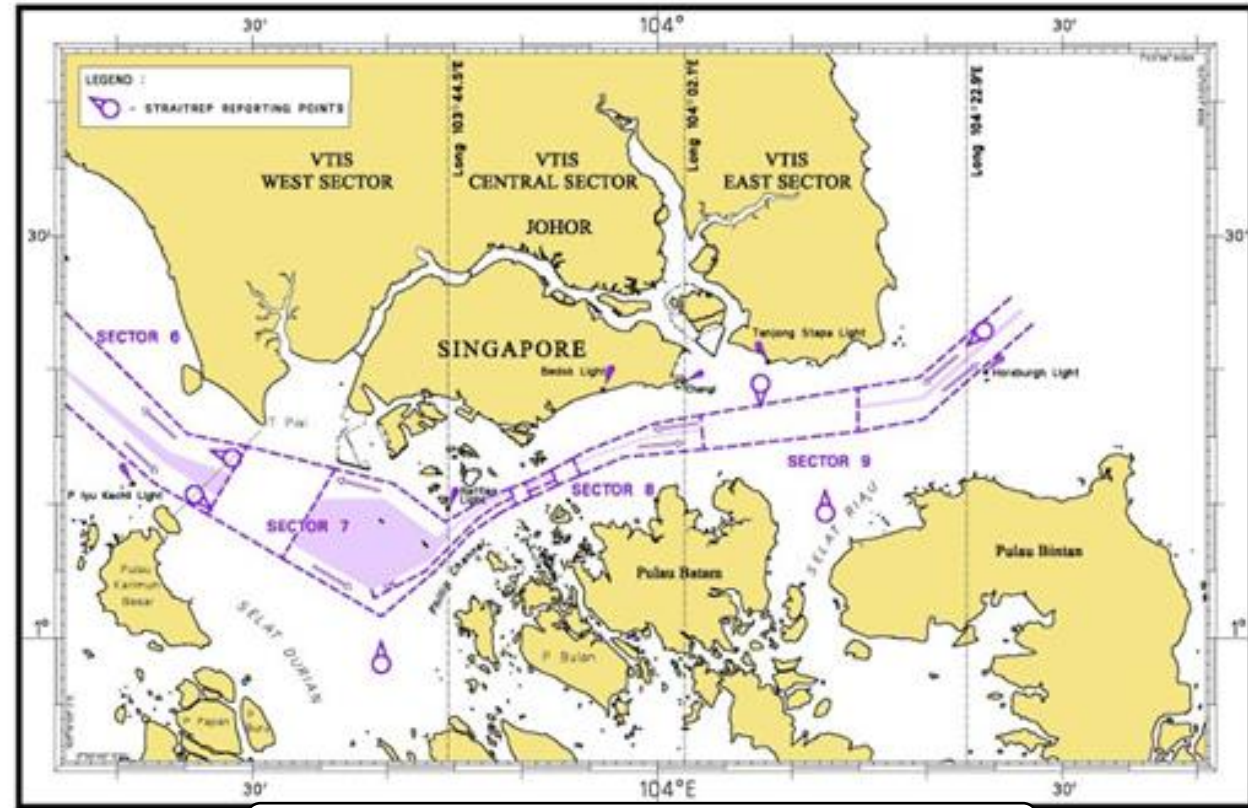


Update on Next Generation Vessel Traffic Management System (NGVTMS)

Background

The Maritime and Port Authority of Singapore (MPA) operates an advanced **Vessel Traffic Information System (VTIS)** to ensure navigational safety and protection of marine environment within Singapore territorial waters and the Singapore Strait.



Singapore's VTS Area of Operations

Background

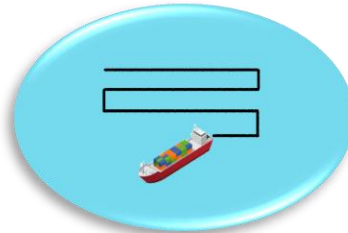
While the current VTIS is serving our needs today, we are planning and designing the **Next Generation Vessel Traffic Management System (NGVTMS)** to advance our VTS capabilities to address future maritime challenges.



