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

DFD PROJECT # 23K1W

DF/ DAMON FARBER RING & DUCHATEAU

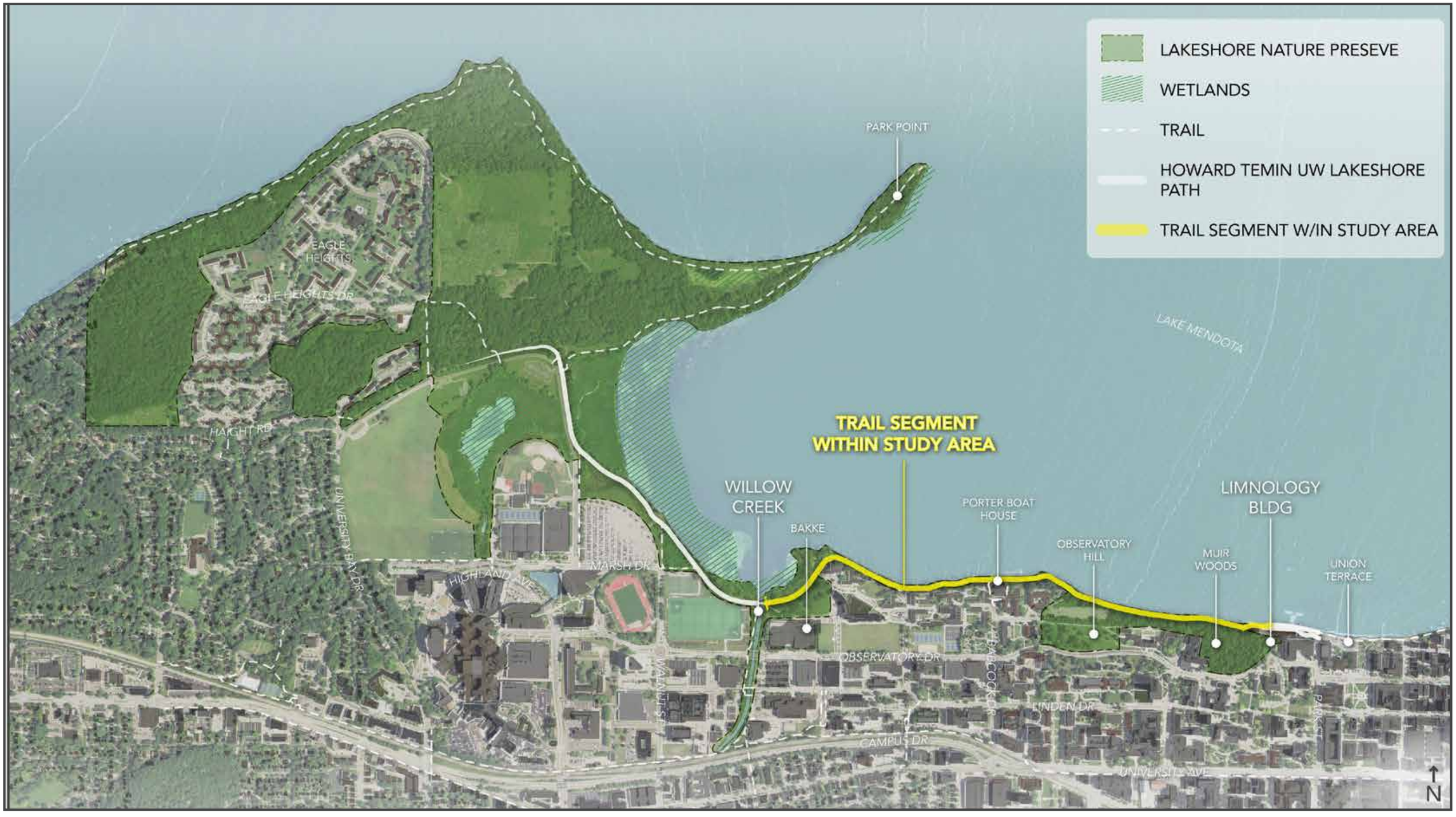
OCTOBER 24, 2024

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



