

Sustainability at Sound Transit

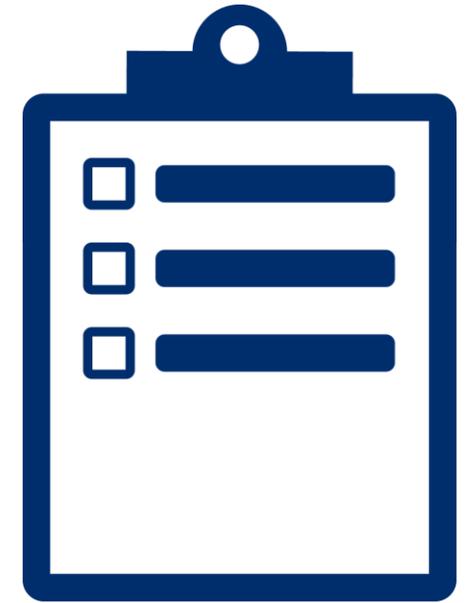
*West Seattle and Ballard Link Extensions
Presentation for Seattle Design Commission*

12/16/2021



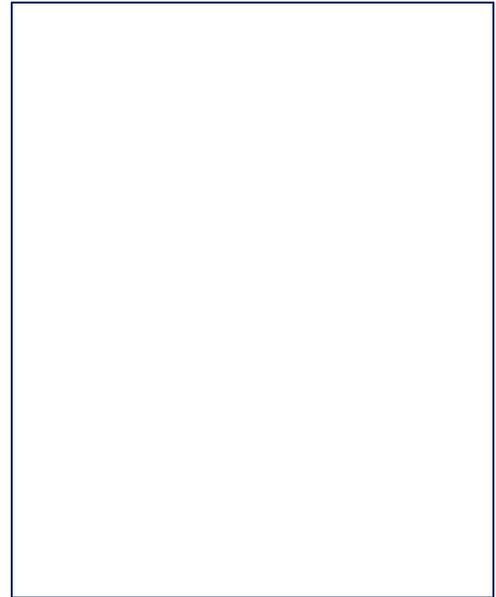
Presentation Agenda

- Agency Sustainability Overview
- Capital Projects & Highlights
- West Seattle and Ballard Link Extensions Project
- Next Steps
- Questions





ity at Sound Transit



People

Planet

Prosperity



Sustainability Focus: 2050 Long-term Goals

PEOPLE	PLANET	PROSPERITY
Social equity addressed and implemented as an agency value	Achieve carbon-free operations <ul style="list-style-type: none"> • Electricity (facilities & light rail) by 2030 • All fleets by 2050 	Build resilience to climate change and natural disasters
All staff champion sustainability	Enhance ecosystem functions	Maximize operational efficiency

PEOPLE

Long-term Goals (2050)	Example Short-term Goals (2024)
Social equity addressed and implemented as an agency value	Create affordable home ownership opportunities on surplus properties
	Build staff awareness and capacity to integrate equity into all business lines
All staff champion sustainability	Certify key staff to green design and building management professional accreditations
	Develop program for agency staff to research new sustainability solutions

PLANET

Long-term Goals (2050)	Example Short-term Goals (2024)
Achieve carbon-free operations <ul style="list-style-type: none">• Electricity (facilities & light rail) by 2030• All fleets by 2050	Purchase available cost-effective, carbon-free electricity Incorporate low-carbon technology standards for facilities into design criteria
Enhance ecosystem functions	Require 85% of eligible construction equipment to meet EPA's highest standards Pilot an advanced environmental mitigation approach

PROSPERITY

Long-term Goals (2050)	Example Short-term Goals (2024)
Build resilience to climate change and natural disasters	Complete tri-county Threat Hazard Identification Risk Analysis and publish a Hazard Mitigation and Response Plan
	Conduct a Climate Resilience Assessment as part of major system capital expansion projects
Maximize operational efficiency	Conduct a pilot to allow design and construction contractors to propose sustainability improvements
	Include green methods or features in at least 75 percent of all new agency procurements

Agency GHG Reduction Targets

Target Year	City of Seattle <i>2008 Baseline</i>	Sound Transit <i>2018 Baseline</i>
2020	<i>n/a</i>	10% reduction (by 2024)
2030	64% reduction	100% reduction for electricity
2050	100% reduction	100% reduction for all energy use

