Frank J. Wood Bridge
Public Meeting

To Discuss the

Environmental Assessment and Draft Section 4(f) Evaluation

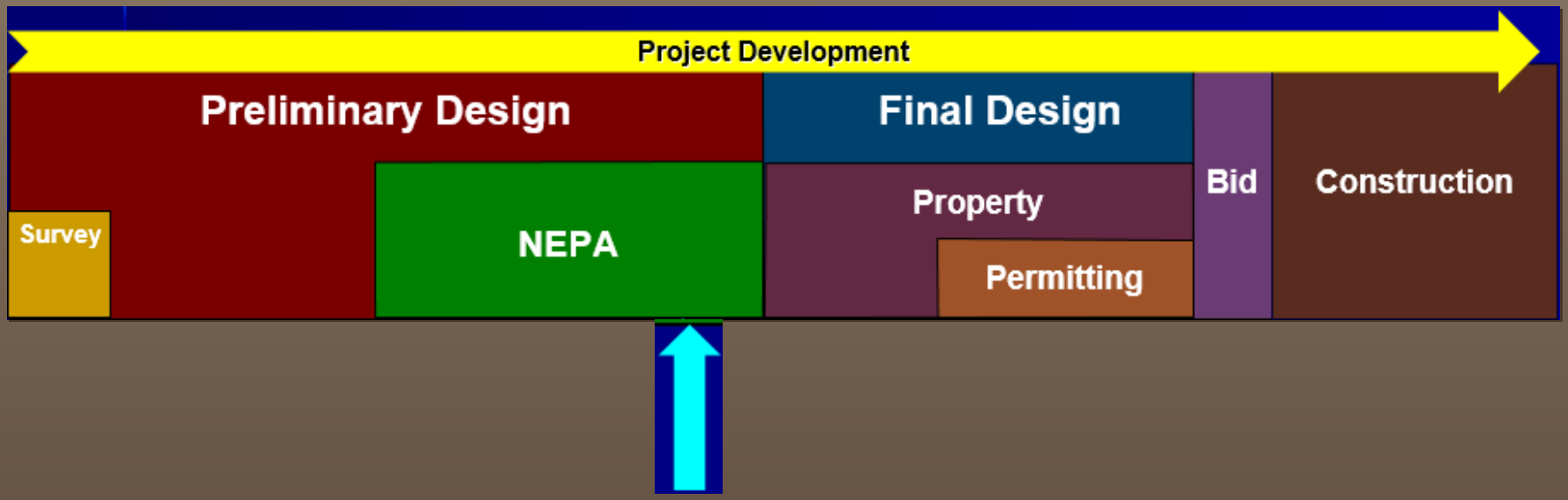
March 28, 2018

FHWA NEPA Process "Umbrella"

- Economic, Social, and Environmental Effects (23 USC 109(h)) analysis
- Public involvement, interagency coordination
- Tribal consultation
- Location, design, and engineering
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
- Noise Standards
- Public Hearing Requirements
- Americans with Disabilities Act

- Endangered Species Act – Section 7
- Civil Rights Act
- Executive Order 12898 (Environmental Justice)
- Section 4(f) of USDOT Act (49 USC 303) - Parks, recreation, etc
- Clean Air Act
- Safe Water Drinking Act
- Clean Water Act 404(b)(1)
- Farmland Protection Policy Act
- National Historic Preservation Act
- Floodplains

Where are we in the Process?



Develop Purpose and Need → Define Alternatives → Assess Impacts → Circulate EA for Review and Comment → Complete Applicable Environmental Processes/Address Comments → EIS Need Decision (FONSI or EIS)

Coordination and Consultation with Agencies and the Public

Comments are Welcome

The Frank J. Wood Bridge EA/Draft Section 4(f) Evaluation is available at http://maine.gov/mdot/env/frankjwood/

Comments can be provided via:

