



FLORIDA

Freight, Logistics & Passenger Operations



FLORIDA DEPARTMENT OF TRANSPORTATION



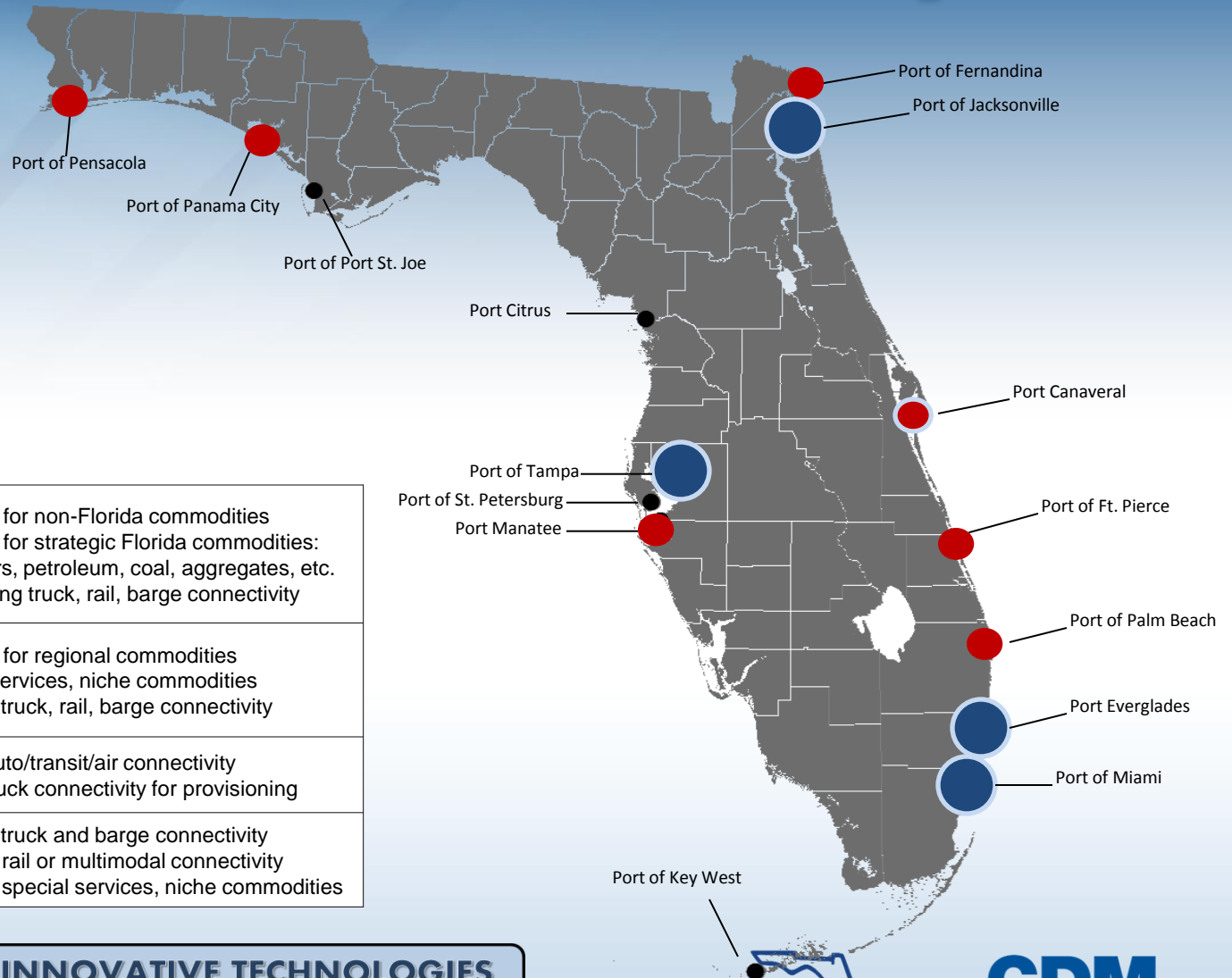
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Overview of Florida's Seaports



