

# A BRIDGE TOO CLOSE

---

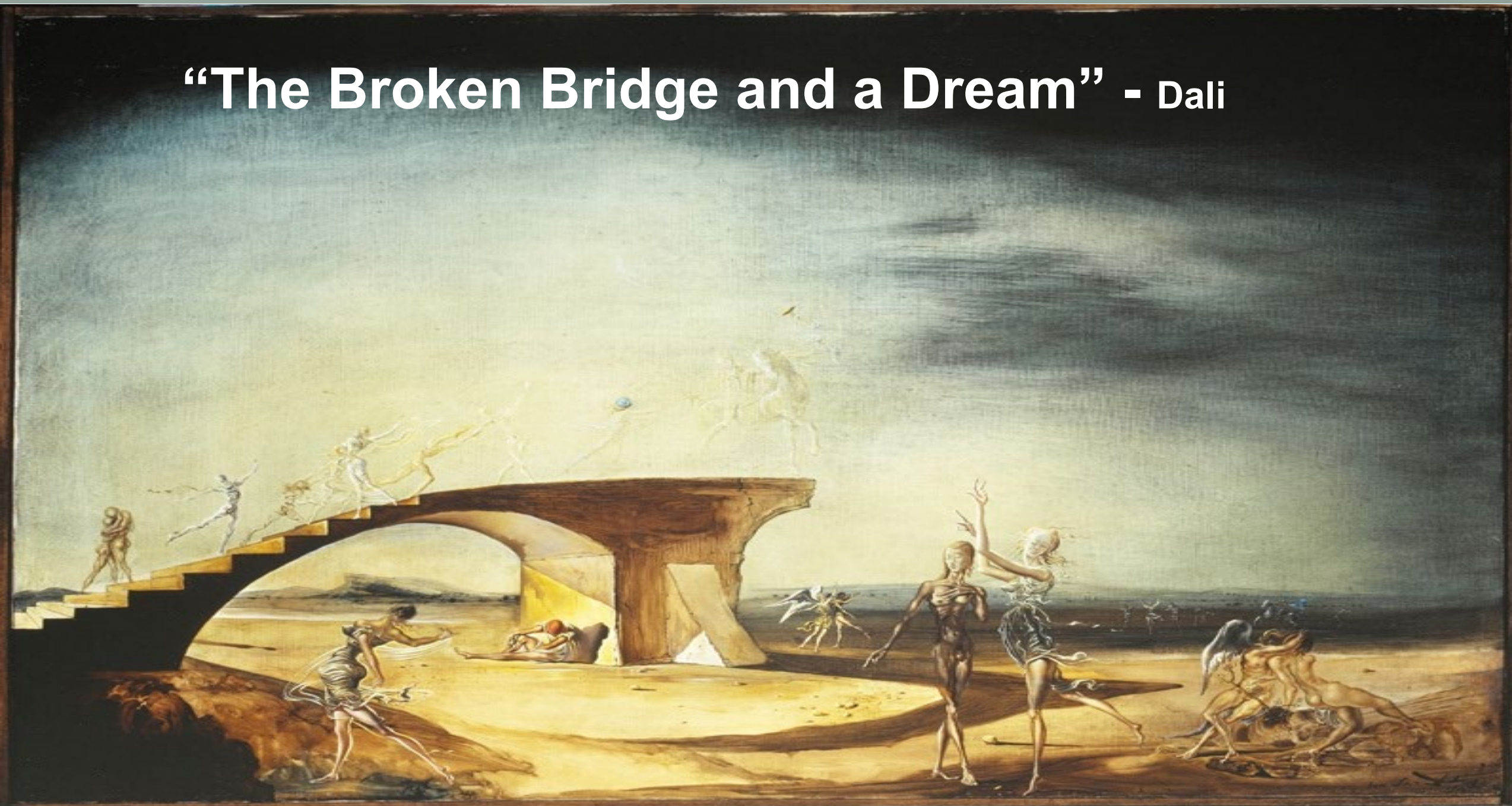
Response Challenges in the USA  
September 16<sup>th</sup>  
Berlin

