

Bridge Type Options for the Cape Fear Skyway

STIP Project No. U-4738

Federal Aid Project No. STP-0017(53)

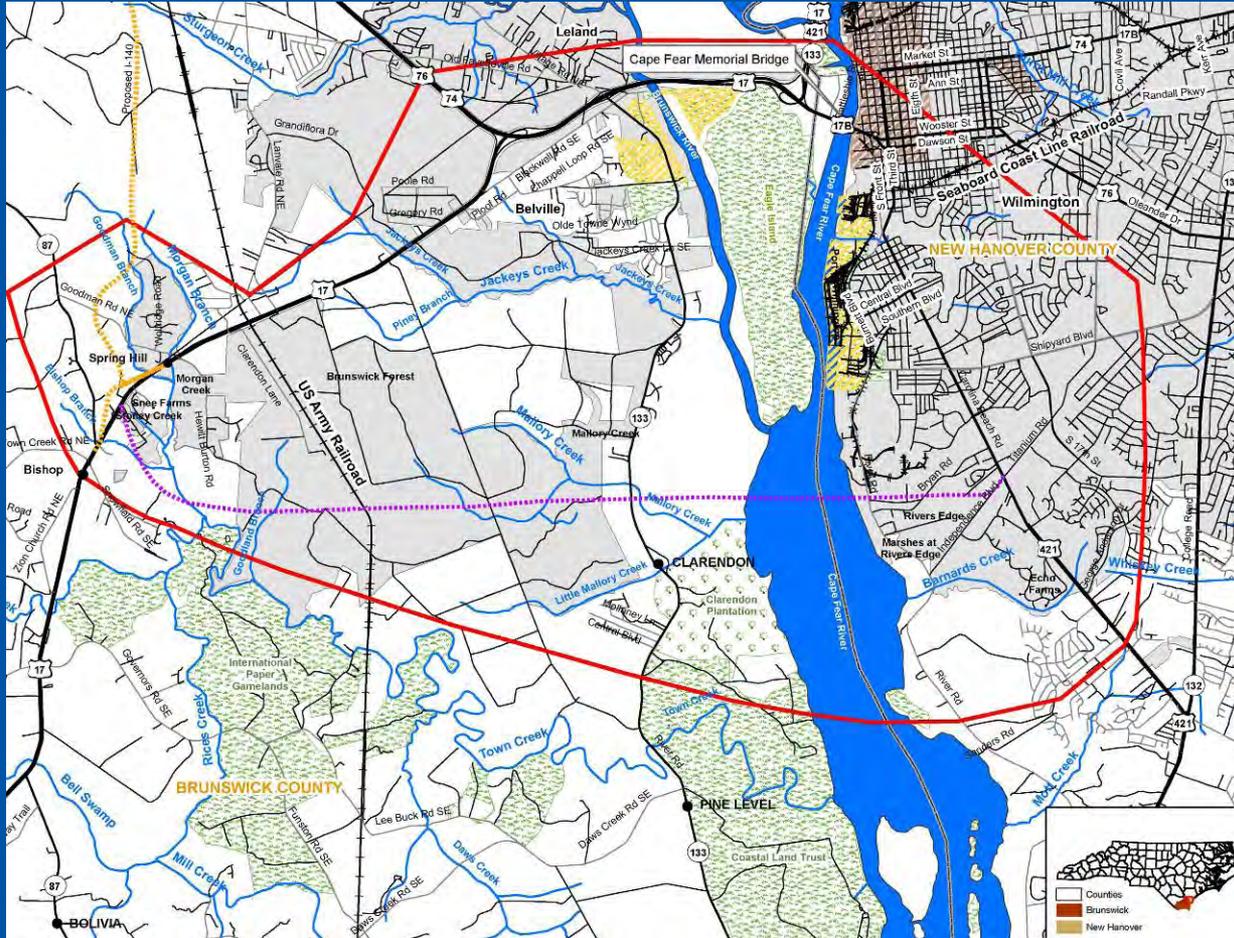
WBS No. 40114

New Hanover and Brunswick Counties, North Carolina





About Cape Fear Skyway





Project Status – Milestones Achieved

- ❖ Prepared Draft Section 6002 Coordination Plan
- ❖ Prepared Draft Purpose & Need Report
- ❖ Prepared Draft Alternatives Screening Analysis
- ❖ Prepared Draft Bridge Study Report
- ❖ Conducted Preliminary Field Studies
- ❖ Prepared functional design plans for bridge crossing area



Project Status – Anticipated Milestones

- ❖ Draft Environmental Impact Statement March 2011
- ❖ Final Environmental Impact Statement March 2012
- ❖ Record of Decision September 2012

