LionRock Maritime
Ports Explored

TugIO - Job Timestamps and Their Operational Value

Last Updated: 18. May 2026
Article Cluster: Data Integration, Metrics & Standards
Applies to: TugIO
Author: Rick Broersma

Source: https://lionrockmaritime.com/tugio-job-timestamps-and-their-operational-value-knowledge-base

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: Every towage job moves through distinct phases: mobilisation, alongside arrival, active assist, and demobilisation. In many operations, the boundaries between these phases are recorded inconsistently or not at all. The result is billing disputes, incomplete job analytics, inaccurate capacity models, and a disconnect between operational events and onboard sensor data.

Solution: TugIO captures six structured timestamps for every job: mob start, alongside, job start, job end, demob start, and demob end. These AIS-derived, machine-readable events create a reproducible job timeline that operators can interrogate directly and share with partner data platforms.

Benchmarks: Phase transitions are detected algorithmically using speed profiles, heading changes, and port geometry signals. Standardized thresholds are applied consistently across all ports and vessel types.

Typical Impact: Structured job timestamp data supports accurate billing, realistic capacity planning, job-level analytics, and the contextual mapping of sensor data to operational phases via third-party integrations.

Executive Answer

In harbor towage, every job is composed of phases that carry independent operational and commercial significance. The mobilisation leg commits the tug before it reaches the vessel. The active assist is the productive work interval. The demobilisation leg closes the cycle. Without a structured record of each phase, operators are working from an incomplete picture.

When timestamps are missing or inconsistent:

- Billing calculations rely on approximations rather than documented phase durations
- Capacity models underestimate job footprint by ignoring transit legs
- Job-level analytics cannot be standardized across ports or captains
- Sensor and fuel data has no operational context to anchor it to

TugIO addresses this by making the job timeline measurable, structured, and sharable.

By capturing all six timestamps for every job, operators can:

- Resolve billing questions with documented, system-generated phase durations
- Build capacity models based on full job cycle time, not just active assist
- Benchmark mobilisation and demobilisation patterns across tugs and ports
- Provide third-party platforms with an operational reference frame for sensor data

The value is not in the timestamps themselves, but in what becomes possible when job events are structured, consistent, and accessible.

LionRock Maritime's TugIO Solution

TugIO is designed to capture and structure the complete operational timeline of every towage job across every port in the platform.

It enables operators to:

- Access precise, AIS-derived timestamps for all six job phases
- Calculate phase durations for billing, analytics, and capacity planning
- Compare mobilisation and demobilisation patterns across tugs, captains, and ports
- Export structured job event data to third-party platforms via the TugIO API
- Map sensor, fuel, and engine data to specific operational phases
- Analyze job-level trends and operational behavior at scale

By combining AIS-based detection with standardized phase definitions, TugIO transforms raw operational activity into a reliable, structured data record that supports decisions across commercial, operational, and analytical functions.

Proven Results

Operations using structured TugIO job timestamp data achieve:

- Improved billing documentation with a system-generated basis for phase-based invoicing
- Clearer resolution of commercial disputes related to job start, end, and duration
- More accurate capacity models incorporating full job cycle time
- Ability to attribute sensor readings, fuel anomalies, and engine data to specific operational phases
- Consistent job-level analytics across ports, fleets, and time periods

The key outcome is not improved reporting alone, but structured operational data that supports active decision-making across commercial, fleet, and analytics functions.

Get started with your Tugboat Analytics today!

Common Causes / Issues in Job Data Completeness

- Manual job logging by crew, which introduces delays and inconsistencies between actual events and recorded times
- Disconnected data systems that record sensor data and job events independently, without a shared reference
- Reliance on AIS alone without contextual filtering, which can misclassify maneuvering events as phase transitions

These gaps prevent operators from using job data as a reliable foundation for billing, capacity planning, or cross-platform analytics.

Solution Overview: Extracting Operational Value from Job Timestamps

Fuel measurement becomes powerful when it is linked to business decisions. The four dashboards shown above represent the core strategic use cases.

Step 1: Mob Start - Mobilisation Begins

Mob start marks the moment the tug departs its berth toward the job location. This timestamp opens the mobilisation leg.

It provides:

- The start reference for mobilisation leg duration
- The opening event of the full job cycle time
- A response time indicator for dispatch and scheduling analysis

This enables operators to:

- Measure tug response time by port, berth position, and tug
- Identify patterns in mobilisation timing across shifts and captains

Charge accurately where mobilisation time is a contractual billing component.

Step 2: Alongside - Arrival at the Vessel

Alongside marks the moment the tug arrives at the position of the vessel it is assisting. This closes the mobilisation leg.

- The end reference for mobilisation leg duration
- The opening of the pre-job positioning window
- A port-level transit time benchmark across jobs
- Calculate mobilisation leg duration as the interval from mob start to alongside
- Benchmark transit times to understand realistic response capability by port

Identify port efficiency patterns where alongside timing reflects traffic or scheduling factors

Step 3: Job Start - Active Assist Begins

Job start marks the beginning of the active assist or escort operation. This is the moment the tug transitions from transit and positioning into productive work.

- The primary billing reference for time-based assist contracts
- The opening of the active assist leg
- A pre-job waiting time indicator (alongside to job start interval)
- Invoice accurately for the active assist period
- Analyze pre-job waiting time across customers, captains and vessel types

Identify coordination patterns that affect time between arrival and start of work

Step 4: Job End - Active Assist Completes

Job end marks the conclusion of the active assist. This timestamp closes the productive work leg and is the primary reference for calculating billable assist duration.