Carbon-Free Light Rail Operations

- Sound Transit operates the nation's first carbon-free light rail service – Dec. 2020
- PSE purchase agreement for renewable energy
- SCL 100% carbon-neutral electricity
- 3rd party verified



Capital Projects Sustainability

Agency Sustainable Design Priorities

Conserve Natural Resources – Efficiency

- Use less (materials)
- Maximize resource efficiency (energy, water, materials)
- Implement restorative design features

Design & Build for the Long Term – Resiliency

- Consider materials with long life-cycles
- Evaluate use of materials for durability, service life
- Review for Climate Resilient design and operations

Plan sustainable infrastructure in coordination with TOD & Access Improvements – Integration



ST3 Project Sustainability Highlights

- ***Included Sustainability Planner on Project Teams***
 - Green building and infrastructure integration from inception
- ***Created Sustainability Cost Allowance***
 - Ensures dedicated funding for sustainability initiatives
 - Allows for project-specific sustainability solutions
- ***Required LEED & Envision Certification***
 - Credits with core requirements aligned to agency standards

Project Roles & Responsibilities

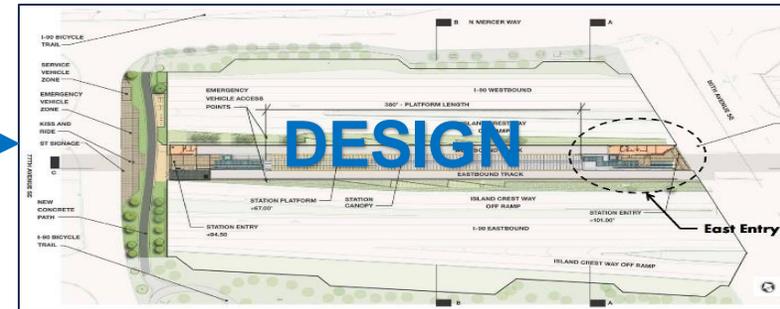
Project Stage & Activity	Responsible Parties
Conceptual Engineering Assess initial sustainability opportunities; ROM estimates	ST Sustainability Staff Design Consultant
Preliminary Engineering Set project sustainability goals; finalize sustainability cost estimates	ST Sustainability Staff Design Consultant
Final Design Develop design packages	ST Sustainability Staff Design Consultants
Final Design (100%) Gather design documents from project team for certification	ST Sustainability Staff Design consultants or DB
Construction Transmittal/Submittal Reviews & Certification	ST Sustainability Staff DB or DSDC

