

The 7<sup>th</sup> Maritime Silk Road Port International Cooperation Forum

**Workshop on Port and MASS: Practices Challenges and Harmonisation**

**Implementation of Autonomous Navigation: Challenges, Benefits & Recommendations**

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Ningbo, China  
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# Scope of Presentation

## □ Background:

- The autonomous Shipping Projects on Selected Countries in the Asia-Pacific
- Potential Impact of Autonomous Shipping in the Asia-Pacific

## □ Part 1:

- Current Challenges to Shipping in Malaysia

## □ Part 2:

- Potential Impact of Autonomous Shipping in Malaysia

## □ Part 3:

- Recommendations & Strategies for Autonomous Shipping in Malaysia
- Recommendations for Autonomous Shipping in the Asia-Pacific

# The autonomous Shipping Projects on Selected Countries in the Asia-Pacific

## ► Collaboration with key players

➤ ESCAP Transport Division: coordinator

## ➤ Target beneficiary countries

- India
- Indonesia
- Malaysia
- Thailand
- Viet Nam

National consultants in all target countries engaged

## ➤ Experts from:

- China
- Japan
- Republic of Korea
- Russian Federation

## INTERNATIONAL COOPERATION IN AUTONOMOUS NAVIGATION TO PROMOTE SAFE, EFFICIENT AND SUSTAINABLE MARITIME TRANSPORT

Study report on Access to autonomous navigation technology and policy recommendations has been developed in the framework of the project INTERNATIONAL COOPERATION IN AUTONOMOUS NAVIGATION TO PROMOTE SAFE, EFFICIENT AND SUSTAINABLE MARITIME TRANSPORT implemented under APEC and is aimed at:



Raising awareness of relevant stakeholders about recent developments in autonomous navigation



Developing recommendations for introduction of autonomous navigation in the region



Supporting selected countries in strengthening their capacity to effectively implement autonomous navigation technologies and exploring possible collaborations on their practical implementation

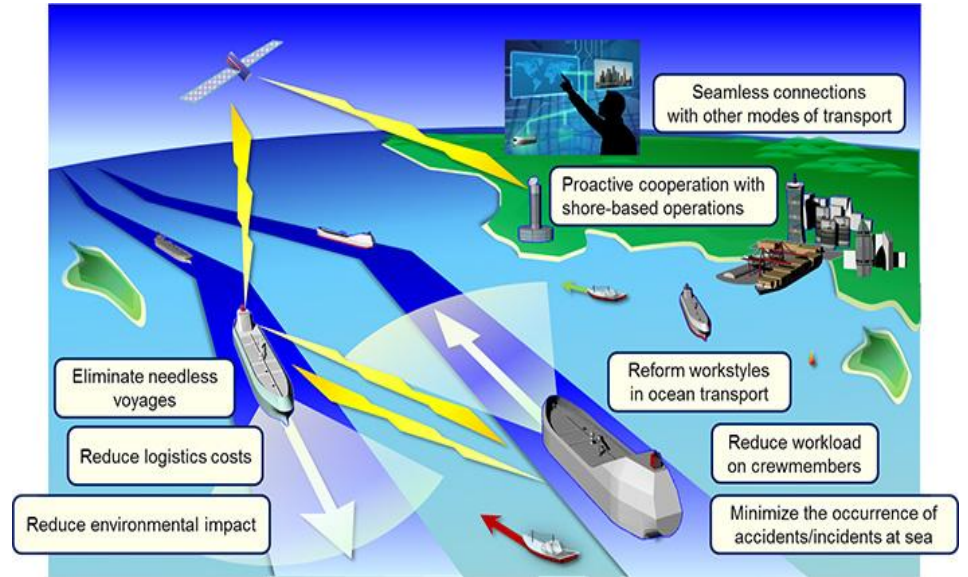


## UN ESCAP's Autonomous Shipping Project

## APEC's Autonomous Shipping Project

# Potential Impact of Autonomous Shipping in the Asia-Pacific Region

- **Navigation Safety:**
  - ✓ Eliminate needless voyages
  - ✓ Minimise the occurrence of incidents at sea
- **Sustainability of Shipping:**
  - ✓ Reduce environment impact
  - ✓ Seamless connections with other modes of transport
- **Economic, technological, social and human:**
  - ✓ Reform workstyles in ocean transport
  - ✓ Reduce workload on crew members
  - ✓ Reduce logistics costs



