

Federal Lands Highway (FLH)

Prefabricated Bridge Elements and Systems (PBES)/Accelerated Bridge Construction (ABC) at Federal Lands Highway Division

Peer-to-Peer Exchange Workshop

Atlanta, GA, Nov. 17

Dan Weston, PE

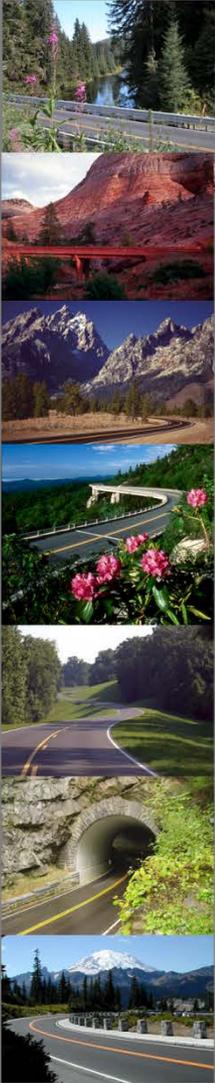
Bridge Design Team Lead

Eastern Federal Lands Highway Division



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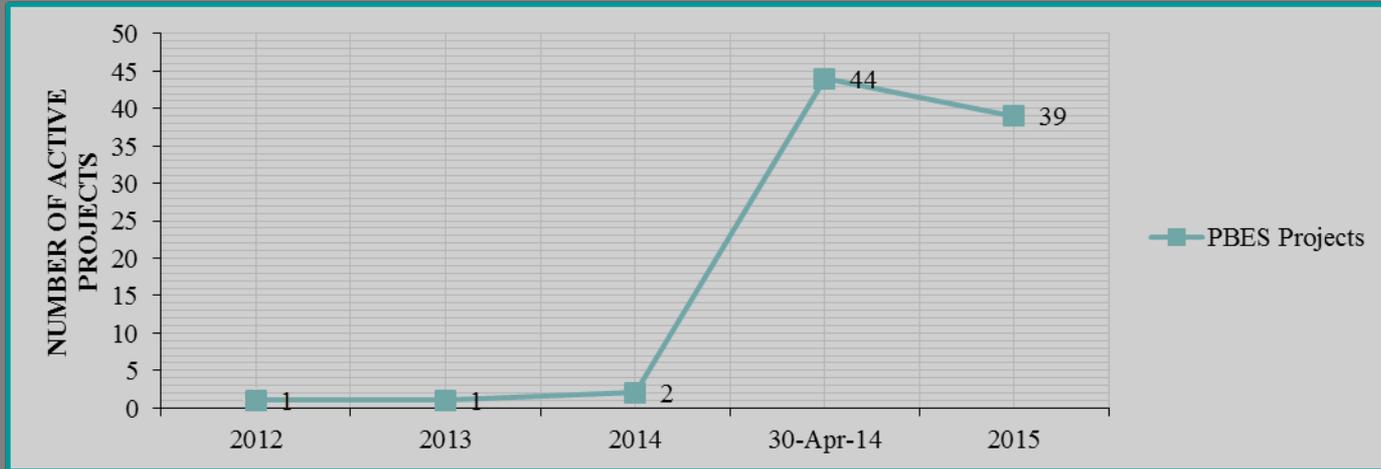


Outline

- **Federal Lands Highway (FLH) Organization**
- **FLH PBES/ABC Policy**
- **PBES/ABC at FLH**
- **SHRP2 Project Example**
- **Lessons Learned / Challenges**
- **Conclusion**



PBES/ABC at FLH



SBN 169(1), 171(1)

NLS 10(1)

PRA-NATR 1E10

SNY 100(1)

Implementation
of PBES Policy

# of PBES Structures Oct., 2014				
	Division			Total
	CFL	EFL	WFL	
Under Construction	8	10	3	21
Under Design	14	6	3	23
Total	22	16	6	44