Design Requirements: Sustainability

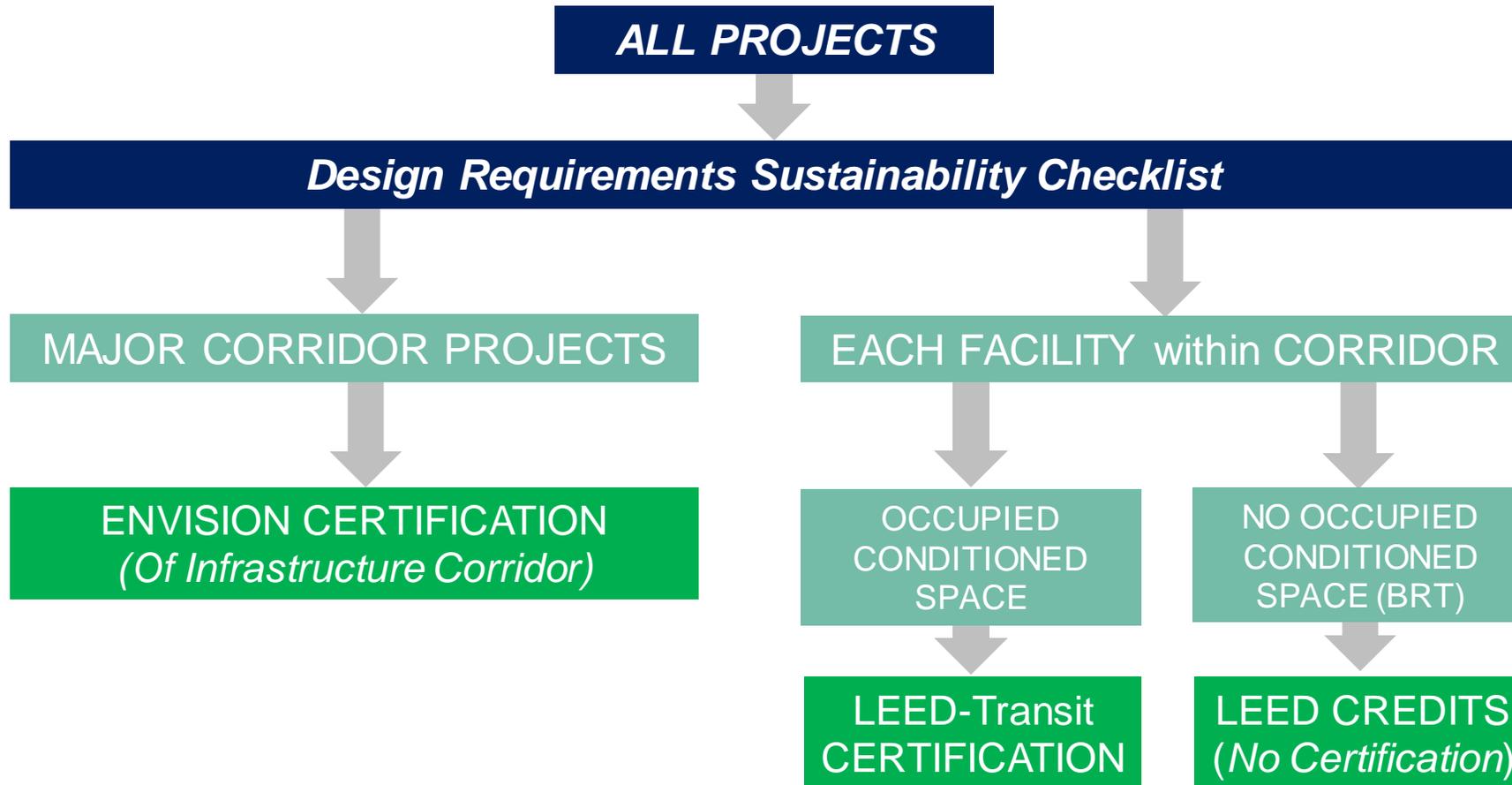
- Sustainability Chapter ensures Sound Transit design requirements are met
- Facilitates integrated design process early
- Reviewed at key project milestones for compliance

Sound Transit Design Checklist

Item	Item Description	WSP						
WSP-1	Design to meet or exceed the following minimum standards:							
WSP-2	Design to meet or exceed the following minimum standards:							
WSP-3	Design to meet or exceed the following minimum standards:							
WSP-4	Design to meet or exceed the following minimum standards:							
WSP-5	Design to meet or exceed the following minimum standards:							
WSP-6	Design to meet or exceed the following minimum standards:							
WSP-7	Design to meet or exceed the following minimum standards:							
WSP-8	Design to meet or exceed the following minimum standards:							
WSP-9	Design to meet or exceed the following minimum standards:							
WSP-10	Design to meet or exceed the following minimum standards:							
WSP-11	Design to meet or exceed the following minimum standards:							
WSP-12	Design to meet or exceed the following minimum standards:							
WSP-13	Design to meet or exceed the following minimum standards:							
WSP-14	Design to meet or exceed the following minimum standards:							
WSP-15	Design to meet or exceed the following minimum standards:							
WSP-16	Design to meet or exceed the following minimum standards:							
WSP-17	Design to meet or exceed the following minimum standards:							
WSP-18	Design to meet or exceed the following minimum standards:							
WSP-19	Design to meet or exceed the following minimum standards:							
WSP-20	Design to meet or exceed the following minimum standards:							



