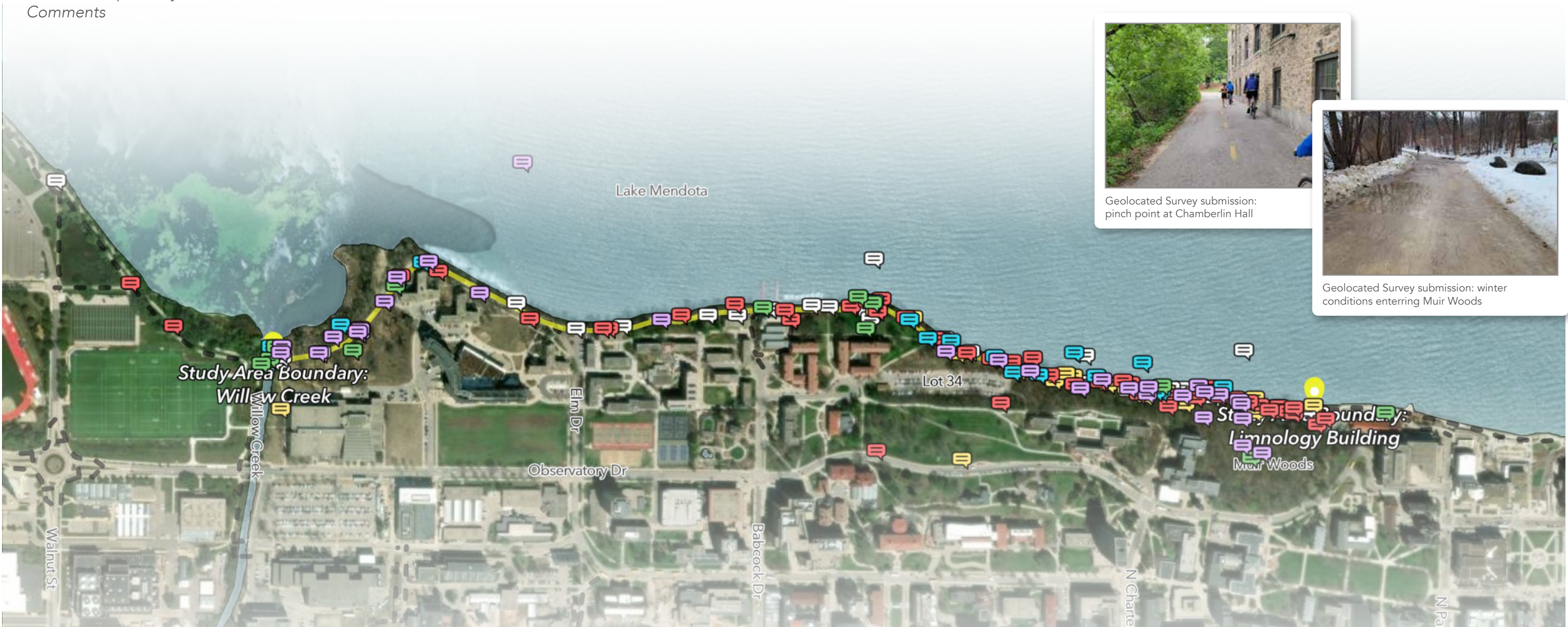
Stormwater /  
Erosion / Flooding

Takeaways: **Erosion and**  
**rutting** issues concentrated  
with area of steep adjacent