Mauricio M. Garrido  
T&T Salvage LLC

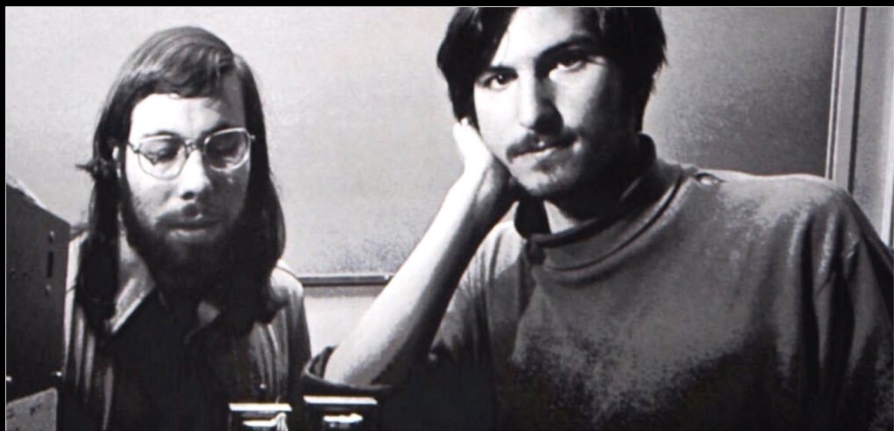
“16\_Sep\_Mauricio Garrido\_Legal & Liability\_W\_02”



