Enhancing State-wide Climate Resilience with Transportation Risk Assessment

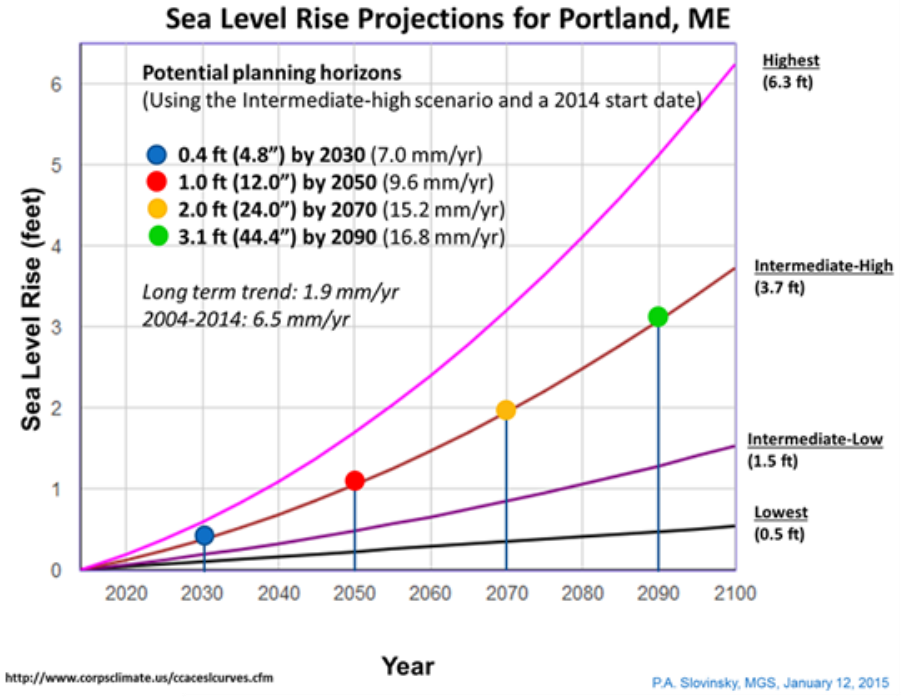
Judy C. Gates

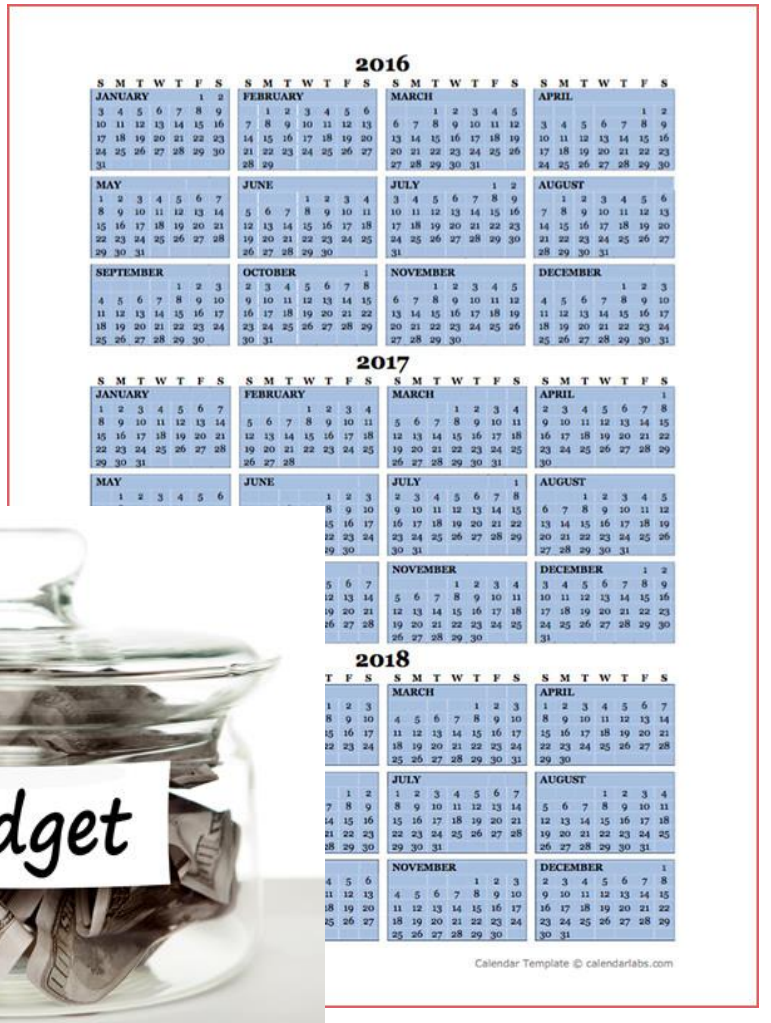
AASHTO Resilience Webinar

June 29, 2020

HNTB

Translating uncertainty into action





Managing risk to state transportation assets

Identify factors influencing delivery

↓

Easily accessible, dynamic data

↓

Early decisions

↓

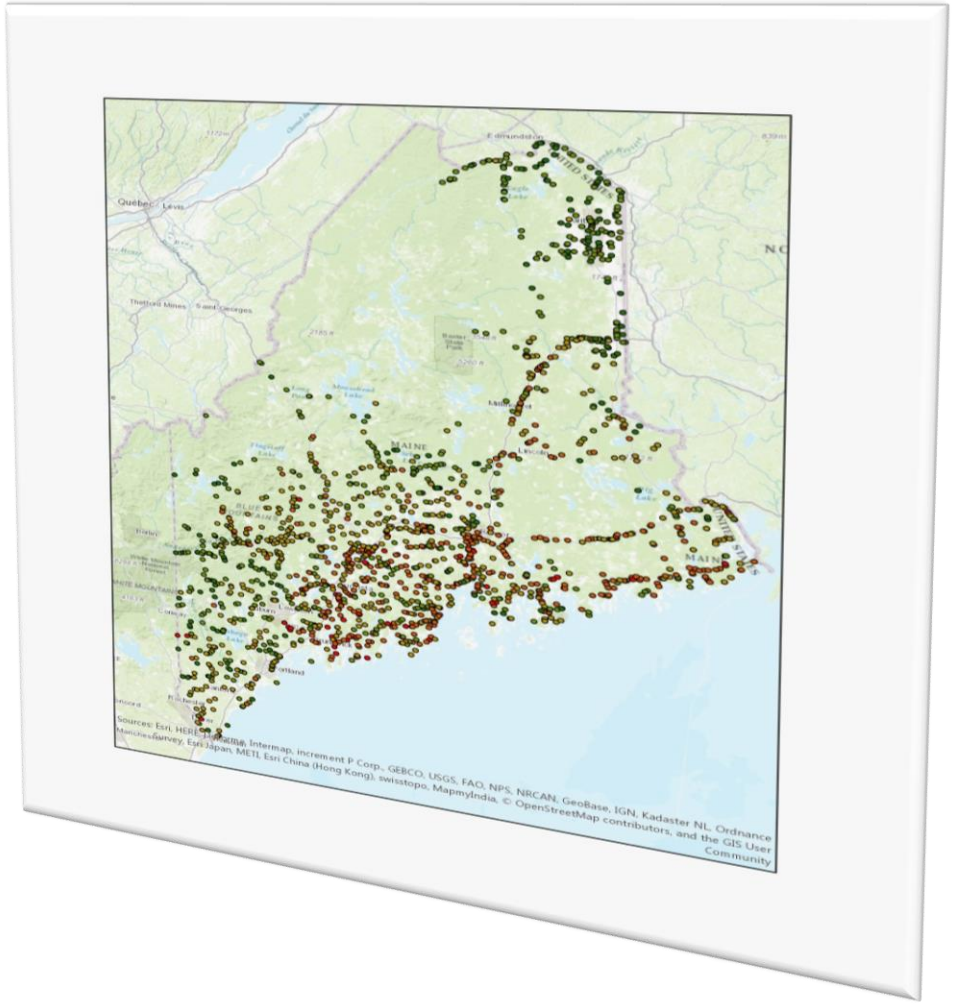
Predictability in schedules and budgets

From data to decisions

Integrating multiple risk factors in project budgets & schedules

TRAPPD

Transportation Risk Assessment for Project Planning and Delivery



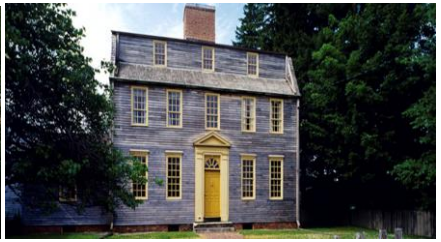
What data is useful?

- Asset condition
- Traveling public
- Stream habitat
- Landscape features
- Climate/weather
- Timing
- Money

- Structure condition
- Existing structure dimensions
- Atlantic salmon/brook trout
- Stream barriers
- Endangered species
- Large habitat blocks
- Conservation priorities
- Historic resources
- Sea level rise projections
- Hydrology/hydraulics
- Emergency access/egress