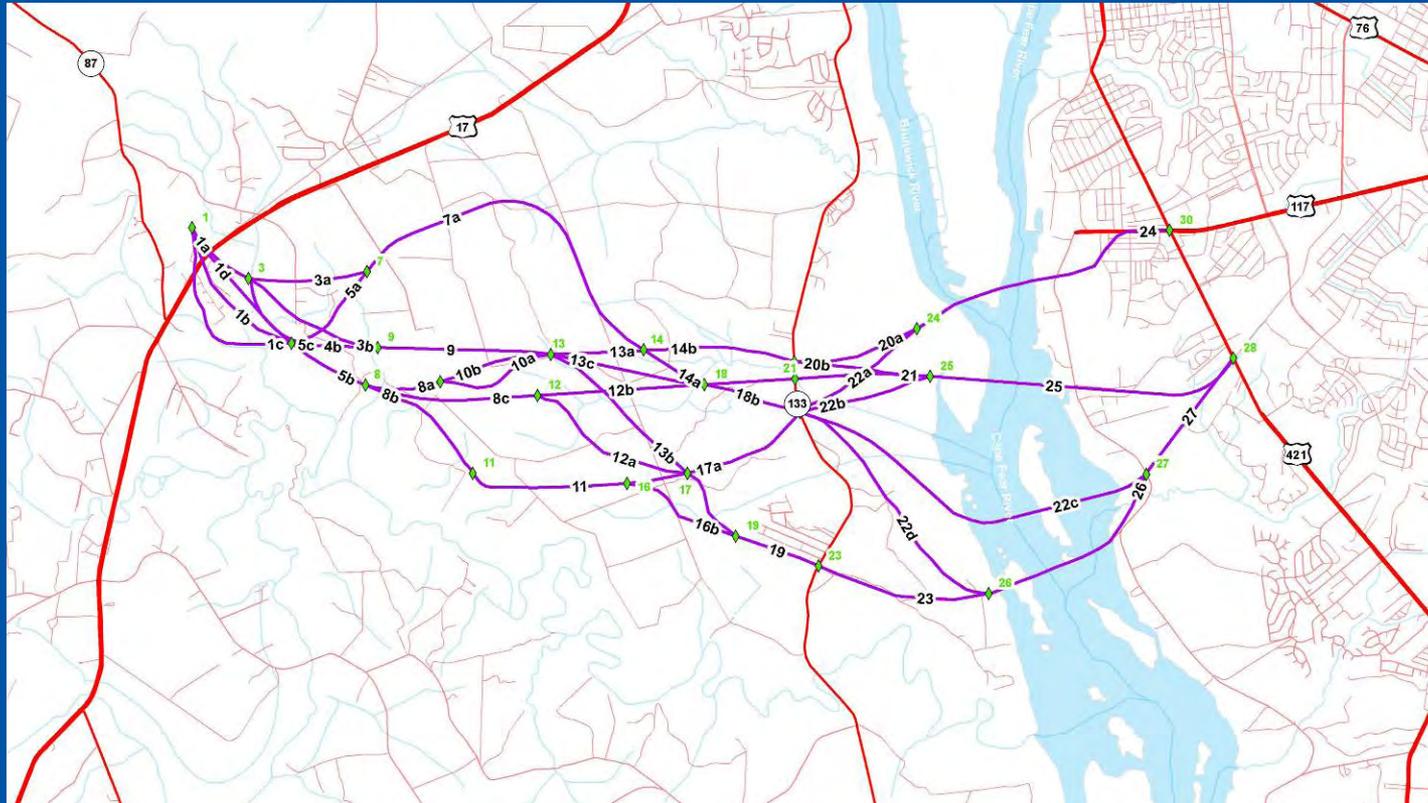


Bridge Study Overview & Purpose

- ❖ Determine appropriate bridge type & size
- ❖ Better cost estimating
- ❖ Better planning for technical studies
- ❖ May accelerate final design timeline



