OMC International - TransitAnalyst

identify behaviours, patterns and trends in pilotage prior to incidents occurring, creating the opportunity to intervene to avoid accidents

the challenge

A 2020 report by the International Group of P&I Clubs concluded that there is, on average, an incident involving vessels under pilotage every week with a cost per incident of approximately US$1.74m. Moreso than the economic impact, the potential for injury and loss of life, as well as environmental damage resulting from maritime incidents is significant.

Marine pilotage is one of only six issues on New Zealand's Transport Accident Investigation Commission Watchlist, noting their solution states: 'Safe conduct of a ship through pilotage waters depends on high standards of passage planning. Pilots and the bridge team must share an understanding of the navigation plan, and know where the ship is allowed to go.' Similarly, the ATSB states in their SafetyWatch brief on Marine Pilotage that a pre-passage information exchange should always include:

- the courses or tracks to be followed

- speeds at critical points during the pilotage

- limits in relation to planned tracks and speeds.

There are excellent and well proven tools and systems available to investigate incidents after they happen. However, what if it was possible to identify behaviours, patterns, and trends prior to incidents occurring, perhaps creating the opportunity to intervene to avoid accidents? This is what TransitAnalyst was created to do.

the innovation
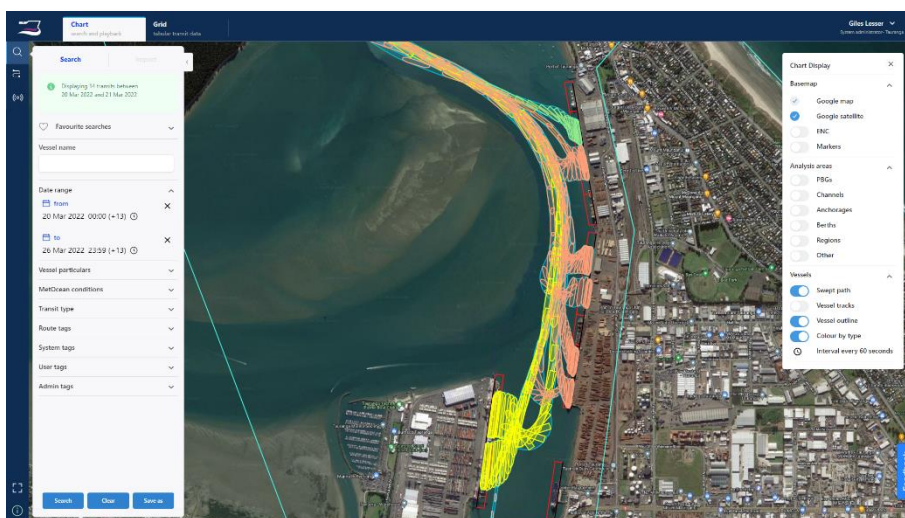
*TransitAnalyst interface showing a range of vessels and swept path*

TransitAnalyst uses big data and AI to create actionable intelligence and full visibility of pilotage operations. Integrating AIS and measured environmental data, it provides simple yet

powerful analytical tools that allow users to inspect, visualise, and report transit results against user defined performance and safety standards.

Using the concept of Critical Navigation Elements from Antonio Di Lieto's book Diligent Pilotage, TransitAnalyst can be configured to monitor what is important for each specific port. Transits that deviate from their plan can be automated tagged for review.

Automated reporting can be configured to allow for immediate feedback.

