



E-NAVIGATION AND AUTONOMY: AN OPERATORS PERSPECTIVE

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Autonomous Operations and E-Navigation Definition

Fundamentally there is an alignment between the two

E-navigation is the harmonized collection, integration, exchange, presentation and

analysis of marine information on board and ashore by electronic means to enhance berth to berth navigation

and related services for

safety and security at sea and protection of the marine environment.

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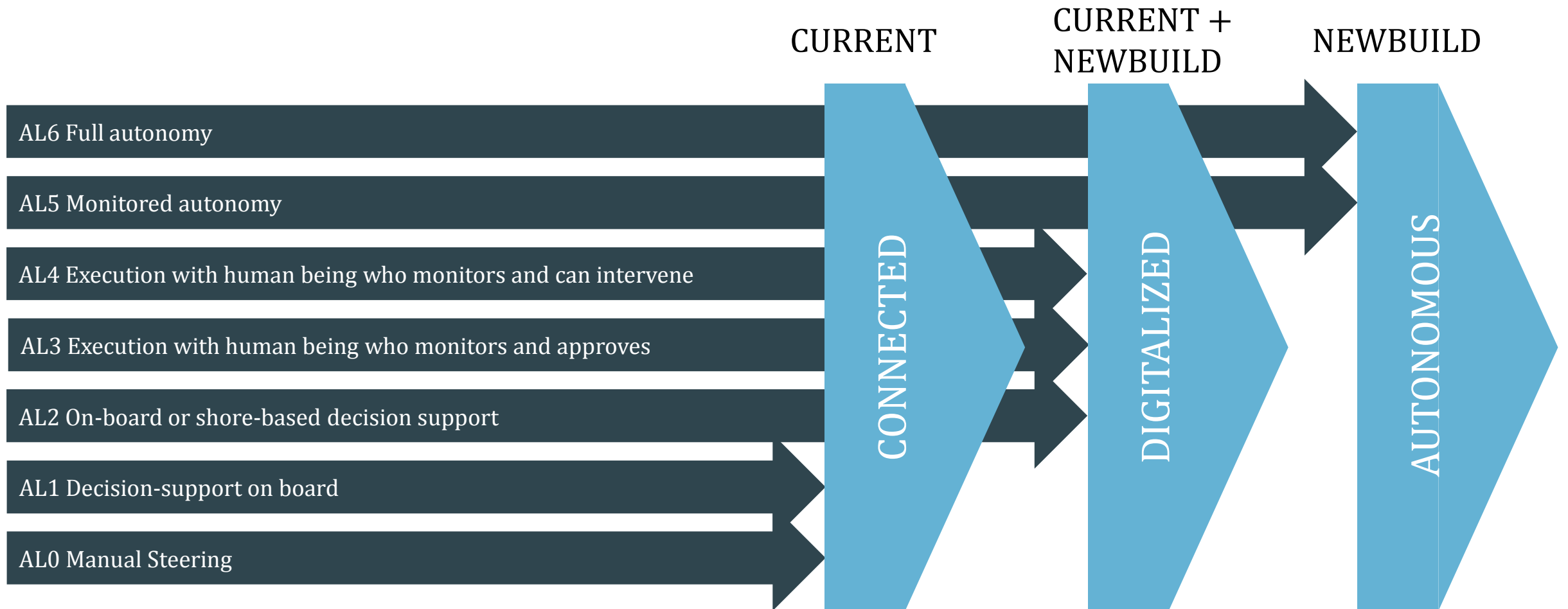
RELIABILITY
EFFICIENCY