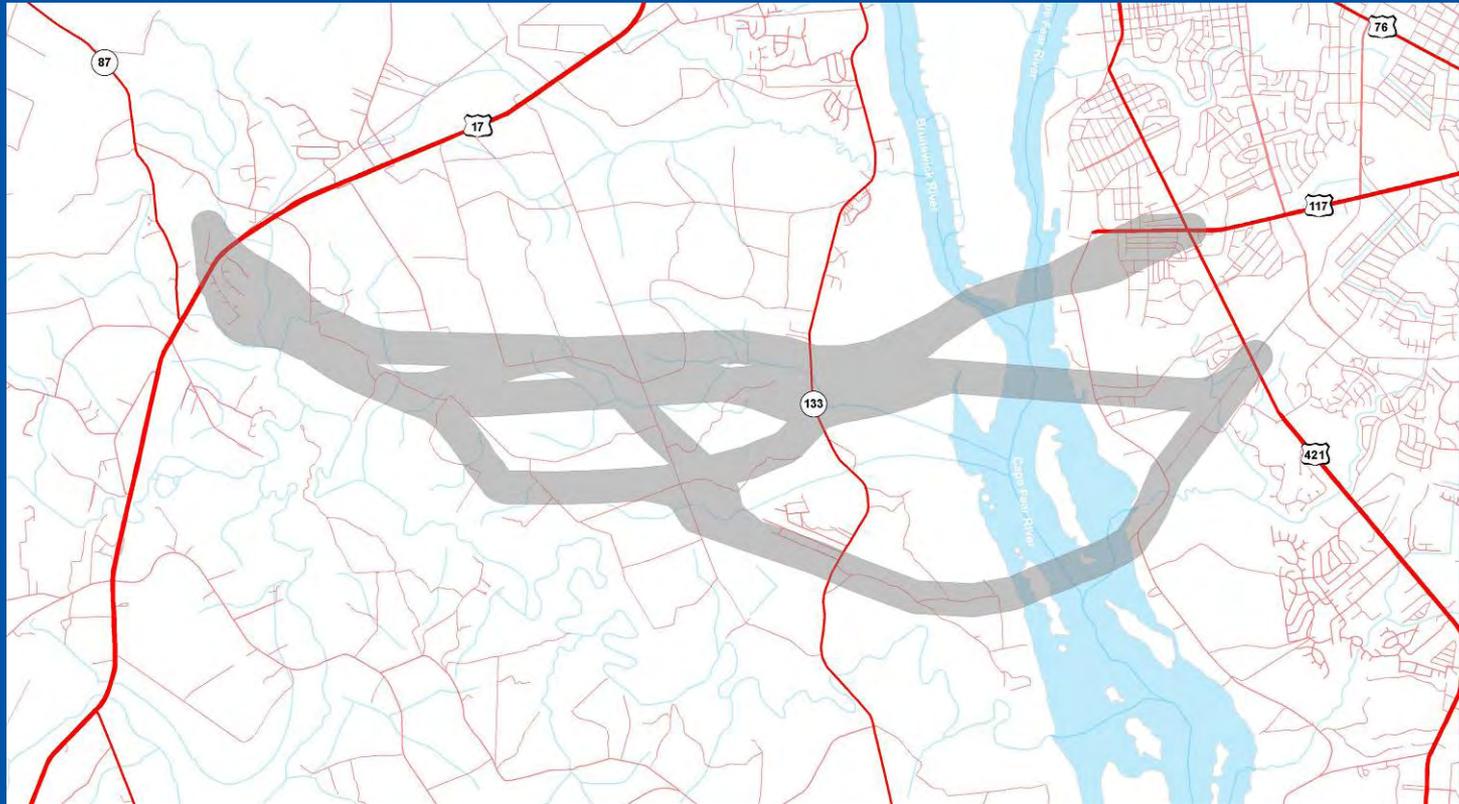
Alternatives Screening



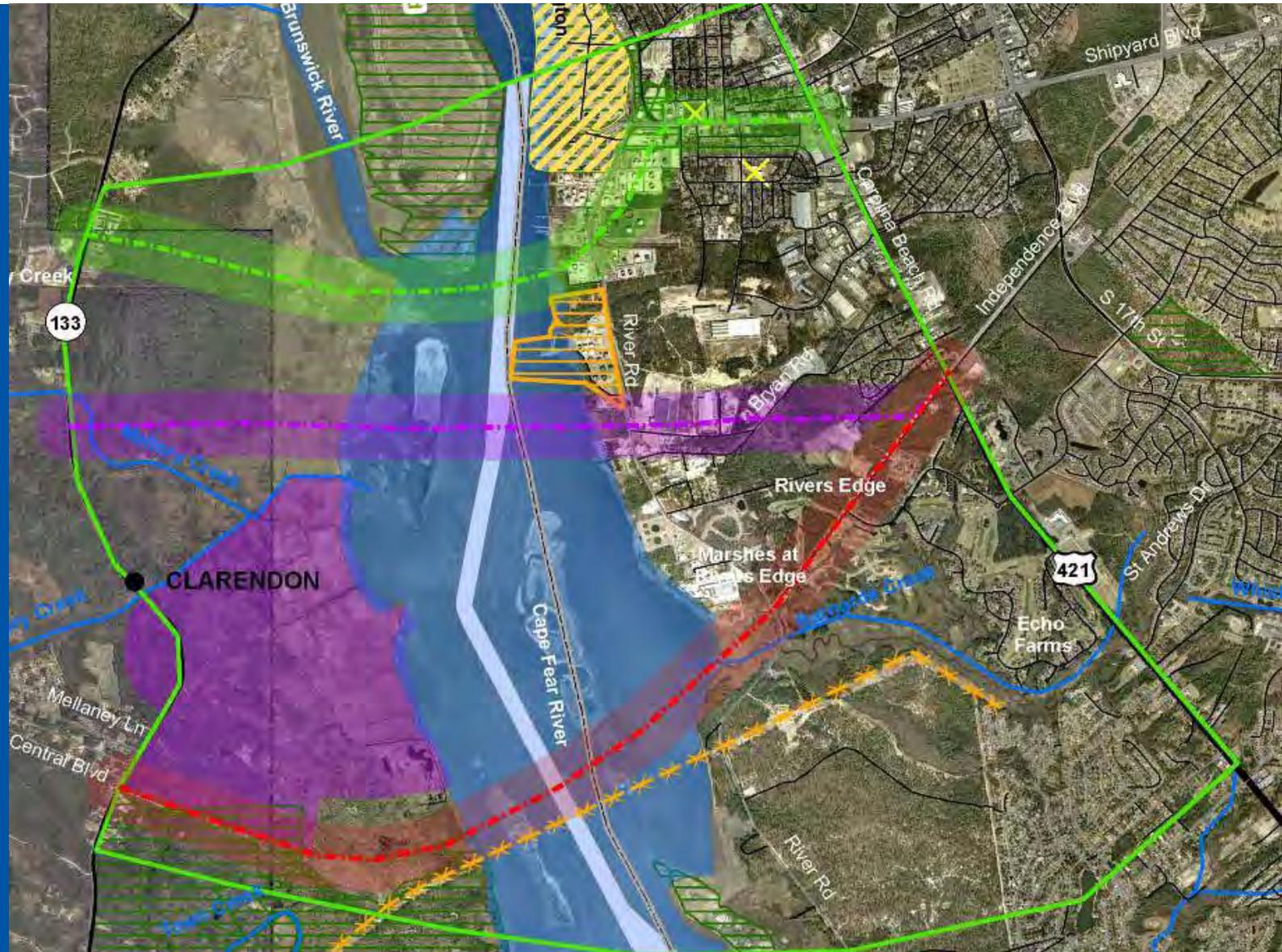
Preliminary Set of Alternative Corridors