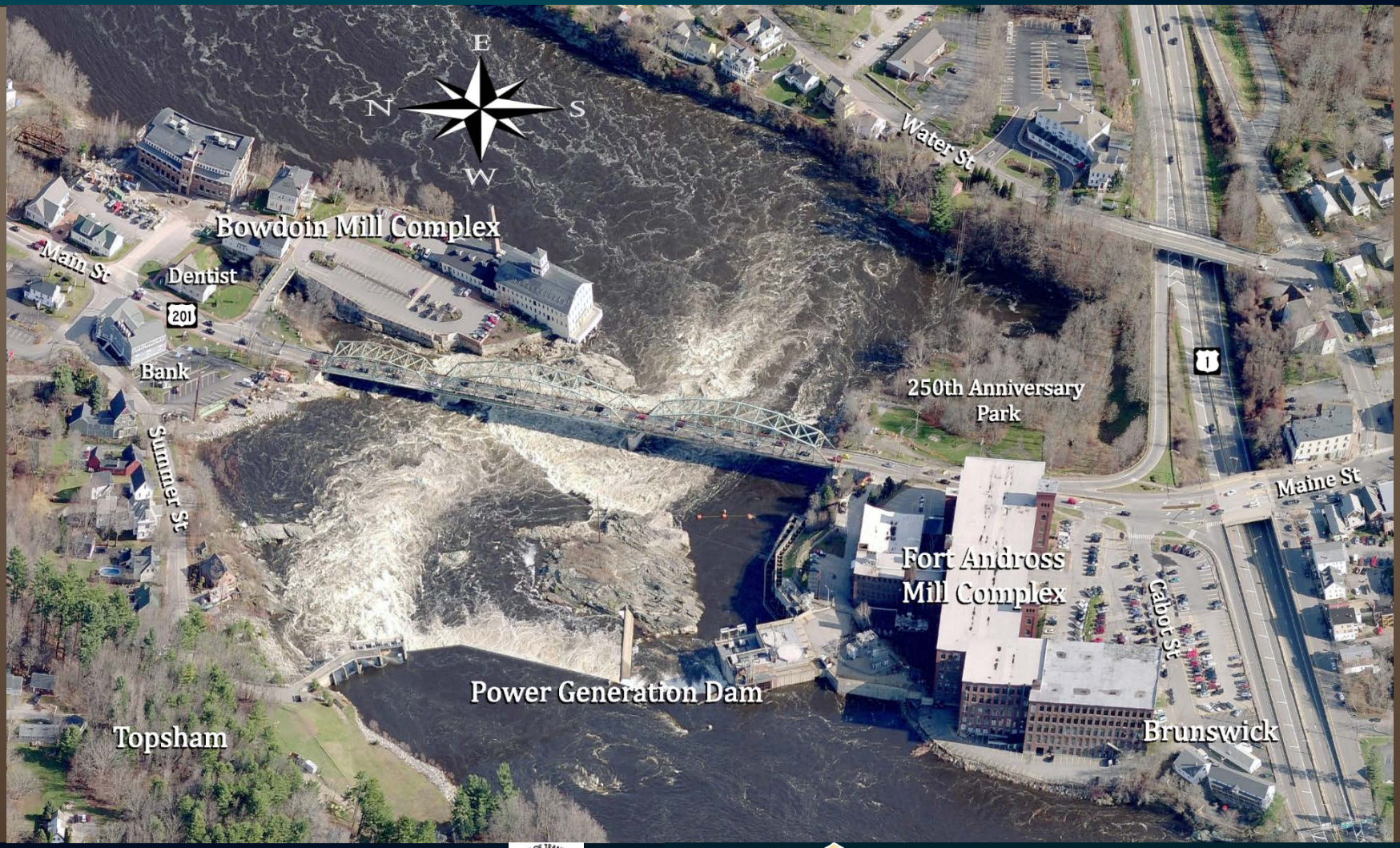
Tonight's meeting

MaineDOT's website

E-mail

Postal mail

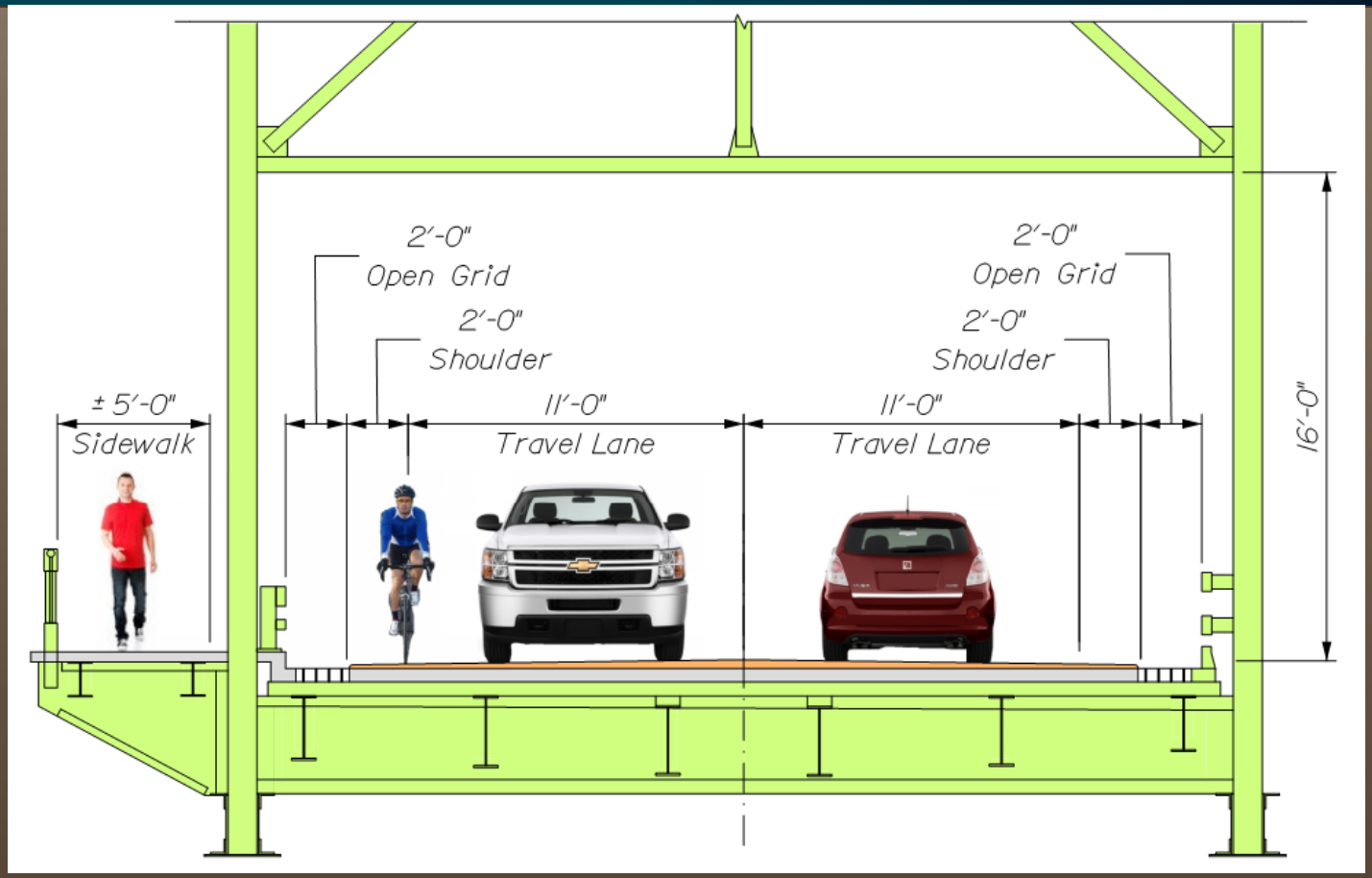
Project Area



Frank J. Wood Bridge

