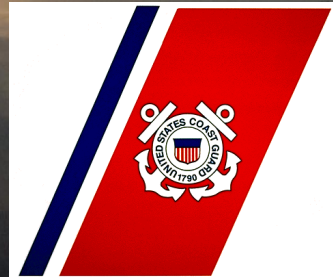


NJDOT Navigation Lighting Backup System

Gerald P. Oliveto, P.E.



NJDOT Bridges Spanning Navigable Waterways

- Forty-one fixed span structures with both fender systems & navigation lights
- Seven fixed span structures with fender systems & no navigation lights
- Fifteen operational drawbridges with fender systems & navigation lights
- Two non-operational drawbridges with fender systems & navigation lights
- Total: 65 NJDOT navigable waterway bridges



NJDOT Bridges Spanning Navigable Waterways

- Two US Coast Guard Districts in New Jersey
- Northern New Jersey: First District (New York)
- Twenty-four NJDOT bridges in First District
- Southern New Jersey: Fifth District (Portsmouth, VA)
- Forty-five NJDOT bridges in Fifth District



United States Coast Guard Lighting Regulations

- 33 CFR 118 governs lights on bridges over navigable water constructed after March 23, 1906
- “Each margin of a navigable channel will be marked by a red light”
- Typically six red lights per bridge
- One light each fender North/East approach
- One light each fender, center span
- One light each fender South/West approach

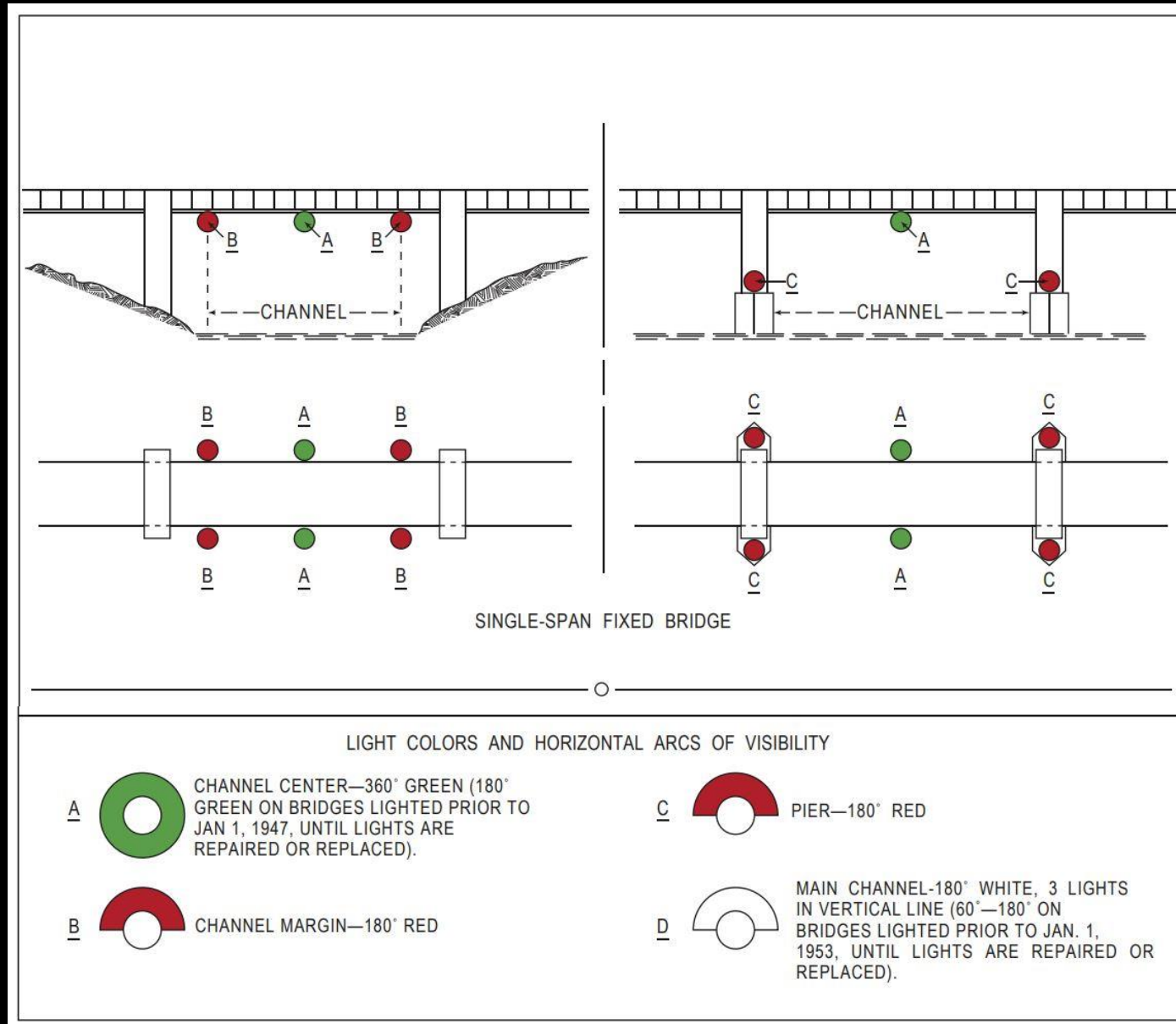


United States Coast Guard Lighting Regulations

- “Center of the navigable channel under each span will be marked by a range of two green lights”
- One light mounted to each outside fascia
- Lights mounted just below outermost edge of bridge span
- Visible 360 degrees for approaching and transiting vessels