Alternatives Screening

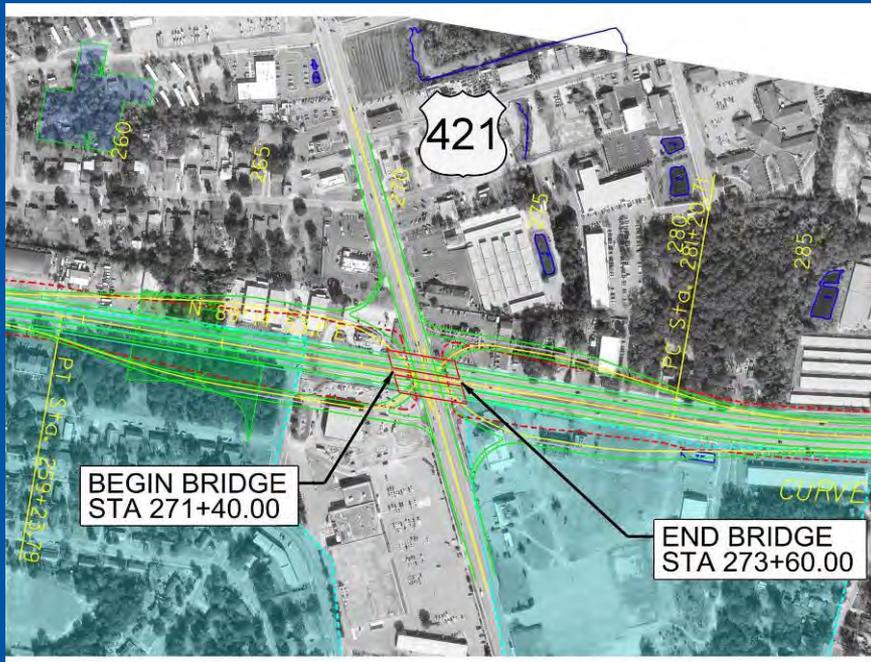


Alternative Corridors – Post Screening





US 421 Interchange Concepts - North



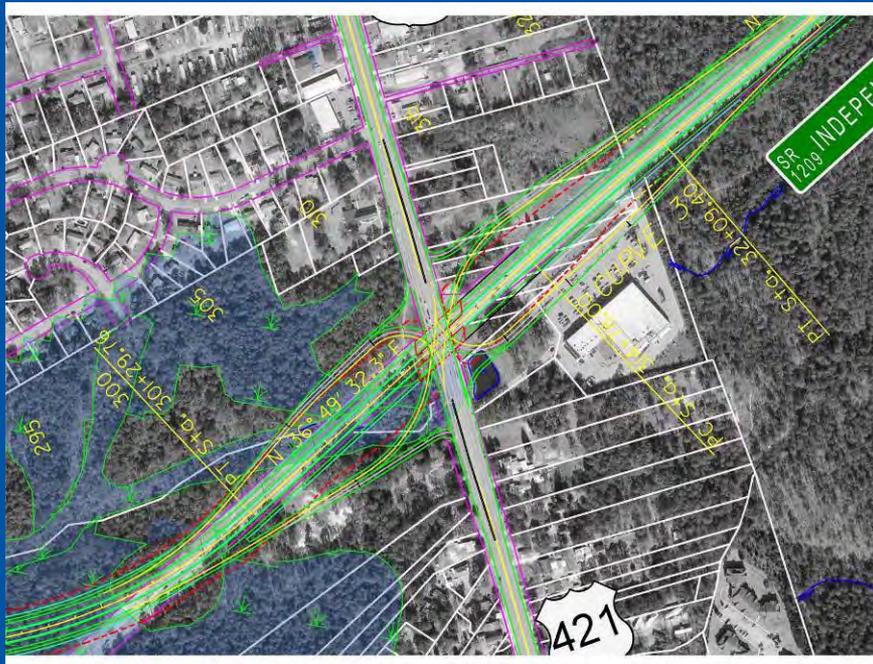
**Single Point
Urban Interchange**



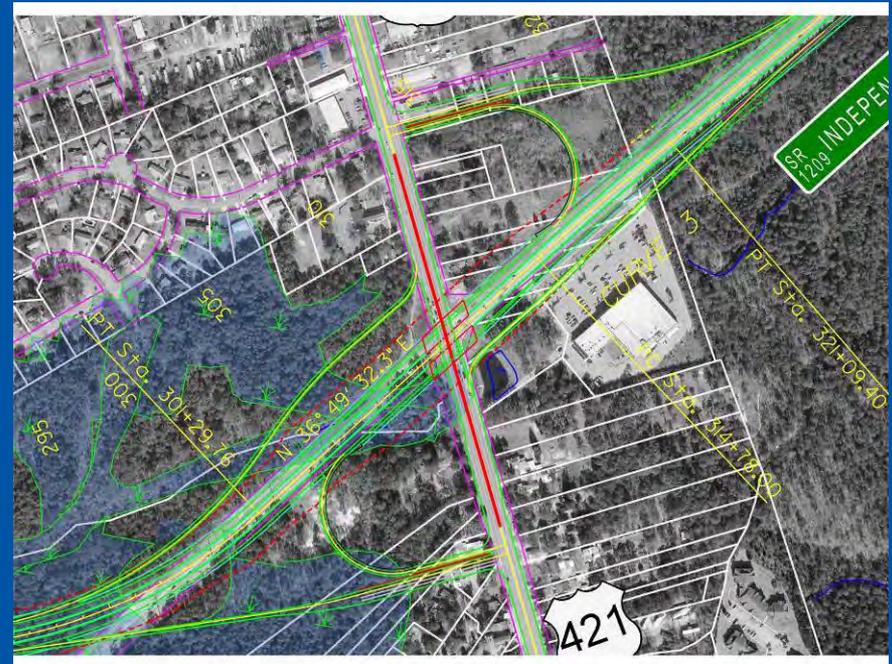
Partial Clover



US 421 Interchange Concepts - Central