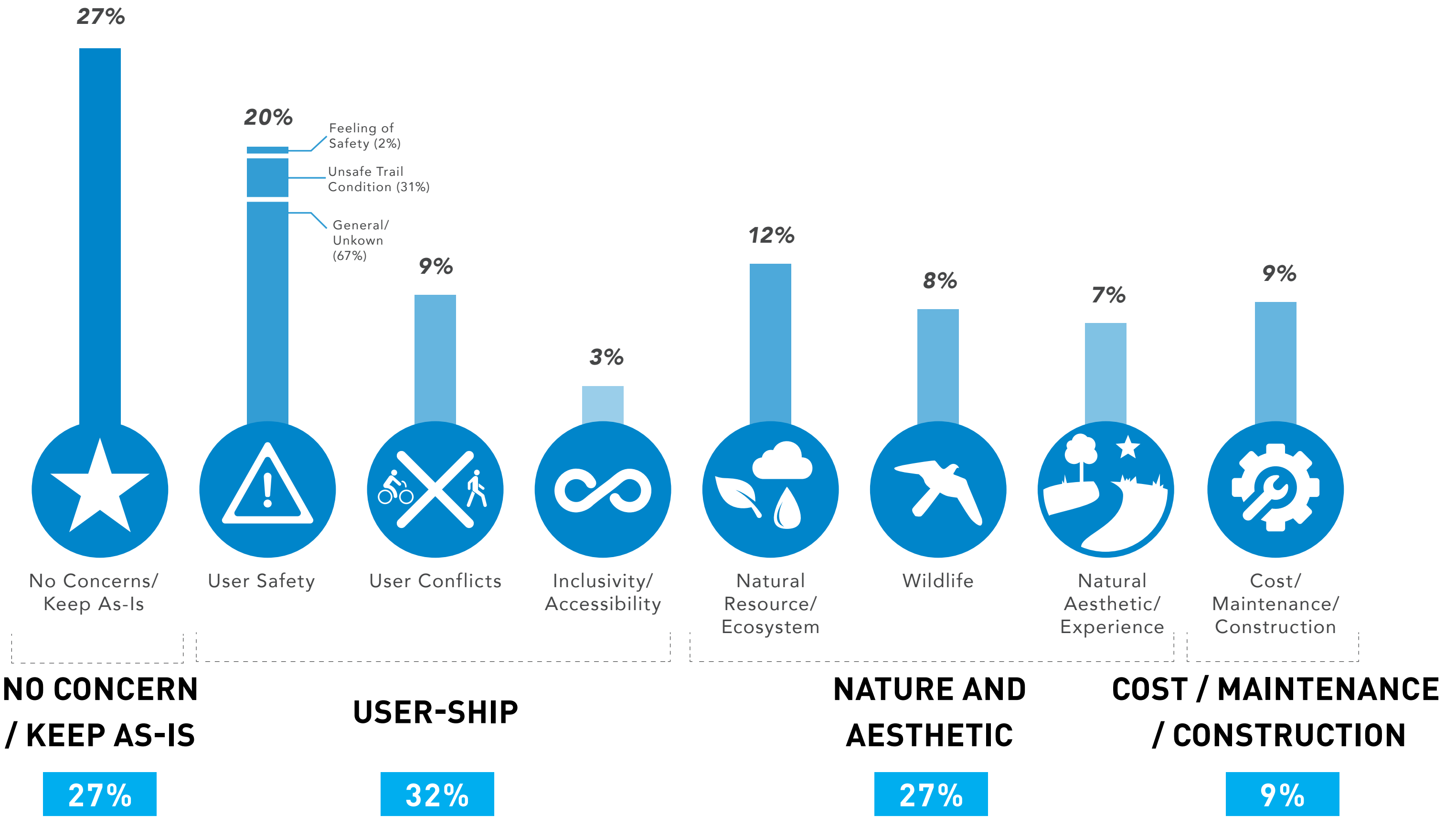
Desirable View  
/ Gathering Spot

Takeaways: Favorite spots  
at **both designed and non-**  
designed areas and focus





ENGAGEMENT SUMMARY





RESEARCH

ENVIRONMENTAL

Meets Surface Type Recommendation for Shared Use Path

- US Forest Service\*\* (based on Trail Classes 5 for bike, ped trails)
- WI DOT Bicycle Facility Design (for shared-use paths)
- UW Madison Campus Standards (for shared-use paths)

Natural Resource Impact

- Short Term-Construction Impact disturbance and excavation extents: low: 0-9' med: 9-18' high: 18'+
- Long Term Impact to root and vegetative growth low: minimizes obstacles to growth med: partially impedes growth high: impedes or completely blocks growth

Water Quality

- Runoff Co-efficient CN values for soil groups B/C from WSP/TR-55
- Contaminants Leaching / Runoff\*\*\* contaminant contribution (chemical leaching, sediment loading from material surface) low: minimal leaching/sediment loading to captures contaminants med: some chemical leaching; sediment loading likely high: chemical leaching/sediment loading will occur

Winter Mgmt Options

- Chemical Based De-icers suitable for use with... Sand Plowing
- Reduced Winter Management meets ADA / Forest Service requirements for surface conditions (for use on slopes, firmness, stability, texture)

\*\*\*Recycled concrete (aggregate base option) risk leaching Pb, though the risk of low due to dilution and rate