- The closing reference for active assist duration
- The end of the primary billing period under time-based contracts
- A point of comparison for assist length by vessel type, port, and job category
- Calculate assist duration as the interval from job start to job end
- Benchmark job length across ports, captains, and vessel types

Support commercial discussions with documented, system-generated job records

Step 5: Demob Start - Return Transit Begins

Demob start marks the moment the tug disengages from the assisted vessel and begins its return to station. This opens the demobilisation leg.

- The start reference for demobilisation leg duration
- A billing reference where demobilisation is separately chargeable

- The moment from which the tug is again available for reassignment
- Accurately represent the post-job commitment in capacity models
- Calculate tug availability for sequential assignment planning

Step 6: Demob End - Tug Returns to Station

Demob end marks the arrival of the tug back at its berth or mooring, closing the full job cycle. The total elapsed time from mob start to demob end is the complete operational footprint of the job.

- The closing reference for demobilisation leg duration
- The final event of the full job cycle
- The total job cycle time when combined with mob start
- Calculate full job cycle time as the complete operational commitment of the tug
- Build realistic capacity models that account for all phases, not just active assist

Close the job record with a confirmed return-to-station event for reporting and analytics.

Integration with Third-Party Data Platforms

TugIO timestamps are not only valuable within the LionRock platform. Because they define precise operational phase boundaries, they serve as a reliable reference frame for any data source that records events in time.

LionRock shares TugIO job data with third-party platforms where operators have established data-sharing arrangements. The six timestamps are transmitted as structured events that the receiving platform maps to its own data streams. The effect is that sensor readings, fuel logs, and engine performance data can be contextually attributed to the specific operational phase during which they occurred.

Techbinder Integration

One example of this is LionRock's data feed to the Techbinder Smart Vessel Optimizer platform. Techbinder receives TugIO job timestamps and displays tug operational status alongside the sensor and performance data it collects independently.

This integration enables:

- Display of job phase events (e.g., Transit, Unberthing) on the Techbinder dashboard with precise start and end times
- Contextual mapping of fuel, engine, and sensor data to the operational phase that generated them
- Investigation of performance anomalies at the phase level rather than only at the voyage or vessel level
- A unified operational view combining LionRock's job structure with Techbinder's sensor intelligence

This kind of cross-platform enrichment is only possible because the TugIO timestamp record is structured, consistent, and machine-readable. The timestamps act as a common reference layer that makes the combination of operational event data and sensor data analytically coherent.

Evidence & Governance

LionRock Maritime applies a transparent, data-driven methodology:

- AIS-based phase transition detection
- Contextual signals including port geometry and vessel scheduling information
- Standardized detection thresholds applied consistently across all ports and vessel types
- Fixed six-timestamp schema ensuring comparability across fleets and time periods

Governance considerations:

- Data-sharing arrangements with third-party platforms are operator-configured
- Schema stability is maintained to ensure reliable integrations without remapping

Operators retain visibility into which data elements are shared and with which platforms

Key KPI Definitions

- Mob Leg Duration: Elapsed time from mob start to alongside. Reflects tug response time and transit capability by port and berth position.
- Pre-Job Positioning Time: Elapsed time from alongside to job start. Captures preparation and coordination time between tug arrival and commencement of the active assist.
- Active Assist Duration: Elapsed time from job start to job end. The core productive work interval and primary reference period for time-based billing.
- Demob Leg Duration: Elapsed time from demob start to demob end. Captures the return transit after job completion. Often underestimated in capacity models.
- Full Job Cycle Time: Elapsed time from mob start to demob end. The complete operational commitment of the tug for a single job, encompassing all phases. The correct unit for capacity modeling.
- Phase Coverage Rate: The proportion of jobs for which all six timestamps are present and within operationally plausible ranges. A measure of data completeness affecting the reliability of downstream analytics.

Do you still have questions?

Contact our support via email

Frequently Asked Questions

Why does it matter whether mobilisation and demobilisation times are recorded separately from the active assist?

The mobilisation and demobilisation legs consume real tug time, fuel, and availability. Capacity models that account only for the active assist duration will systematically underestimate the operational footprint of each job. Separating the phases gives operators an accurate picture of both the commercial value and the operational cost of each assignment, and allows more reliable scheduling of sequential jobs.

How does TugIO determine when a job phase has begun or ended without requiring manual input from the crew?

TugIO detects phase transitions algorithmically using AIS position data, vessel speed profiles, heading changes, and contextual signals including port geometry. The detection logic uses standardized thresholds calibrated across a wide range of port environments and vessel types, producing consistent results without dependence on crew reporting or manual logging.

How does sharing TugIO timestamps with a platform like Techbinder add value beyond what either system provides independently?

TugIO provides the operational event structure; Techbinder provides sensor-level performance data. Fuel consumption data is more useful when you know whether it occurred during a lightsailing mobilisation or a high-demand active assist. Engine load data is more actionable when it can be attributed to a specific job phase. The TugIO timestamp gives every sensor reading an operational context, which is what makes cross-platform analysis operationally meaningful.

Can job timestamp data be used to support commercial negotiations with port authorities or customers?

Yes. System-generated timestamps provide a documented basis for demonstrating job scope, phase durations, and operational commitment. Where billing disputes arise from differing records of when an assist began or ended, or where contract discussions require evidence of mobilisation response times, the TugIO record offers a structured, consistent reference that does not rely on manual reporting from either party.

Contact

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

Generated: 18/05/2026