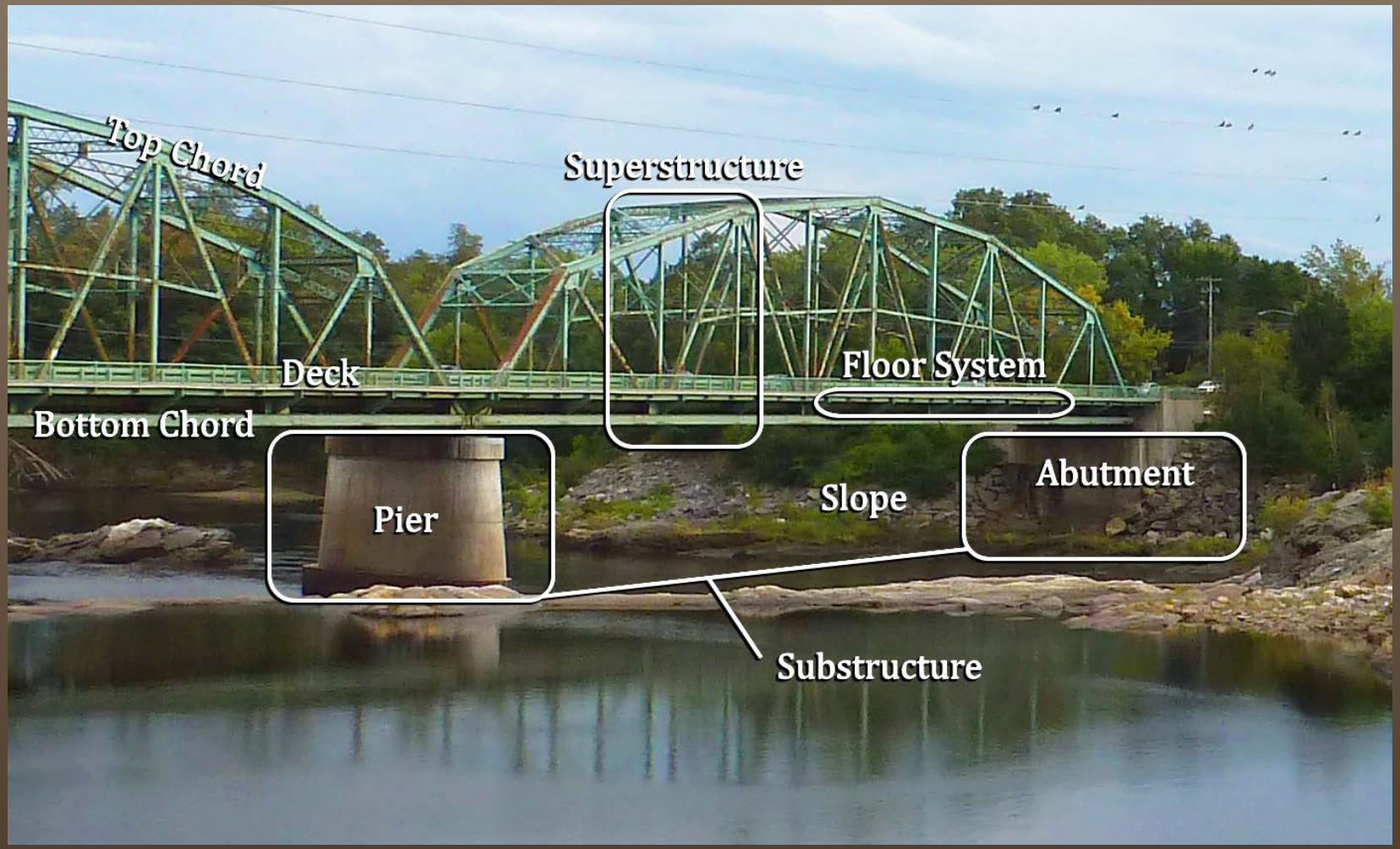
- 805 ft, three-span steel truss
- Built in 1931 (87 yrs old)
- Annual Average Daily Traffic Appx. 19,000 vpd
- Appx. 9 bridges at this site since 1795