HOWARD TEMIN LAKESHORE PATH / JCAC 10/24, 2024

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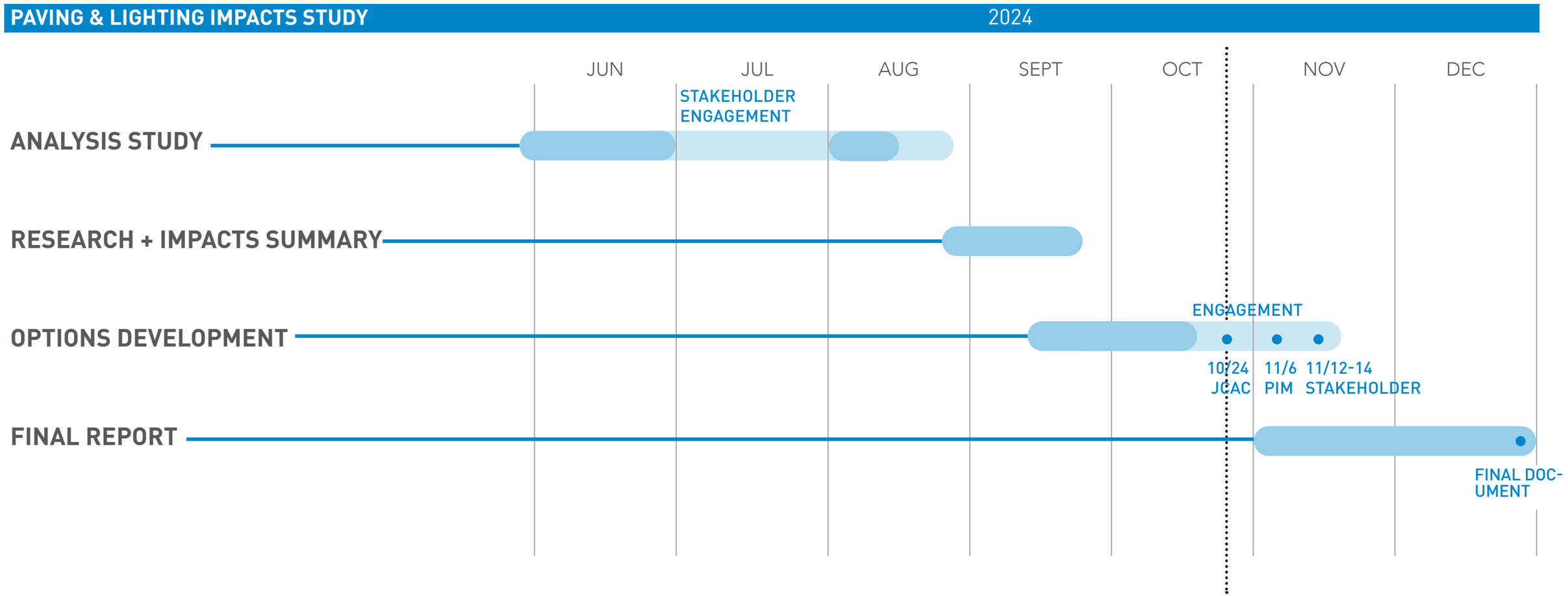
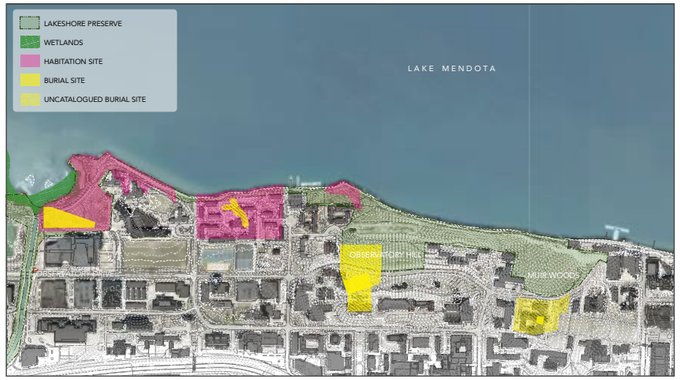
SCHEDULE OVERVIEW