SURFACING / OPTIONS

SOCIO-ECONOMIC

User Safety + Experience

| existing conditions (disruptant)   | STABILIZED COMPACTED AGGREGATE  | BONDED AGGREGATE SURFACE  | existing conditions (porious)  | PERMEABLE ASPHALT MIXTURE  | TYPICAL CONCRETE   | PERVIOUS CONCRETE   | PERMEABLE UNIT PAVEMENT (PICP)   | SUSPENDED PAVEMENT  | BOARDWALK   | PIP RUBBERIZED SURFACE   | COMBINED AGGREGATE AND RUBBER  |
|--|---|---|--|--|--|---|--|---|---|--|--|
| Compacted aggregate over compacted aggregate base and compacted subgrade   | Latex polymer mixed with compacted Aggregate path to stabilize surface, | Resin applied to surface of compacted aggregate path to form impervious surface | Bituminous layer(s) over compacted aggregate base and compacted subgrade | High void content bituminous over aggregate storage layer and compacted subgrade | Portland limestone cement over compacted aggregate base and compacted subgrade | Concrete with high void content over aggregate storage layer and compacted subgrade | Spaced out interlocking concrete unit pavers over aggregate storage layer and compacted subgrade | PICP set over structural "soil cells" containing growing medium over compacted subgrade | Elevated structure installed over piles or footings | Flexible bound rubber over EPDM cushion course, compacted aggregate and compacted subgrade | 50% recycled rubber chips with 50% chipped granite aggregate over compacted aggregate and compacted subgrade |
| low/ medium  | low/ medium   | medium  | medium   | medium   | medium   | high  | medium   | medium  | N/A   | medium   | medium   |
| Sound Cues for Safety Awareness material texture/ looseness: low: fixed /sound absorbing texture med: fixed but smooth high: very loose/ coarse texture  | high  | high  | medium   | low/ medium  | low/ medium  | medium  | medium   | medium  | medium*   | low  | low  |
| Ability to Add Traffic Control low: uneven surface, low suitability to stripe/ affix controls med: uneven, striping possible/ difficult to affix controls high: uniform surface; suitable to stripe & affix controls | low   | low   | medium   | high   | high   | high  | medium   | medium  | medium/high   | medium/high  | medium/high  |
| ADA Suitability meets ADA / Forest Service requirements for surface conditions (for use on slopes, firmness, stability, texture)   | low/ medium   | medium  | medium   | high   | high   | high  | medium   | medium  | medium/high   | high   | high   |
| Aesthetics / Natural Experience low: "man-made" material med: mixed appearance high: "natural" material  | high  | high  | medium   | low  | low  | low   | low  | low   | low   | low/medium   | low/medium   |
| Operations   |   |   |  |  |  |   |  |   |   |  |  |
| Install Cost \$ low: \$0-10/sqft \$ med: \$10-20/sqft \$\$\$ high: \$20/sqft+  | \$  | \$\$  | \$\$   | \$   | \$\$   | \$\$  | \$\$ to \$\$\$   | \$\$\$  | \$\$\$  | \$\$\$   | \$\$\$   |
| Annual Maintenance Effort low: minimal surface repair, low cleaning med: occasional surface repair and cleaning high: regular erosion / surface repair, specialty cleaning   | high  | medium  | medium   | low/medium   | high   | low   | high   | high  | high  | medium/high*   | medium/high*   |
| Lifespan resurface / replace: low: 0-10 yrs med: 10-20 yrs high: 20+ years   | low/ medium   | low/ medium   | medium   | medium   | high   | high  | medium/high  | high  | high  | medium/high*   | medium/high*   |
| Products: Soil-Sement; Organic-Lock; Kalka * With low impact plow (feet or rubber edge)  |   |   |  |  |  |   |  |   |   |  |  |
| Products: Additive Resin Bonded Surfacing; Klingstone 400  |   |   |  |  |  |   |  |   |   |  |  |
| Assumes broom finish   |   |   |  |  |  |   |  |   |   |  |  |
| Products: Tree Parker, SilvaCell   |   |   |  |  |  |   |  |   |   |  |  |
| *Varies with material selection: Wood/ Metal/ Composite available  |   |   |  |  |  |   |  |   |   |  |  |

LENSES FOR RESEARCH

SURFACING

- » ENVIRONMENTAL
- » NATURAL RESOURCE IMPACT
- » WATER QUALITY
- » WINTER MANAGEMENT
- » SOCIO-ECONOMIC
- » USER SAFETY
- » AESTHETICS
- » OPERATIONS

