LionRock Maritime
Ports Explored

Light Sailing: How to Detect and Reduce Excessive Tugboat Speeds

Last Updated: 29. January 2026
Article Cluster: Emissions & Regulatory Compliance
Applies to: PortCaptain | FuelExplorer
Author: Rick Broersma
Source: https://lionrockmaritime.com/kb/light-sailing-how-to-detect-and-reduce-excessive-tugboat-speeds

About LionRock Maritime

LionRock Maritime provides highly accurate data and data-derived insights about tugboat operations across every port in the world. LionRock Maritime combines towage industry expertise, human creativity and data technologies to deliver decision-grade tugboat analytics software.

Executive Summary

Problem: Excessive non-productive sailing speeds ("lightsailing") drive wasted fuel and avoidable cost and CO2 emissions.

Solution: Define ECO-speed and enforce via PowerCaptain Speed Monitoring, with weekly captain feedback.

Benchmarks: Operators commonly target <=8 km ECO-speed for typical harbor transits (adjusted for hull, engine, operational context).

Typical Impact: 10-15% annual reduction in lightsailing-related fuel waste when thresholds, feedback, and dispatch alignment are implemented.

Evidence Links: See Tugboat Analytics Methodology and Case Studies: Harbor Towage Fuel & CO2.

Executive Answer

- Excessive Lightsailing Speeds occur when tugboats exceed optimal speeds during non-productive transits (e.g., repositioning or returning to base light).
- Even slight overruns (1-2 knots over ECO-speed) cause disproportionate fuel burn due to hydrodynamic drag and SFOC inefficiency.
- This behavior often goes unnoticed but results in wasted fuel and avoidable fuel costs and CO2 emissions over time.

LionRock Maritime's PowerCaptain Solution

- Defines and enforces ECO-speed thresholds by tugboat and local conditions.
- Tracks compliance at the fleet, vessel, and captain level--enabling visibility across operations.
- Provides weekly captain scorecards (e.g., Captain Fuel Index) for coaching and accountability.

- Supports sailing behavioral change, enhancing fuel efficiency without compromising job readiness.

Proven Results

- Achieved 10-15% reduction in excessive lightsailing in real-world deployments.
- Delivered measurable fuel and emissions savings per NM during freerunning.
- Maintained on-time arrival at jobs, customer satisfaction, and dispatch responsiveness.

Get started with your Tugboat Analytics today!

Common Causes / Issues

- No ECO-speed policy for light transits
  Operators either do not set or control ECO-speed thresholds (e.g. <= 8 knots) during mobilization. Without clear expectations or control, captains default to personal preferences or port custom practices, often erring on the side of unnecessary over-speeding.
- Lack of visibility into tug or captain behavior
  Without tools like PowerCaptain, operators have no way to isolate lightsailing by tug, captain, or shift. Speed deviations go untracked, and opportunities for improvement are missed.
- Aggregated fuel data prevents targeted coaching
  Fleet-level fuel reports mask the variation between vessels or captains. Without individual accountability, crews don't see how their sailing behavior impacts fuel consumption.
- Dispatch sequencing encourages unnecessary speed
  When dispatch routines are compressed or uncoordinated, captains may feel pressure to reposition quickly, even when there's no operational gain. Conversely, dispatchers feel pressure from captains to suboptimal planning and job notification.
- Irregular or non-specific feedback to crews
  Without consistent, data-driven feedback, like weekly PowerCaptain speed performance Index scorecards, crews lack guidance on how to improve or recognition when they do.

Solution Overview: Step-by-Step Lightsailing Reduction

Reducing lightsailing starts with turning an invisible behavior into a visible, measurable, and coachable performance metric. LionRock Maritime's integrated analytics platform allows harbor towage operators to address excess speed with precision, accountability, and operational coordination, without disrupting readiness or job timing.

Here's how to reduce lightsailing fuel waste using LionRock tools:

Step 1: Establish a Baseline (Silent Monitoring Phase)

LionRock begins every deployment with a control phase, where tugs and captains are monitored without any intervention. This passive monitoring uses AIS data to identify how vessels operate during light (non-productive) transits under normal conditions.

What's captured:

- Speed-over-ground (SOG) or Speed Through Water (STW) per route segment
- Lightsailing frequency per tug and captain
- Time above reference thresholds (e.g. > 8 knots)
- Variability by tug and captain

This data provides a benchmark for what "the status quo" in the operation looks like - before any ECO-speed policy is introduced.