# “The Broken Bridge and a Dream” - Dali







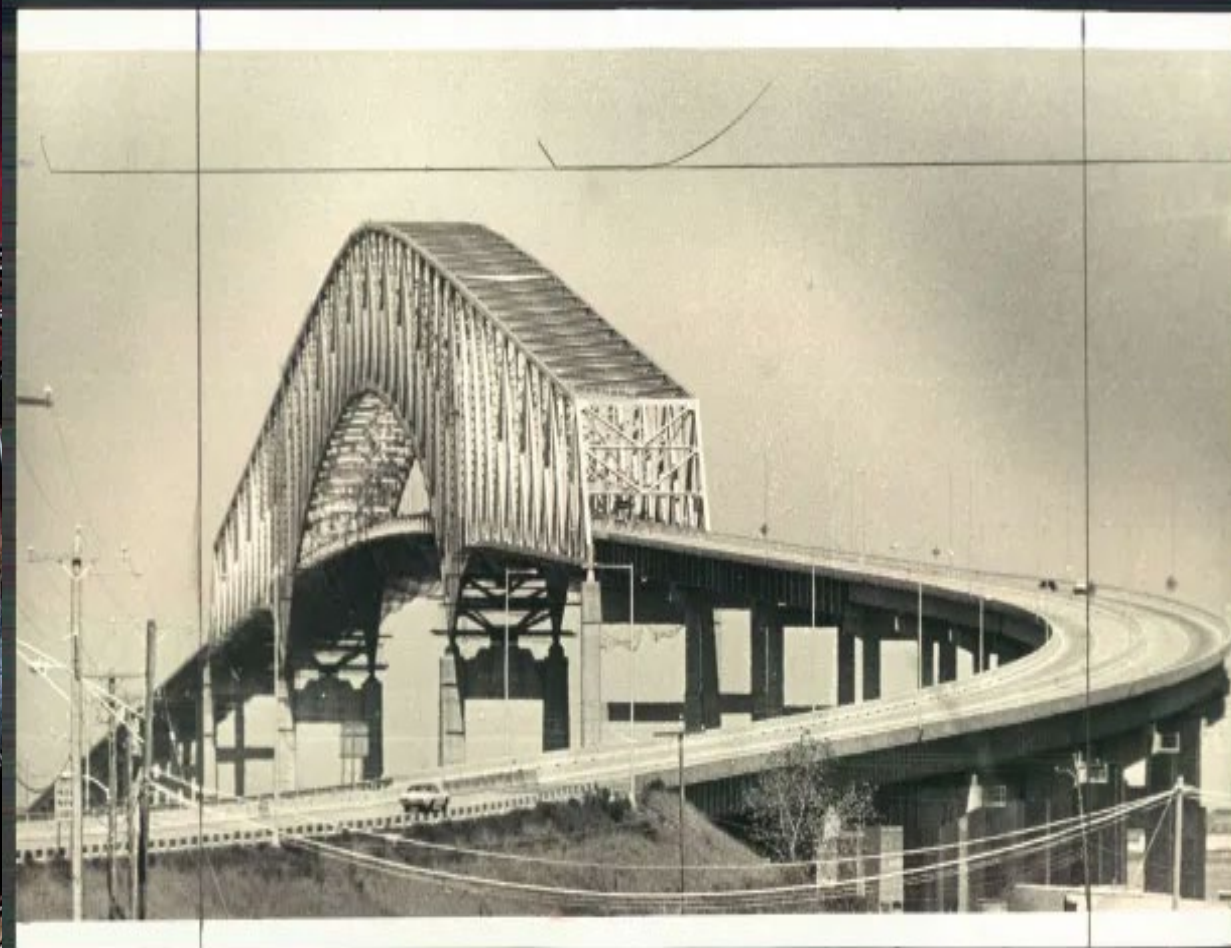
apple incorporated

January 3, 1977





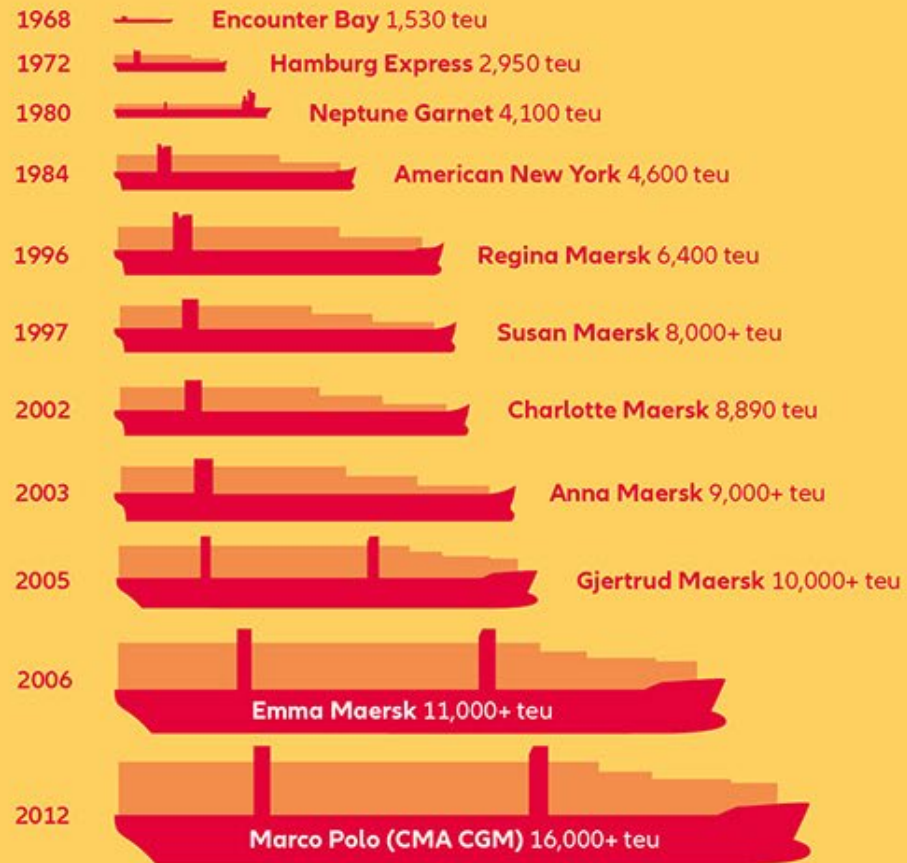