United States Coast Guard Lighting Regulations



Typical Navigation Lighting



Typical Navigation Lighting



United States Coast Guard Lighting Regulations

- Lights shall be displayed from sunset to sunrise and at all other times when visibility is less than one mile
- 33 CFR 533 governs Penalties for Violations
- Civil penalty of \$25,000 per instance for inoperable navigation light
- Separate offense for each day a violation continues



NJDOT Navigation Light Repair Procedure

- Upon notification of malfunctioning light, Emergency Electrical work order issued
- Electrical crews repair same day
- Work order closed, USCG notified
- In event of unrepairable light, USCG notified
- Temporary solar lights installed



NJDOT Navigation Light Repair Challenges

- Time to mobilize, retrieve boat, launch, perform repairs, demobilize
- Inclement weather conditions:
 - rain, snow, wind, marine advisories
- Seasonal conditions:
 - ice in waterway, icy fender system, early nightfall in winter, shore traffic in summer
- Overtime costs



Retroreflective Panels on Bridge Piers

- 33 CFR 118.100 allows for installation of retroreflective panels with approval from USCG District Commander



- Better identify bridge piers
- Backup for red channel margin lights
- Increased visibility of fender system/channel

Retroreflective Panels on Bridge Piers



- Linear Delineation panels utilized on NJDOT highways since 2013
- Available commercially: yellow, white, orange, red
- 1.5", 4", 6" heights x 34" lengths

Retroreflective Panels on Bridge Piers

- Temporary installation of red 6" x 34" panels
- Placement of one panel beneath each red navigation light
- Submitted to USCG
- Approved by USCG 1st & 5th Districts as acceptable backup system for navigation lighting
- Permanent installations under way



Navigation Lighting Backup System



Navigation Lighting Backup System

- Panels cost approximately \$15
 - Once in place, navigation light has redundancy
 - Eliminates USCG Civil Penalty for malfunctioning light
- 
- Eliminates overtime costs for NJDOT crews
 - All repairs can be performed during safe daylight conditions on next business day