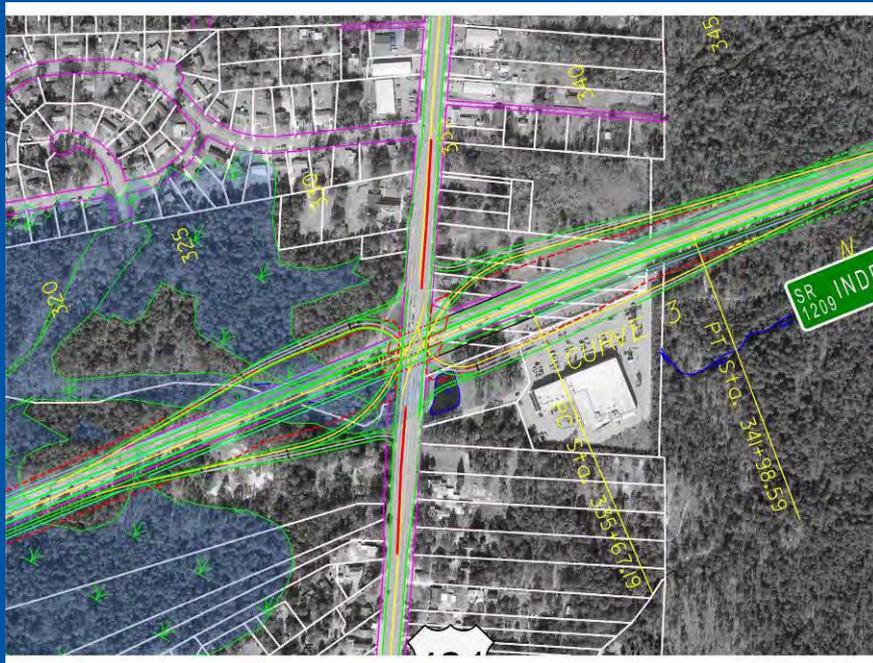
**Single Point
Urban Interchange**



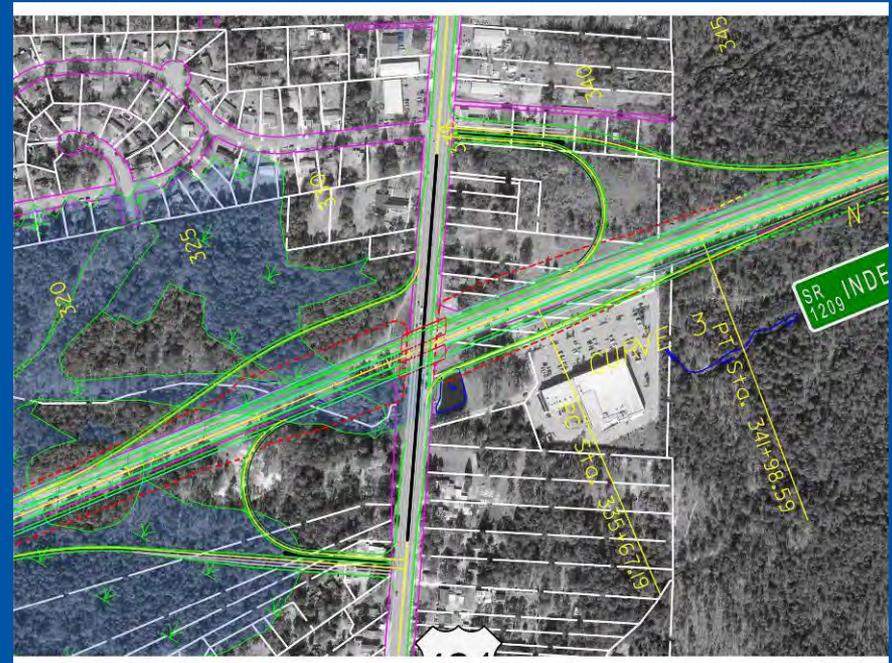
Partial Clover



US 421 Interchange Concepts - South



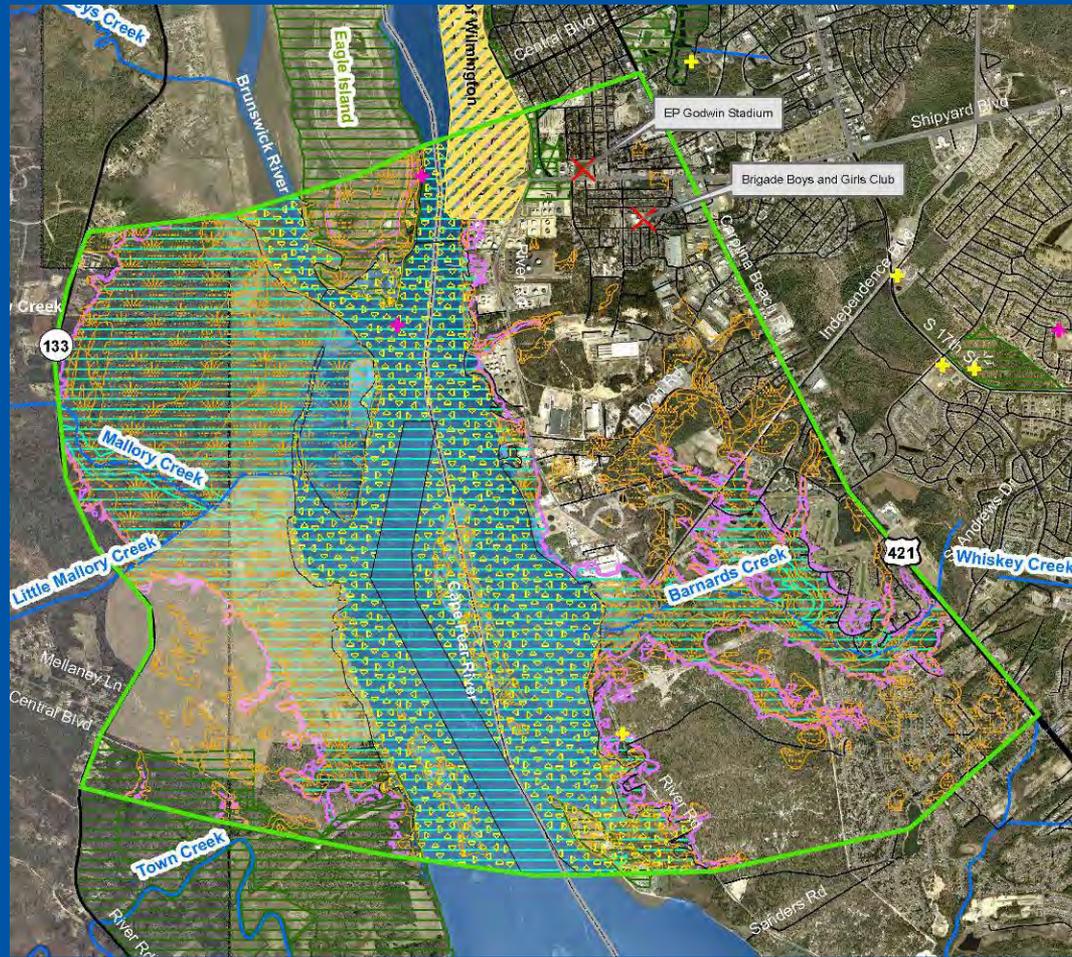
**Single Point
Urban Interchange**



Partial Clover

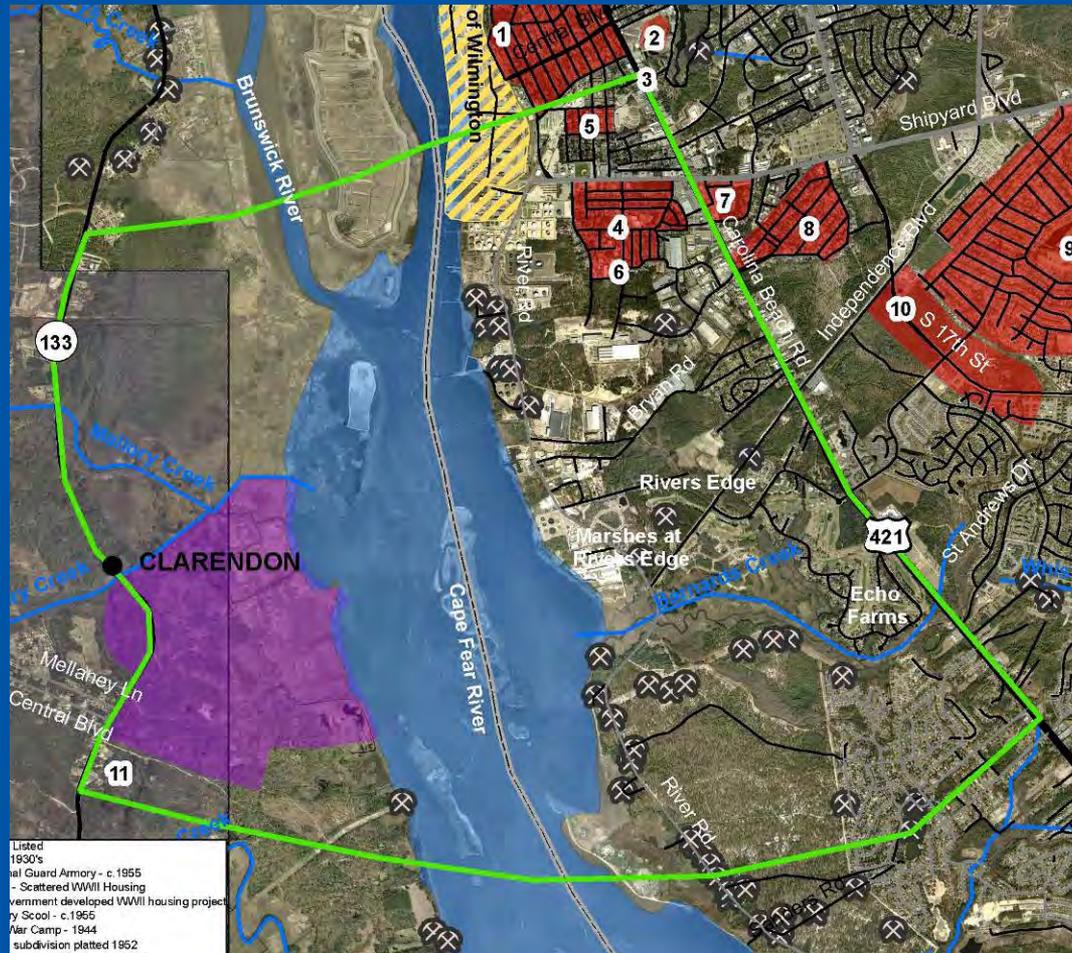


River Crossing Constraints - Environmental