	Major Cargo Gateway Port (Deep Draft)	<ul style="list-style-type: none"> • Gateway for non-Florida commodities • Gateway for strategic Florida commodities: containers, petroleum, coal, aggregates, etc. • Very strong truck, rail, barge connectivity
	Regional Cargo Gateway Port	<ul style="list-style-type: none"> • Gateway for regional commodities • Special services, niche commodities • Effective truck, rail, barge connectivity
	Major Cruise Port	<ul style="list-style-type: none"> • Strong auto/transit/air connectivity • Strong truck connectivity for provisioning
	Regional Port	<ul style="list-style-type: none"> • Effective truck and barge connectivity • Potential rail or multimodal connectivity • Potential special services, niche commodities

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Overview of Florida's Seaports

- ❖ Since 2011, the state has invested more than \$640 million in Florida's deepwater ports.
- ❖ September 2013: Gov. Scott announced a \$150 million investment in critical Florida port projects
- ❖ October 2013: Gov. Scott announced plans for an additional \$35 million in Florida port projects.



Florida's Department of Transportation's (FDOT) Focus on Marine Related Technology

Presentation Overview:

- ❖ **Bridge Height Restriction and Collision Avoidance Monitoring**
- ❖ **Autonomous Freight Vehicles and Marine Terminal Automation**
- ❖ **Key Environment Initiatives and Clean Burning Fuels (LNG/CNG)**

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❖ Bridge Height Restriction and Collision Avoidance Monitoring

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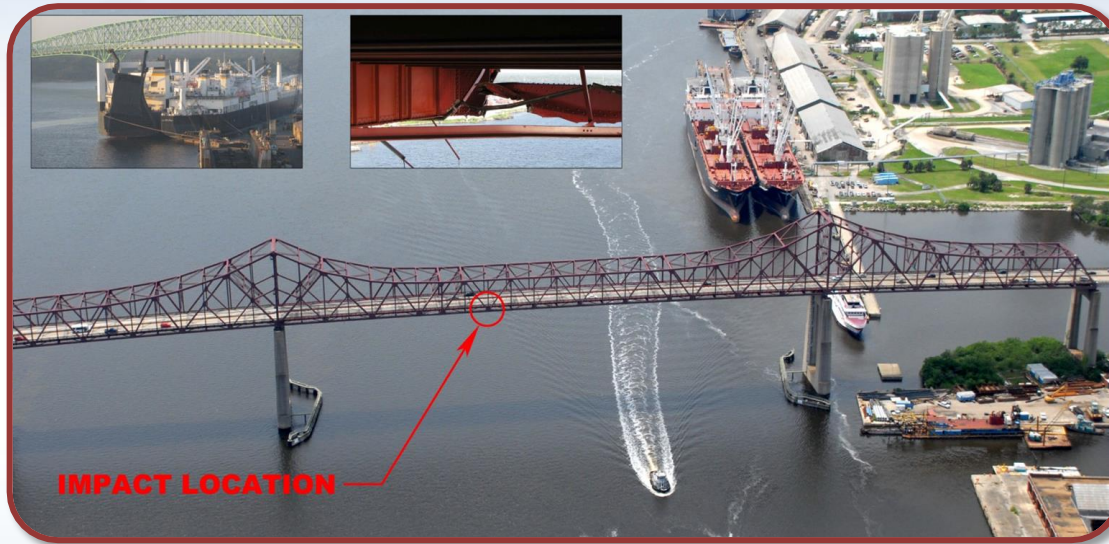


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Bridge Height Restriction and Collision Avoidance Monitoring

Thursday, Sept. 26, 2013 – Day of Impact



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Bridge Height Restriction and Collision Avoidance Monitoring

Inspection Findings:

- ❖ Bottom Tension Chord Severed
- ❖ Bottom Laterals Failed
- ❖ Gusset Plate Damage
- ❖ Floor beam Movement



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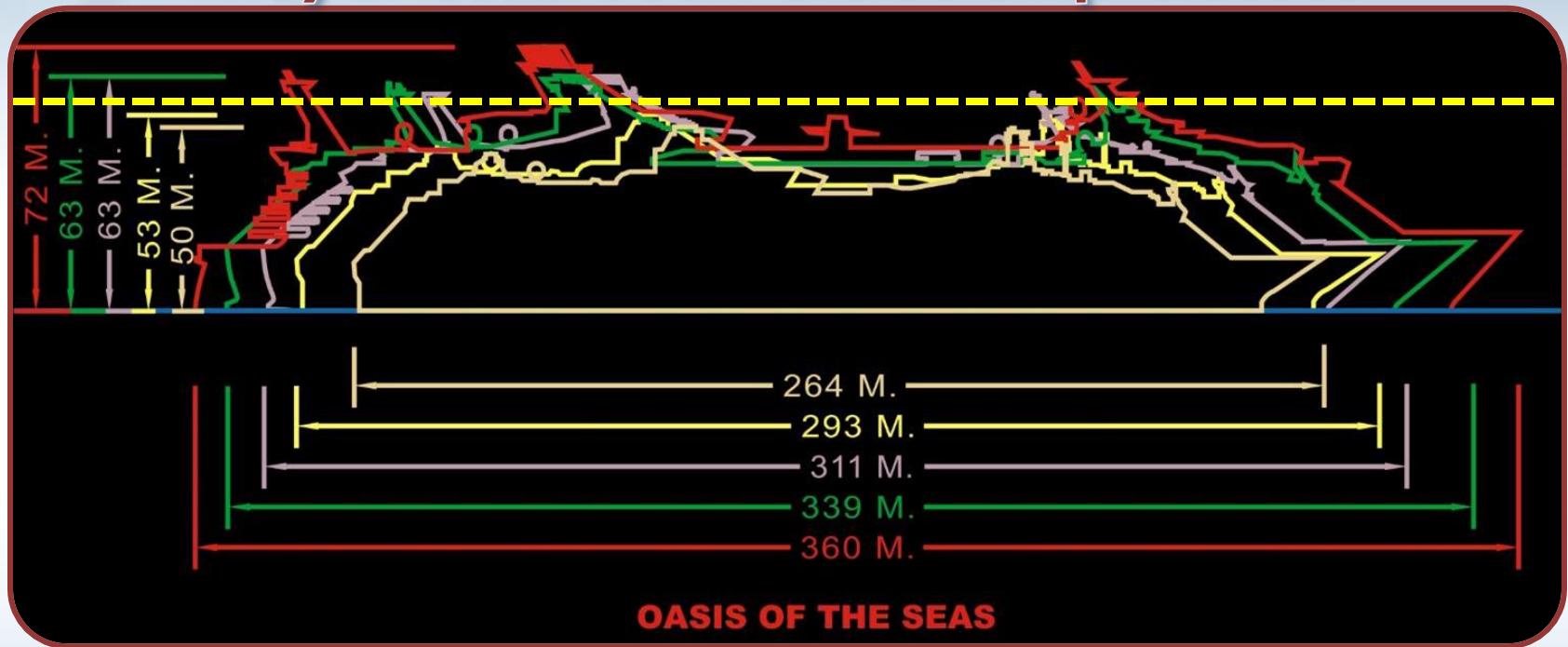
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Bridge Height Restriction and Collision Avoidance Monitoring

Royal Caribbean Cruise Ship Classes



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Bridge Height Restriction and Collision Avoidance Monitoring

- ❖ **What Will Happen To Tampa Bay Business As Ships Get Larger?**
- ❖ **Most Ships Can No Longer Transit Under The Sunshine Skyway Bridge**