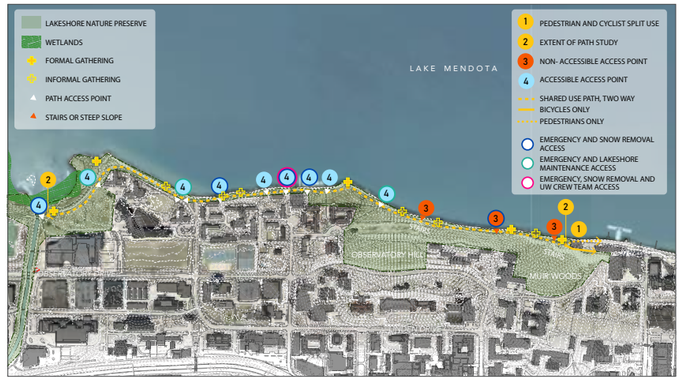


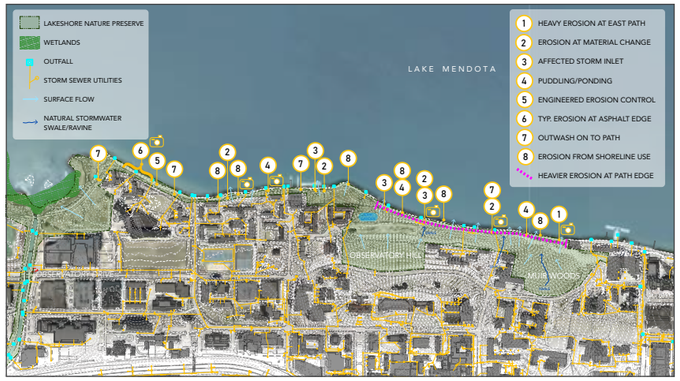
ANALYSIS

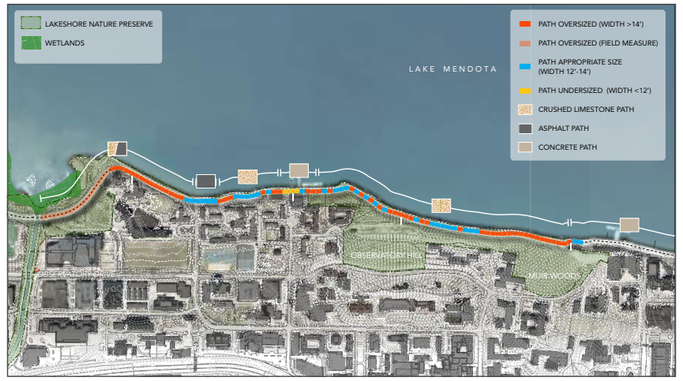
ANALYSIS MAPS

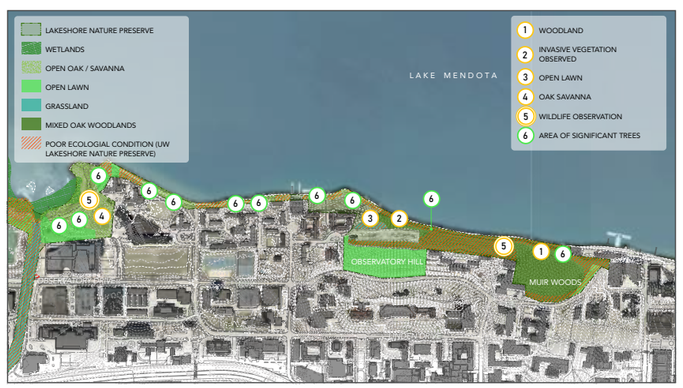
» CULTURAL RESOURCES
» PATH CIRCULATION
» PATH EROSION
» PATH SURFACING AND WIDTH
» LIGHTING QUALITY
» VEGETATIVE QUALITY