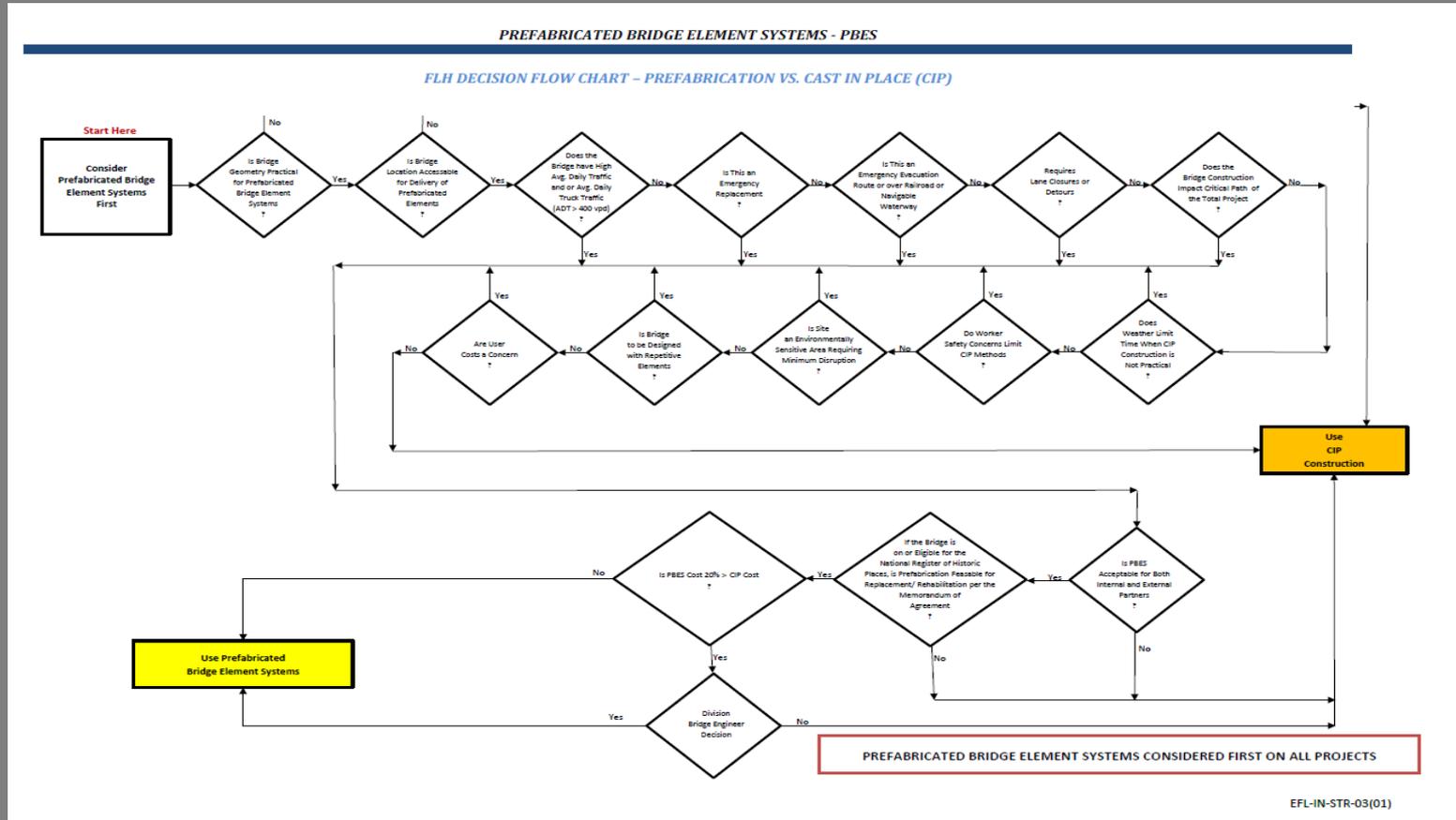


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FLH Office of Bridges and Structures Policy

Prefabricated Bridge Element Systems considered first on all projects!