# 1977







## 50 YEARS OF CONTAINER SHIP GROWTH

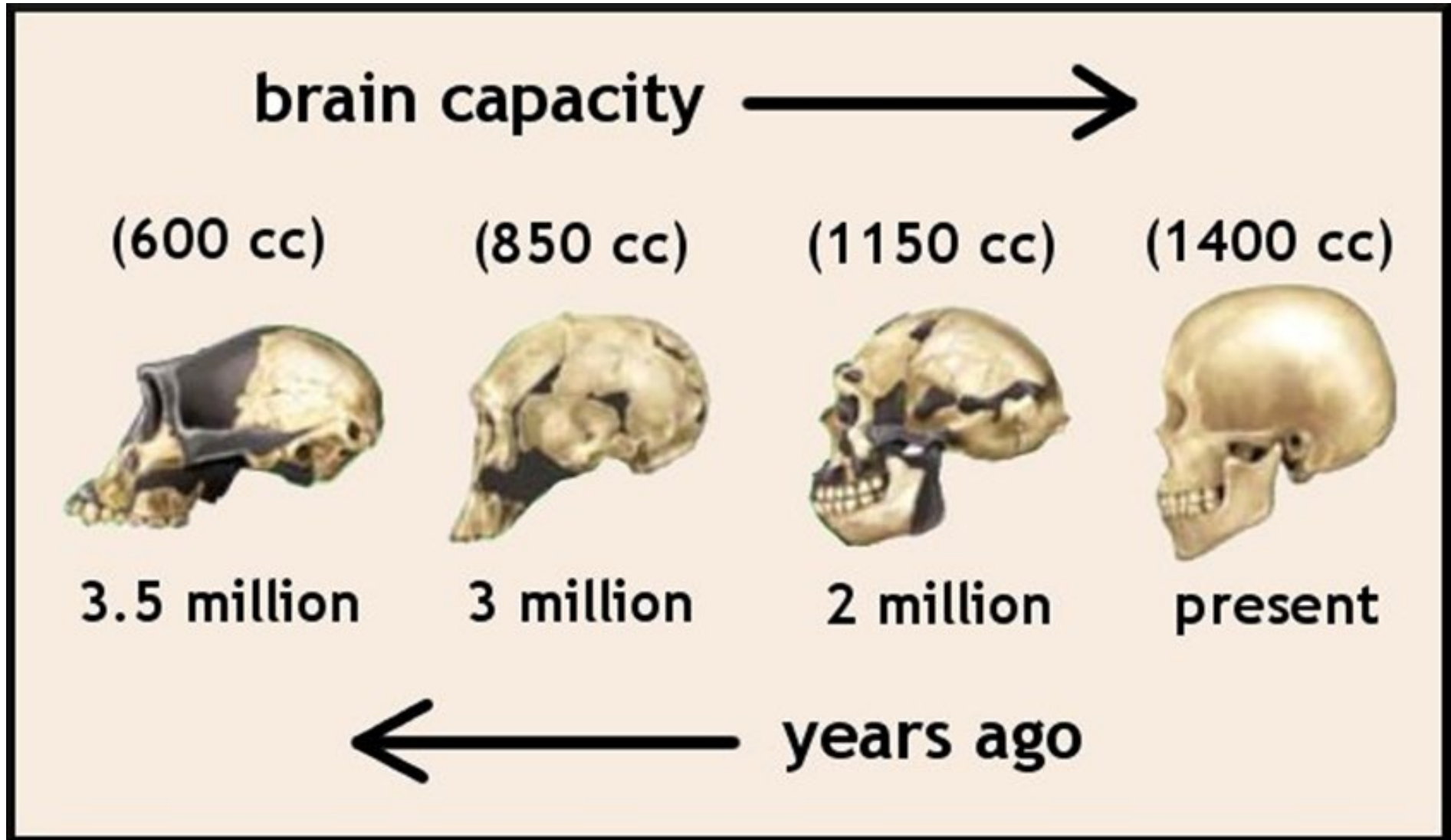


Container-carrying capacity has increased by around **1,500% since 1968** and has almost doubled over the past decade