ONLINE SURVEY

1,912 ONLINE SURVEY RESPONSES
1,325 SURVEY COMMENTS

+ PUBLIC INFORMATION MEETING

127 GEOLOCATED COMMENTS

~40 ATTENDEES
18 COMMENT CARDS

+ STAKEHOLDER MEETINGS

COMBINED 11,049 INSIGHTS

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

COMMON THEMES/ KEY TAKEAWAYS

ENGAGEMENT SUMMARY

127
GEO-LOCATED COMMENTS

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

x48

Safety Issue or Observation

Takeaways: Safety observations concentrated around **eastern**

x28

Wildlife / Natural Resource Feature

Takeaways: Wildlife sightings focus on **land and water**

x28

Other

Takeaways: Misc. observations throughout the trail focus on

x22

Lighting Issue / Observation

Takeaways: Comments split between **desire to maintain**

x14

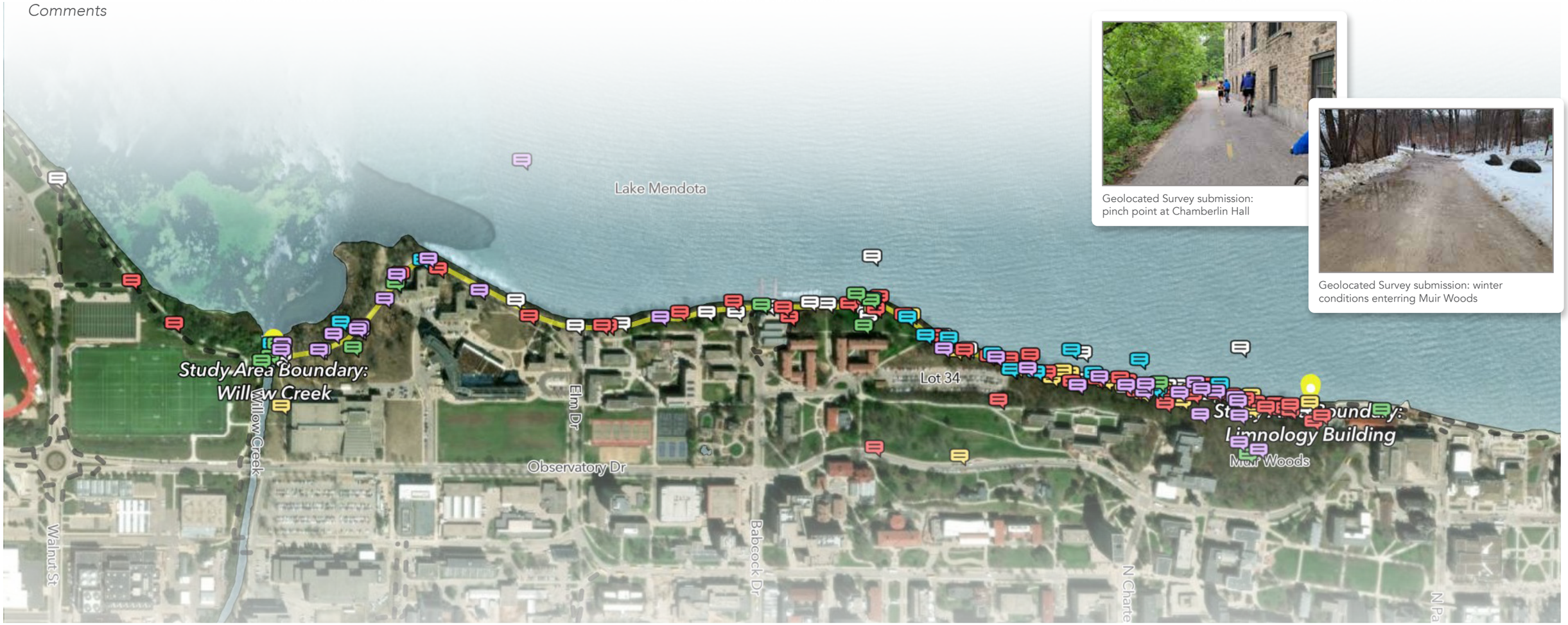
Stormwater / Erosion / Flooding

Takeaways: **Erosion and rutting** issues concentrated

x9

Desirable View / Gathering Spot

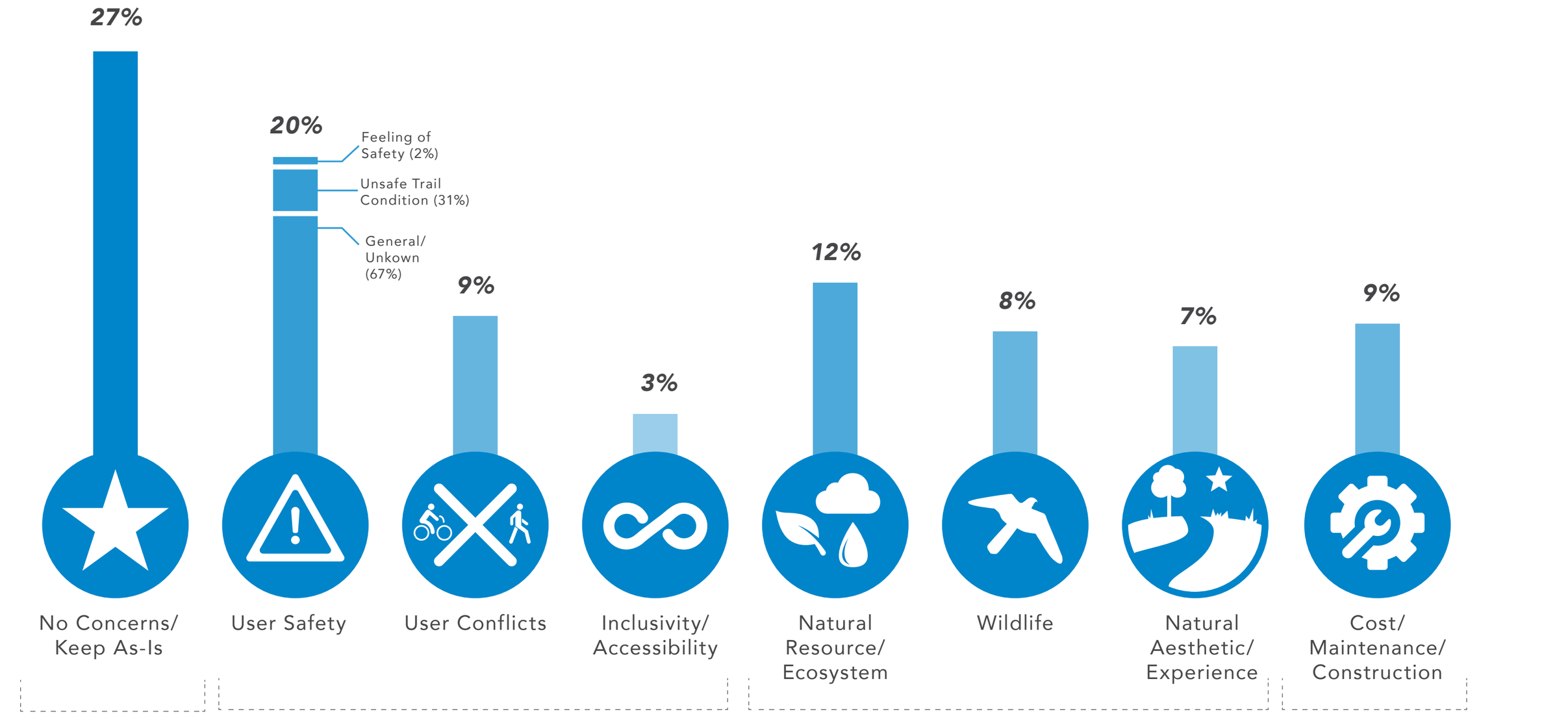
Takeaways: Favorite spots at **both designed and non-**