PBES/ABC at FLH

Various Types of Projects

- Bridge Replacement
- Emergency Repairs
- Rural/Remote Locations
- Urban Locations
- Challenging Environmental Conditions
- Simple Construction w/o Contractor
- Major Structures





George Washington Memorial Parkway Dead Run and Turkey Run Bridges, VA

- Constructed in 1998
- ADT 20,000
- Weekend closures
- 100'-150' erected per weekend
- Construction – 1 season for 3 bridges
300'- 400' in length (each)
- 1.5 spans (150 feet) per weekend



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Sabine National Wildlife Refuge, LA

- Emergency Relief Funding – Hurricane damage
- 2 Bridges – Bridge length 70' (3 spans each)
- High performance concrete (HPC) in remote location
- 1 week to drive piles
- 2 weeks to erect superstructures



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Vieques National Wildlife Refuge, Puerto Rico



- Remote location
- 70' Span
- Precast worked well for the remote location
- GRS-IBS Abutments
- Voided slabs



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Wolf Trap National Park Pedestrian Bridge Wolf Trap National Park for the Performing Arts, VA



- Prefabricated in 3 sections
- 15 minute full closure
- Main span erected in 4 hours
- Normal construction – 25 days



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Glacier National Park, MT

- Bridge length: 85'-0"
- Entire bridge precast
- Precast due to extreme weather conditions
- Construction time
Sept 29 – Nov. 11, 2014



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Sequoia National Park, CA

- 34' single span
- Cost effective design
- NPS forces built bridge
- Construction – 3 months with 6 people



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Foothills Parkway Bridge 2

Great Smoky Mountains National Park, TN



Design Visualization

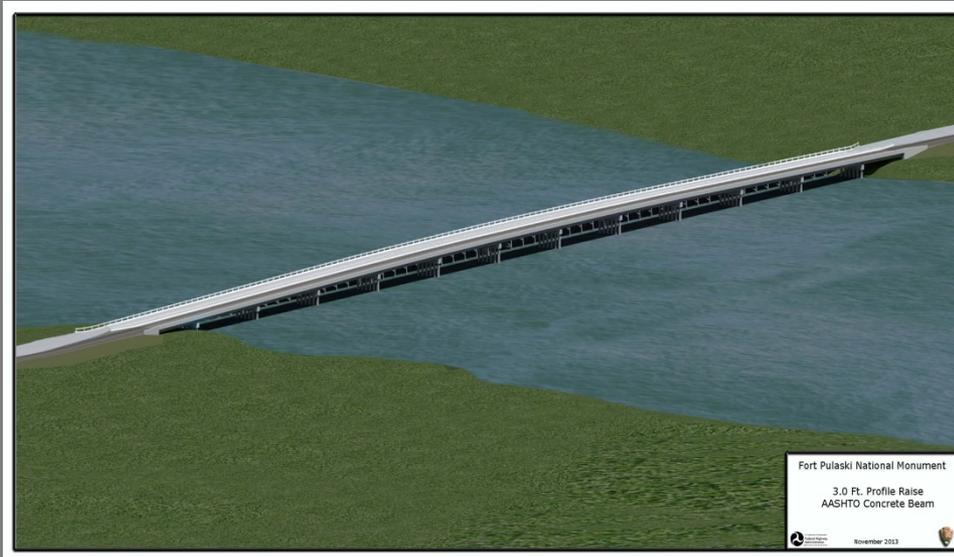
- ✓ **2013 American Segmental Bridge Institute (ASBI) Award of Excellence**
- ✓ **Roads & Bridges Magazine — Number 2 of the 2013 Top 10 Bridges**
- ✓ **2014 PCI Design Award — Best Bridges with Main Span More than 150'**