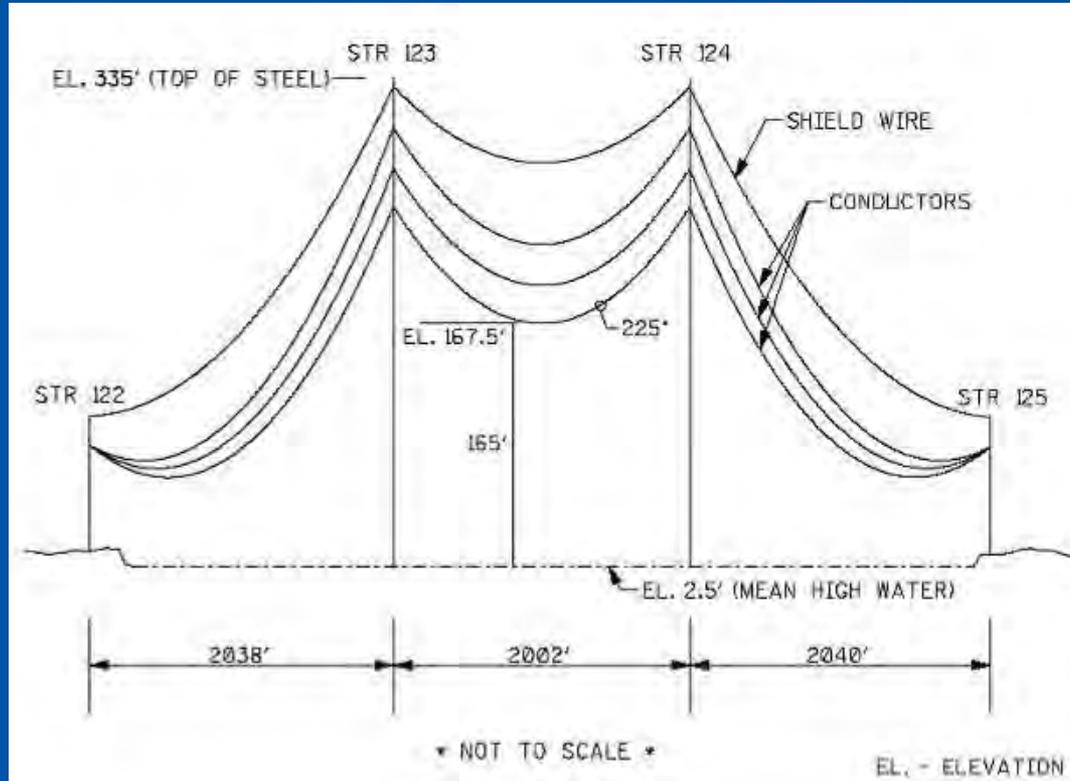


River Crossing Constraints - Cultural





River Crossing Constraints - Navigational



Vertical Clearance Requirements

Downstream Progress Energy Powerline — ~165' Vertical Clearance



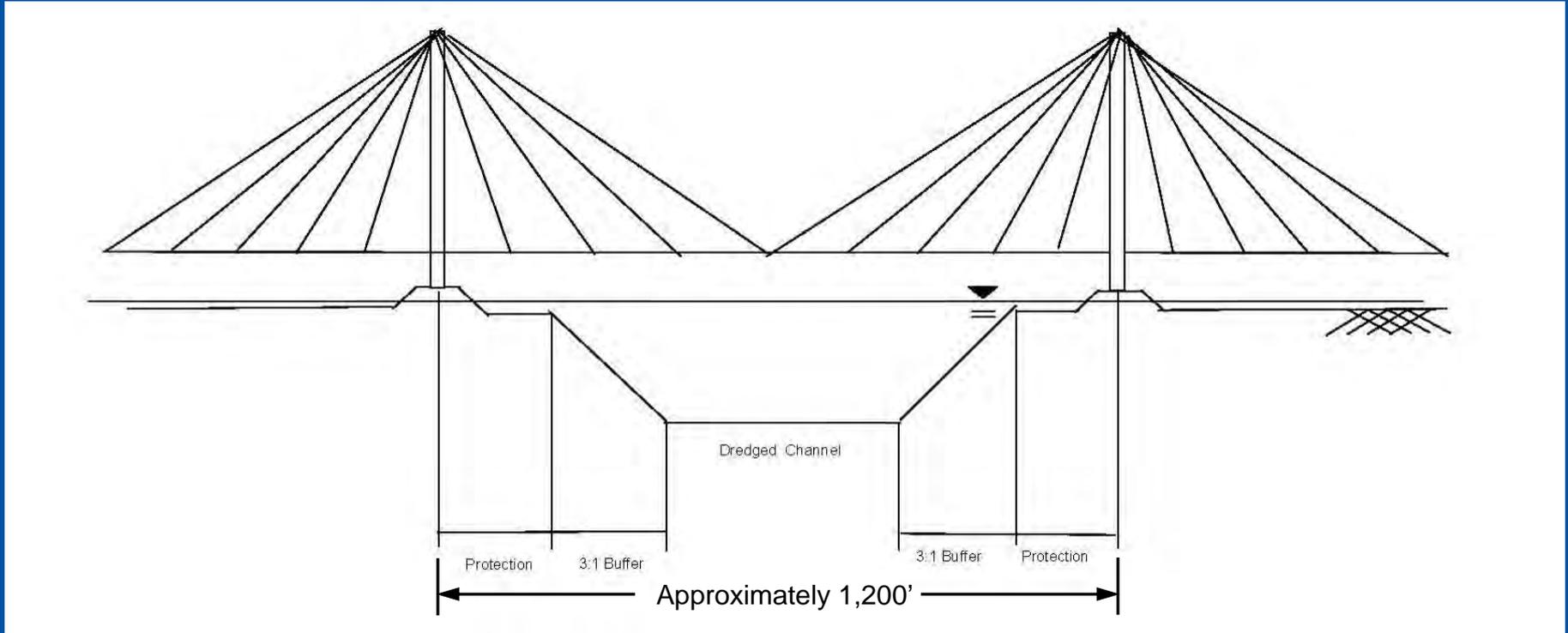
River Crossing Constraints - Navigational