Additionally, TransitAnalyst users can easily search for previous transits based on a range of criteria such as vessel type and size, and the prevailing environmental conditions. This allows a pilot to prepare for an upcoming job by reviewing previous transits of similar vessels undertaken during similar conditions.
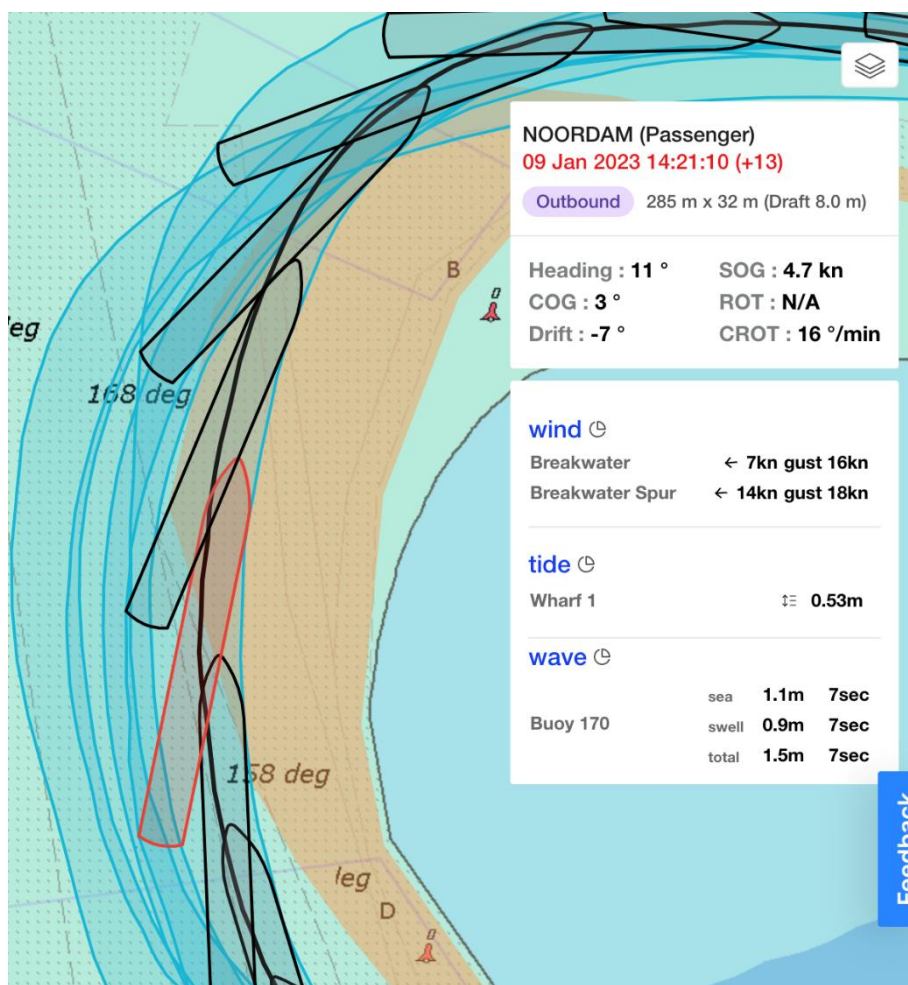
Highlighting examples of vessels' swept paths encroaching on safety corridors

The ability for users to enter comments against transits provides for learnings to be shared across the organisation.

Since being commercially released this year, the use cases for TransitAnalyst have been varied, including reviewing vessel speeds, swept paths, berthing manoeuvres, drift angles,

rates of turn, training of new pilots, assessing environmental limits, preparing for new vessel classes, and improving simulator models.

how it was implemented

TransitAnalyst was developed in response to the request from a port that wanted to understand whether their existing operational thresholds (e.g. current and wind limits for different vessel types and sizes) were appropriate.

The port had PPU data, but this was only useful for analysing individual transits in isolation.

They also had AIS data which could be used to review a range of transits, but this approach presented several issues.

For instance, the AIS data was not linked with met-ocean data, it only provided antennae location and not swept paths, and the data quality could not be verified.

Ultimately, the development of TransitAnalyst resolved all these issues. AIS data undergoes rigorous quality assurance, and can be corrected where appropriate. All measured met-ocean data is stored alongside the transit information so that the exact conditions can be recalled for the entire transit. TransitAnalyst also produces swept paths, allowing users to identify exactly the position of the entire vessel at every stage of the transit.

The implementation of each TransitAnalyst system commences with a workshop between the client stakeholders (typically Harbour Master, Pilots, Marine Mangers, etc.) and OMC International's Pilotage Advisor.

The discussion focuses on the key challenges the port faces in terms on navigation, and the desired outcomes from the implementation of TransitAnalyst.

Following the workshop, the system is configured with the Critical Navigation Elements discussed, and the client is provided with comprehensive training.