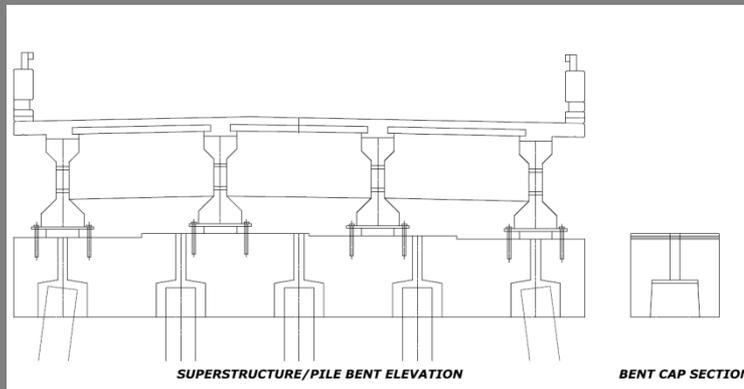
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Fort Pulaski Bridge, GA



- Bridge length: 1295'
- 70'/105' spans
- Entire bridge precast
- Partial depth deck panels
- Construction – 1 Calendar year



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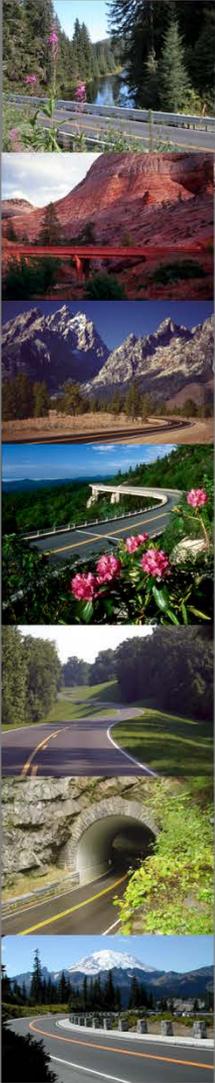
Arlington Memorial Bridge, Washington DC

- Movable Steel Truss Bascule Span
- Total length of the bridge: 2,108 feet
- Bascule span: 216 feet (Main Trunnion to Main Trunnion)
- Approach Spans: 10 Total (5 on each side of bascule)
- Curb to curb: 60 feet (6 lanes)
- Sidewalk width 17 feet



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FEDERAL LANDS HIGHWAY BRIDGE

Seney National Wildlife Refuge

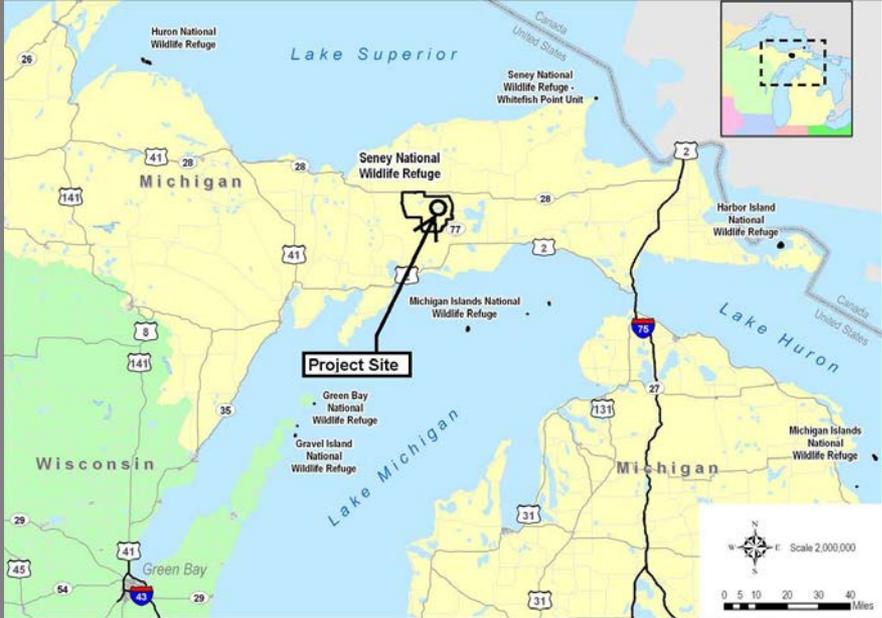
J to H Spillway Bridge



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Seney National Wildlife Refuge Michigan Upper Peninsula