Frank J. Wood Bridge

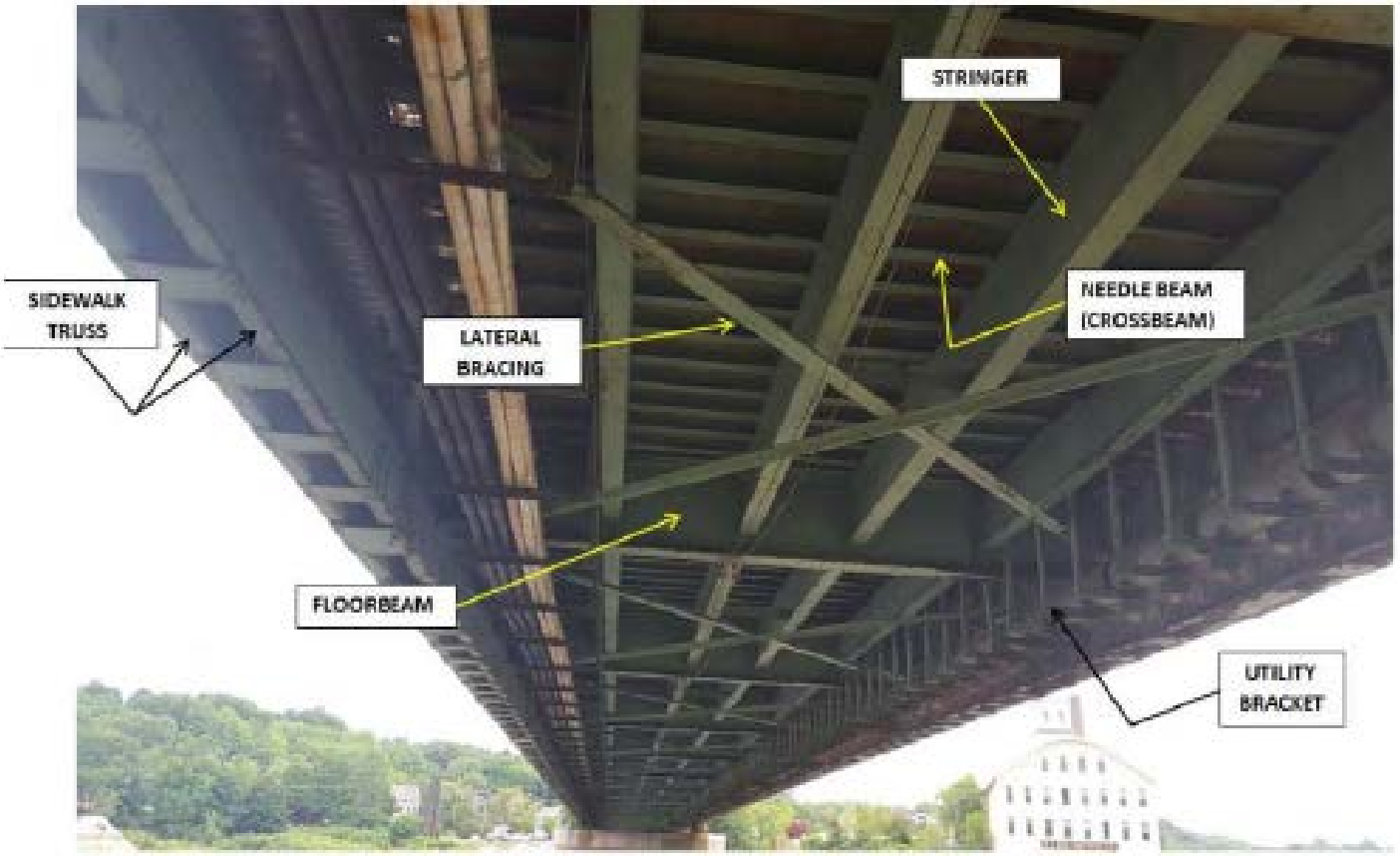


Existing Bridge Section

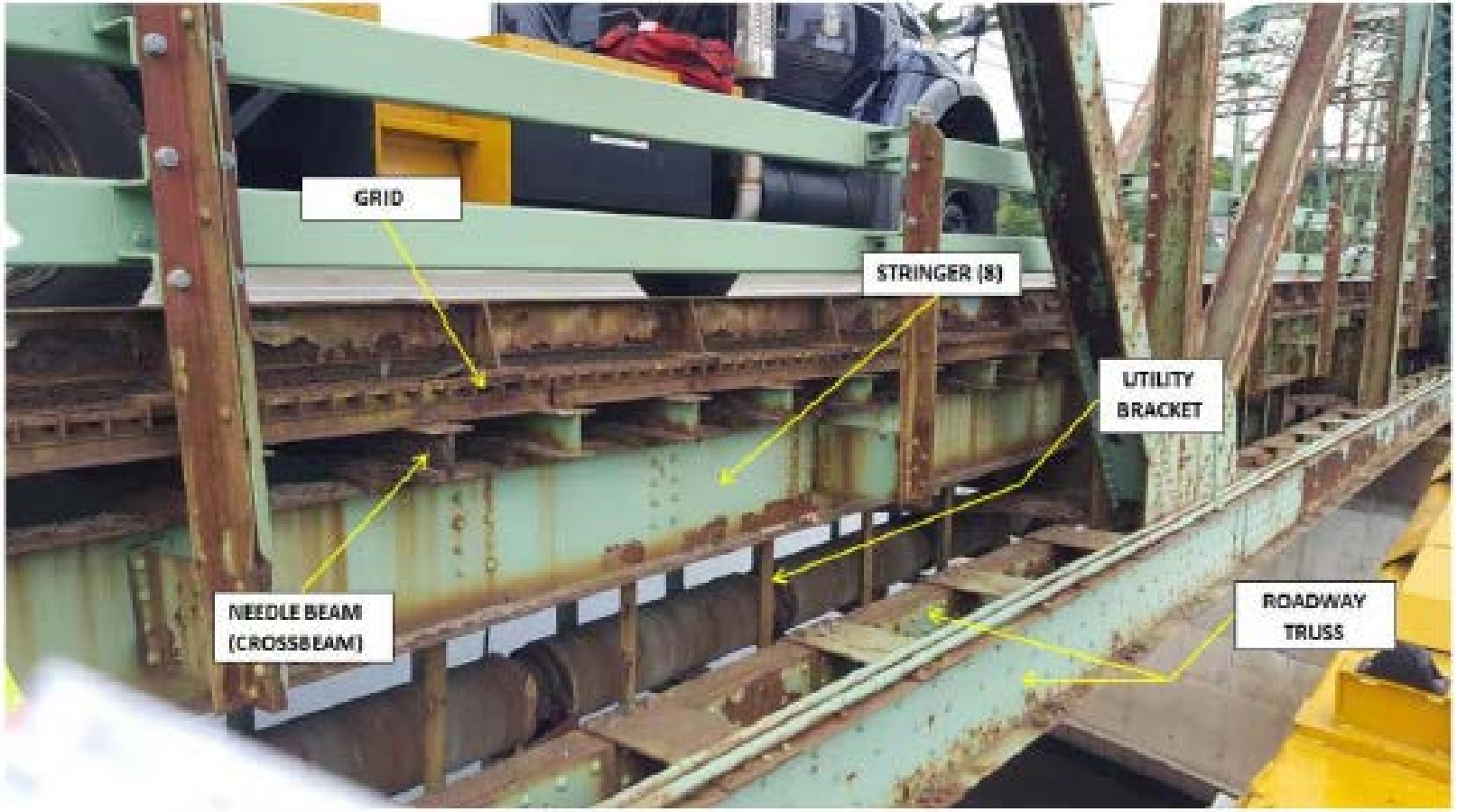
Truss Nomenclature



GENERAL NOMENCLATURE



Typ. nomenclature of Frank J Wood Bridge – looking north from Abut. 1 to Pier 1, in Span 1.



Typical Nomenclature of Frank J Wood Bridge – Looking Northwest midspan of Span 2.

Bridge Condition

- Fracture Critical Bridge Inspections on a 21 month cycle
  - In-depth inspection to asses the condition of critical elements such as connections, fracture critical & fatigue prone members
  - Required after the 2007 collapse of the I35W bridge in Minneapolis
  - This inspection of FJW takes about a week and costs $30,000
- June 2016 Inspection
  - Deck & superstructure condition lowered from “Fair” to “Poor” based on advanced deterioration of the deck, floor system & bottom chord
- August 2016 Special Inspection
  - Posted for a 25 ton weight limit due to deterioration, particularly around the floor beam ends

Floor Beam Connections

Floor Beam Condition

Severe Corrosion at Cross Beam

Pack Rust in Bracing and Bottom Chord

Severely Corroded Rivets

April/May 2017 Repair Project

- Strengthened floor system, cleaned, and applied protective coating to “hotspots”
- A short-term 5 year fix to maintain the 25 ton posting

Repair of Stringer 8 to Floorbeam 2 (Brunswick side).

This column of 4 high strength fasteners joins the cover plates to the 5/16" thick angle fastened to the Floorbeam web. 5 plies of steel involved.

These 2 columns of high strength bolts (8) pull together cover plates, shims and the Stringer web.

This column of holes was unable to be used. Contractor inadvertently flipped plate backwards after drilling 3 required holes in cover plate. Using the cover plate as a template, the holes drilled through the Stringer web were incorrectly located. The result is the last column of holes could not be used. Rather than torch cut, or re-fabricate all the parts, Designer William Doukas, PE, accepted the 8 fasteners in place through the web alone as adequate to support the load. See computations at end.