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SAFETY

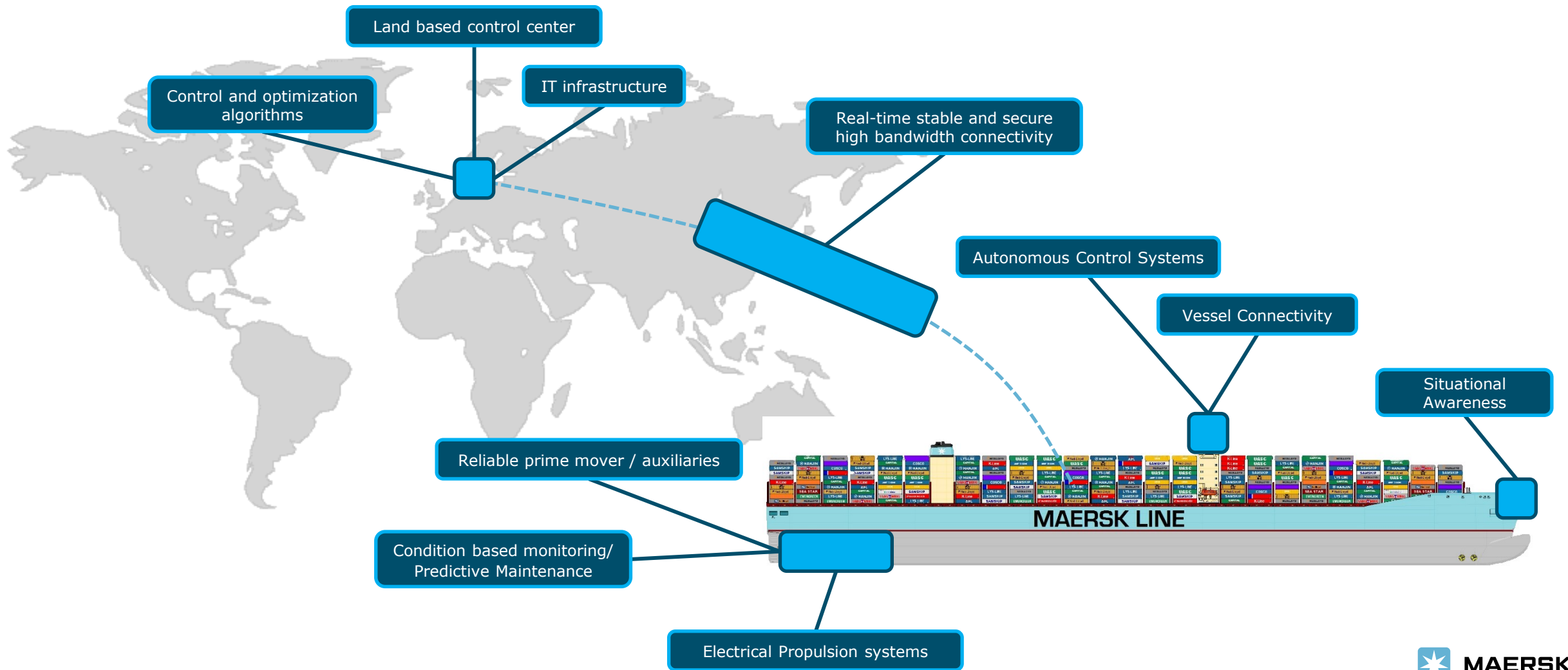
The journey towards autonomy

True autonomy requires bespoke newbuilds



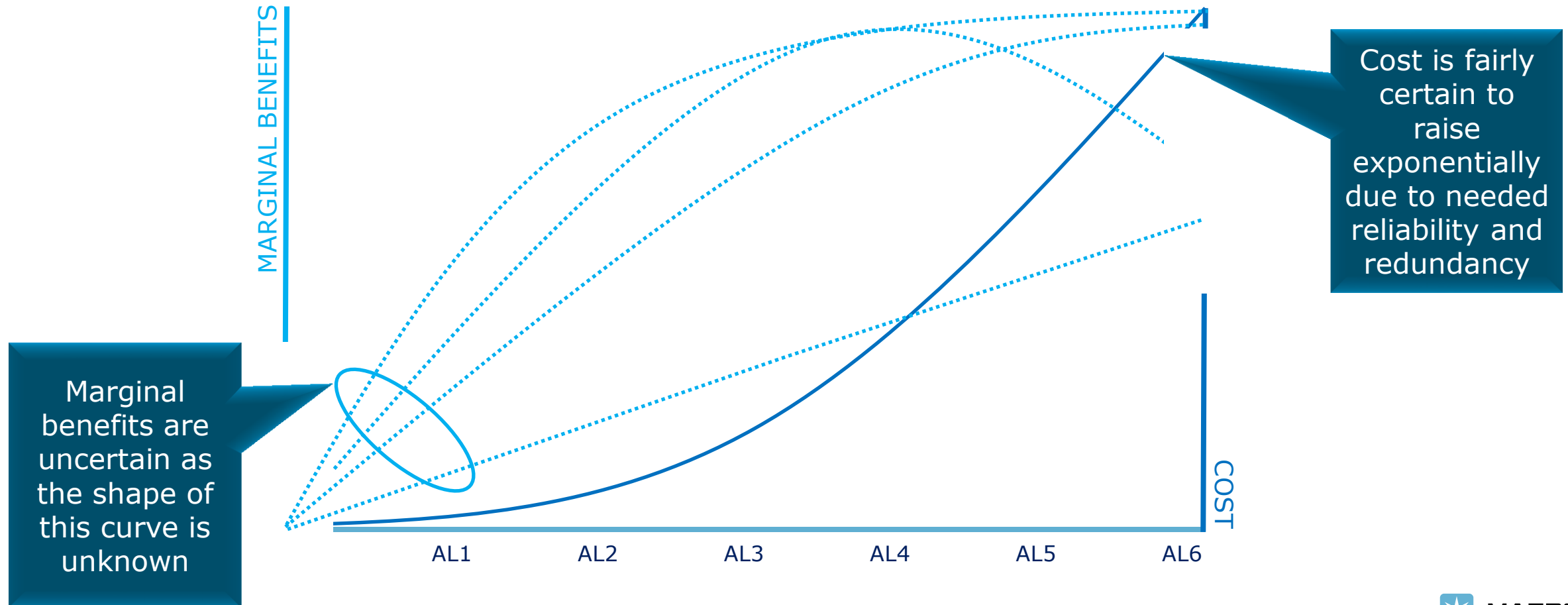