Some clients then manage the system themselves, whilst others have requested that OMC provide monthly analysis and reporting.
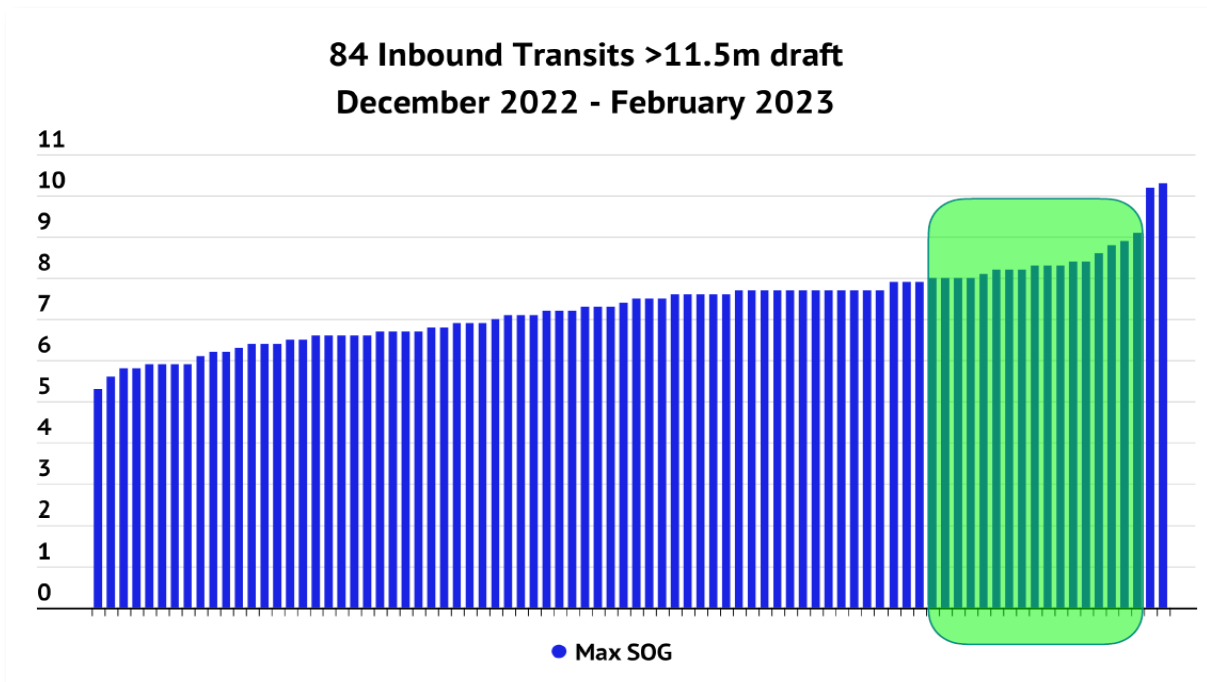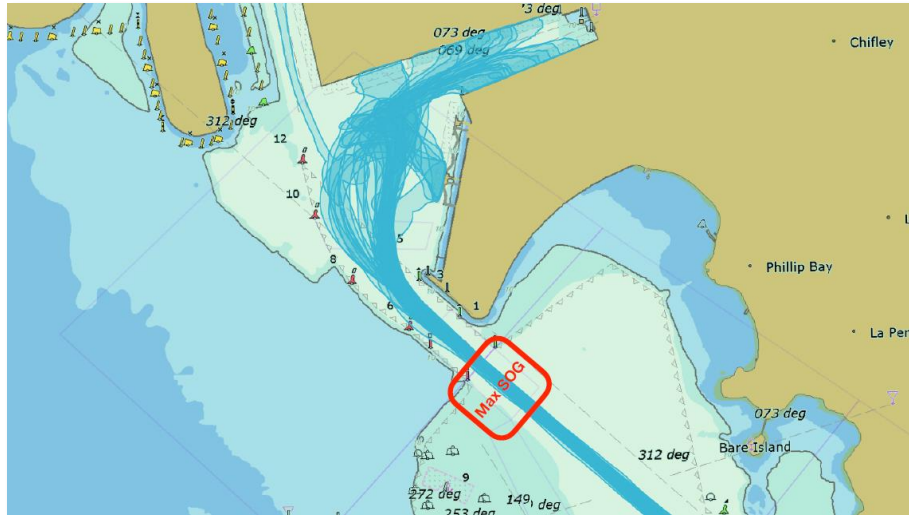
result

The adoption of TransitAnalyst has been overwhelmingly positive. Some feedback from users is below:

"TransitAnalyst was initially introduced to support the evaluation of the pilotage risks of accepting a new class of vessel at the port. However, we have learned that through its ongoing use in our daily operations that its most powerful aspect is that it is a tool for us, as professionals, to use. As individuals we can debrief each transit that we conduct; but we can also observe the transits of other pilots within the team. We have learned that the analysis of

optimal transits, either our own or those of our teammates, is as valuable as the analysis of the outliers.

TransitAnalyst gives us the ability to dive down and into the detail of day-to-day operations


Analysis of Speed Over Ground results from 3 months of data

and facilitates technical conversations within the team. But the cultural change we have experienced through these conversations is allowing us to look up and out at other influencing factors." Matt Conyers, Specialist Pilot, Port Nelson.

"As a Pilot training for my third port, I have found TransitAnalyst to be an invaluable tool. Rather than be in a position to watch then essentially 'wing it' for the first time on/off a berth, TransitAnalyst allows for a more detailed and structured approach to training. It provides me

with the ability to search then scrutinise all previous arrivals/departures from the port including on/off all berths and in all weather and tide conditions. So rather than 'wing it' I can be as prepared as possible.