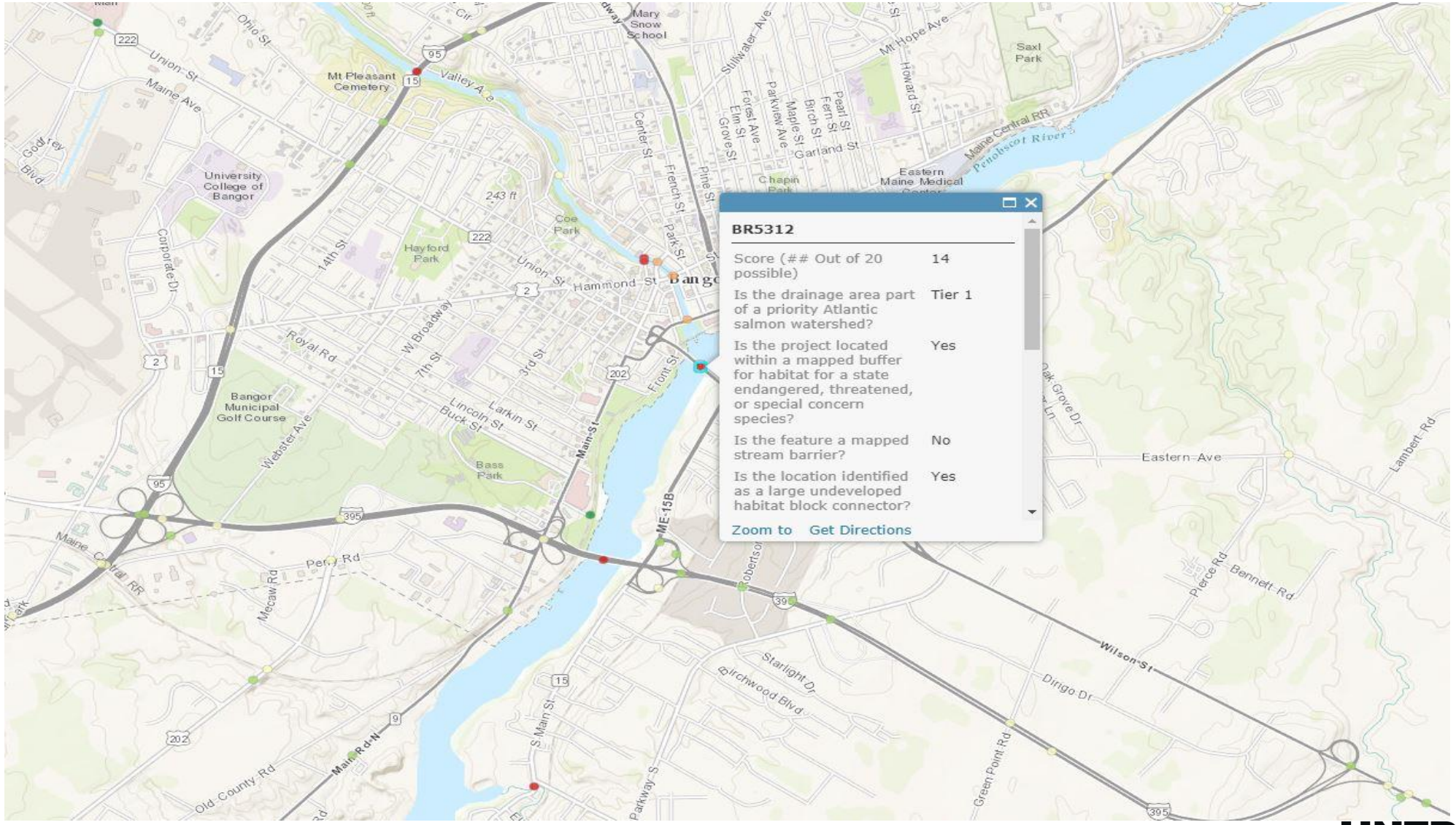





Sources of risk

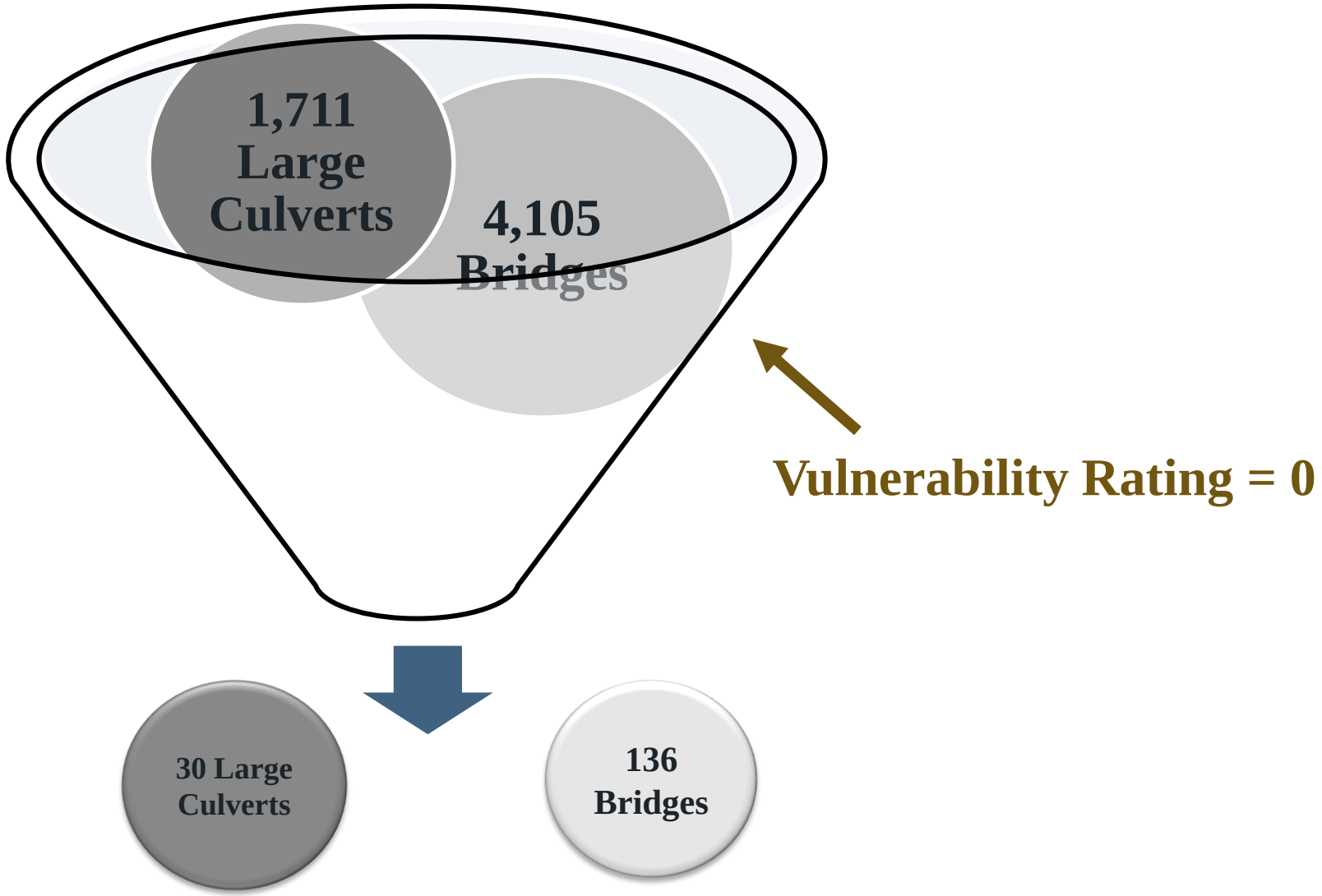
	Proxy Indicator	Proxy Description	Maine DOT Risk Type	Data source	Data Source Details	Key Maine DOT staff	Narrative Scoring	Numeric Score	Proxy Risk Rating	Risk Rating by Value Type
Ecology	Is the project located within a mapped buffer for habitat for a state endangered, threatened, or special concern species?	Presence of the habitat and/or any buffers critical to a lifestage of species listed under Maine's Endangered Species Act identifies the potenial need for pre-construction surveys, passage modifications, or post-construction monitoring that may need to be incorporated into project design.	budget, process, schedule	GIS layer	MEGIS	Ham	No	0		
							Yes	1		
Hydrology	Is the existing structure greater than or equal to the calculated bankful width?	Maine's USFWS and USACE consider stream crossing structures with a span equal to or greater than 1.2 times the stream bankfull width (1.2 x bfw) to be fully accessible for all aquatic species. Any crossing less that 1.2 x bfw may need to be upsized or pay in lieu fee mitigation depending on its location.	budget, schedule	StreamStats	StreamStats with MATS [Span_Width]	Hebson	≥1.2x calculated bankful width	0		
							1.0-1.2x calculated bankful width	1		
							<1.0x calculated bankful width	2		
Landscape	Is the feature subject to coastal threats of sea level rise (SLR) and/or storm surge (SS)?	Sea level rise and storm surge projections for coastal Maine were developed using the most current NOAA data and applied to tidally-influenced assets. Storm surge is considered to most imminent and therefore unpredictable threat; projected sea level rise data are being used to update MaineDOT's bridge design guidance.	budget	NOAA		GEI	Not coastal, No	0		
							Low 50-yr SLR scenario (+1 ft)	1		
							Low 100-yr SLR scenario (+2 ft)	2		
							High 50-yr SLR scenario (+2 ft)	3		
							High 100-yr SLR scenario (+5 ft)	4		
							100-yr SS	5		