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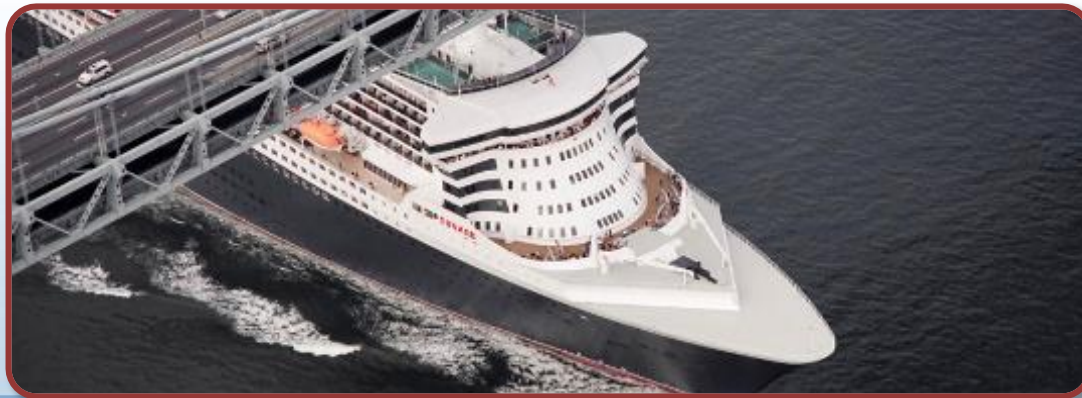
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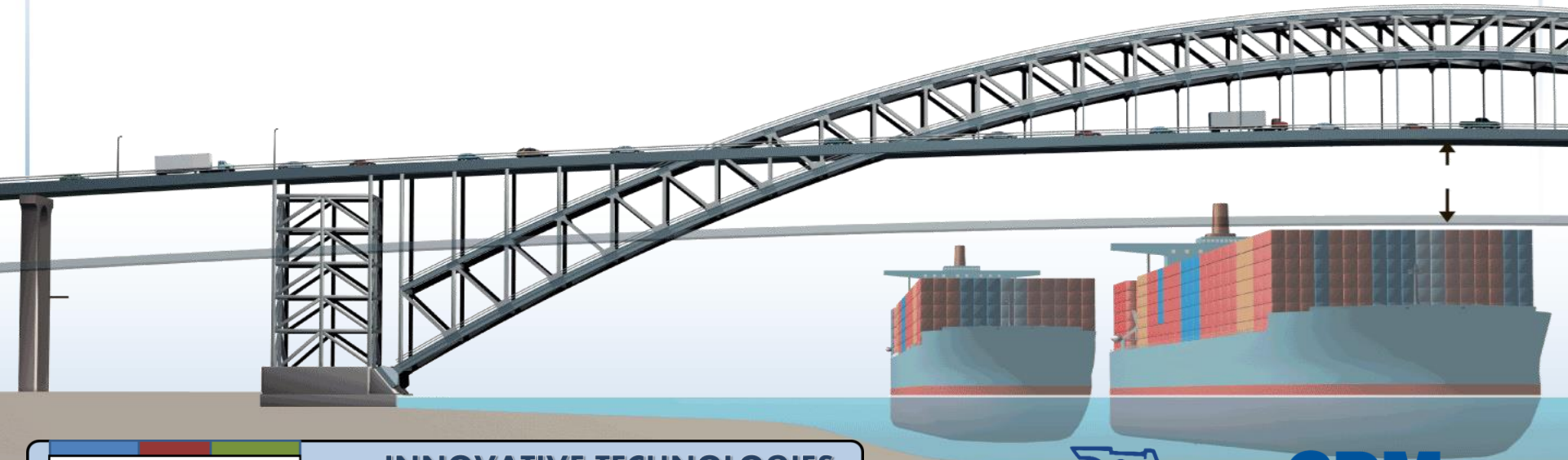
Bridge Height Restriction

