Roebling Labs LLC

We build vessel collision warning systems for vulnerable bridges.

Roebling Labs continuously assigns a threat level to each vessel by combining real-time transponder (AIS) tracking, trajectory forecasting, and AASHTO impact analysis.

Problem

NTSB Recommendation H-25-030 to “incorporate motorist warning systems capable of activating when a threat is identified.”

Solution

The vessel collision warning system by Roebling Labs alarms when a high-consequence vessel is on a collision course with a vulnerable bridge element. Our system also detects if a vessel collision likely just occurred.

Each vessel is ranked by both consequence and probability of a collision, according with the below risk matrix.

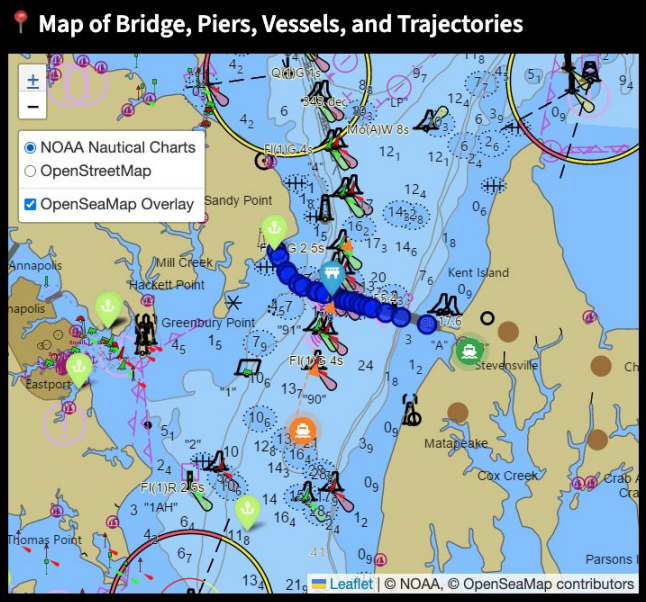

Figure 1 - Screenshot of Dashboard

Prototype Software at: www.vesselcollision.com

Consequence of Collision	Probability of Collision: Low	Probability of Collision: Medium	Probability of Collision: High	Probability of Collision: High
Bridge Ultimate Stength (H) / Vessel Impact Force (P) < 10 Calculated per AASHTO — Medium to High	MONITOR (Large vessel moving away from the bridge, far from the bridge, or proceeding on an expected trajectory if approaching the bridge at near range.)	CAUTION - CALL VESSEL (Large vessel approaching the bridge on an unexpected trajectory. Time to attempt contact before closing traffic gates.)	ALARM - CLOSE GATES (Large vessel approaching bridge on a collision course with a pier. Immediate traffic gate closure recommended.)	COLLISION DETECTED - INSPECT FOR DAMAGE (Large vessel likely collided with a bridge pier. Bridge structural damage possible.)
Bridge Ultimate Stength (H) / Vessel Impact Force (P) >= 10 Calculated per AASHTO — Low	NEGLIGABLE THREAT (Anchored, far away, and/or small vessels)	LOW THREAT (Small vessel approaching the bridge at an unexpected trajectory.)	LOW THREAT (Small vessel approaching bridge on collision course with a pier. Bridge unlikely to be damaged or disturbed.)	LOW THREAT (Small vessel likely collided with a bridge pier. Bridge structural damage unlikely.)
	Within 30 nautical miles	Within 2 nautical miles and moving towards the bridge on an unexpected trajectory	Within 1 nautical mile, heading toward bridge, and a trigger of: unexpected trajectory, location, speed, or distress signal	Vessel trajectory stopped, deviated sharply, or terminated at a bridge pier location.

Figure 2 - Risk Matrix
Vessel threat level updated continuously.

About Us

www.roeblinglabs.com

Roebling Labs LLC is a resident company at The Engine “Tough Tech” incubator built by MIT.
Bentley Systems, the makers of Microstation CADD software, funded our development program.

Scott Snelling, P.E.
CEO
20+ Years in bridge industry

Josh Burnett
Chief Technical Officer
20+ years designing electronics and software for life-safety critical medical devices and laboratory instrumentation