Geolocated Survey submission: pinch point at Chamberlin Hall

Geolocated Survey submission: winter conditions entering Muir Woods

ENGAGEMENT SUMMARY



NO CONCERN / KEEP AS-IS

27%

USER-SHIP

32%

NATURE AND AESTHETIC

27%

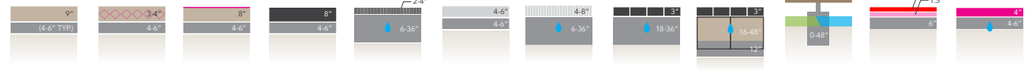
COST / MAINTENANCE / CONSTRUCTION

9%

COMMON THEMES/ KEY TAKEAWAYS

RESEARCH

SURFACING / OPTIONS



	existing conditions (dominant) COMPACTED AGGREGATE	STABILIZED COMPACTED AGGREGATE	BONDED AGGREGATE SURFACE	existing conditions (portions) TYPICAL ASPHALT	PERMEABLE ASPHALT MIXTURE	TYPICAL CONCRETE	PERVIOUS CONCRETE	PERMEABLE UNIT PAVER (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
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 WSS/TR-55*												
Contaminants Leaching / Runoff*** *contaminant contribution (chemical leaching, sediment loading from material surface)* low: minimal leaching/sediment loading to captures containments med: some chemical leaching; sediment loading likely high: chemical leaching/sediment loading will occur												
Winter Mgmt Options *suitable for use with...*												
Chemical Based De-icers												
Sand												
Plowing												
Reduced Winter Management												
***Recycled concrete (aggregate base option) risk leaching Pb, though the risk of low due to dilution and rate												
SOCIO-ECONOMIC												
User Safety + Experience												
Resistance to Erosion / Heave low: loose to flexible paving med: flexible to rigid paving high: rigid paving	low/ medium	low/ medium	medium	medium	medium	high	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	medium*	low	low
Ability to Add Traffic Control low: uneven surface, low suitably 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	high	medium	medium	medium/high	medium/high	medium/high
ADA Suitability *meets ABA/ Forest Service requirements for surface conditions (for use on slopes, firmness, stability, texture)*	low/ medium	medium	medium	high	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	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*		
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*		
		Products: Soil-Sement; Organic-Lock; Kafka * With low impact plow (feet or rubber edge)	Products: Addastone Resin Bonded Surfacing; Klingstone 400			Assumes broom finish			Products: Tree Parker, SilvaCell	*Varies with material selection: Wood/ Metal/Composite available		