LIGHTING

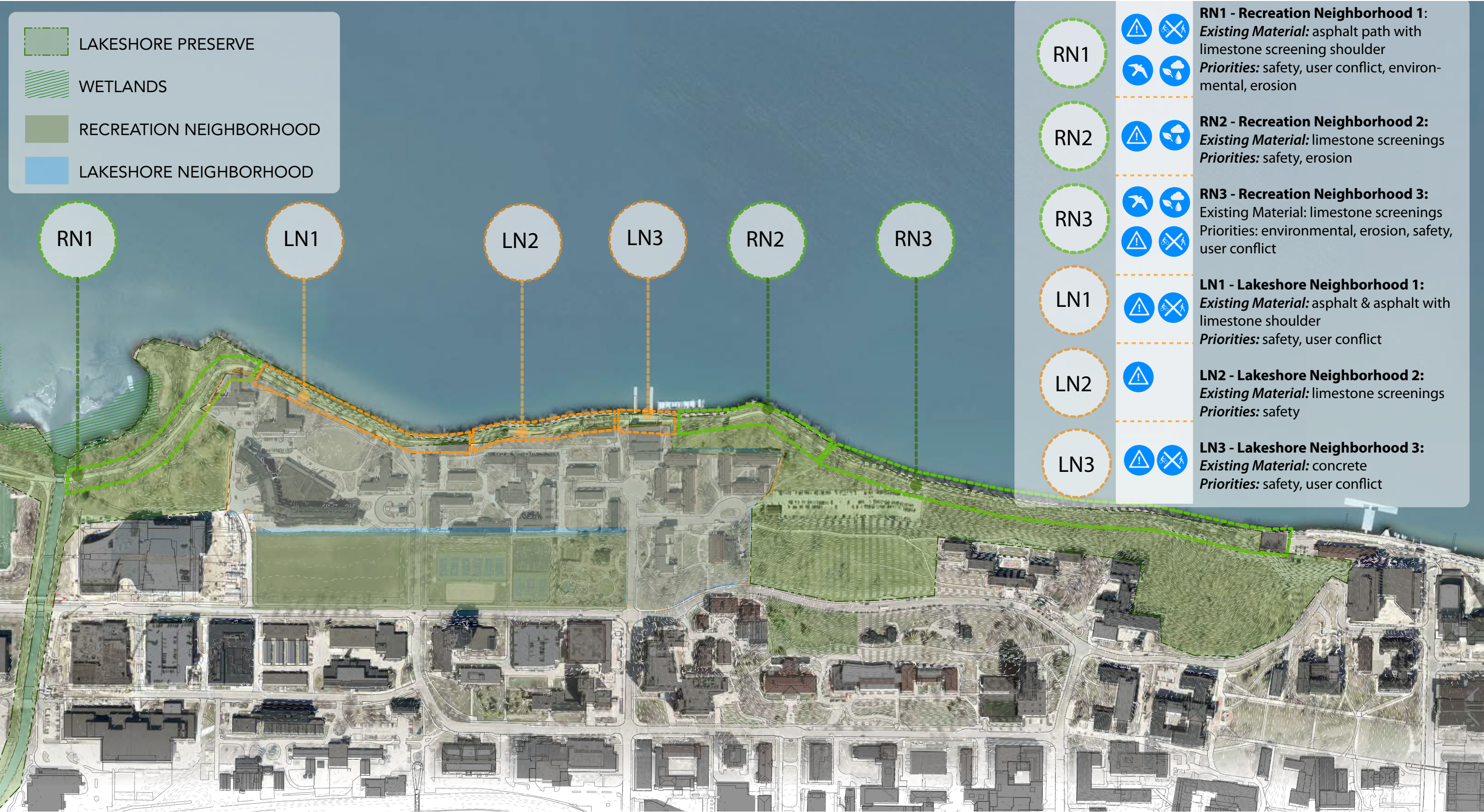
- » ENVIRONMENTAL
- » CULTURAL
- » SOCIAL
- » ECONOMIC

LIGHTING / OPTIONS

| IES Defined Recommendations<br><i>aligned with the ICES/DA Model Lighting Ordinance</i>  |  | EXISTING<br>LIGHTING<br>STRATEGIES                             | LIGHT ZONE 0<br>STRATEGIES   | LIGHT ZONE 1<br>STRATEGIES  | EXISTING<br>CONTROL<br>STRATEGIES | BASIC<br>CONTROL<br>STRATEGIES                                       | ADVANCED<br>CONTROL<br>STRATEGIES   |
|--|--|--|--|---|-----------------------------------|--|---|
|  |  | N/A  | 0.0 FC at grade<br>0 Max Uplight<br>0 Max Glare<br>No Blue Light                     | 0.4-0.8 FC at grade<br>5:1 Ave:Min at grade<br>1 Max Uplight<br>1 Max Glare<br>Minimal Blue Light | N/A                               | - Extinguish lights at a curfew<br>- Dim lights when area unoccupied | - Extinguish or dim lights at a curfew<br>- Dim or brighten lights based on user proximity and preference via app |
| Meets Standards  | WI DOT Standards   | X  | X  | ✓   | N/A                               | N/A  | N/A   |
|  | WI DFD Dark Sky IES/DA Model Lighting Ordinance  | X  | ✓  | ✓   | X                                 | ✓  | ✓   |
| Environmental Impact   |  |  |  |   |                                   |  |   |
|  <b>Wildlife Impact</b><br><i>poor:</i> does not consider wildlife<br><i>med:</i> addresses people over wildlife<br><i>excellent:</i> addresses wildlife over people  |  | where lights: <i>poor</i><br>where no lights: <i>excellent</i> | <i>excellent</i>   | <i>good</i>   | <i>poor</i>                       | <i>good</i>  | <i>good</i>   |
|  <b>Natural Resources Impact (Energy Usage)</b><br><i>poor:</i> no LED lights, uncontrolled<br><i>excellent:</i> minimal LED lights, controlled   |  | N/A  | <i>excellent</i>   | <i>good</i>   | N/A                               | <i>good</i>  | <i>good</i>   |
|  <b>Environmental Nighttime Quality</b><br><i>poor:</i> no regard for nighttime quality<br><i>med:</i> addresses LUX, L.E., controls personal safety<br><i>excellent:</i> addresses M.O.I.S.S. controls personal preference                       |  | where lights: <i>poor</i><br>where no lights: <i>excellent</i> | <i>excellent</i>   | <i>good</i>   | <i>poor</i>                       | <i>good</i>  | <i>excellent</i>  |
|  <b>Construction Disturbance</b><br><i>low:</i> disturbance above grade only<br><i>med:</i> trenching 24" deep curbs, 48" deep border bases<br><i>high:</i> trenching 24" deep curbs, 48" deep border bases, 60" deep joint bases                 |  | N/A  | <i>moderate</i>  | <i>high</i>   | N/A                               | <i>low</i>   | <i>low</i>  |
| Cultural Impact  | <b>Cultural Resource Preservation</b><br><i>Med:</i> depends on proximity of trail user<br><i>low:</i> controls, address local light pollution<br><i>excellent:</i> controls prioritize personal preference              | N/A  | <i>prioritize darkness: excellent</i><br><i>prioritize resource visibility: poor</i> | <i>prioritize darkness: poor</i><br><i>prioritize resource visibility: excellent</i>              | N/A                               | <i>good</i>  | <i>excellent</i>  |
| Social Impact  | <b>Trail Condition</b><br><i>Med:</i> depends on proximity of trail user<br><i>low:</i> addresses high or low trail use times<br><i>high:</i> brightens trail for mixed use, allows for personal preference via controls | N/A  | <i>prioritize darkness: excellent</i><br><i>prioritize resource visibility: poor</i> | <i>prioritize darkness: poor</i><br><i>prioritize resource visibility: excellent</i>              | N/A                               | <i>good</i>  | <i>excellent</i>  |
|  <b>User Conflict Resolution</b><br><i>low:</i> changes will not brighten the trail for mixed use<br><i>med:</i> addresses high or low trail use times<br><i>high:</i> brightens trail for mixed use, allows for personal preference via controls |  | N/A  | <i>poor</i>  | <i>high</i>   | N/A                               | <i>moderate</i>  | <i>high</i>   |
|  <b>Safety</b><br><i>low:</i> changes will not brighten the trail for mixed use<br><i>med:</i> addresses high or low trail use times<br><i>high:</i> brightens trail for mixed use, allows for personal preference via controls                   |  | N/A  | <i>poor</i>  | <i>high</i>   | N/A                               | <i>moderate</i>  | <i>high</i>   |
| Economic Impact  | <b>Install Cost</b><br><i>low:</i> low quantity added lights, controls<br><i>moderate:</i> moderate quantity added lights, standard controls<br><i>high:</i> costly controls   | N/A  | <i>low</i>   | <i>moderate</i>   | N/A                               | <i>moderate</i>  | <i>high</i>   |
| <b>Maintenance / Operations Cost</b><br><i>low:</i> low quantity added lights, controls<br><i>moderate:</i> moderate quantity added lights, standard controls<br><i>high:</i> high costs of controls, maintenance agreements, data management, app maintenance   |  | N/A  | <i>moderate</i>  | <i>moderate</i>   | N/A                               | <i>moderate</i>  | <i>high</i>   |
| <b>Maintenance Activities / Lifespan</b><br><i>low:</i> LED fixtures, 15-20-year lifespan<br><i>med:</i> standard controls, 10+ year lifespan or devices<br><i>high:</i> high-cost controls, 10+ year lifespan or devices  |  | N/A  | <i>low</i>   | <i>low</i>  | N/A                               | <i>moderate</i>  | <i>high</i>   |