Navigation Lighting Backup System

After



Before

NJ Route 35 over
Shark River Inlet

Navigation Lighting Backup System

After



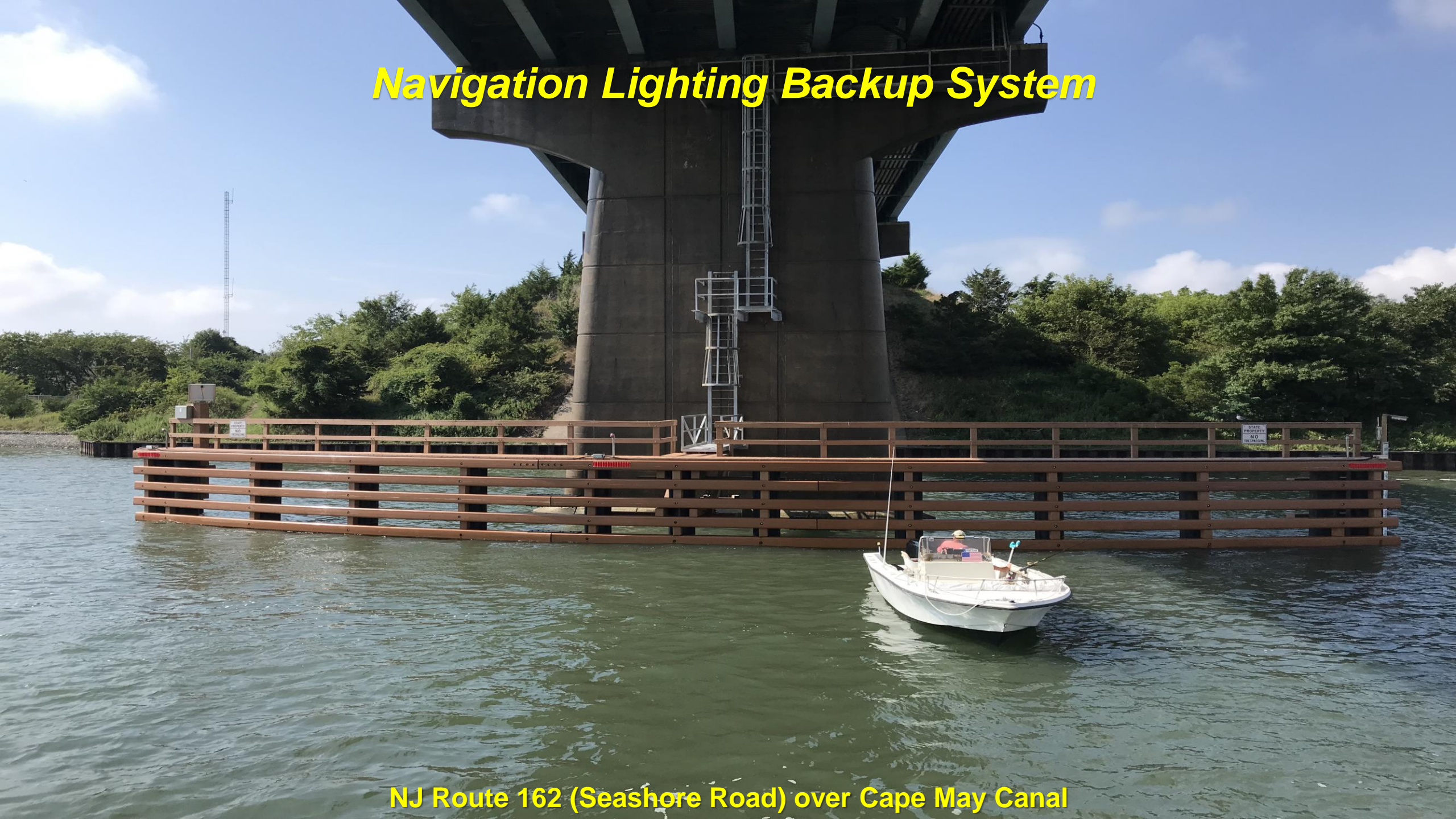
Before

**NJ Route 47 over
Grassy Sound**

Navigation Lighting Backup System

NJ Route 52 over Rainbow Channel

Navigation Lighting Backup System



NJ Route 162 (Seashore Road) over Cape May Canal

Navigation Lighting Backup System



NJ Route 35 over Shark River Inlet

Navigation Lighting Backup System



NJ Route 35 over Manasquan River

Navigation Lighting Backup System

- Installations began July 2019
- 19 of 65 bridges complete
- Anticipated goal of December 31, 2019 for complete installation

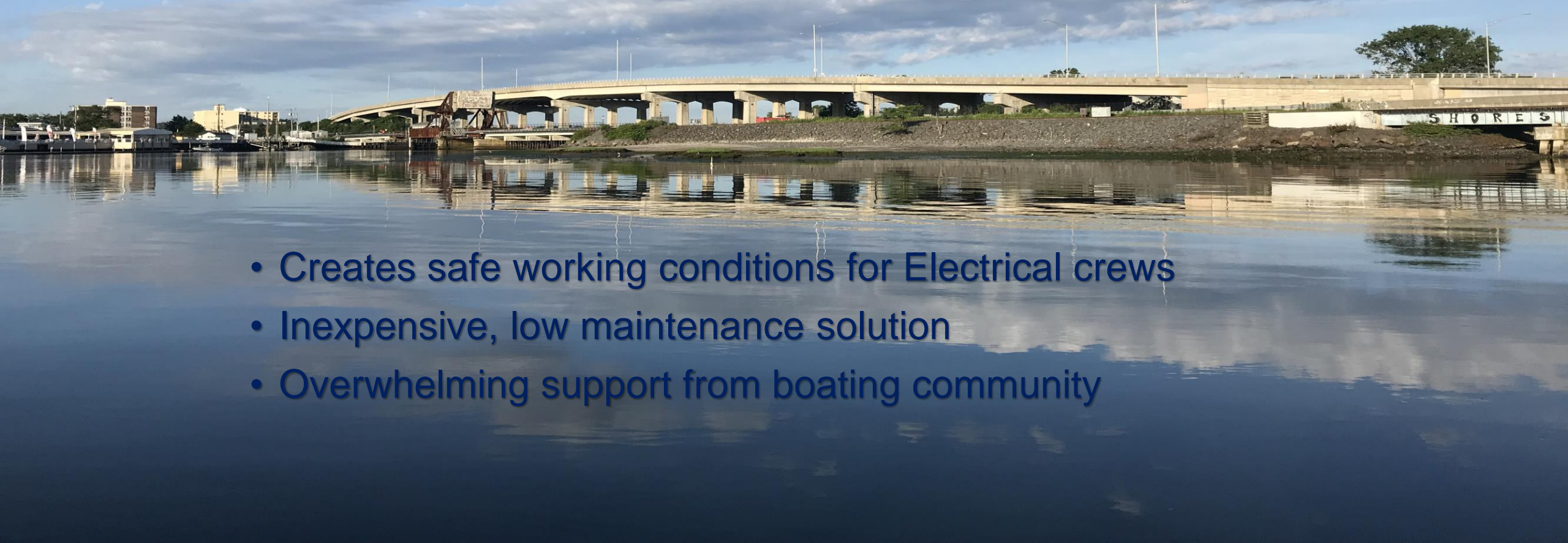


NJ Route 71 over Shark River

Navigation Lighting Backup System

- Delineation of navigable channel in all weather conditions
- Provides safety features for marine community
- Significant cost savings for Department and taxpayers

- Creates safe working conditions for Electrical crews
- Inexpensive, low maintenance solution
- Overwhelming support from boating community



Thank you!

Gerald P. Oliveto, P.E.

Gerald.Oliveto@dot.nj.gov