- ❖ **New York – Verrazano Narrows Bridge** 219'
- ❖ **San Francisco – Golden Gate Bridge** 225'
- ❖ **Suez Canal – Peace Bridge** 230'
- ❖ **Panama Canal – The Americas Bridge** 201'
- ❖ **Tampa Bay - Sunshine Skyway Bridge** 180'



Bridge Height Restriction and Collision Avoidance Monitoring

- ❖ How others are dealing with this issue – NY/NJ (Bayonne)
- ❖ Raising the bridge 64 feet - from 151 feet to 215 feet air draft



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Bridge Height Restriction and Collision Avoidance Monitoring

- ❖ **NOAA Air Gap Sensor on Dames Point Bridge in Jacksonville, Florida.**
- ❖ **Uses Laser and Radar to take measurements every 6 minutes.**



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Bridge Height Restriction and Collision Avoidance Monitoring

- ❖ Growth in trade will heighten the need for the nation's maritime assets and related multimodal transportation systems to be performing at peak capacity.
- ❖ Experts estimate Post-Panamax vessels currently account for 16% of the world's container fleet and, 45% of the capacity of the fleet.



	Panamax	Post-Panamax
Capacity:		
Containers(TEUs)	4,500	12,000
Dimensions:		
Beam	32m (106')	49m (160')
Length	294m (965')	366m (1,200')
Draft	12m (39.5')	15m (50')

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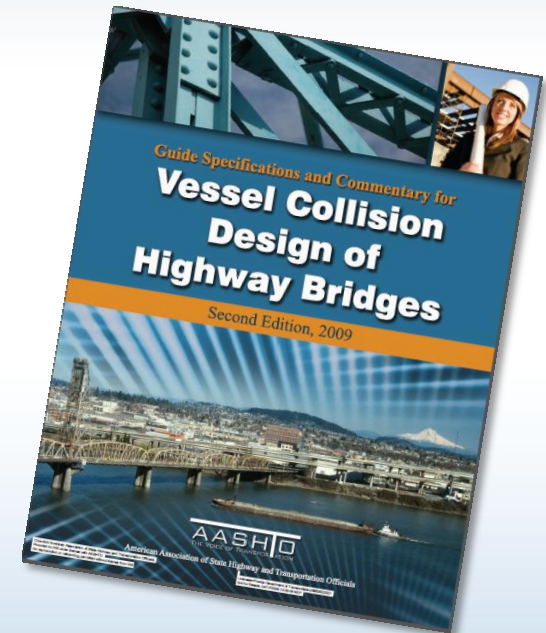
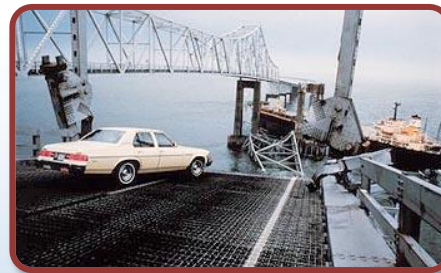
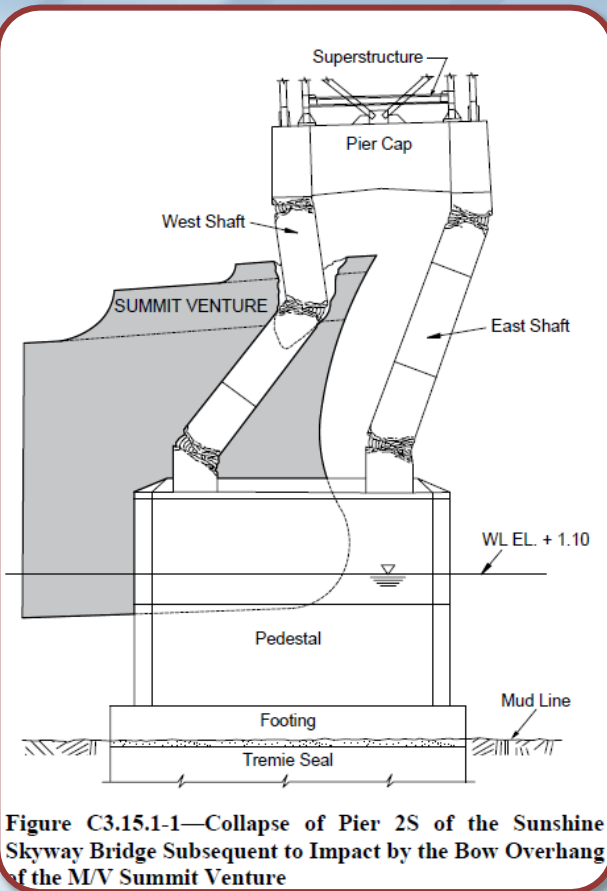