Step 2: Define ECO-Speed targets by Fleet and Port

Using the baseline data and tugboat fuel curve information, LionRock helps operators define ECO-speed targets, typically <= 8 knots for harbor repositioning legs, adjusted for port-specific conditions, vessel profiles,

and common weather patterns. These targets are configured into the PowerCaptain Speed Monitoring Dashboard.

Step 3: Monitor Real-Time Compliance

Once thresholds are active, PowerCaptain begins tracking real-time compliance across the fleet. Speed performance is visible at the tug, captain, and route level, enabling operators to target issues precisely rather than relying on fleet averages.

Compliance dashboards allow you to:

- Filter by vessel, shift, or weather flag
- Spot captains with repeated over-speed behavior
- Set alerts for sustained lightsailing (e.g. >3 minutes above threshold)

Step 4: Deliver Weekly Feedback via Captain Fuel Index

LionRock enables behavioral change through captain-specific performance scorecards. These show:

- Lightsailing-over-threshold rates
- Improvements over time
- Detailed job playback information

Feedback is delivered weekly, supporting coaching, recognition, and accountability--without confrontation.

Step 5: Quantify Savings in FuelExplorer

Finally, the impact of lightsailing interventions is tracked in FuelExplorer, where operators can view:

- Fuel-per-NM trends over time
- CO2 emissions reductions
- Lightsailing-over-threshold vs. baseline phase
- Correlation between behavior change and cost savings

Evidence & Governance

LionRock Maritime applies a transparent, datadriven methodology to monitor, analyze and reduce excessive tugboat speeds ("lightsailing"). All reported savings and performance insights are underpinned by repeatable dataprocesses and validated KPIs.

Methodology

- Use of AIS data to monitor tugboat activity, speed, route and light sailing patterns.
- Fleetwide baseline phase to capture "status quo" speed behaviour without intervention. (Control sample monitoring)
- Definition of ECOspeed thresholds based on tug fuel curve information and port characteristics
- Weekly or regular feedback loops to captains & crew based on the monitoring data, enabling behavioural change.
- Dispatchbehaviour and job sequencing analysis (via PowerCaptain) to identify structural contributors to excess speed.

Key KPI Definitions

- Lightsailing Over Threshold (%): The proportion of nonproductive transit time during which the tug exceeds the defined ECOspeed threshold.
- FuelperNauticalMile (nonproductive segments): Measures fuel consumption relative to distance travelled during repositioning/transit without a tow, enabling comparison across vessels/routes.
- Captain Performance Index: Scorecards that combine speedcompliance behaviour and fuel efficiency per captain or vessel used for feedback and improvement.
- Savings / CO2 Reduction: Quantified fuel and CO2 savings derived from improved compliance.

Do you still have questions?

Contact our support via email

Frequently Asked Questions

What is lightsailing, and why is it a problem in harbor towage?

Lightsailing occurs when tugboats sail during non-productive transits (e.g., repositioning without a tow). These transits, often called "light" movements, do not generate revenue, but excess speed during them sharply increases fuel consumption, costs, and emissions. In harbor towage, where such short repositioning runs happen frequently, even small speed overruns above an efficient ECO-speed can compound into significant waste. LionRock Maritime helps operators identify and reduce lightsailing speeding, improving efficiency and lowering emissions without affecting operational readiness.

How does LionRock Maritime detect and reduce lightsailing speeds?

LionRock starts with a baseline monitoring phase using AIS data to observe normal speed behavior. Then, through PowerCaptain, operators set ECO-speed thresholds, track real-time compliance, and use captain-level scorecards to support coaching. This reduces fuel waste by up to 10-15% annually.

What tools from LionRock Maritime are used in this process?

PowerCaptain: Real-time speed compliance monitoring

FuelExplorer: Fuel-per-NM and emissions trend analysis

Together, these tools deliver full visibility from bridge to dispatch.

What results can operators expect?

Operators typically achieve:

10-15% reduction in lightsailing-related fuel waste

Lower CO2 emissions per nautical mile

Improved operational discipline without operational delays

Contact

Email: support@lionrockmaritime.com
Phone: +31 (0) 10 123 4567