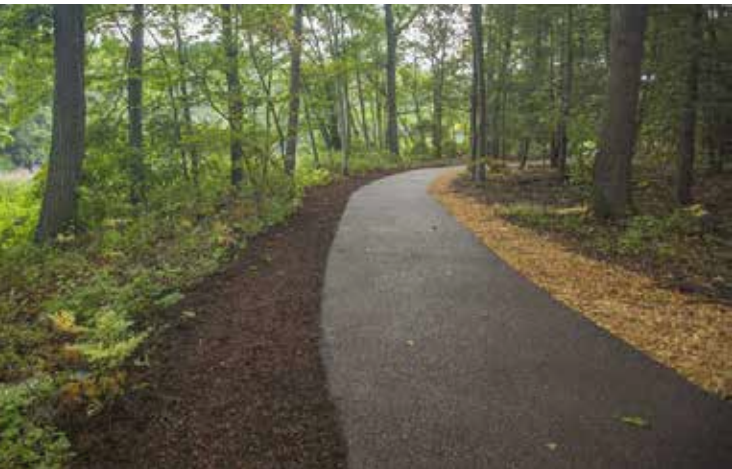



OPTIONS EVALUATION - SURFACING





CASE STUDIES - PATH SURFACING

|                | PHEASANT BRANCH TRAIL + CONSERVANCY / MIDDLETON, WI  | BLOOMINGDALE TRAIL (THE 606) CHICAGO, IL   | WELLESLEY OFFICE PARK WALKING PATH / WELLESLEY, MA  | GARVER PATH MADISON, WI  |
|----------------|--|--|---|--|
|                |   |    |    |                                 |
| SIZE           | Avg. 8' wide, 2 miles separate, 8 miles of trail in conservancy  | 2.5 miles, 14' wide (avg)  | 1 mile, 6' wide   | 2800' length, 10' wide   |
| PAVEMENT TYPES | <ul style="list-style-type: none"><li>• Aggregate</li><li>• Asphalt</li><li>• Porous Asphalt</li><li>• Boardwalk</li></ul> | <ul style="list-style-type: none"><li>• Concrete</li><li>• Rubber Shoulder</li></ul> | <ul style="list-style-type: none"><li>• <b>Bound Aggregate:</b> Combined aggregate rubber</li><li>• Wood chip/ natural shoulder</li></ul> | <ul style="list-style-type: none"><li>• <b>Asphalt</b> with boardwalks</li><li>• Curb edge/ natural edge</li></ul> |
| USERS          | 2,500 users/day; 30,000 users/year   | 3,000 users/day; 1.1M users/year   | Volume data not available   | Volume data not available  |