LIGHTING / OPTIONS

	LIGHTING STRATEGIES: EXISTING LIGHTING STRATEGIES	LIGHT ZONE 0 STRATEGIES	LIGHT ZONE 1 STRATEGIES	CONTROL STRATEGIES: EXISTING CONTROL STRATEGIES	BASIC CONTROL STRATEGIES	ADVANCED CONTROL STRATEGIES
	N/A	0.0 FC at grade 0 Max-Uplight 0 Max Glare No Blue Light	0.4-0.8 FC at grade 5:1 Ave/Min at grade 1 Max-Uplight 1 Max-Glare Minimal Blue Light	N/A	– Extinguish lights at a curfew – Dim lights when area unoccupied	– Extinguish or dim lights at a curfew – Dim or brighten lights based on user proximity and preference via app
IES Defined Recommendations *aligned with the IES/IDA Model Lighting Ordinance*						
Meets Standards						
WI DOT Standards	X	X	✓	N/A	N/A	N/A
WI DFD Dark Sky IES/IDA Model Lighting Ordinance	X	✓	✓	X	✓	✓
Environmental Impact						
Wildlife Impact *poor: does not consider wildlife good: addresses people over wildlife excellent: addresses wildlife over people*	where lights: poor where no lights: excellent	excellent	good	poor	good	good
Natural Resources Impact (Energy Usage) *poor: more LED lights, controlled excellent: minimal LED lights, controlled*	N/A	excellent	good	N/A	good	good
Environmental Nighttime Quality *poor: no regard for nighttime quality good: addresses LMI, LZ's, controls prioritize safety excellent: addresses MUSH, controls prioritize personal preference*	where lights: poor where no lights: excellent	excellent	good	poor	good	excellent
Construction Disturbance *low: disturbance above grade only moderate: trenching 24" deep conduit, 48" deep isolator bases high: trenching 24" deep conduit, 48" deep bollard bases, 60" deep pole bases*	N/A	medium	high	N/A	low	low
Cultural Impact						
Cultural Resource Preservation *Mixed: depends on priorities of trail user good: controls address basic light reduction excellent: controls prioritize personal preference*	N/A	prioritize darkness: excellent prioritize reassurance/visibility: poor	prioritize darkness: poor prioritize reassurance visibility: excellent	N/A	good	excellent
Social Impact						
Trail Condition *Mixed: depends on priorities of trail user excellent: addresses high vs low trail use times high: brightens trail for mixed use, allows for personal preference via controls*	N/A	prioritize darkness: excellent prioritize reassurance/visibility: poor	prioritize darkness: poor prioritize reassurance visibility: excellent	N/A	good	excellent
User Conflict Resolution *low: changes will not brighten the trail for mixed use excellent: addresses high vs low trail use times high: brightens trail for mixed use, allows for personal preference via controls*	N/A	poor	high	N/A	medium	high
Safety *low: changes will not brighten the trail for mixed use excellent: addresses high vs low trail use times high: brightens trail for mixed use, allows for personal preference via controls*	N/A	poor	high	N/A	medium	high
Economic Impact						
Install Cost *low: low quantity added lights, controls excellent: moderate quantity added lights, standard controls high: many controls*	N/A	low	medium	N/A	medium	high
Maintenance / Operations Cost *low: low quantity added lights, controls excellent: moderate quantity added lights, standard controls high: high uses of controls, maintenance agreement, data management, app maintenance*	N/A	medium	medium	N/A	medium	high
Maintenance Activities / Lifespan *low: LED fixtures, 10-20 year lifespan excellent: standard controls, 10+ year lifespan on devices high: high cost controls, 10+ year lifespan on devices*	N/A	low	low	N/A	medium	high

LENSES FOR RESEARCH

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

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

OPTIONS EVALUATION - SURFACING

RN1

RN1 - Recreation Neighborhood 1:
Existing Material: asphalt path with limestone screening shoulder
Priorities: safety, user conflict, environmental, erosion

RN2

RN2 - Recreation Neighborhood 2:
Existing Material: limestone screenings
Priorities: safety, erosion

RN3

RN3 - Recreation Neighborhood 3:
Existing Material: limestone screenings
Priorities: environmental, erosion, safety, user conflict

LN1

LN1 - Lakeshore Neighborhood 1:
Existing Material: asphalt & asphalt with limestone shoulder
Priorities: safety, user conflict

LN2

LN2 - Lakeshore Neighborhood 2:
Existing Material: limestone screenings
Priorities: safety

LN3

LN3 - Lakeshore Neighborhood 3:
Existing Material: concrete
Priorities: safety, user conflict

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	• **Aggregate** • **Asphalt** • **Porous Asphalt** • **Boardwalk**	• **Concrete** • Rubber Shoulder	• **Bound Aggregate:** Combined aggregate rubber • Wood chip/ natural shoulder	• **Asphalt** with boardwalks • Curb edge/ natural edge
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