Vertical Clearance Requirements
Upstream Cape Fear Memorial Bridge – ~135' Vertical Clearance



River Crossing Constraints - Navigational



Horizontal Clearance Requirements



Bridge Types – Movable Span



Lift Span

Cape Fear Memorial Bridge over Cape Fear River, Wilmington, NC



Bridge Types – Movable Span



Bascule

Woodrow Wilson Bridge over Potomac River, Alexandria, VA



Bridge Types – Movable Span

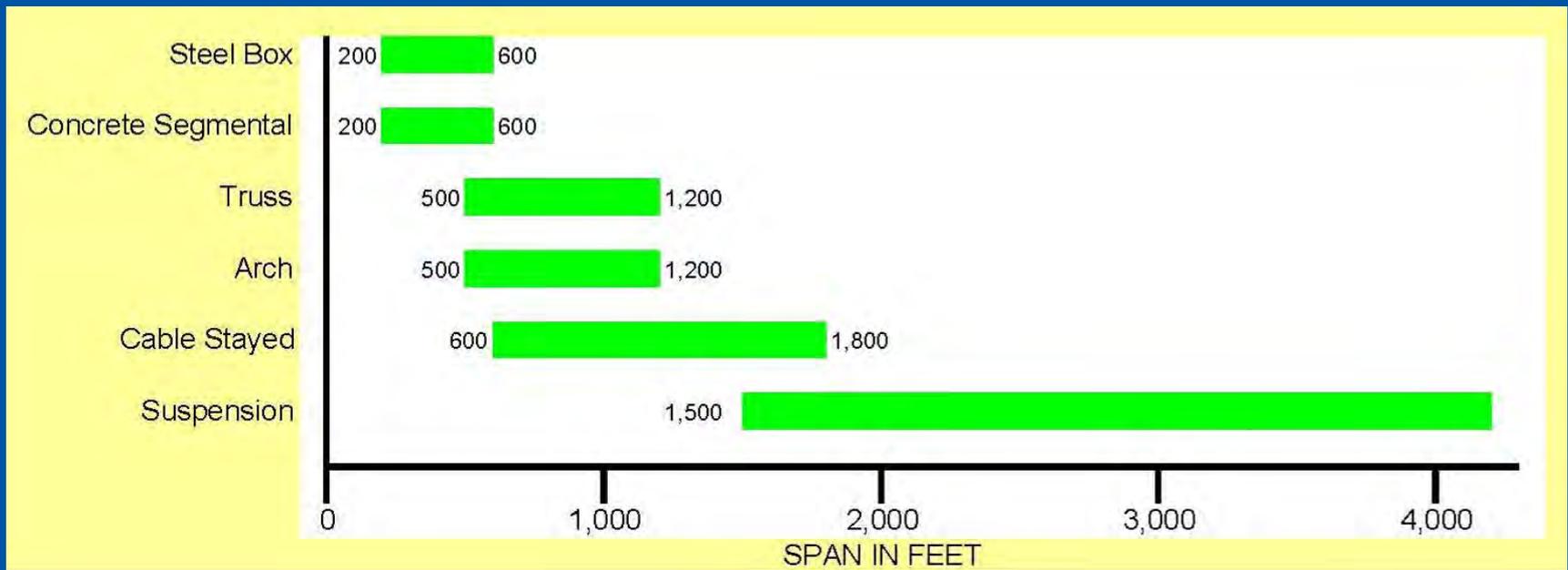


Swing Span

George P. Coleman Bridge over York River, Yorktown, VA

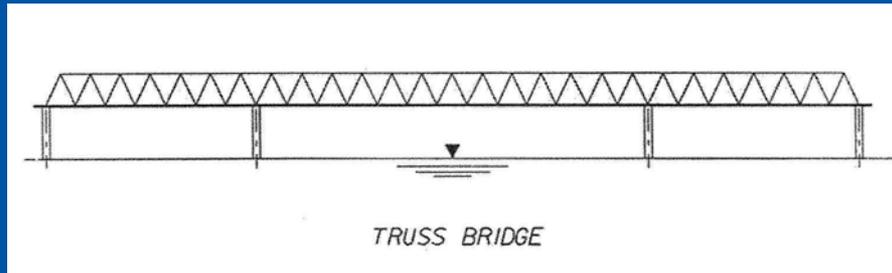


Bridge Type vs Span Range





Bridge Types – Fixed Span

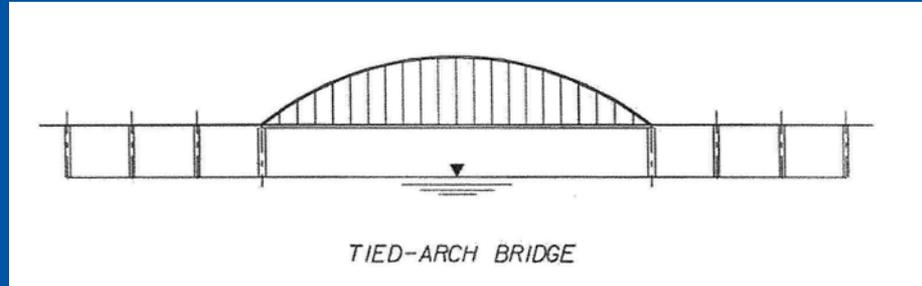


Truss

Newark Bay Bridge over Newark Bay, Bayonne, NJ



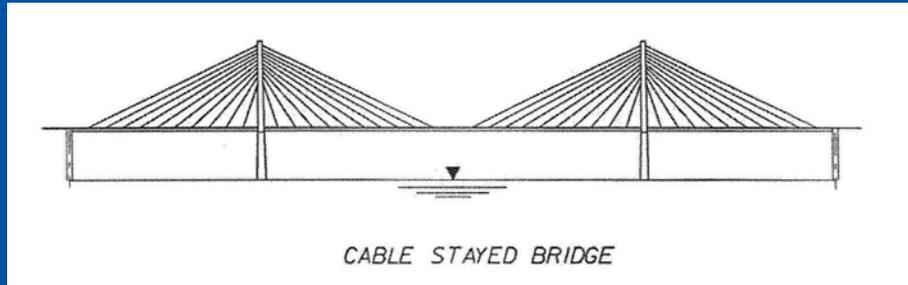
Bridge Types – Fixed Span



Tied Arch
Fremont Bridge over Willamette River, Portland, OR



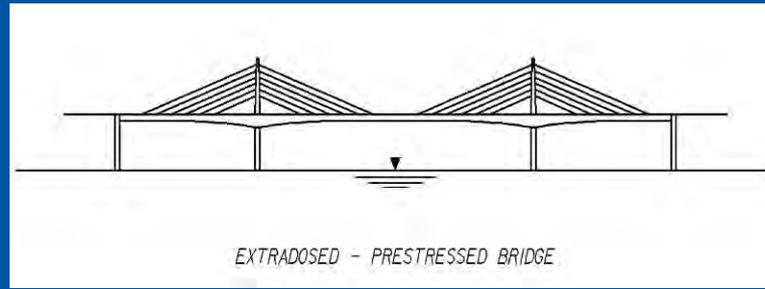
Bridge Types – Fixed Span



Cable Stayed
Sunshine Skyway Bridge over Tampa Bay, Tampa, FL



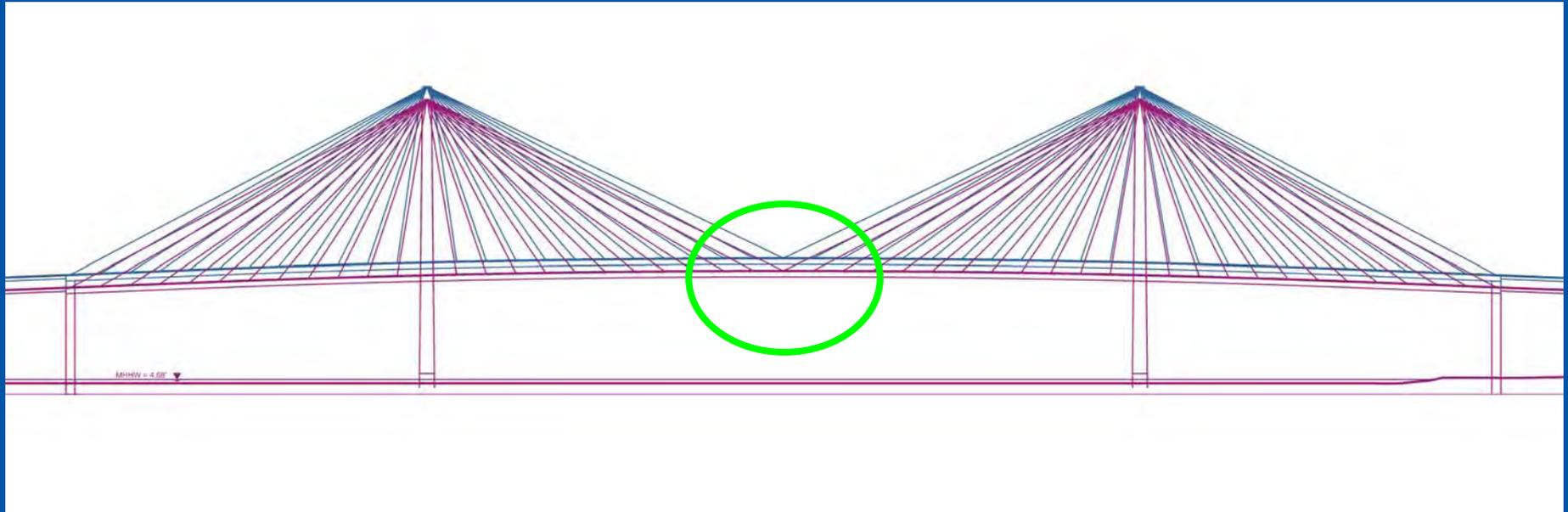
Bridge Types – Fixed Span



**Extradosed Prestressed
North Arm Bridge over Fraser River, Vancouver**



Plan Views – 187' Vertical vs 165' Vertical



165' vertical clearance

187' vertical clearance



NC 58 Emerald Isle Bridge Comparison