Fully autonomous vessel

A complete evolution of modern vessels is needed for true autonomous ULCVs



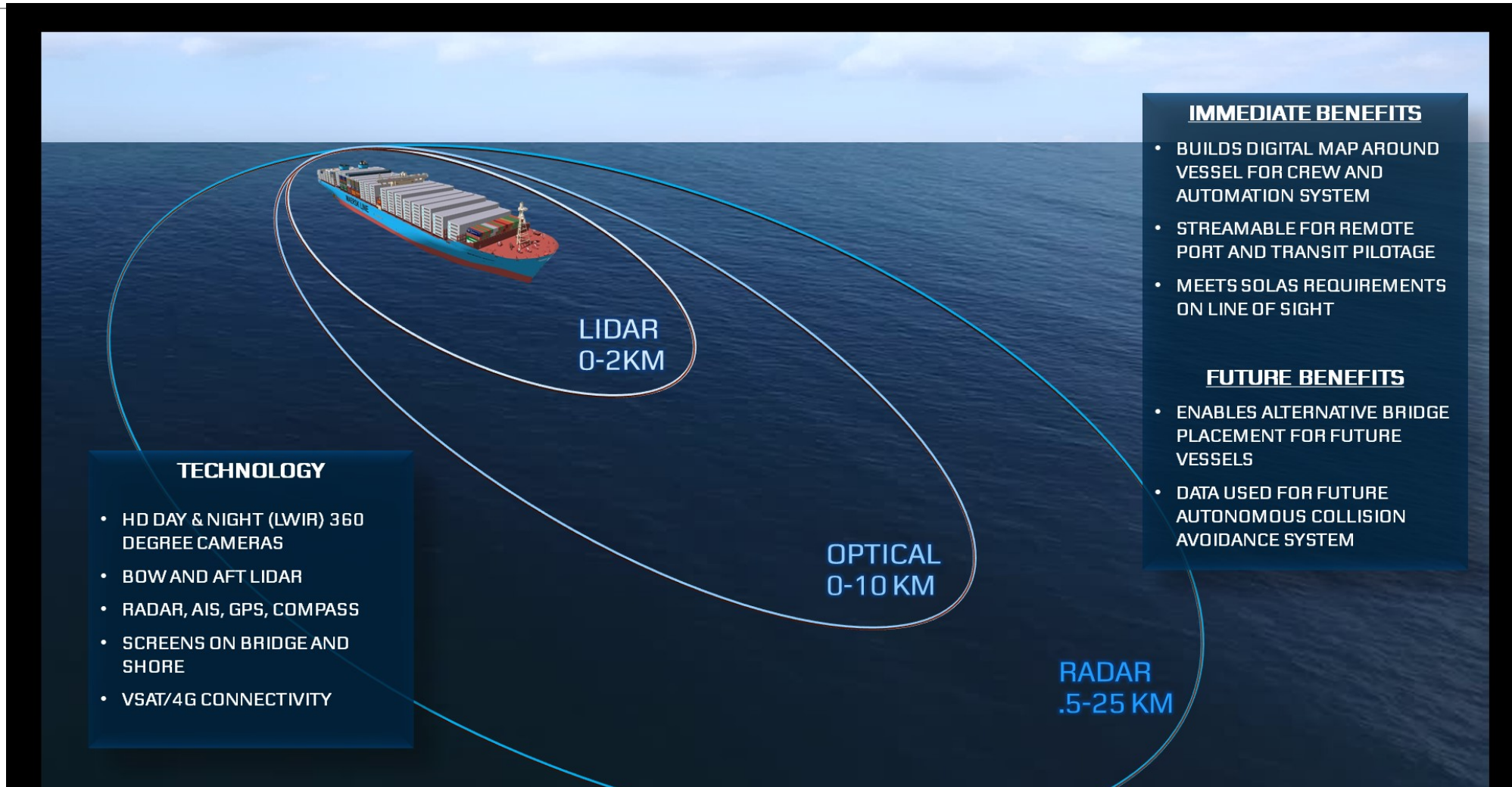
Autonomy benefits are not currently calculatable while cost is