Informing MaineDOT's asset decisions

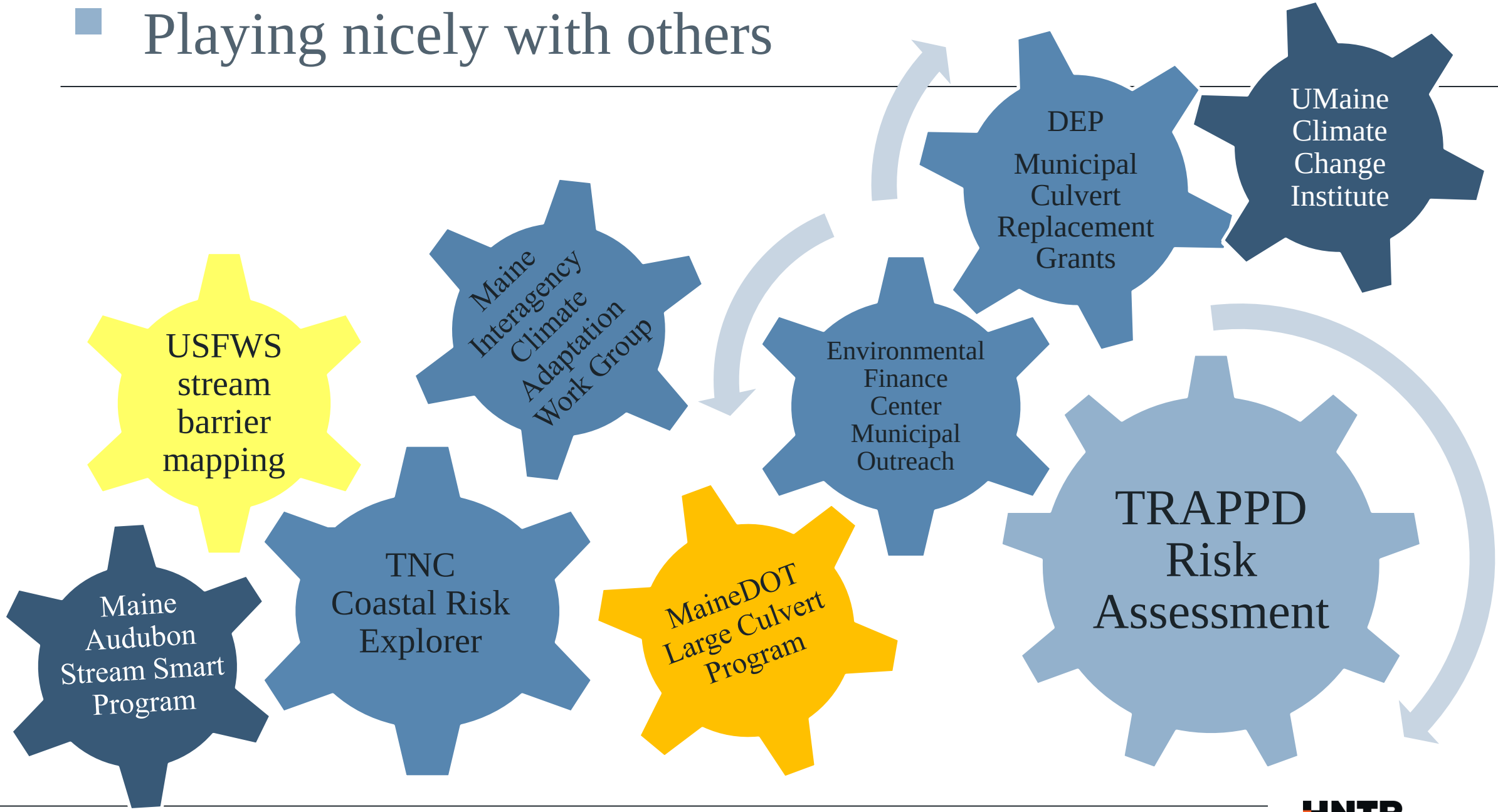


Right-sizing

Filtering on sea level rise & storm surge risk in Maine's coastal towns…



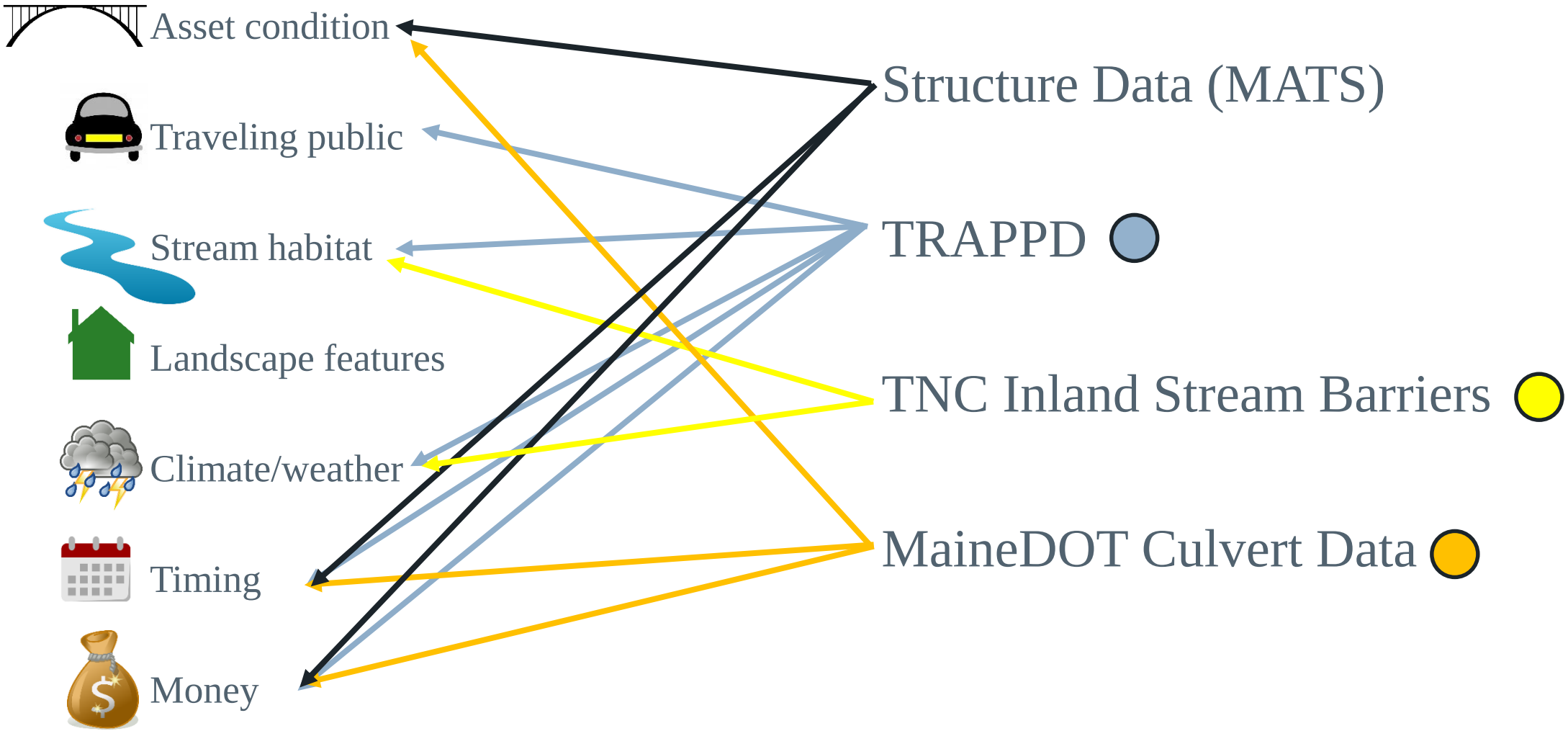
Playing nicely with others



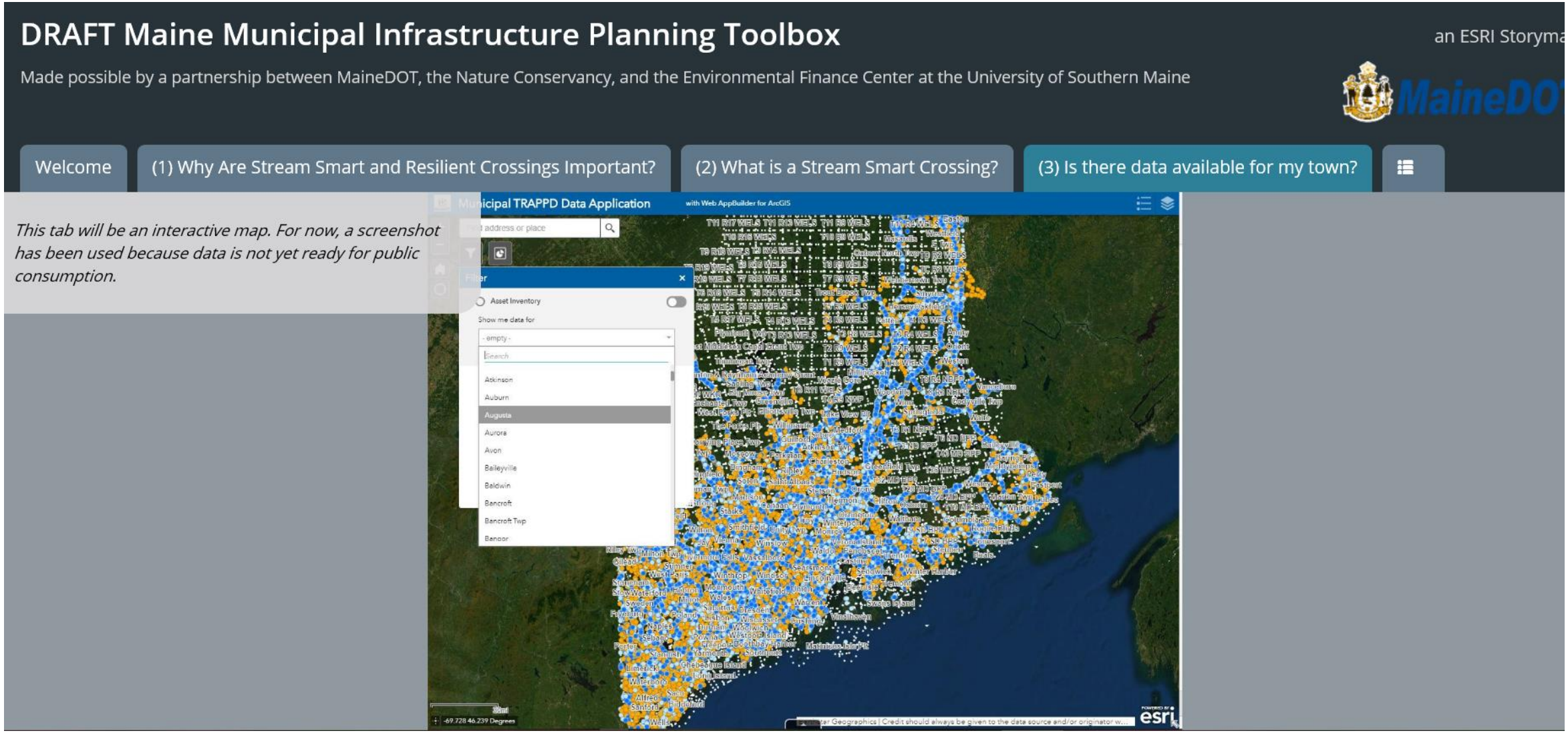
Work in progress

Color Code	Dataset	Responsibility	Data	Approximate number of returned records	Number of structures for further evaluation
	TRAPPD	State	Bridges, minor spans, large culverts	6,000	~200
	MaineDOT Culvert Data	State	Culverts between 12” and 5’	35,000	~13,200
	TNC Inland Stream Barriers	Municipal, private, state	Any	25,000	~6,100