Design Requirements: Sustainability

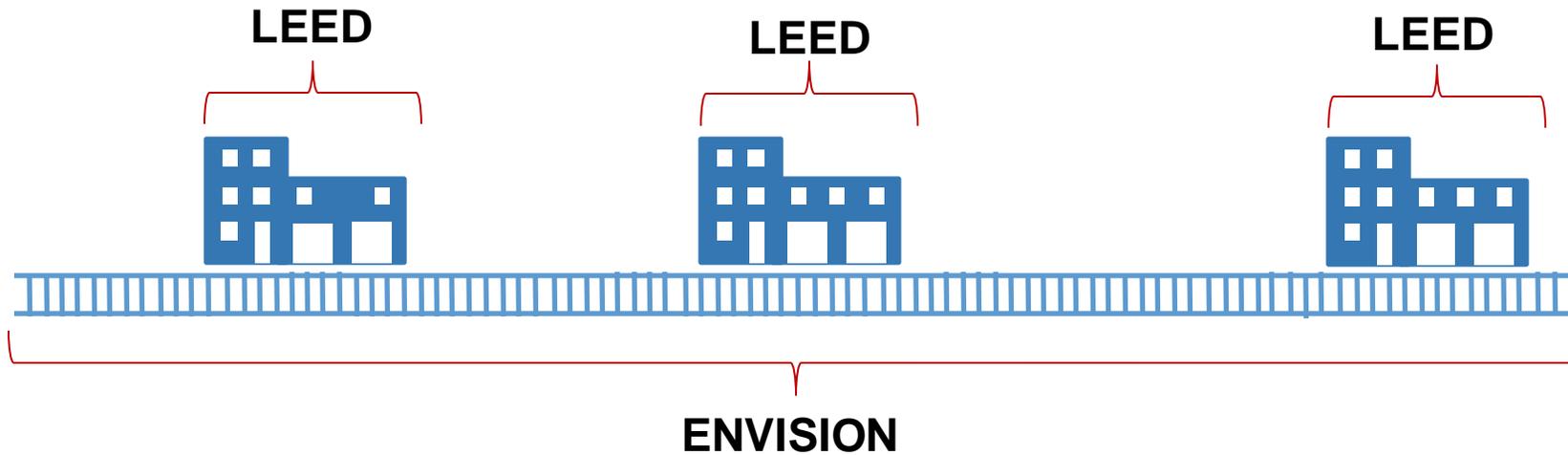


Design Requirements: Certifications



LEED Transit
Optimized for
Stations

ENVISION
Optimized for Complex
Infrastructure Projects:
Process focused



LEED Green Building Highlights



COMPLETED

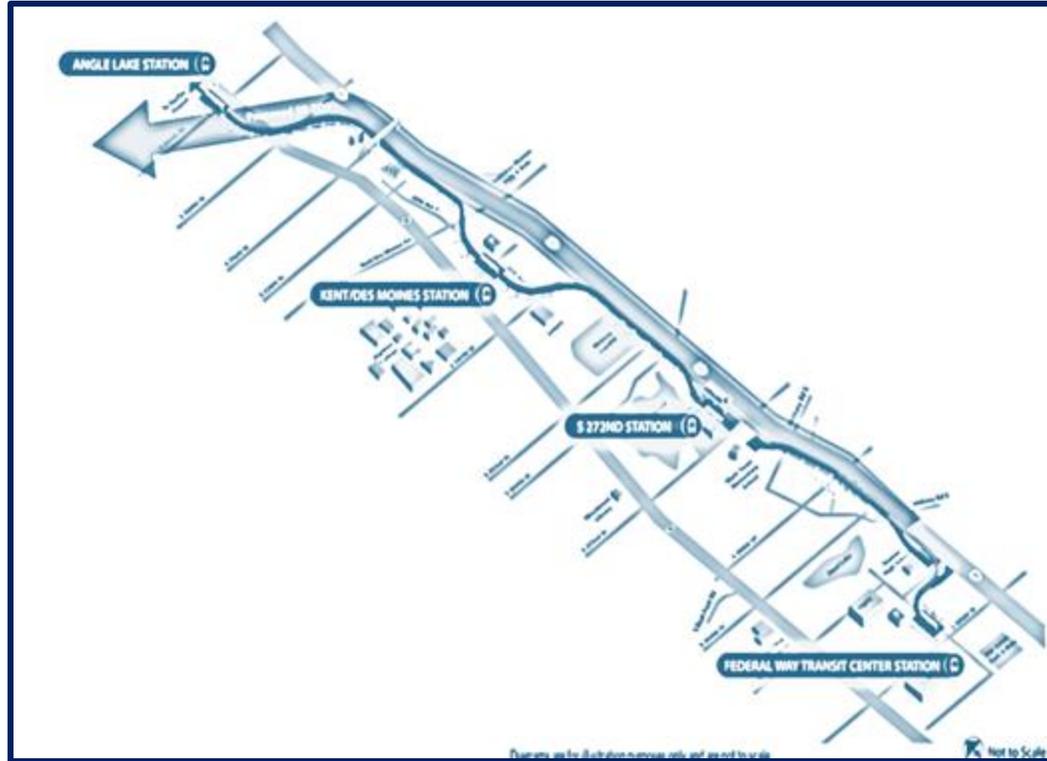
- Angle Lake Station – **Gold**
- Maintenance of Way Building (MOW) – **Silver**
- Sounder Yard Train & Engine Crew Building – **Silver**
- OMF-East/MOW – **Gold**