Current industry projects will help to firm up cost-benefit analysis



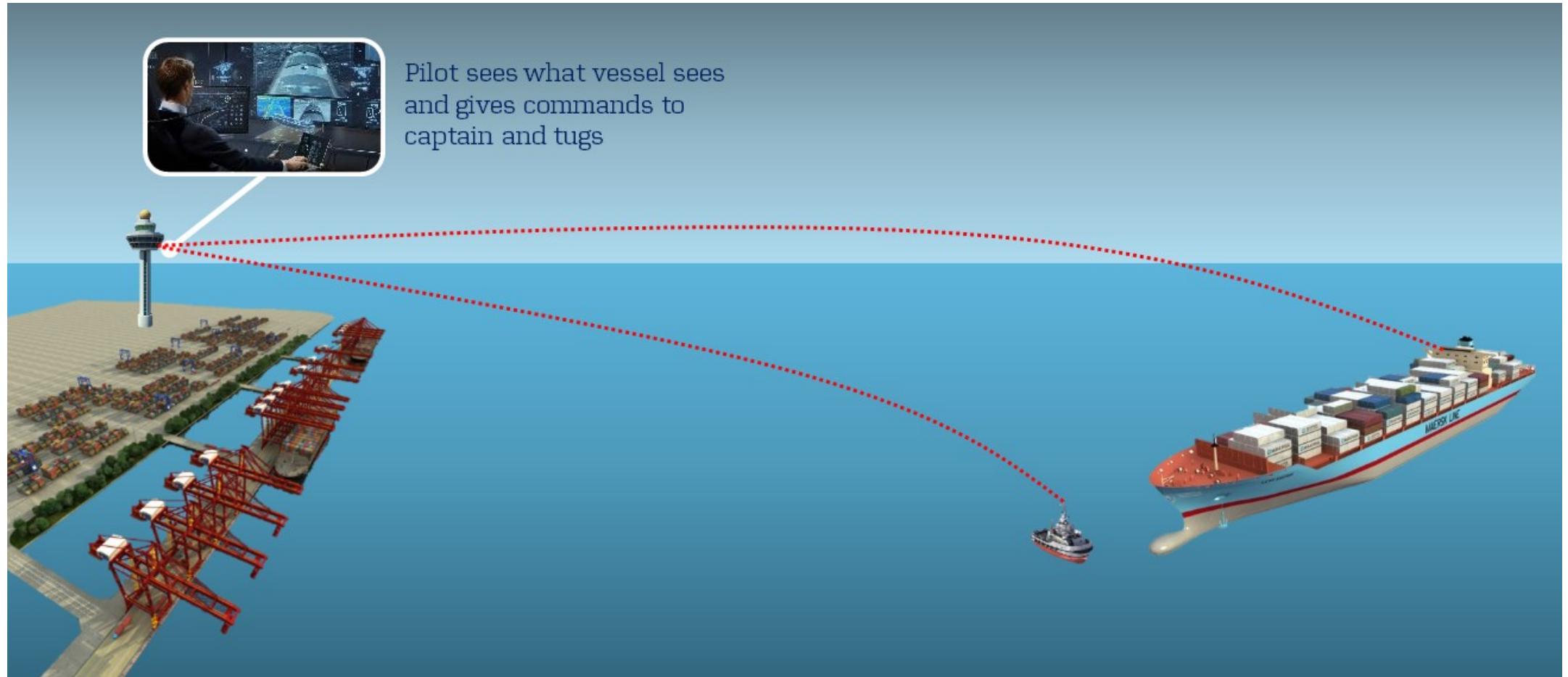
2018 Testing – Situational Awareness

Unlocking value through new technologies

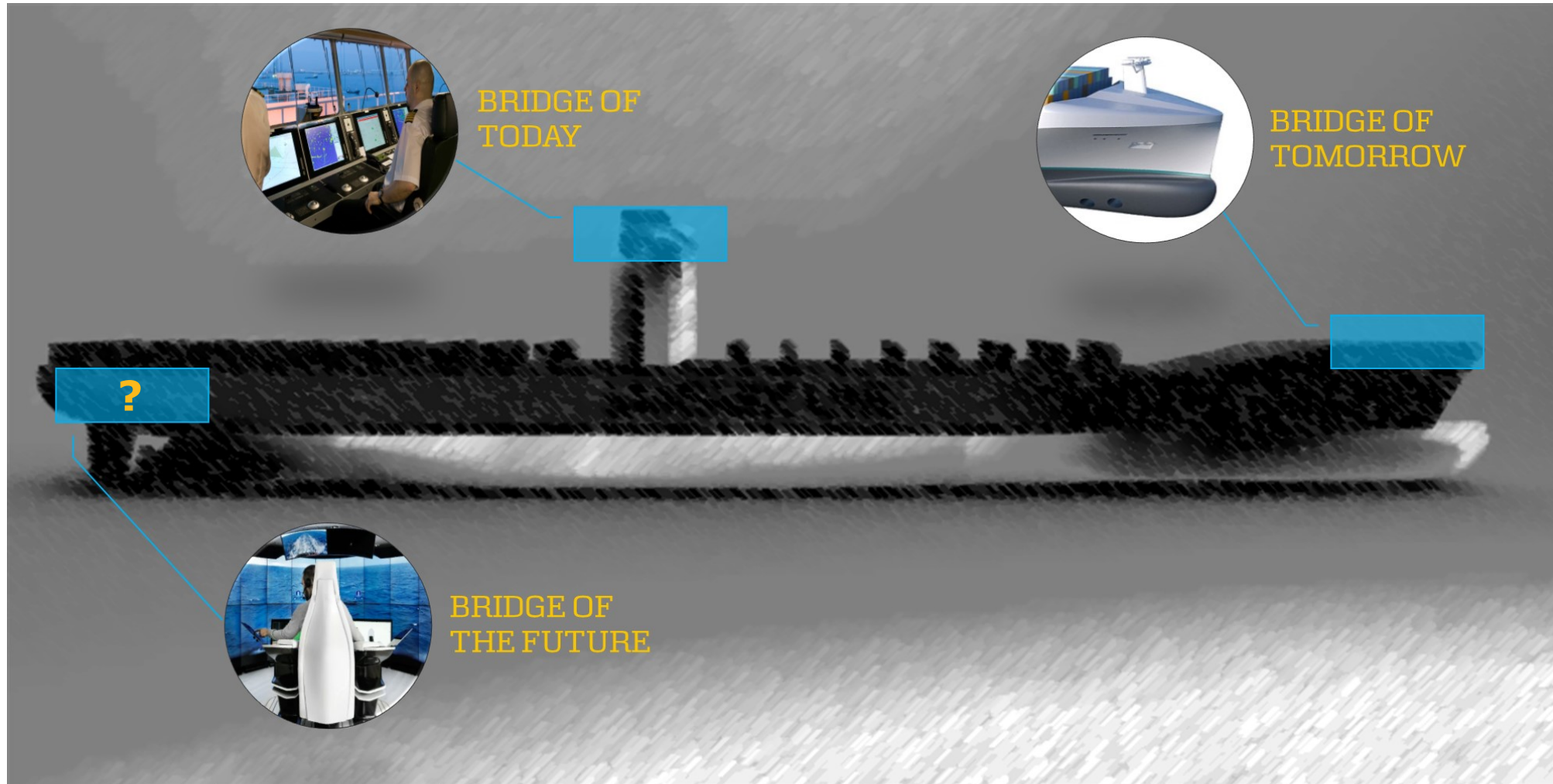


2018 Testing – Situational Awareness

Unlocking value through new technologies



Situational Awareness: The key to future bridge placement



“Autonomy” is not a goal in itself

Key is to improve the safety, reliability, and efficiency of operations

The aim of “autonomy” is to improve operations

Operational improvement

Safety

Examples and benefits

- Collision avoidance
- Severe weather avoidance
- Improved visibility
- Enhanced situational awareness
- Reduced risk for crew

Reliability

- Technical trouble shooting between vessel and office-based staff
- Early detection/alerts
- Predictive maintenance
- Simplified vessel design
- Centralized maintenance

Efficiency

- Reduced fuel consumption
- Port call optimization
- Real-time route optimization
- System wide energy efficiency
- Increased repeatability

- Shore-ship connectivity is the most immediate enabler of operational improvement
 - Unmanning is not an aim for Maersk Line
 - Regulation needs to keep up with the pace of technology

Thank You