CASE STUDIES - PATH SURFACING

SAFETY  
CONTROLS

- Signage
- Markings/ striping
- Curbs & edges



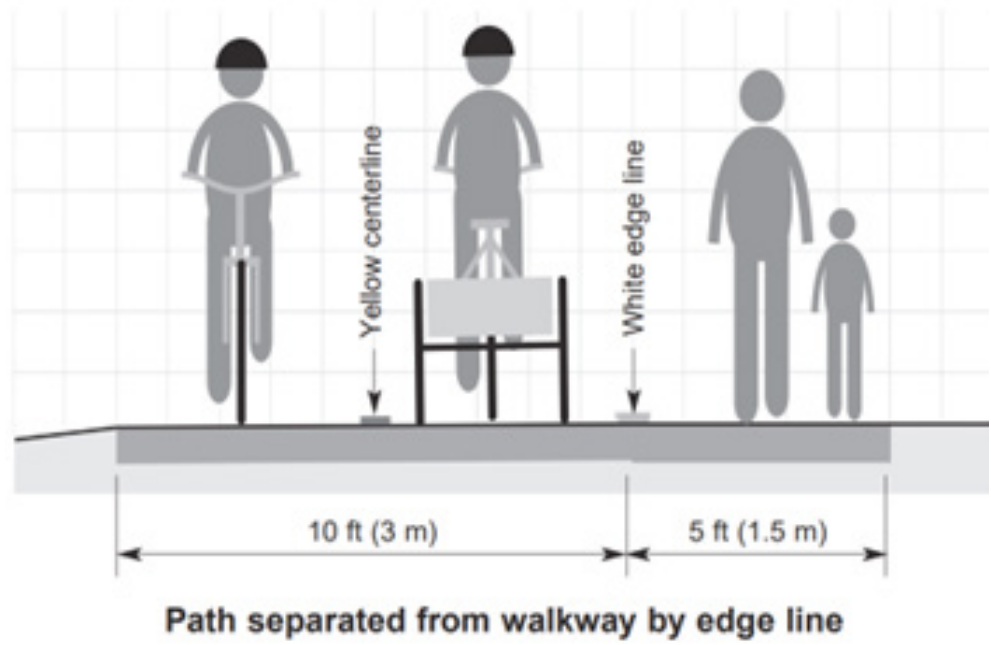
Material change/ integrated infrastructure as striping