IN PROGRESS

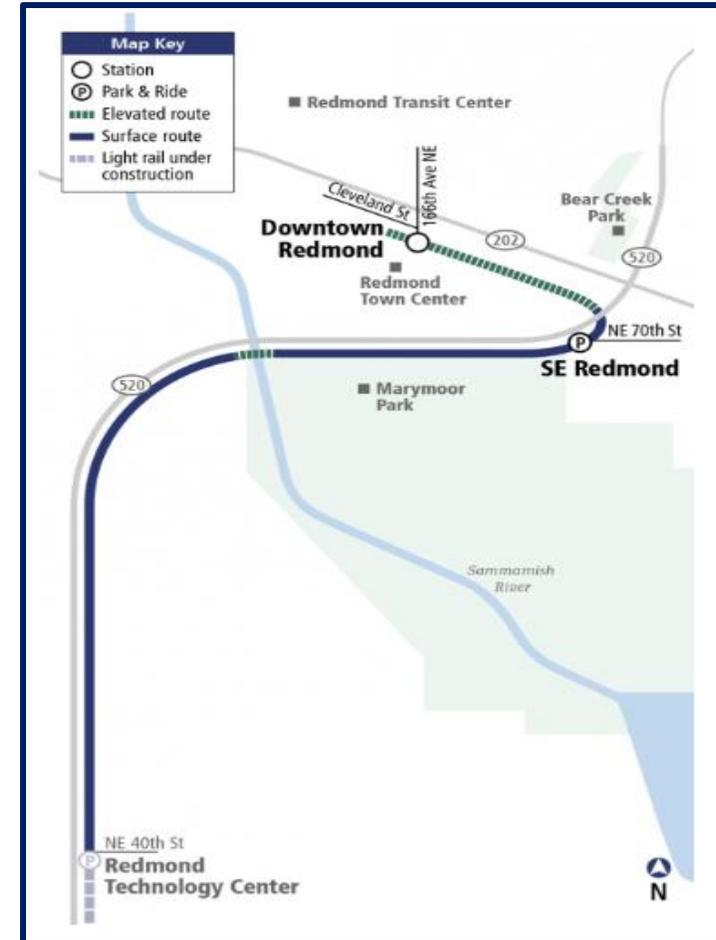
- Tacoma Link OMF (2022)
- Union Station O&M - (2022/23)
- Lynnwood City Center Station (2024)
- Federal Way Transit Center Station (2024)
- Downtown Redmond Station (2024)
- End of Line Facility (2024)
- Bus Base North (2024)
- Sounder Maintenance Base (TBD)
- 130th Street Infill Station (TBD)
- OMFS & MOW-South (TBD)
- MOW-North (TBD)



Envision Pilot Projects



Federal Way Link Extension



Downtown Redmond Link Extension

Reducing Embodied Emissions: Lower Carbon Concrete



Pilots at Lynnwood Link & Puyallup:

- *Shoreline 145th & 185th Station Garages: **26%** reduction in Global Warming Potential (GWP)*
- *Lynnwood Transit Center Garage: **20%** reduction in GWP*
- *Puyallup Park & Ride Facility: **33%** reduction in GWP*

Evolving Design Standards



Proposed Design Requirements:

- Concrete performance standards
- Extended monitoring & commissioning into occupancy
- Higher LEED minimum certification (Silver → Gold)
- Higher Envision minimum certification (Silver → Gold)
- Carbon-free facilities
- PV and EV readiness