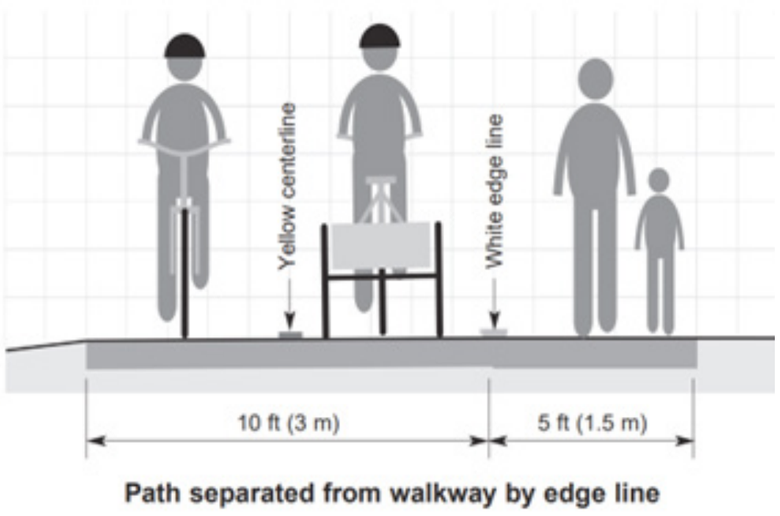
SAFETY CONTROLS

- 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



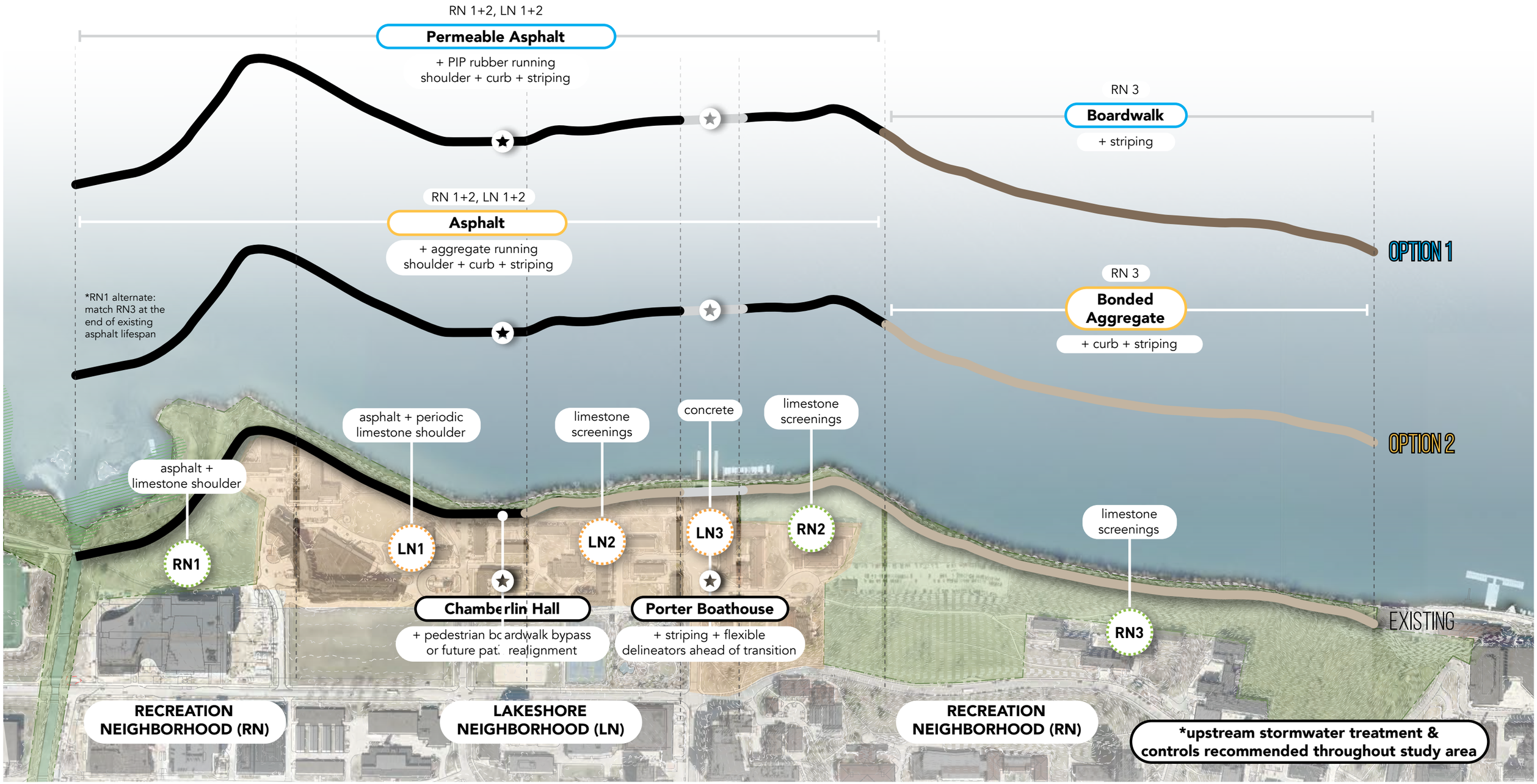
WI DOT Bicycle Design Handbook shared path separation methods