Purpose and Need for Action

The purpose of the project is to address poor structural conditions and load capacity issues on the Frank J. Wood Bridge and to address mobility and safety concerns for pedestrians and bicycles.

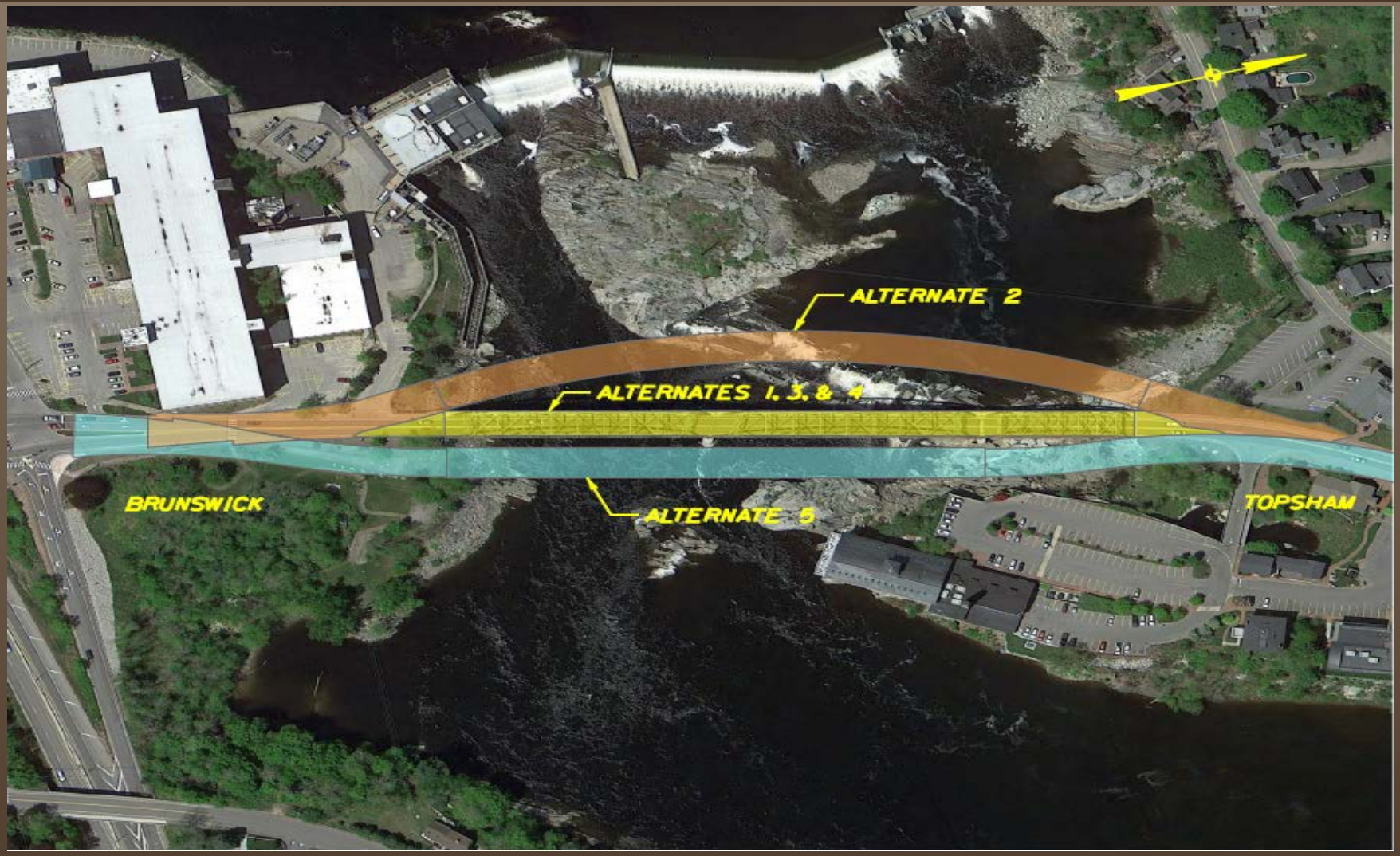
Alternatives Investigated

MaineDOT identified and considered several alternatives to address the purpose and need. These alternatives were refined and expanded based on input from the public and the Section 106 consulting parties

No Build Alternative – Presumes the existing structure remains unchanged except for regular maintenance and serves as a baseline

1. Replacement Bridge on Existing Alignment
2. Replacement Bridge on Upstream Alignment (Preferred Alternative)
3. Bridge Rehabilitation with Existing Westerly Sidewalk
4. Bridge Rehabilitation with a New Easterly Sidewalk
5. Replacement Bridge on Downstream Alignment

Alternatives Investigated



Environmental Considerations

The effects relative to the following considerations were assessed for the identified alternatives

- Natural Resources such as endangered species, essential fish habitat, wetlands & waterbodies, floodplains & hydraulics, and hazardous materials
- Cultural Resources such as historic architectural resources, archaeological resources, Section 4(f)

Environmental Considerations

- Social and Economic impacts such as residential & business, bicycle & pedestrian, construction & traffic, utilities, FERC boundary, right of way, and cost