*Illustration of Potential Impact of Autonomous Shipping*

(Source: <https://www.mol.co.jp>)

## Part 1:

### Current Challenges to Shipping in Malaysia

- As a council member of the IMO, Malaysia:
  - ✓ Complies with **IMO instruments** such as the SOLAS, COLREG, MARPOL & ISPS Code
  - ✓ Participates in the **IMO's programs** on safety of navigation & reduction of greenhouse gas emissions from ships & ports
- However, the **safety of navigation** & the **sustainability of shipping** remain as major concerns in Malaysia



*Malaysia's participation in the IMO programs*

*(Source: Ministry of Transport Malaysia)*

# Current Challenges to the **Safety of Navigation** in Malaysia

- Malaysia collaborates the IMO & neighboring nations to improve the **safety of navigation** by:
  - ✓ **The Malacca Strait Patrols and Traffic Separation Scheme** help prevent collisions
  - ✓ **Malaysian Maritime Enforcement Agency** enforces maritime laws and regulations
- However, there are still **marine incidents** happening in Malaysian waters.



*Traffic Separation Scheme in the Strait of Malacca*  
(Source: <https://mehsoms.net>)



A recent ship's fire in the Malaysian waters  
(Source: Local daily)



# Part 2: SWOT Analysis for Impact of Autonomous Shipping on The Safety of Navigation

## ❖ Strengths:

- ✓ Safety improvement
- ✓ Enhanced situational awareness
- ✓ Faster response time

## ❖ Weaknesses:

- ✓ Lack of human oversight
- ✓ Limited regulatory framework
- ✓ Limited infrastructure

## ❖ Opportunities:

- ✓ Enhance the sustainability of shipping
- ✓ Real-time risk management

## ❖ Threats:

- ✓ Public acceptance
- ✓ Cybersecurity vulnerabilities
- ✓ Economic implications



Illustration of an autonomous ship

Source: <https://sync.cobham.com/>



## Part 2: SWOT Analysis for Impact of Autonomous Shipping on the Sustainability of Shipping

### ❖ Strengths:

- ✓ Reduced emissions
- ✓ Increased use of renewable energy
- ✓ Improved coastal monitoring

### ❖ Weaknesses:

- ✓ Potential for environmental accidents
- ✓ Disruption of marine life
- ✓ **Limited regulatory framework**

### ❖ Opportunities:

- ✓ **Improved environmental sustainability**
- ✓ Real-time monitoring and response
- ✓ Advancements in sustainable technology

### ❖ Threats:

- ✓ Potential environmental accidents
- ✓ Disruption of marine ecosystems and wildlife
- ✓ Inadequate enforcement of environmental regulations



Illustration of an autonomous ship

Source: <https://www.porttechnology.org/>

## Part 2: Potential Impact of Autonomous Shipping in Malaysia

The autonomous shipping technology has potential to improve the shipping in Malaysia through:

### ➤ Improved Safety of Navigation

- ✓ It can **reduce the risk of human error** by using advanced sensors, computer systems, and artificial intelligence to navigate more accurately and avoid

### ➤ Enhanced Sustainability of Shipping

- ✓ It can improve **environmental sustainability** and mitigate **climate change** by reducing emissions and increasing the use of renewable energy

## Part 2: Potential Impact of Autonomous Shipping in Malaysia

The autonomous shipping technology has potential impact on shipping in Malaysia through:

### ➤ Increasing Cybersecurity Risks

- ✓ Autonomous ships are vulnerable to cyber attacks
- ✓ VTMS could be a risk to cyber attacks as the current AIS system which is an integral part of its system is vulnerable to security breach
- ✓ Threats to safety and security protection

### ➤ Limited Regulatory Framework

- ✓ Limited regulatory framework on autonomous shipping poses a challenge
- ✓ Need to comply with the IMO's MASS Code by 2028 to ensure safe and sustainable implementation