Asphalt path with aggregate shoulder, no controls



Asphalt path with concrete shoulder and striping



WI DOT Bicycle Design Handbook shared path separation methods



Rumble strips in bike lane before curve

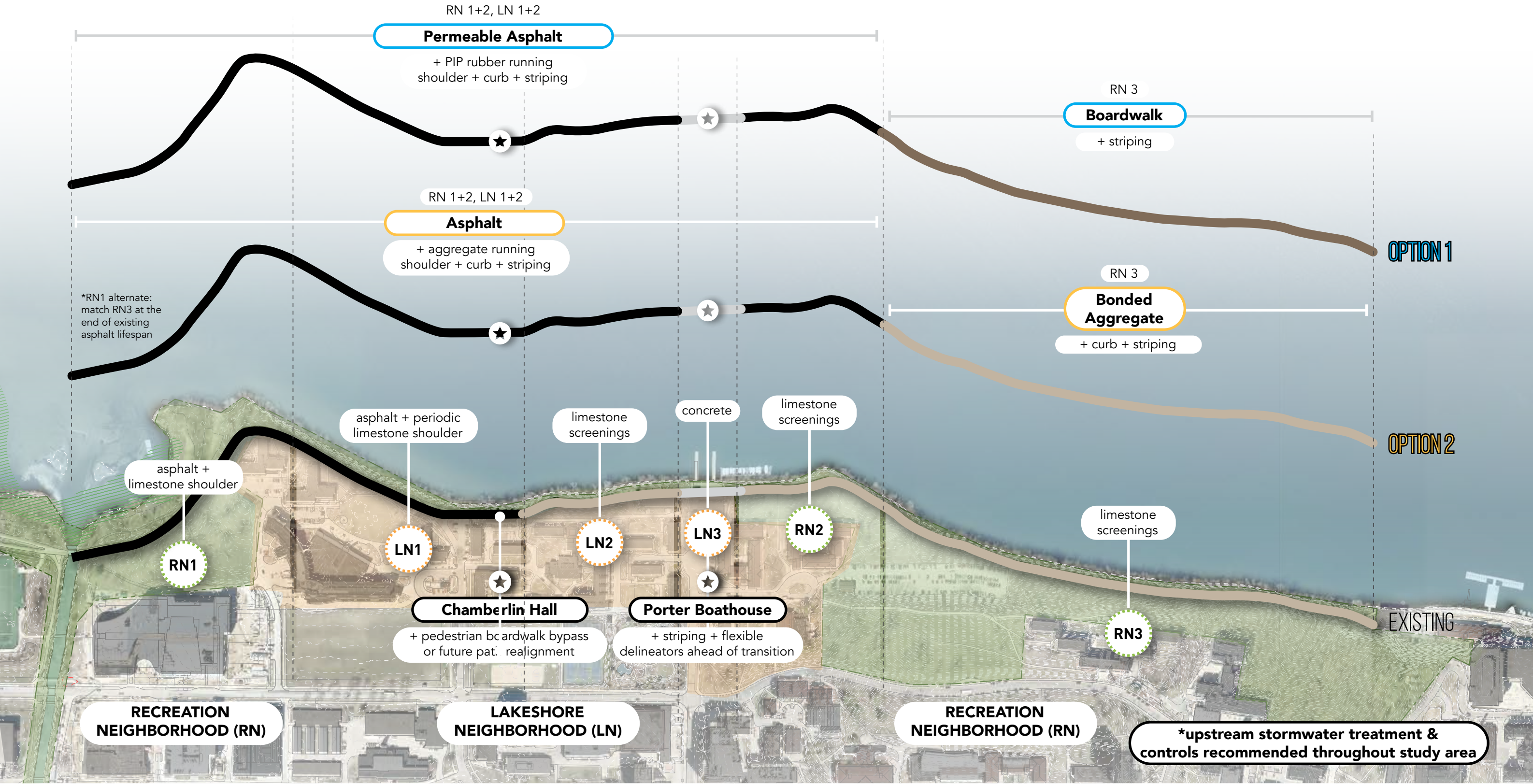


Flexible delineators at surface change/ intersections



SURFACING - OPTIONS

Note: Programming recommendations (i.e. operational rules) are not currently captured in project scope but recommended to be considered in future work.





PAVING - OPTION 1

LN1

LN2

RN1

RN2

PAVING

PERMEABLE ASPHALT W/ PIP

RUBBER SHOULDER + CURB

CONTROLS

STRIPING



(left) Permeable asphalt, Middleton, WI; (right) Concrete with Rubber Running strip, Chicago, IL

RN3

PAVING

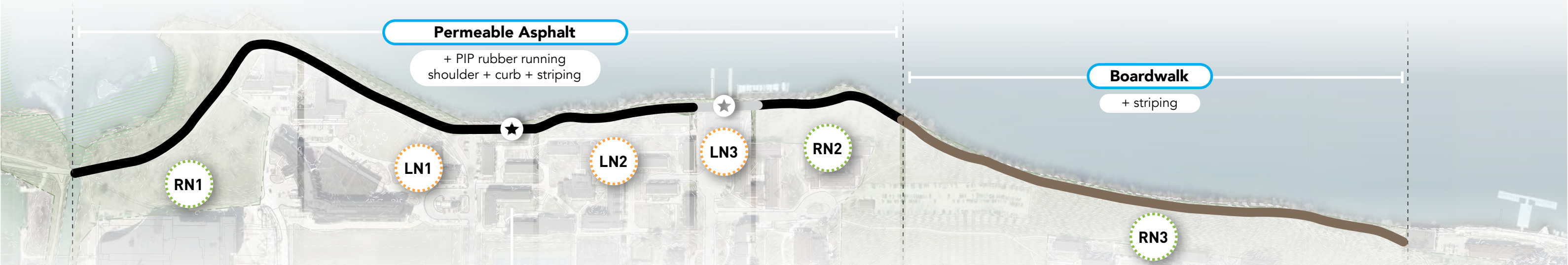
BOARDWALK

CONTROLS

STRIPING + SIGNAGE



Low boardwalk, Muir Woods National Monument, CA





PAVING - OPTION 2

LN1

LN2

RN1

RN2

PAVING

ASPHALT W/ PIP RUBBER SHOULDER + CURB

CONTROLS

STRIPING



Typical asphalt with aggregate running strip

RN3

RN1\*

PAVING

BONDED AGGREGATE W/ CURB

(COMPOSITE/RESIN/WAX BONDED AGGREGATE, TBD)

CONTROLS

STRIPING + SIGNAGE



(left) Bonded Aggregate Surface Product; (right) Combined Permeable Aggregate and Rubber Surface, Wellesley, MA





LIGHTING - OPTION

- RN3
- LN1
- LN2
- LN3

RECOMMENDATION

LIGHT ZONE 1 / **WARM WHITE**  
2400K-3000K OR CORRELATED COLOR TEMPERATURE WHITE LIGHT

- Melanopic Daylight Equivalency Ratio (0.35-0.48)
- Widely available in standard commercial exterior products
- Reassurance Visibility for discerning detail, color of objects