After the job is completed, TransitAnalyst then provides me with my vessel position, swept path, speeds and actual weather/tide information during the transit. This allows for a comprehensive de-brief using actual data rather than relying on the memories of myself and the training pilot. Over a period of time, I can look back through my training history and identify patterns of good piloting, but also areas where improvement is needed. TransitAnalyst has ensured a targeted and enjoyable training experience, ensuring that every training job completed is used to maximum value." Colin Sellars, Pilot, Port of Tauranga Limited

36 transits (88%)   5 transits (12%)
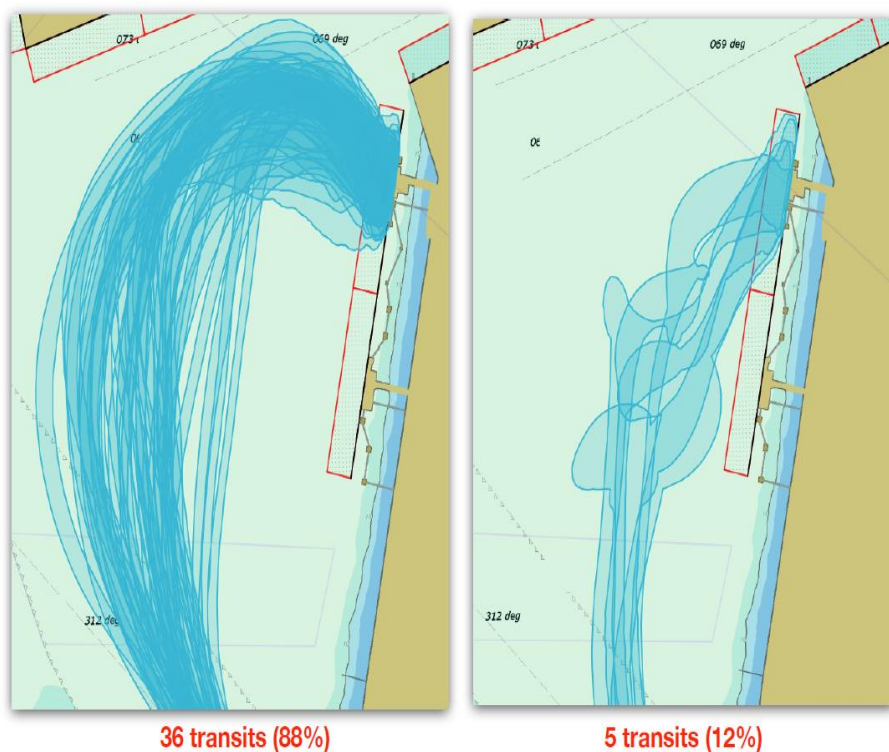
TransitAnalyst used to highlight the different approaches to manoeuvring into berth. This analysis was used to start a discussion within the marine team as to why there were different approaches

"Any port authority that does not have a TransitAnalyst in 2023 needs to get their head read. I thought I knew what was going on in [name of port removed], but I'm seeing things that the Harbour Master is not aware of, and just wouldn't believe." Senior Pilot, Australia (anonymized at their request).

"Use of [TransitAnalyst] provides an opportunity for critical review and continuous improvement across multiple facets of Port Operations. The technology assists with assurance and training outcomes to be met in a real time and continual basis". Myron Fernandes, Harbour Master, Sydney.

"Port Phillip Sea Pilots have implemented using the Transit Analyst software across our operations within Port Phillip Bay. It also forms part of a major project we are undertaking to establish shared passage plans and joint validation and verification of pilotage tasks. The systemic improvement across our business has led to safety improvements which benefit all of our customers and in return all Victorians." Capt Damian Laughlin, Port Phillip Sea Pilots

conclusion

Professor Sidney Dekker, renowned safety researcher states that the absence of incidents is not evidence of safety. TransitAnalyst is providing the tools to visualise and understand exactly what is happening in the absence of incidents, and creating transparent, data oriented pilotage operations which drive safety outcomes.

TransitAnalyst can be viewed with suspicion; as big brother watching every move, ready to criticise any mistake. The reality is that with global AIS coverage, anyone can already access transit data with a little effort. Furthermore, following an incident, there will absolutely be those looking for errors and eager to assign blame.

Organizations that have implemented TransitAnalyst have done so with a culture of transparency, openness, and continuous improvement. The aim is to use the available data to prevent incidents from occurring. This is achieved through identifying what is actually happening, and having evidence based discussions about best practices.

LINK: https://omcinternational.com/