## Part 3: Recommendations for Autonomous Shipping in Malaysia

### ➤ Enhancing Safety of Navigation

- ✓ Develop **regulations and guidelines** for autonomous ships based on IMO's MASS Code
- ✓ Provide **training and education programs** for stakeholders
- ✓ Improve the **VTMS monitoring system** to track autonomous ships
- ✓ Conduct regular **safety assessments** to evaluate performance and identify potential risks



*Vessel Traffic Management System (VTMS)*

(Source: <http://rds.co.in/Marine.html>)

# Recommendations for Autonomous Shipping in Malaysia

## ➤ Mitigating Environmental Impact

- ✓ More stringent enforcement on **environmental laws**
- ✓ Incentivize the use of **clean energy sources**
- ✓ Promote **sustainable port infrastructure**
- ✓ Promote **waste management**



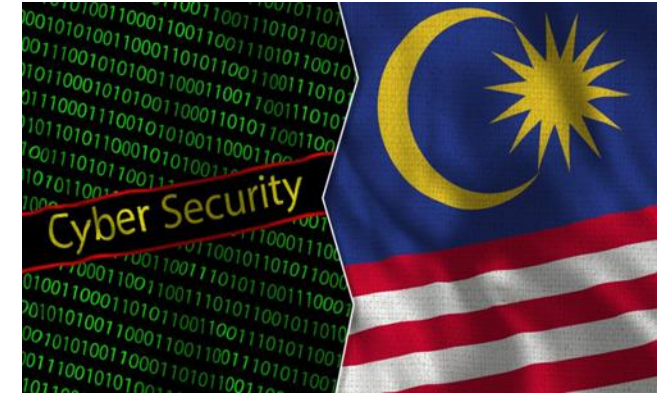
Malaysia's Contribution to the United Nations' Sustainable Development Goals (SDGs)

(Source: Mazlin Mokhtar, Lee K E & S Sivapalan)

# Recommendations for Autonomous Shipping in Malaysia

## ➤ Mitigating Cybersecurity Risks

- The **Cyber Security Malaysia (CSM)** & the **National Cyber Security Agency (NACSA)** are to further mitigate cybersecurity risks to be guided by the **National Cyber Security Policy (NCSP)** & the **Malaysia Cyber Security Strategy (MCSS) 2020 – 2024**
- To enhance the **VTMS/AIS monitoring system** to counter risks to cyberattacks through:
  - ✓ **Information-sharing** on cybersecurity to prevent threats to safety and security protection
  - ✓ Coordinate **training** on countering cybersecurity measures



*Cybersecurity in Malaysia*

(Source: <https://techwireasia.com>)

# Recommendations for Autonomous Shipping in Malaysia

## ➤ Enhancing Regulatory Framework

- ✓ Enhance regulatory framework with the **IMO's MASS Code** by 2028 on the safety of navigation & the sustainability of shipping
- ✓ Collaborate with international organizations to develop global standards
- ✓ Collaborate with stakeholders to develop and implement safe & sustainable shipping practices
- ✓ Coordinate research and development in autonomous technology



### **Part 3: Strategy to Prepare Malaysia for Autonomous Shipping**

- **Invest in Technological Infrastructure:** Invest in the necessary technological infrastructure to **support the development and operation of autonomous ships**, including its **regulatory framework**.
- **Enhance Navigation Safety:** Enhance **navigation safety** by promoting the use of advanced technology such as collision avoidance systems, electronic chart displays, and automated identification systems.
- **Promote Sustainable Shipping:** Promote **sustainable shipping practices** by encouraging the use of low-emission fuels, such as liquefied natural gas (LNG) and biofuels.
- **Develop a Skilled Workforce:** Develop a **skilled workforce** to support the development and operation of autonomous ships.
- **Foster Collaboration:** Foster **collaboration with other countries**, international organizations, & the private sector to promote the safe and sustainable development of autonomous shipping



## Part 3: Recommendations for Autonomous Shipping in the Asia-Pacific

- **Enhance collaborations** with international organizations such as the IMO, United Nations ESCAP, APEC & ASEAN
- Encourage nations to enhance their **regulatory framework & VTMS monitoring systems** to track autonomous ships for safety of navigation
- Promote **information-sharing** among regional organizations and nations
- Establish a **regional task force** to address the potential impact on environment and local communities
- Coordinate and promote **research and development** on autonomous shipping

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***Thank You 谢谢***

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