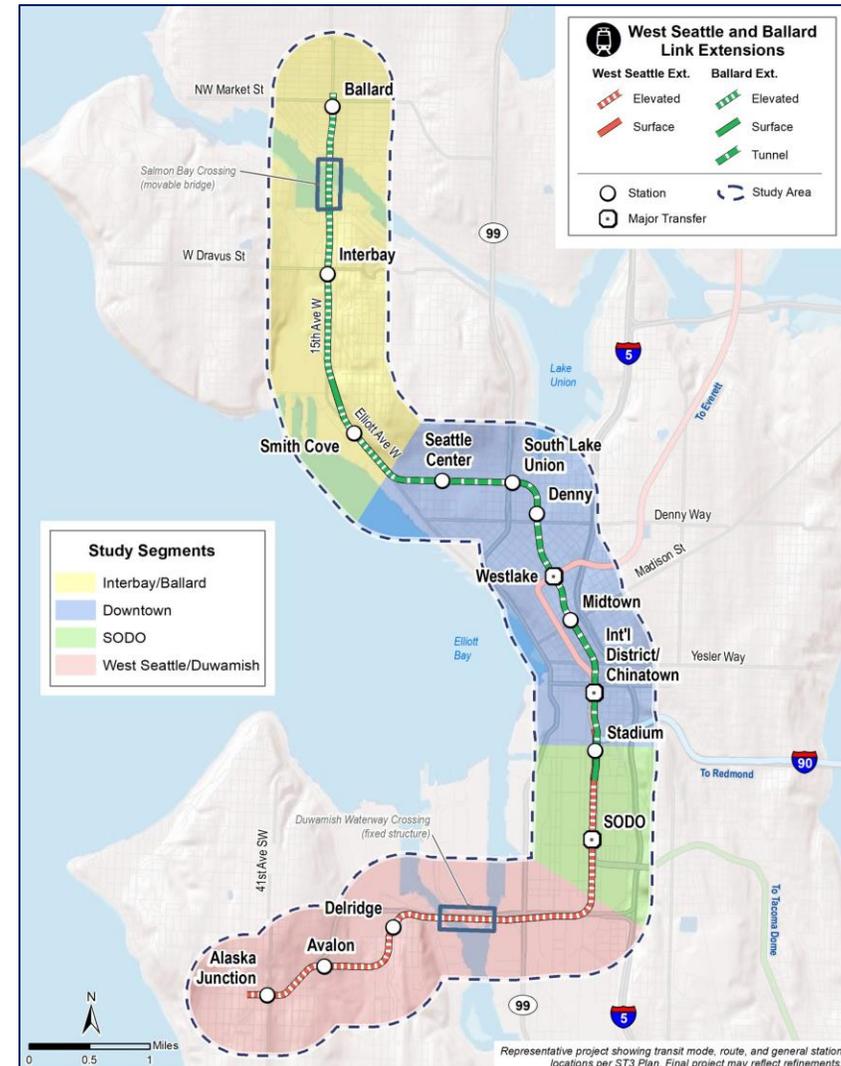
WSBLE Sustainability & Current Scope

WSBLE Sustainability Scope

2018-2019 – Set Goals

2020-2021 – Assess
Climate Change Vulnerability

2021-2022 – Identify
Sustainability Opportunities



Phases 1 & 2 (2018–2021)

Set Project Sustainability Goals

- LEED & Envision Certification Requirements
- Climate Resilient, Efficient Design
- Carbon-Free Operations
- Lower Embodied-Carbon Design

Sustainability Research Topics

- Developed initial list of potential sustainability measures for consideration
- Narrowed to key research topics (in progress)

Phase 2 Climate Vulnerability Analysis:

Review WSBLE project alignment and light rail infrastructure with regard to climate change impacts

- Sea Level Rise
- Extreme Heat & Drought
- Storm Events
- Precipitation Patterns
- Additional Hazards