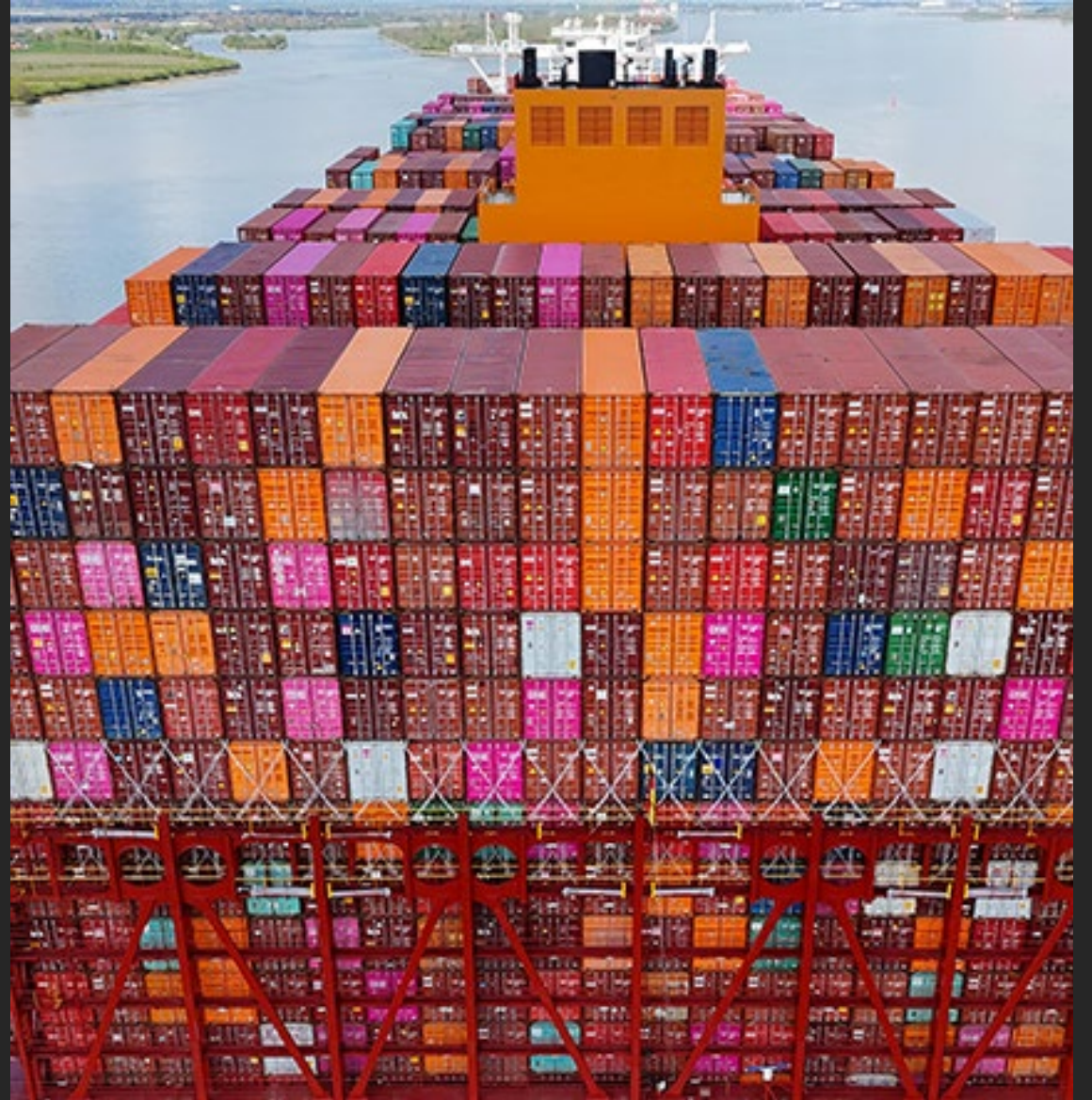




# EVOLUTIONARY MISMATCH



















**Nope!**





## AILWAY BRIDGE OVER THE SUEZ CANAL

- On December 31st 1954 a Liberian tanker rammed a steel bridge across the Suez Canal and company officials announced the waterway would be closed for the next eight days for repairs. The 10,892 ton tanker 'World Peace' stuck fast broadside across the channel at El Firdan about 50 miles south of Port Said.

A large section of the bridge was torn free and dropped onto the deck of the ship but there were no casualties. Canal Company officials said the waterway would be closed to all ships for eight days whilst very important damage was repaired. The tanker was en route to Gibraltar from Kuwait.

## Severn Railway Bridge

- On 25 October 1960, in thick fog and a strong tide, two barges (named the Arkendale H and Wastdale H) which had overshot Sharpness Dock, collided with one of the columns of the bridge after being carried upstream.[10] Two bridge spans collapsed into the river.[10] As they fell, parts of the structure hit the barges causing the fuel oil and petroleum they were carrying to catch fire. Five people died in the incident.[10]





# LAKE PONTCHARTRAIN CAUSEWAY

- August 1, 1974, the towboat, M/V MISS ANDY, pushing four barges (two abreast), struck the east span of the Lake Pontchartrain Causeway in New Orleans, Louisiana; 252 feet of the bridge collapsed into the water. Two motor vehicles plunged into the lake through the void created by the collapsed deck, resulting in three fatalities.
- As a result of its investigation of this accident, the Safety Board issued a safety recommendation letter on January 8, 1975, in which it asked the Greater New Orleans Expressway Commission to: H-74-42 Install a warning system on those sections of the Lake Pontchartrain causeway that are vulnerable to impact by errant marine vessels. The system should activate automatically to warn motorists of danger ahead, should the causeway span collapse.