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Seney National Wildlife Refuge Michigan Upper Peninsula



Existing Bridge:

- Built in 1943
- Bridge length: 111'-6" (10 spans)
- 11'-5" curb-to-curb
- Timber stringers and timber plank deck with longitudinal running boards
- Stoplog water control structure with concrete piers
- Provides vehicle, bicycle and pedestrian access to the refuge



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New Bridge:

- The existing stoplog water control structure to remain in place
- Bridge length: 132'-3" (3 spans)
- 12'-0" curb-to-curb
- Wisconsin 21" box beams
- Parapets cast with beams
- 5 ½" reinforced CIP overlay
- Precast abutments, piles and pier caps



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Precast Abutments and Pile Cap

Precast Beams with Integral Bridge Rail



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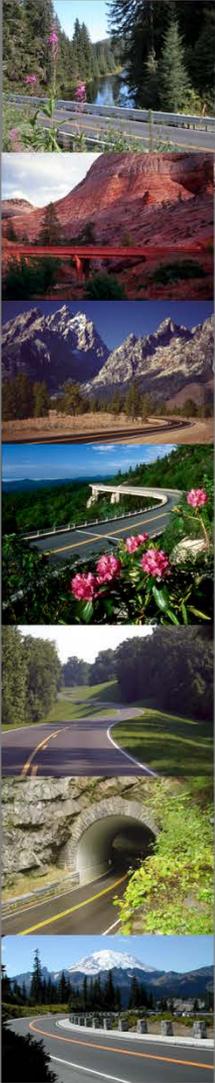


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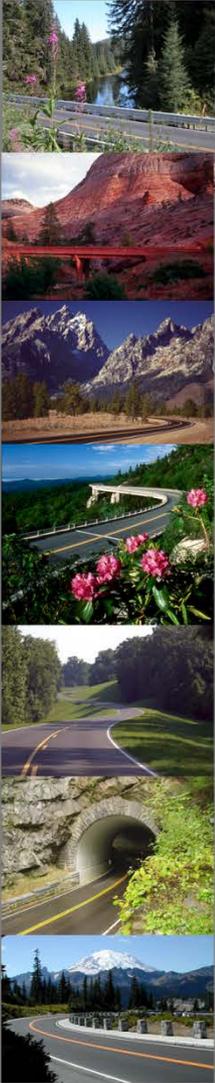
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Lessons Learned / Challenges

- Contractor's knowledge with PBES construction
- Contractors are set up for cast-in-place construction
- Slightly higher construction costs estimates





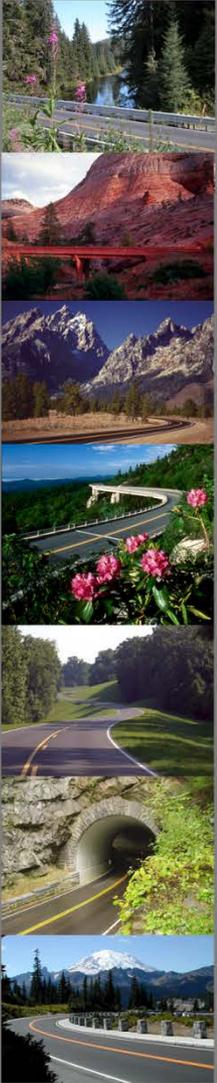
Conclusion

- FLH currently has about 40 active PBES/ABC projects
- PBES/ABC have been used in a wide variety of applications
- PBES/ABC is considered first on all projects
- FLH continues to implement the technology and expand the use of PBES/ABC to all types of bridges



FLH Bridges and Structures

Thank you!



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