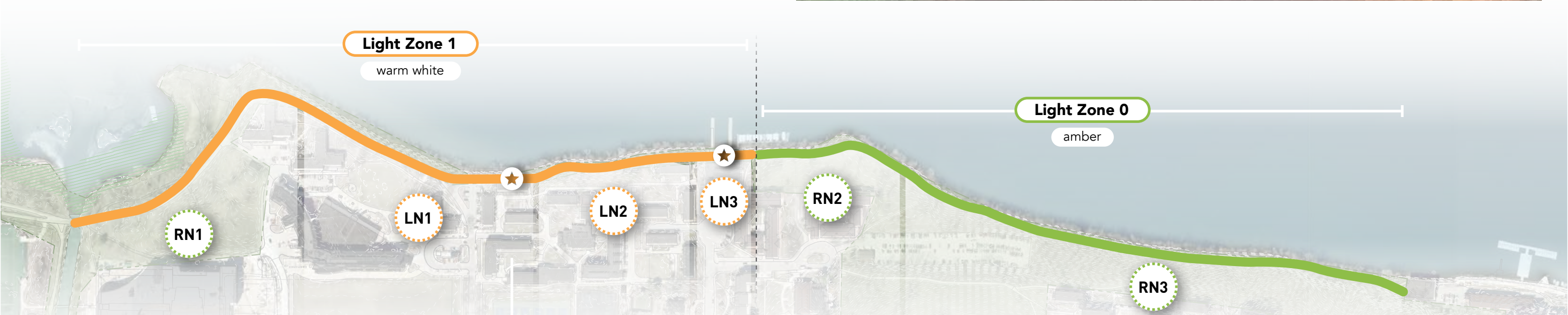


- RN2
- RN3

RECOMMENDATION

LIGHT ZONE 0 / **AMBER**  
1800K-2000K OR SINGLE WAVELENGTH AMBER LIGHT

- Melanopic Daylight Equivalency Ratio (0.35-0.48)
- Widely available in standard commercial exterior products
- Lower Reassurance Visibility than white light





NEXT STEPS

1 FINALIZE PIM PRESENTATION AND  
FEEDBACK EXERCISES W/ CLIENT TEAM

2 REPORT SELECTED OPTIONS  
TO ENGAGEMENT GROUPS

PIM #2 [11/6] →

STUDENT CENTRIC SESSION,  
CAMPUS PARTNERS, LAKESHORE  
NATURE PRESERVE [11/12-11/14]

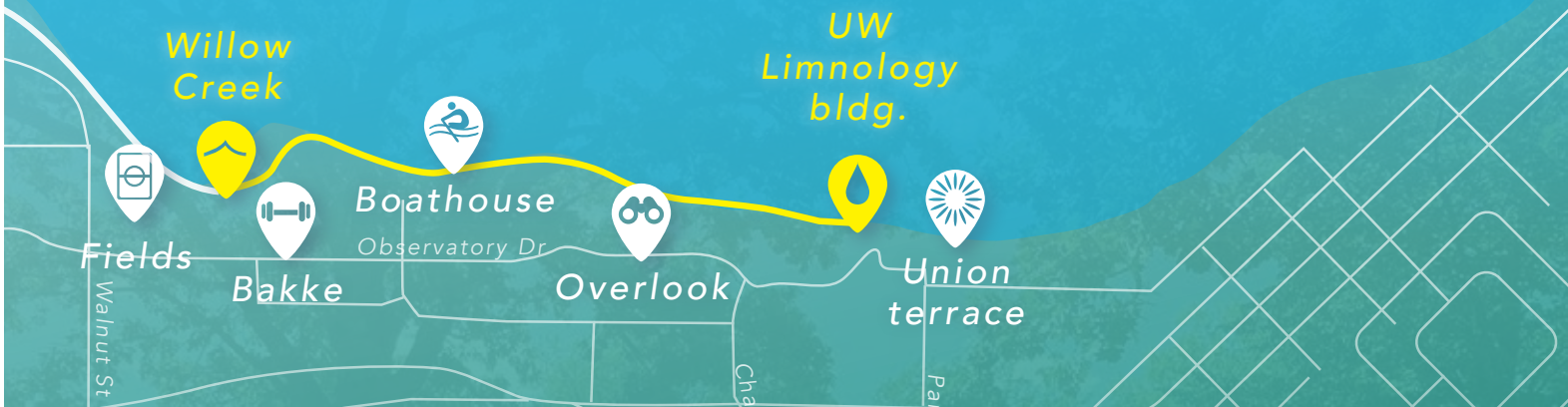
DESIGN REVIEW BOARD - [12/17])

3 PREPARE FINAL REPORT

THANK YOU!

WE WANT TO HEAR FROM YOU!

UW HOWARD TEMIN  
**LAKESHORE PATH**  
LIGHTING AND  
PAVING STUDY



**? PUBLIC INFORMATION MEETING**

- Review research findings
- Share engagement summary to date
- Review preliminary lighting and paving options
- Gather input and feedback to inform final recommendations

**🕒 WEDNESDAY, NOVEMBER 6**

**5:30pm - 7:30pm**

Join us for a presentation at 5:30pm with feedback activity and discussion to follow

**📍 HOLT CENTER**  
**Kronshage Hall, 1650 Kronshage Dr.**

HOSTED BY **DF/ DAMON FARBER**



Questions? Contact Damon Farber at [jrefsland@damonfarber.com](mailto:jrefsland@damonfarber.com)