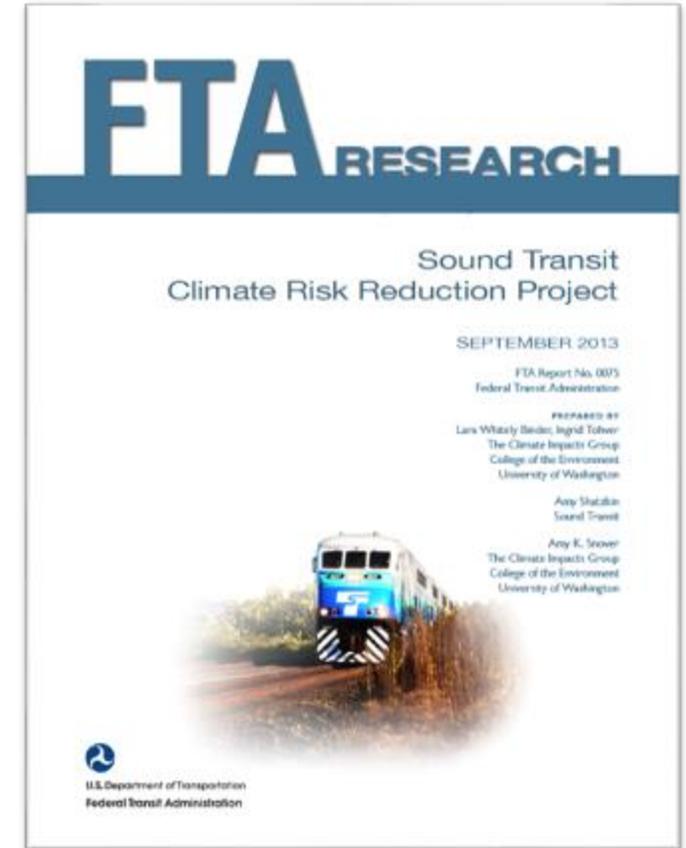


Identify potential project vulnerabilities & design/operations mitigation strategies work for future project phases

2011-2013: Climate Risk Reduction Project

Identified Puget Sound climate change impacts and assessed effects on all ST systems

- Link light rail
- Sounder commuter rail
- ST Express bus



Update Climate Change Projections



\$2.00

TUESDAY, JUNE 29, 2021

The Seattle Times

WINNER OF 11 PULITZER PRIZES

INDEPENDENT AND LOCALLY OWNED FOR MORE THAN 124 YEARS

SEATTLETIMES.COM

New heat record, new worries

108 DEGREES | Broiling air left the region primed for wildfires; health toll is unknown.



Washington state sees more flooding, next storm approaches

Climate Change Vulnerability Analysis

Link Light Rail	Heat	Sea Level	Storms	Hydrology	Landslides
Rail/Track	●	●	●	●	●
Overhead Catenary System	●		●		
TPSS & Other Electrical Equipmt.	●	●	●	●	
Tunnels		●	●	●	
Bridges & Elevated Structures	●	●	●	●	
Rail Service Operations	●	●	●	●	●

Overview of Climate Vulnerability



Identify Adaptation Options & Vulnerability

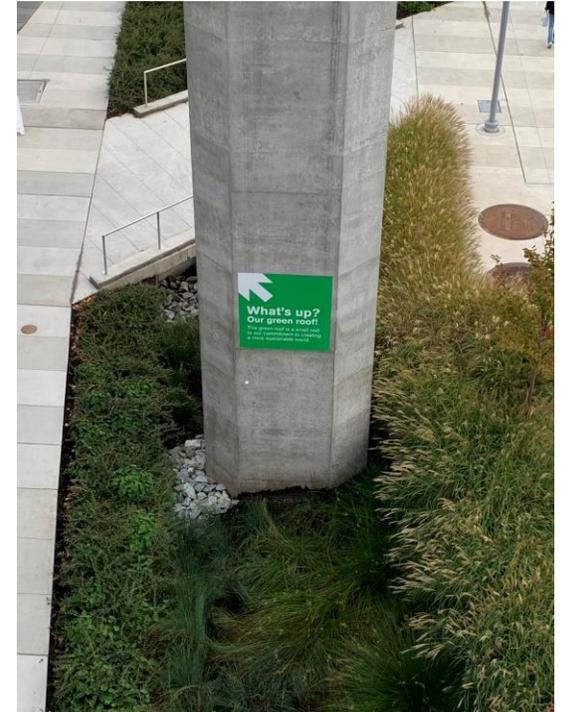
- **Rated climate impacts on infrastructure**
- **Identified adaptation measures**
 - Siting/Location
 - Design
 - Operations
- **Assessed climate vulnerability**



WSBLE Project Elements & Effects	Impacts	Adaptive Capacity	Vulnerability
Rail/Track			
Rail buckling, fatigue cracking, pavement rutting, and switch failures	Moderate	Moderate	Low

Identify Sustainability Opportunities

- *Green stormwater infrastructure*
- *Wayside energy storage and use*
- *Underground traction power substations*
- *Ground-source heat pumps*
- *Reliable energy-efficient escalators*
- *Energy-efficient ventilation*



What's Next

- **Sustainability Management Plan**
LEED & Envision Certification Strategies
- **Climate Resiliency Design Audits**
Reviews for Adaptation Strategies
- **LEED Technical Studies**
Underground Stations & Certification Strategies



Thank you.

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