Alternatives Dismissed From Further Consideration

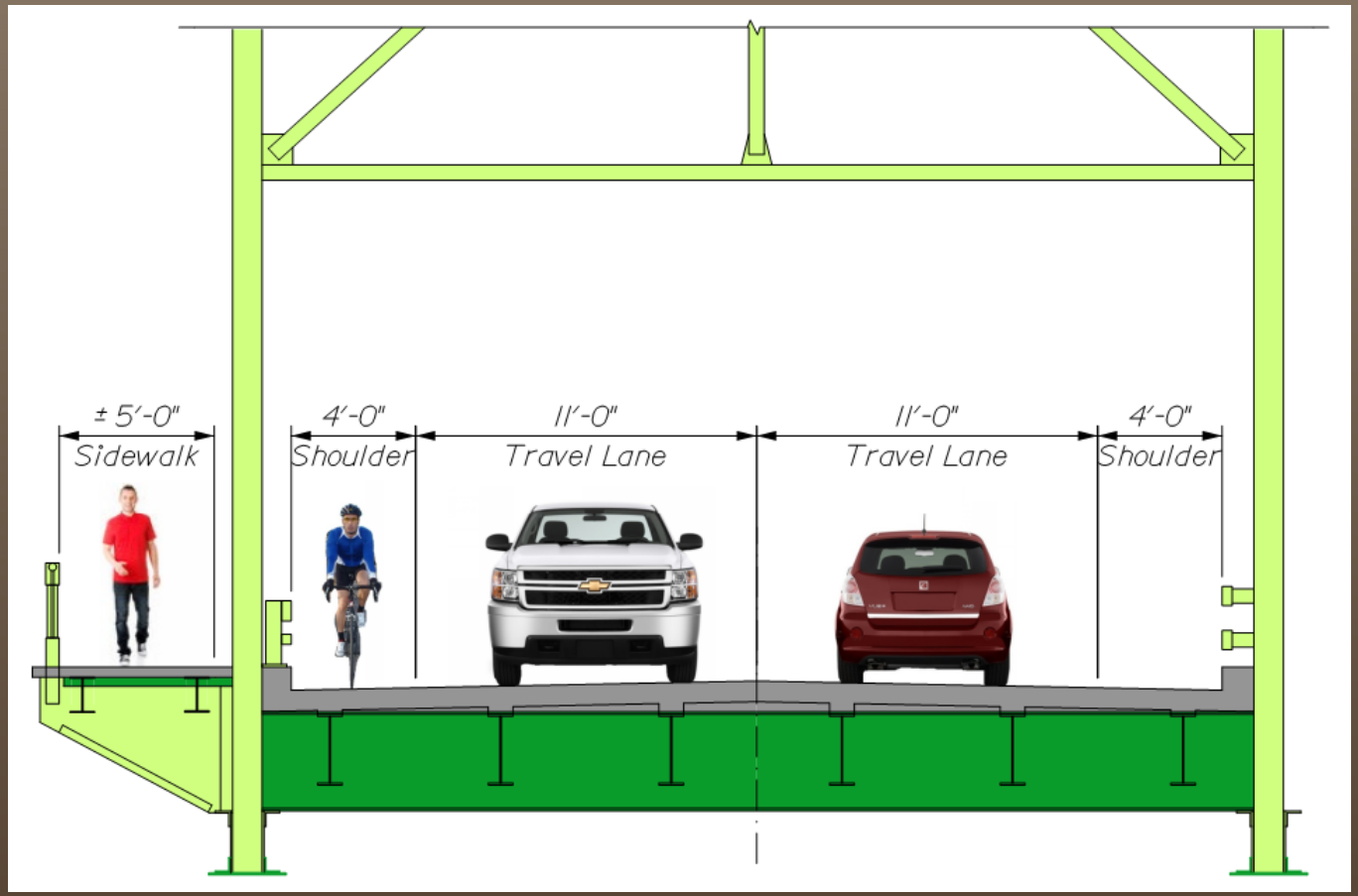
- Alt. 5 – Replacement on downstream alignment
  - Eliminated due to an unacceptable increase in flood elevations at the Bowdoin Mill Complex (Up to 6 feet higher along the Sea Dog parking area and restaurant)

- No Build Alternative
  - Continued deterioration will result if further weight restrictions and eventual closure
  - Does not meet purpose and need

Alt. 3 & 4 – Bridge Rehabilitation Options

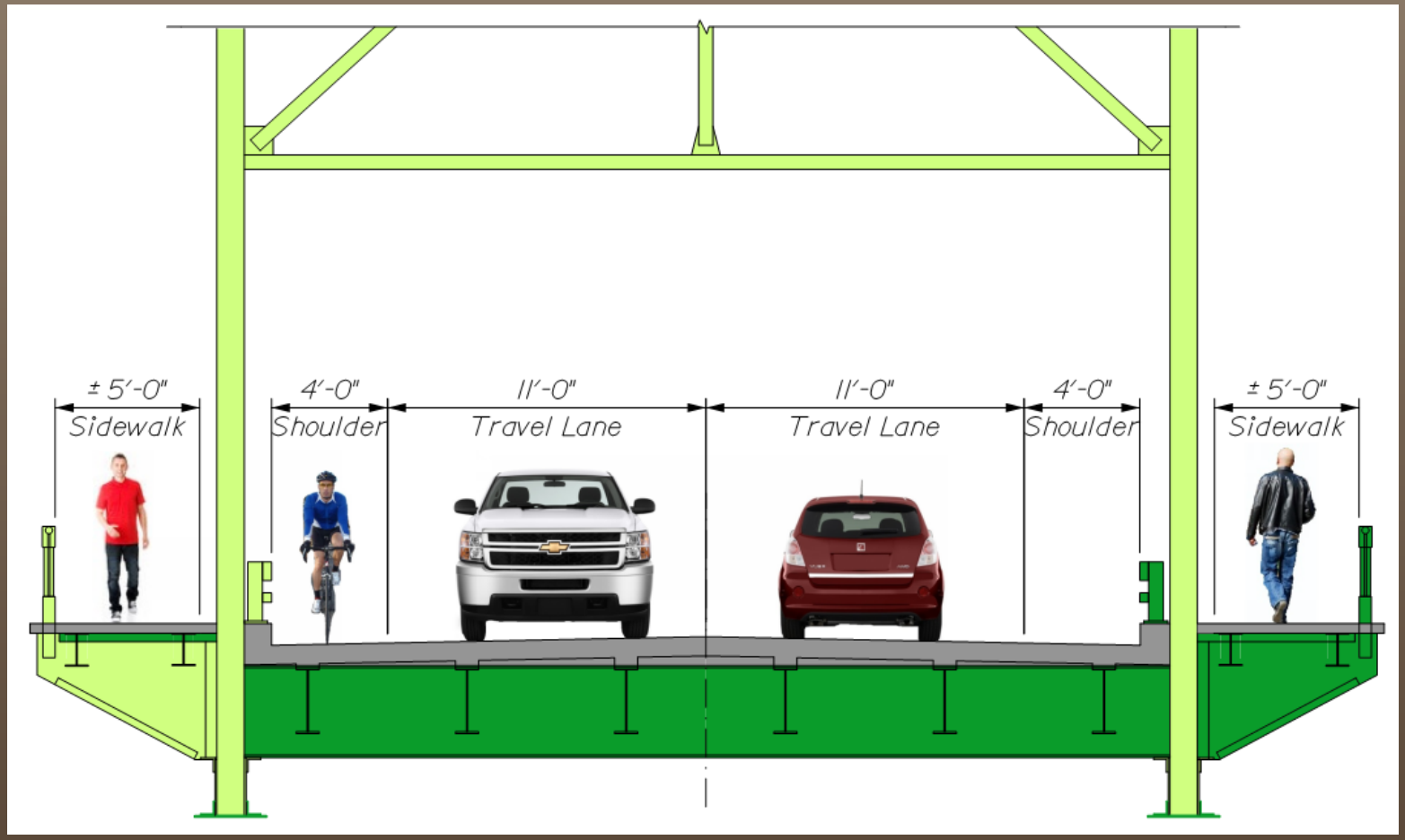
- Replace steel floor system
- Replace parts of the truss bottom chord
- Replace utility hangers
- Replace existing bridge deck
- Repair concrete substructure units
- Paint entire superstructure
- Construct temporary bridge on upstream side