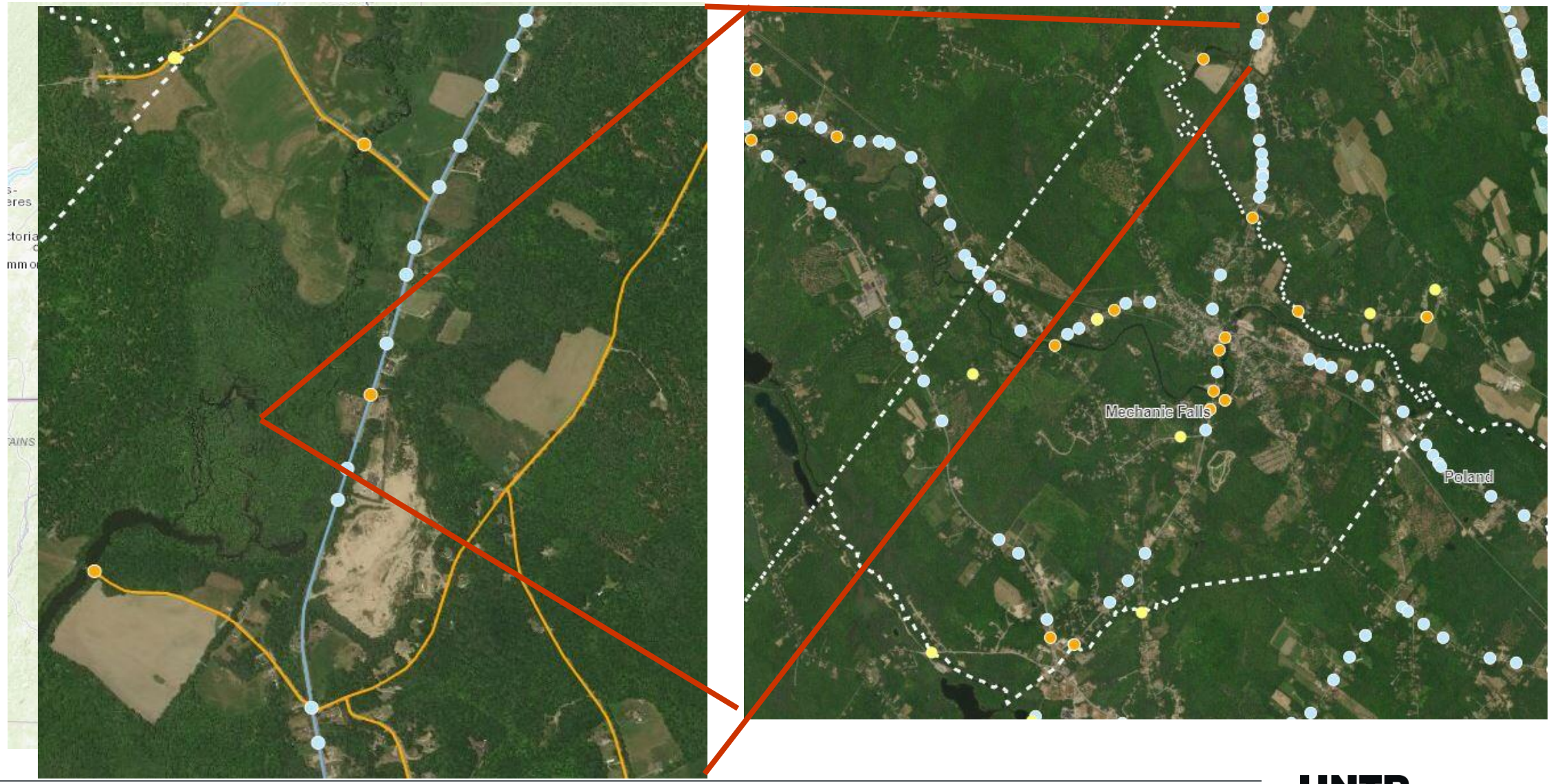
Who's on first



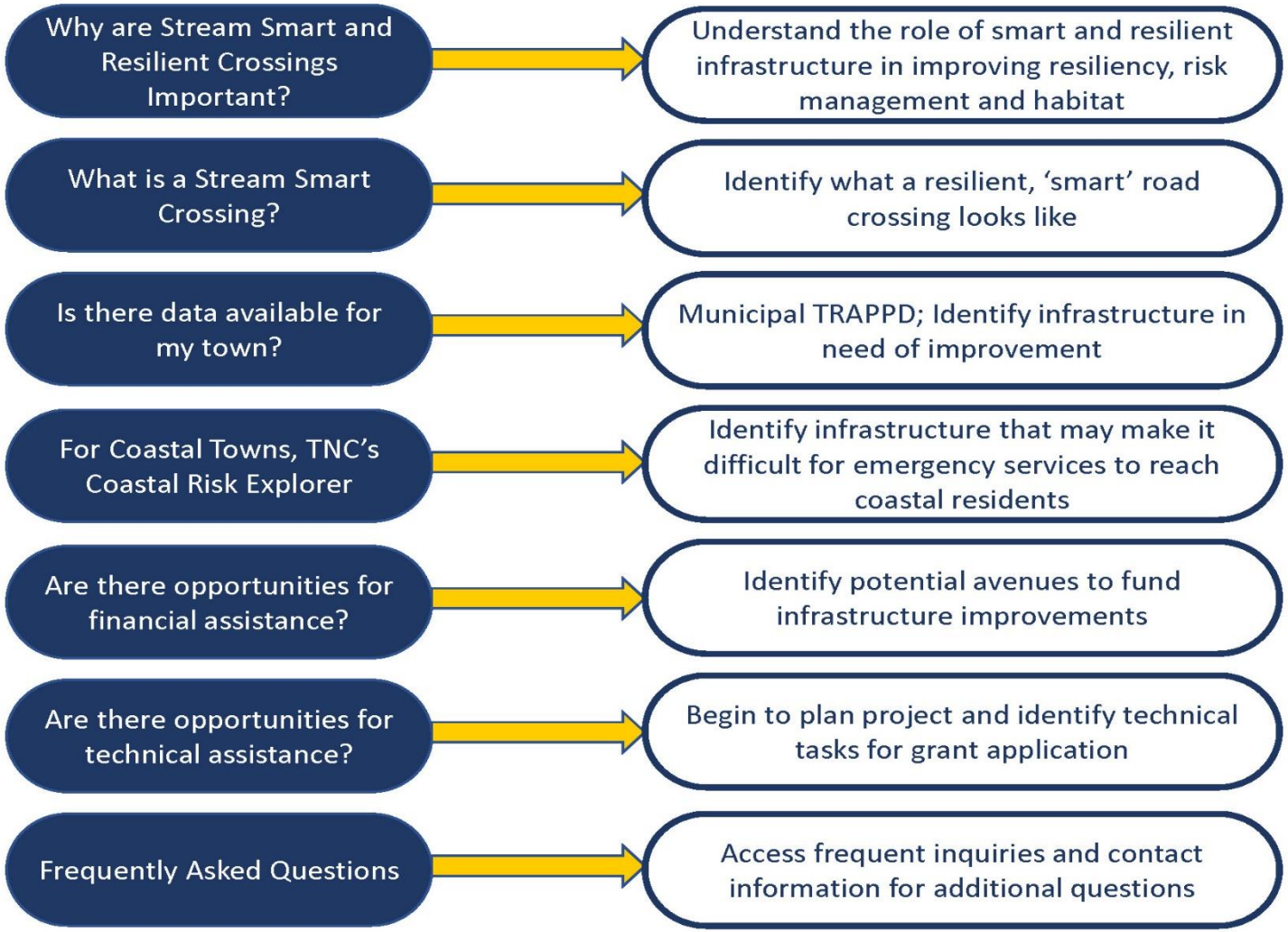
Creating synergy



Importance of scale – inland example (Mechanic Falls, ME)



More than just points on a map



Storymap_Outline.jpg

The objective

Understand probability

↓

Reduce consequence

↓

Minimize risk

↓

Maximize resiliency

Thank you!

jugates@hntb.com