Holden Beach Bridge Comparison





Virginia Dare Bridge Comparison



Cape Fear Skyway Bridge

Main Span Length: 1,200'

Vertical Clearance: 187'

Virginia Dare Bridge

Main Span Length: ~230'

Vertical Clearance: ~65'



I-140 Wilmington Bypass Bridge Comparison





Cape Fear Memorial Bridge Comparison



Cape Fear Skyway Bridge

Main Span Length: 1,200'

Vertical Clearance: 187'

Cape Fear Memorial Bridge

Main Span Length: ~350'

Vertical Clearance: ~135' lifted



I-295 James River Bridge Comparison



Cape Fear Skyway Bridge

Main Span Length: 1,200'

Vertical Clearance: 187'

James River Bridge

Main Span Length: ~630'

Vertical Clearance: ~150'

Note Harp Design



Sunshine Skyway Bridge Comparison



Cape Fear Skyway Bridge

Main Span Length: 1,200'

Vertical Clearance: 187'

Sunshine Skyway Bridge

Main Span Length: ~1,200'

Vertical Clearance: ~175'



Cooper River Bridge Comparison

Cape Fear Skyway Bridge

Main Span Length: 1,200'

Vertical Clearance: 187'

Cooper River Bridge

Main Span Length: ~1,550'

Vertical Clearance: ~187'





Verrazano Narrows Bridge Comparison



Cape Fear Skyway Bridge

Main Span Length: 1,200'

Vertical Clearance: 187'

Verrazano Narrows Bridge

Main Span Length: ~4,260'

Vertical Clearance: ~228'