Alt. 3 – Bridge Rehabilitation One Sidewalk



Proposed Bridge Section – Alternate 3

Alt. 4 – Bridge Rehabilitation Two Sidewalks



Lightweight concrete-filled exodermic deck required to offset weight of added sidewalk

Alt. 1 & 2 - Replacement Bridges

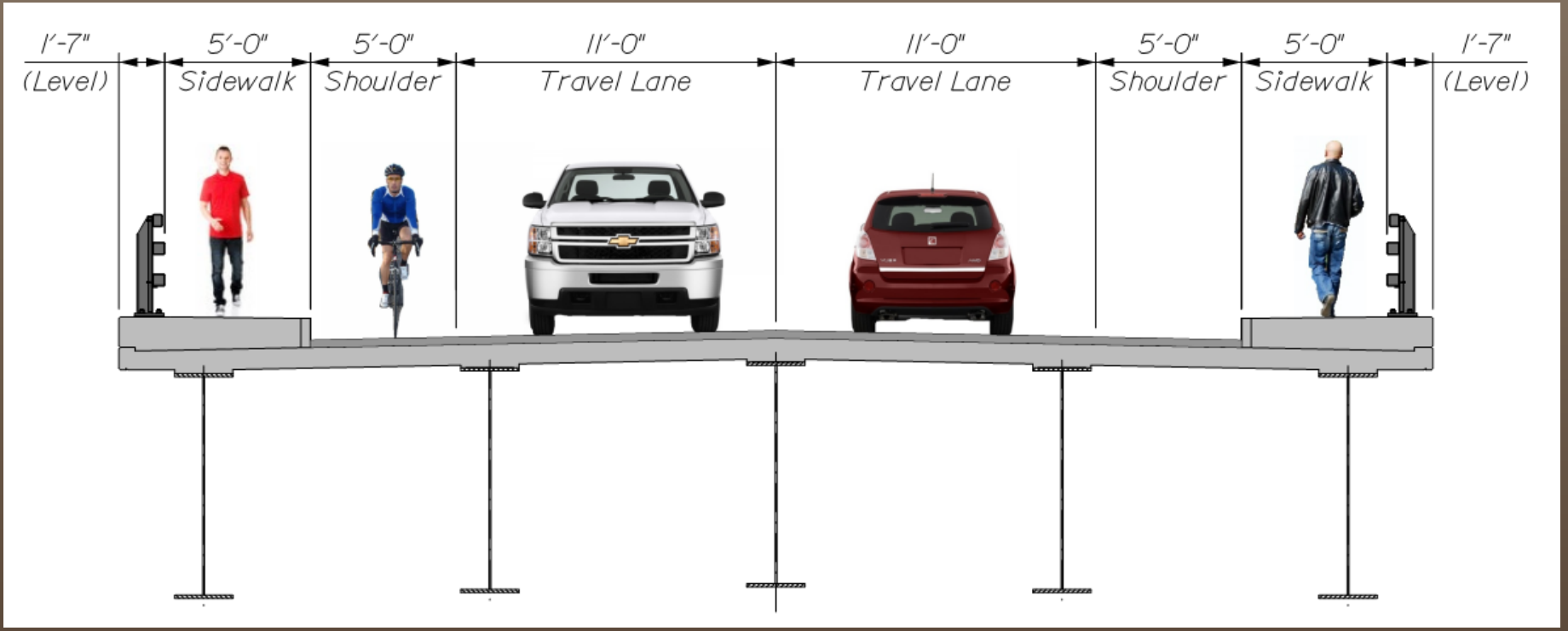
Alt. 1 - Replacement Bridge on Existing Alignment

- 800 foot long, multiple span, steel girder bridge on existing alignment

Alt. 2 - Replacement Bridge on Upstream Alignment

- 835 foot long, multiple span, steel girder bridge on a curved upstream alignment

Alt. 1 & 2 Bridge Section



Alt. 2 - New Bridge on Curved Upstream Alignment

Rendering of Curved Upstream Bridge

Alternatives Analysis

A complete alternatives analysis can be found in the Environmental Assessment and Draft Section 4(f) Evaluation and the Preliminary Design Report

http://maine.gov/mdot/env/frankjwood/

Section 4(f) Resources Within Project Area

Five historic properties identified

- Summer Street Historic District
- Cabot Mill
- Pejepscot Paper Company
- Brunswick Topsham Historic District
- Frank J. Wood Bridge

One park identified

- The 250th Anniversary Park

Traffic Impacts

- User costs
  - Traffic disruption results in indirect costs to users of the bridge
  - User cost used to quantity this disruption - based on extra distance traveled and time required
  - $22,000 per day for full closure
- Business impacts
- Maintenance of traffic options
  - Complete closure w/off-site detour
  - Single lane closure with staged construction
  - On-site detour w/ temporary bridge
  - Utilize existing bridge

Traffic Impacts

	Alt 1	Alt 2	Alt 3 & 4 w/temp	Alt 3 & 4 w/o temp
Construction Duration	3.5 yrs	2.5 yrs	3 yrs	3 yrs
Traffic Impacts	3 mo. single lane	2 mo. single lane	3 mo. single lane	20 mo. closure
User Cost	$0.9 M	$0.6M	$0.9M	$13M