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Bridge Height Restriction and Collision Avoidance Monitoring

- ❖ Skyway Collision in 1983
- ❖ 37 People Died from Driving off



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Bridge Height Restriction and Collision Avoidance Monitoring

- ❖ **FDOT Working with Partners to perform a research and development project seeking to consolidate existing technologies.**
- ❖ **Key Initiatives include safety to passengers, protection of infrastructure and monitoring occurrence of incidents.**

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❖ Autonomous Freight Vehicles and Marine Terminal Automation

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Florida Automated Vehicles

- 2012:** Florida passes House Bill 1399, sponsored by Senator Jeff Brandes
- 2013:** First Florida Automated Vehicles Summit (Tampa)
- 2014:** Working Groups, Pilot Projects, Research, and the 2nd Annual FAV Summit

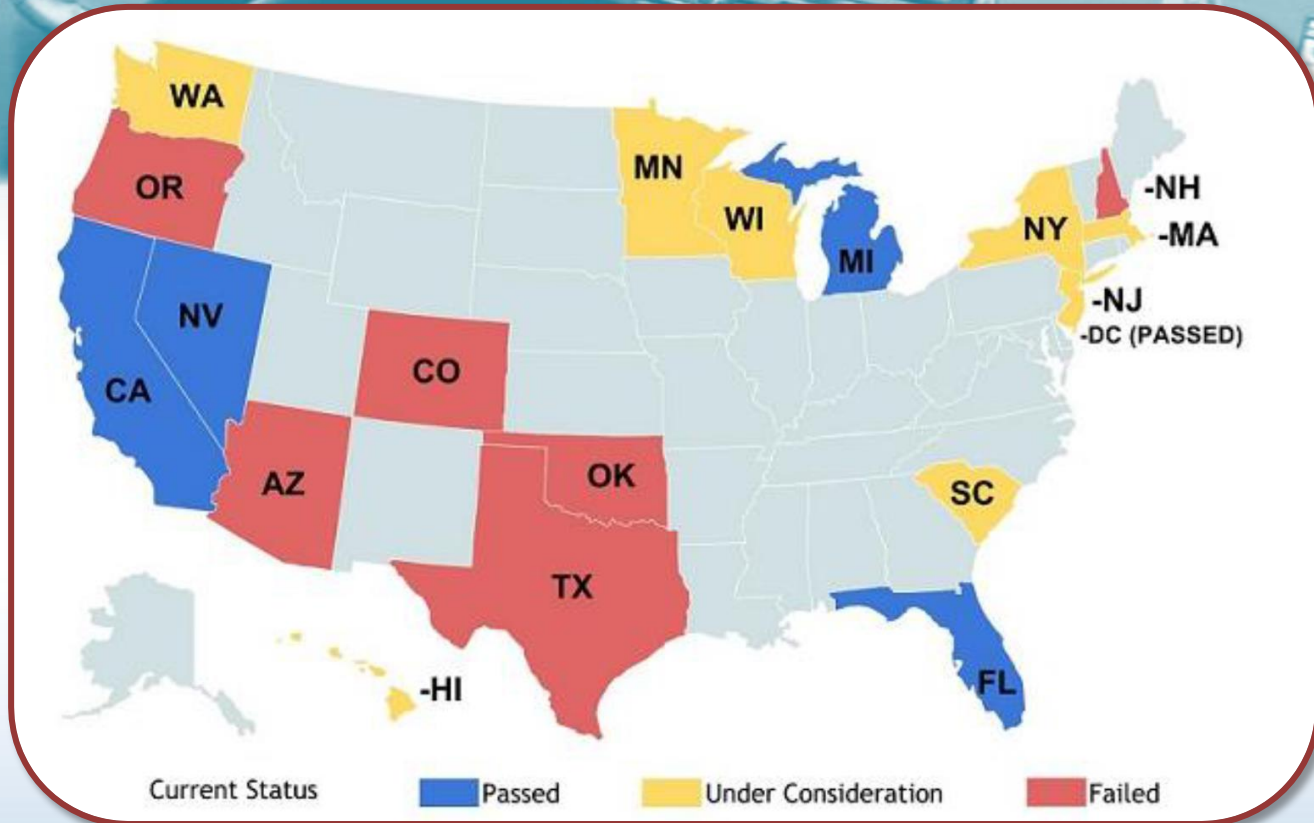


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Florida Automated Vehicles Currently Legislation for Testing Automated Vehicles in Four States





Florida's Marine Terminal Automation



2014:

PortMiami Received 6 New Super Post Panamax Cranes that can operate fully electric and have technology to be semi-autonomous.

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Florida's Marine Terminal Automation



Currently in 2014:

FDOT has established a freight working group on automated vehicles.

December of 2014:

FDOT is inviting several Autonomous Freight Vehicle Manufacturers to the Statewide Summit.

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Key Environment Initiatives and Clean Burning Fuels (LNG/CNG)

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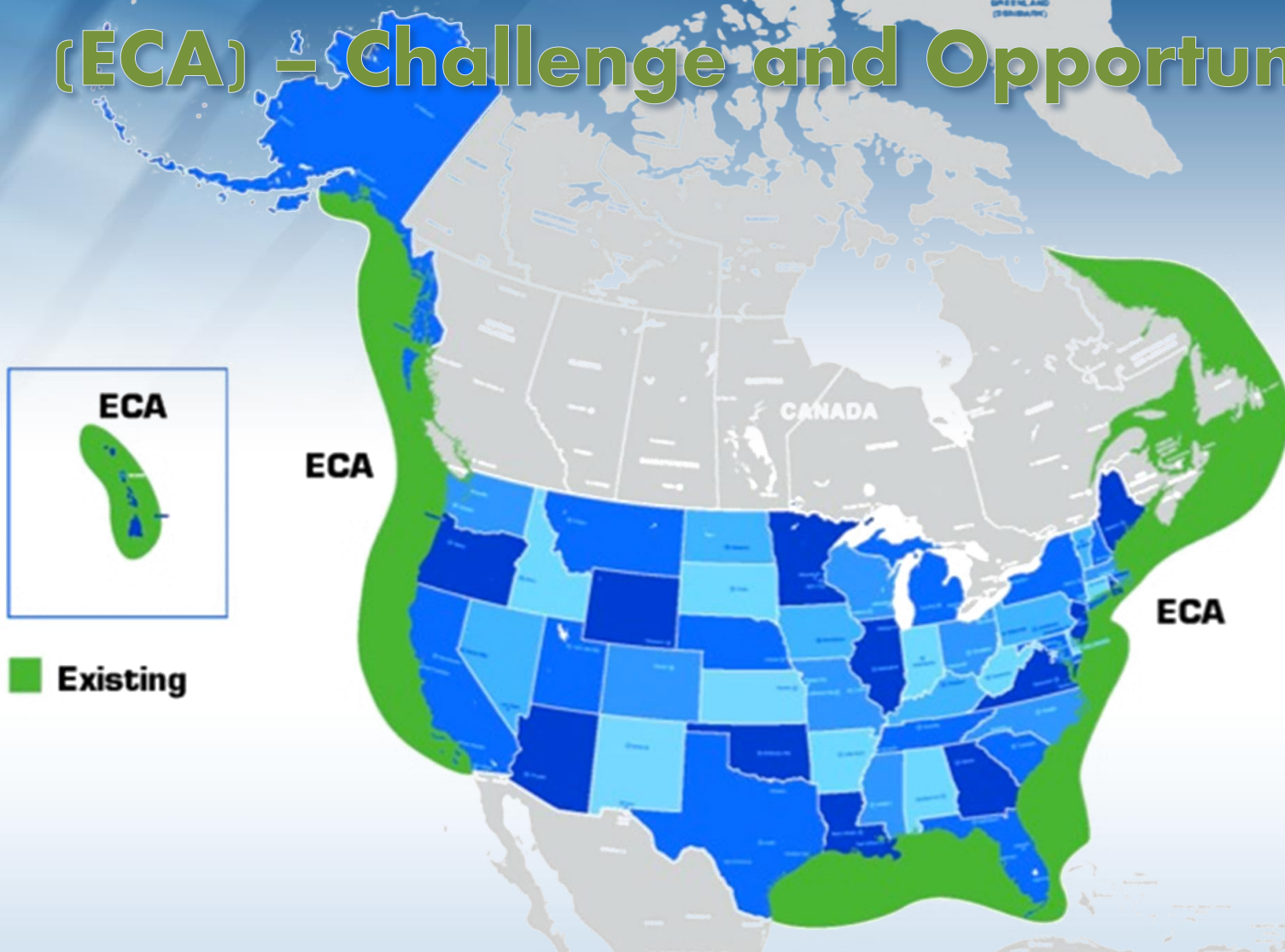
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North American Emission Control Area (ECA) – Challenge and Opportunity