### ***Benjamin Harrison Bridge, Hopewell, Virginia-***

- ***February, 24, 1977*** The *SS Marine Floridian*, a bulk Sulphur carrier, rammed the support pier between the bridge's northern approach causeway and its northern tower span and continued under the span until the vessel's starboard bridge wing struck the span. The bridge tender was slightly injured while evacuating the bridge; no other injuries occurred. Total property damage was estimated to be \$8.5 million.
- As a result of its investigation of this accident, the Safety Board recommended that the FHWA: H-78-2
- Work with the U. S. Coast Guard to develop specifications for the design of dolphins, fenders, and other energy absorption and/or vessel redirection devices for the protection of both bridge and vessel during an accidental impact. Issue these design specifications along with guidelines and requirements for the placement of dolphins, fenders and energy absorption and redirection devices.



## **SUNSHINE SKYWAY BRIDGE: 35 DEAD**

- May 9, 1980: The 609-foot freighter Summit Venture was navigating through the narrow, winding shipping channel of Florida's Tampa Bay when a sudden, blinding squall knocked out the ship's radar. The ship sheared off a support of the Sunshine Skyway Bridge, dropping a 1,400-foot section of concrete roadway during the morning rush hour. Seven vehicles, including a bus with 26 aboard, fell 150 feet into the water. Thirty-five people died.



## SEEBER BRIDGE: 1 DEAD

- May 28, 1993: The towboat Chris, pushing the empty hopper barge DM3021, hit a support pier of the Judge William Seeber Bridge in New Orleans. Two spans and the two-column bent collapsed onto the barge. Two cars carrying three people fell with the four-lane bridge deck into a canal. One person died and two people were seriously injured.