Future Challenges in Vessel Traffic Management

Next Generation Vessel Traffic Management System (NGVTMS)

Enhanced Coordination
for SAR Operations



Data Analytics to
enhance VTM Operations



MASS Operations



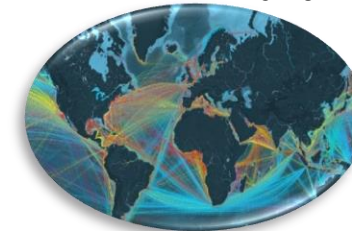
Just-In-Time
Operations



Maritime
Digitalisation



E-Navigation for integrated
maritime ecosystem



NGVTMS

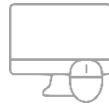
To transform Singapore's VTIS into a "State-of-the Art" NGVTMS that embraces technologies, innovative solutions and is future-proofed to provide efficient and value-added services to ships now and future so as to enhance navigational safety and the protection of the marine environment

Envisaged Operating Concept for NGVTMS – Perspective of Authority

PRESENT STATE



2D visualization for tracking of surface vessels



Utilises standard HMI (e.g. mouse, keyboard, monitor)



Manual detection of emerging situations (e.g. heavy traffic)



Limited information sharing with only WOG agencies



3D monitoring of maritime assets (e.g. drones, USVs, ships)



Optimise performance (e.g. fatigue and stress monitoring) using HMI



Leverage AI and ML to predict emerging situations



Data sharing with stakeholders in the maritime ecosystem



Automation of repetitive work to improve efficiency



Monitor work behaviour (e.g. language, radio ethics) for feedback and improvement



Task-focus operations based on priority and availability



Data analysis (e.g. vessel traffic, anchorages) to optimize operations

Envisaged Operating Concept for NGVTMS – Perspective of Vessels



ENROUTE TO SINGAPORE



Open Seas & Approaches to Singapore Strait

Singapore Strait and Port Waters



Receives Pre-Arrival Notifications (PANs) from vessels



Data Exchange (e.g. voyage plans) for traffic prediction and JIT operations



Communicates with vessels via Satellite (e.g. Sat-VDES)



Provides relevant information (e.g. hotspots) in advance



Provides e-Navigation Services (e.g. meteorological & safety information)



Primarily using VHF voice communications



Automatic data exchange with vessels and other centres (e.g. VTS and MASS)



Improve Navigational Safety by reducing traffic density within AO



Reactive to emerging situations (e.g. collisions)