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

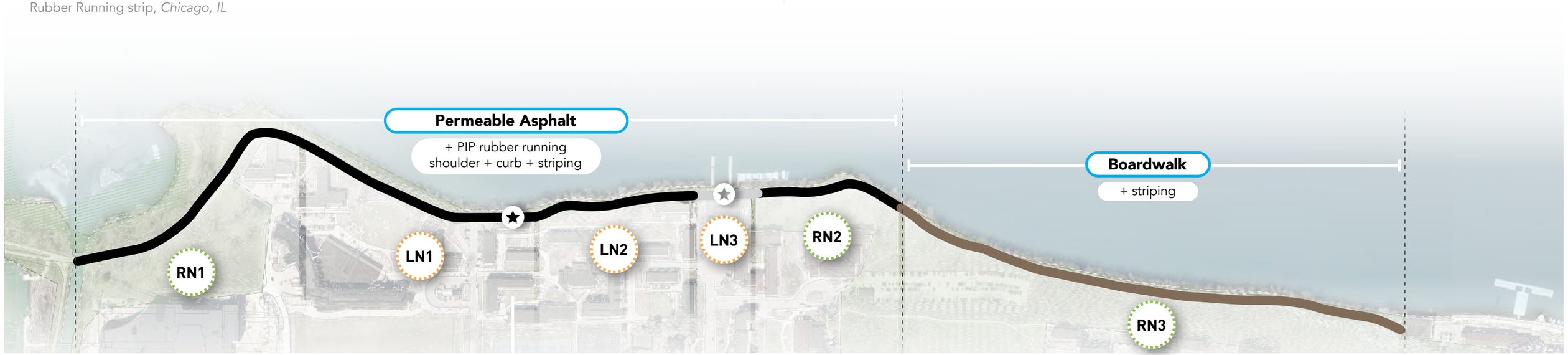
PAVING

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

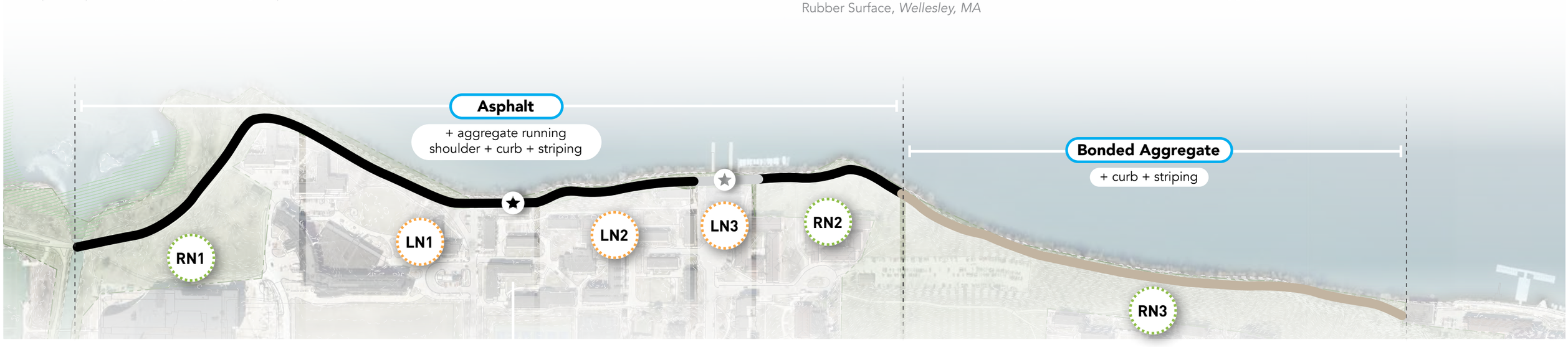
BONDED AGGREGATE W/ CURB

(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!