Temporary Bridge $4M

Safety

- Improvement bicycle & pedestrian safety
  - Provide connectivity for sidewalks and avoid mid-block crossings
  - Provide 5 foot minimum shoulders and adequate lane width
- Improve bridge safety
  - Provide a dependable bridge that can carry all legal loads & is not fracture critical

Dependability

- Alt. 3 & 4 will require more traffic disruptions for future rehabilitation, preservation, and fracture critical inspection activities
- Alt. 1 & 3 can be designed for a 100 year service life with low maintenance

Cost

- Preliminary construction costs
  - Initial costs to construct the project based on recent bid histories for similar projects
- Life cycle costs
  - Economic analysis tool used to compare relative merit of alternatives
  - Converts estimated costs throughout life of alternative to current dollar equivalents (present value)
  - Assumes money is set aside today for future work and considers factors such as earned interest and inflation
  - Transportation agencies are not able to set aside money for future work

Cost

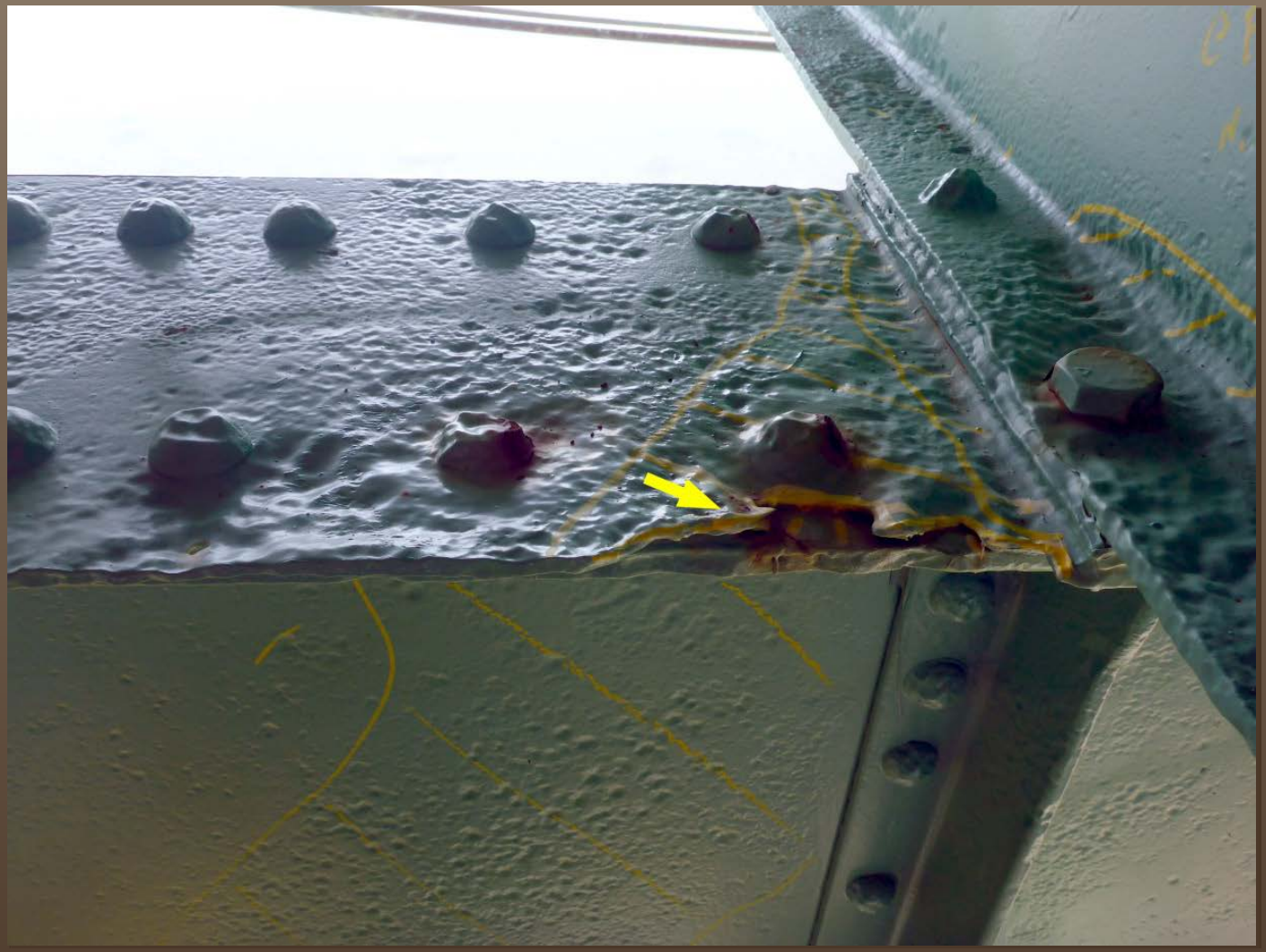
- Service life costs
  - Totals all estimated bridge costs throughout the life of an alternative including initial construction cost and all future inspection, maintenance and rehabilitation
  - Provides a true comparison of the expected real costs to an agency when examining alternatives

Preliminary Cost & Cost over service life v. Length of Service Life

	Service Life (years[6])	Preliminary Construction Estimate	Estimated Service Life Costs[7]	Estimated Yearly Average Maintenance & Operations Cost of Service Life[8]	Increased Percentage Maintenance & Operations; Average Annual Cost Per Service Life Year
Alternative 1	100	$16 M	$20.3M	$43,000	0%
Alternative 2	100	$13M	$17.3M	$43,000	0%
Alternative 3	75	$15M	$35.2M	$269,333	626%
Alternative 4	75	$17M	$38.2M	$282,667	657%

Figure 4: Costs over Service Life

Deer Isle – Sedgwick Bridge



Paint project completed in the fall of 2009 at a cost of $10.5M

Funding Needs

- A funding level of $140M per year is required to eliminate at least 90% of our structurally deficient and poor condition bridges on Corridor Priority 1-3 roads
- Current funding levels average around $120M per year
- MaineDOT is often required to post, or even close, important bridges due to funding shortfall

Summary

The Environmental Assessment identifies impacts and effects of each alternative and discusses the following:

- Historic Resources
- Parks and Recreational Areas
- Endangered Species
- Fisheries
- -Wetlands and Waterbodies
- -Traffic
- -Cost
- -Public Involvement

Based on the information and assessments completed to date, the preferred alternative is Alt. 2 - Replacement Bridge on Upstream Alignment

Questions