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Key Environment Initiatives and Clean Burning Fuels (LNG/CNG)

Possible Solutions to the ECA

- ❖ **Do nothing:** Cost of 1% compliant IFO 380 is significantly higher with further increases expected in 2015 and beyond
- ❖ **Install exhaust gas cleaning system:** Scrubbers use existing fuel with added costs
- ❖ **Convert to Natural Gas:** Meet all current and future emissions requirements, cleanest of all options

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Key Environment Initiatives and Clean Burning Fuels (LNG/CNG)

- ❖ Conversion to natural gas will reduce ship emissions well below even the world's most stringent air quality standards that are outlined in the North American Emissions Control Areas
- ❖ LNG will virtually eliminate Particulate Matter (PM), Sulfur Dioxide (SO_x) and Nitrous Oxide (NO_x) and dramatically reduce , Carbon Dioxide (CO₂).
- ❖ No other viable fuel source provides the same levels of environmental safety



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Key Environment Initiatives and Clean Burning Fuels (LNG/CNG)



Marlin Class

- ❖ 3100 TEU
- ❖ First LNG container ships in the world
- ❖ Dual fuel capable MAN engine
- ❖ Bunker in Jacksonville
- ❖ First delivery 4th QTR 2015, second early 2016

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Key Considerations in Maritime Investments in LNG

- ❖ Natural gas commodity prices are low relative to marine petroleum fuels
- ❖ To be used as a marine fuel natural gas must be liquefied to increase its energy efficiency
- ❖ Conversion of vessels to LNG is expensive (conversion of engines, installation of LNG storage tanks and related safety systems)
- ❖ Target vessels with high utilization and fuel use relative to size and engine power (maximize fuel cost savings)
- ❖ Economics of any specific project will hinge on: (1) vessel fuel use; (2) delivered LNG prices; and (3) vessel conversion costs

Key Considerations in Maritime Investments in LNG

- ❖ **Conversion to natural gas will reduce ship emissions well below even the world's most stringent air quality standards that are outlined in the North American Emissions Control Areas**
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Questions and Answers



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