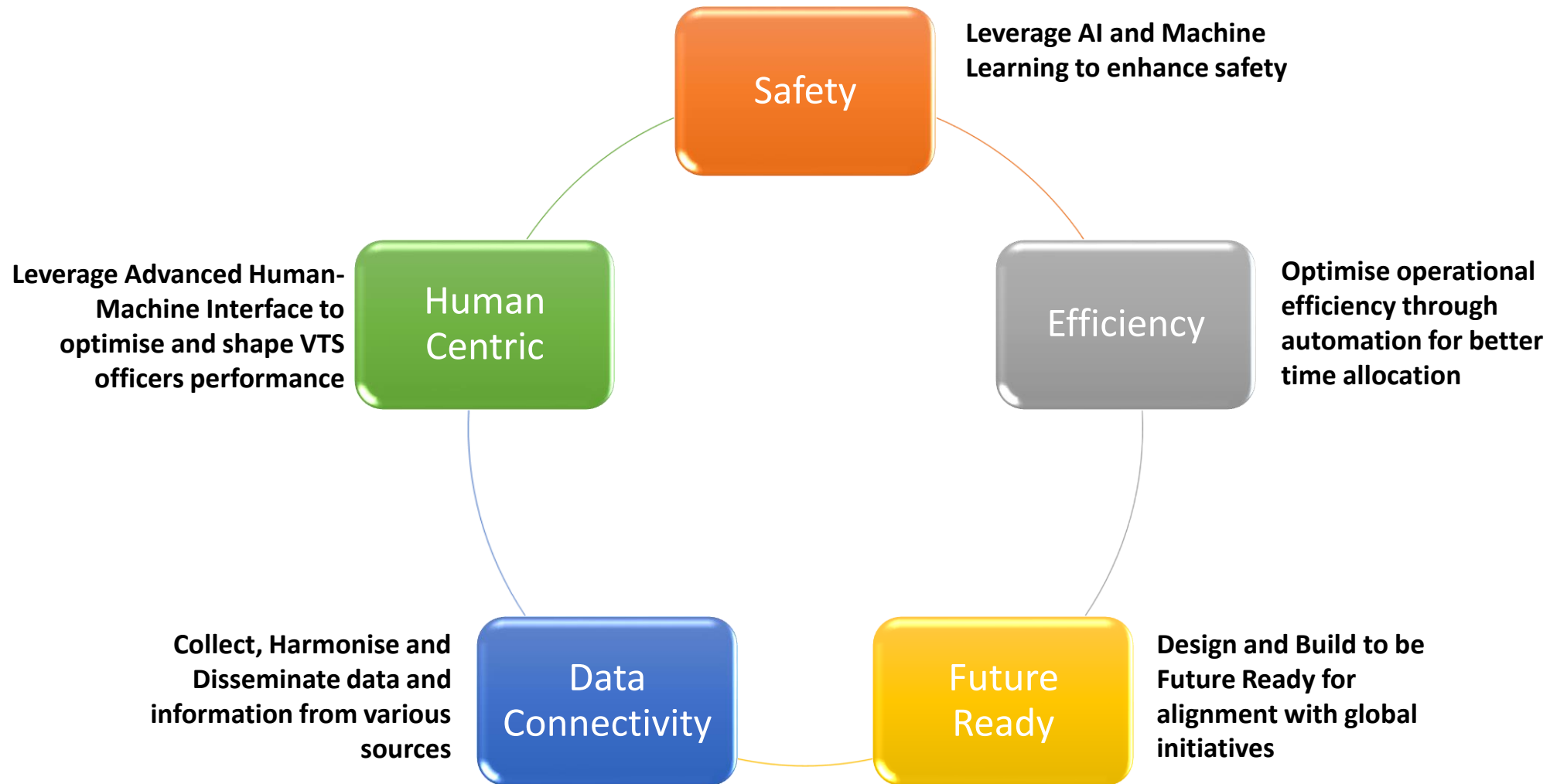


Preemptive alerts to vessels on potential issues (e.g. collisions)



Communicates with vessels via Terrestrial means (e.g. Terrestrial-VDES, Maritime 5G)

Principal Considerations for NGVTMS Development

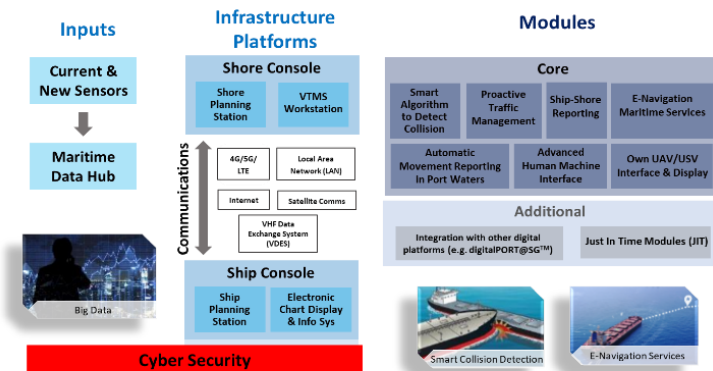


Development Timeline for NGVTMS

Phase 1

Innovation Programme [2018- 2023]

- MPA completed a three-year Innovation Programme in 2021 to develop and test new operating concepts and technologies to enhance navigation safety and efficiency of vessel traffic management.



Phase 2

Prototyping [2023- 2025]

- MPA will start to develop a system prototype in 2023 to test various vessel traffic management applications such as the Smart Collision Detection and Proactive Traffic Management in a real-time sandbox operating environment. This will enable MPA to gain insights on potential new capabilities and scope the requirements and specifications for system implementation.

Phase 3

System Implementation [2025 - 2028]

- The final phase will consist of design, development, installation, testing, and commissioning of the NGVTMS. The system will be deployed from 2025 for 24/7 operations.





M P A
SINGAPORE



MARITIME
SINGAPORE

For Information