## BIG BAYOU CANOT: 47 DEAD

- Sept. 22, 1993: Barges being pushed by a towboat in dense fog hit and displaced the Big Bayou Canot railroad bridge near Mobile, Alabama. Minutes later, an Amtrak train with 220 people aboard reached the displaced bridge and derailed, killing 47 people and injuring 103 people.



## **EADS BRIDGE: 50 INJURED**

- April 14, 1998: The Anne Holly tow traveling through the St. Louis Harbor rammed into the center span of the Eads Bridge. Eight barges broke away. Three of them hit a permanently moored gambling vessel below the bridge. Fifty people suffered minor injuries.





## **QUEEN ISABELLA CAUSEWAY: 8 DEAD**

- Sept. 15, 2001: A tugboat and barge struck the Queen Isabella Causeway in Port Isabel, Texas, causing a midsection of the bridge to tumble 80 feet into the bay below. Eight people died after motorists drove into the hole.



## **INTERSTATE 40 BRIDGE: 14 DEAD**

- May 26, 2002: A barge hit the Interstate 40 bridge over the Arkansas River at Webbers Falls, Oklahoma, collapsing a 500-foot section of road and plunging vehicles into the water. Fourteen people died and 11 were injured.





# GREAT BELT BRIDGE INCIDENT

- On March 3<sup>rd</sup> 2005 M/V Karen Danielsen crashed into the Danish Great Belt Bridge on during a trip from Svendborg to Finland. The crash knocked two cranes off the ship, and destroyed the top deck of the ship's bridge. A fire also broke out on board. The chief officer was at the helm, and was killed in the crash. His body was discovered in the hold. An autopsy revealed that he had a blood alcohol concentration of at least 1.55 parts per 1000. Several of the other crew members, all of whom were from Croatia, were badly injured, including the captain.
- The bridge received no structural damage and was able to reopen several hours later.





## EGGNER'S FERRY BRIDGE

- Jan. 27, 2012: The Delta Mariner hit the the Eggner's Ferry Bridge US68/KY80 in on Kentucky Lake near Golden Pond, Ky. The vessel struck the bridge causing a portion of the bridge to collapse onto the bow. The 312-foot Delta Mariner hauled rocket components for the Delta and Atlas systems to launch stations in Florida and California. The cargo was not damaged in the collision with the bridge. No Injuries or deaths







- **On February 22, 2024 A cargo ship rammed into a bridge in the Chinese city of Guangzhou , plunging five vehicles including a public bus into the river.**
- The accident killed two people and injured one. A section of the bridge fractured, with the ship trapped under it. The vessel did not appear to be carrying cargo.
- Guangzhou lies on the Pearl River delta and one is of the busiest seaports in mainland China.

1980



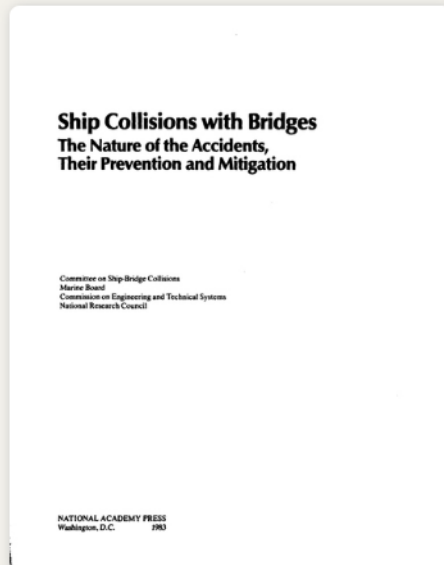


# National Academies – Washington DC

## 1983

NATIONAL  
ACADEMIES

*Sciences  
Engineering  
Medicine*



## Ship Collisions with Bridges

The Nature of the Accidents, Their Prevention and Mitigation

(1983)

Download Free PDF

Read Free Online

SHARE



# National Academies – Washington DC

26

TABLE 1 (continued)

