

Why did Francis Scott Key Bridge collapse?

The Francis Scott Key Bridge, which collapsed after being hit by the container ship MV Dali as it left the Port of Baltimore, was built before the latest standards on bridge protection were put in place

FRANCIS SCOTT KEY BRIDGE

Completed 1977, three years before collapse of **Sunshine Skyway Bridge** across Tampa Bay, Florida which led to new regulations

Last inspected May 2021, given "fair" rating by Federal Highway Administration

SOUTH

NORTH

Collapsed section

Truss bridge distributes load along entire length of structure – designed to span longer distances with less material, but lacks redundancy – **if one span fails, all three collapse**

Impact zone

Span 1

Main span 366m: world's third longest continuous truss bridge

Interstate 695

PATAPSCO RIVER

Navigation channel

Bridge debris blocking narrow shipping lane

SUNSHINE SKYWAY BRIDGE

Artificial island: Built around piers – sand core protected against wave and current erosion by armoured slope protection

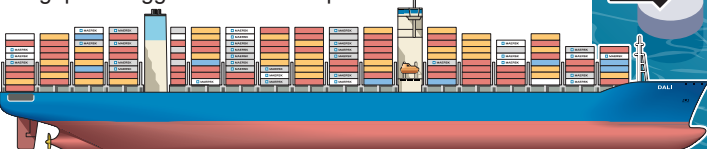
Increased "dolphin" protection

Dolphin: Circular barrier filled with concrete or sand designed to divert ship, absorb energy of impact

Sparingly situated dolphins may have been insufficient

Fender: Crushable concrete box wrapped around pier to protect it from impact
Not designed for weight of modern cargo ships

MV DALI Length 300m Gross tonnage 95,128
Singapore-flagged container ship



At 8 knots, ship could have generated 1.2 million joules of energy