---

Bridge:	14. FRANCIS SCOTT KEY BRIDGE, Outer Baltimore Harbor Crossing, Maryland.
Opening year:	1972.
Bridge struct.:	Fixed highway bridge, 4 main support columns with concrete camel pier protection devices, fendered with timber.
Navig. aspects:	Vertical clearance 185 ft, horizontal clearance 1100 ft.
Date/Accident:	August 29, 1980. Vessel sailing at 12 knots lost all propulsion and control about 600 yards from bridge. Vessel drifted into main pier at speed of about 6 knots.
Vessel:	<u>Blue Nagoya</u> (Ro-Ro/containership).
Environment:	Haze; visibility 2 miles.
Cause:	Shorting of main electrical control board; total loss of power and control.
Damage:	Protective concrete structure destroyed.
Remarks:	--
Other accidents:	--
Reference:	U.S.Coast Guard accident investigation report, 9 December 1980.



# National Academies – Washington DC

2

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

#### 1. The problem of ship-bridge collisions is serious.

- o While catastrophic collisions are rare, their frequency and severity appear to be increasing. Traditional margins of safety are narrowing as major navigational channels become increasingly obsolescent for the volume of vessel traffic, the greater mass and size of large modern vessels, and the reduced maneuverability of these vessels. Overwater bridges are built without design and construction attention to the interactions of ship, bridge, and waterway, or to the prevention and mitigation of ship collisions.

- o Damaging collisions short of bridge collapse are more frequent: several have been near-catastrophic.

- o Ship-bridge collisions can easily be envisioned that are far worse than any that have occurred.

- o While not within the specific scope of the committee's study, bridges over the inland waterways appear to be at equally serious risk of vessel collisions: tug-barge and push-tow combinations have grown in displacement and are susceptible to forces of the physical environment.

# National Academies – Washington DC

2. Many elements of the ship-bridge-waterway system contribute to the risk of ship collisions with bridges, but the system is not systematically planned or evaluated.

- o The fragmentation of jurisdiction and responsibility for the elements of land and marine transportation leaves no single agency or authority to ensure the safety of bridges against ship collisions.

- o Coordination has recently been emphasized, but without a structure for effective systems analysis planning and action, it is questionable if adequate coordination will occur.

- o Techniques of analysis have been developed to identify threats, hazards, and system vulnerabilities, to estimate risk and evaluate possible consequences, and to project the costs of various accidents as well as those of preventing or mitigating them. A considerable body of literature pertinent to evaluating ship-bridge collision forces has been accumulated but has not been widely disseminated or applied in the United States.



# National Academies – Washington DC

## **Recommendations**

**1. A national policy needs to be formulated and stated by the U.S. Department of Transportation that new bridges over navigable waterways shall be designed for the possibility of ship collisions and that existing bridges shall be evaluated for protective and mitigative measures.**

# Who dropped the ball?

- Secretary Buttigieg delivered remarks at the White House press briefing addressing the collapsed Baltimore bridge's durability, **stating it was not made to withstand a direct impact from a vessel that weighs "about 200 million pounds."** He noted that rebuilding will not be quick, easy or cheap, but said it will get done. March 27, 2024



# CHALLENGES = HIGHER COSTS

- ▶ Weather
- ▶ Politics
- ▶ Regulations
- ▶ Stakeholders
- ▶ Limited Resources





Percepción del  
padre

Percepción del  
niño

Percepción de  
la madre





# SALVAGE RESPONSE UNDER US REGULATIONS



# SALVAGE UNDER USA REGULATIONS

## Casualty Response Framework

- ❑ Pollution Driven System
- ❑ Civil & Criminal Liability Exposure
- ❑ Inexperienced Regulators – State & Federal
- ❑ Regimented Response System – Incident Command System



# SALVAGE UNDER USA REGULATIONS



CHALLENGES = COMPLEXITY = COSTS

**Are Actuaries looking far ahead enough?**

**Are you collecting enough premium?**

# Thank you!

Mauricio Garrido  
T&T Salvage LLC

