COLLISION PREVENTION
SHIPUNIVERSE
ADVANCED STRATEGIES

☐ 1. Collision Avoidance Fundamentals

Ensures strict adherence to COLREGs, proper lookout practices, and communication protocols. / Train crews with regular BRM sessions / Conduct fleet-wide collision avoidance drills / Minimal investment (mainly training and procedures)

☐ 2. ARPA for Collision Risk Assessment & Early Avoidance

Tracks nearby vessels and predicts collision risks. / Calibrate ARPA systems regularly / Train bridge crews to interpret CPA/TCPA data / Moderate investment (software and training)

☐ 3. AIS for Real-Time Vessel Tracking & Collision Prevention

Enables real-time vessel tracking to improve situational awareness. / Ensure AIS transceivers are operational / Regular software updates / Minimal to moderate investment (Class A systems may be needed)

☐ 4. Integrated Bridge Systems (IBS) for Centralized Collision Monitoring

Centralizes radar, AIS, and ECDIS into a unified control system. / Standardize IBS across the fleet / Train crews on IBS data interpretation / Moderate to significant investment (hardware and integration)

☐ 5. ECDIS with Real-Time Data for Safer Route Planning

Digital navigation with live data for improved route planning and hazard detection. / Regularly update digital charts / Implement backup navigation systems / Moderate investment (software updates and crew training)

☐ 6. Advanced Marine Radar for Early Hazard Detection

Enhances visibility in poor weather and low-light conditions. / Ensure radar systems are updated and operational / Regular system tests / Moderate to significant investment (system upgrades and maintenance)

☐ 7. LIDAR & Infrared Sensors for Low-Visibility Detection

Detects obstacles and hazards in low-visibility conditions. / Equip vessels with LIDAR or infrared systems / Train crews to interpret sensor data / Moderate to significant investment (hardware and integration)

☐ 8. Dynamic Positioning Systems (DPS) for Safe Navigation

Maintains position or navigates precisely in confined or high-traffic spaces. / Equip vessels with DPS and calibrate regularly / Train crews on station-keeping techniques / Significant investment (hardware and maintenance)

☐ 9. Real-Time Ship-to-Ship Data Sharing

Improves situational awareness by allowing vessels to exchange navigation data. / Ensure AIS systems are properly configured / Integrate with VHF for real-time communication / Minimal to moderate investment (software and integration)

☐ 10. Satellite-Based Collision Avoidance & Weather Routing

Optimizes routes based on real-time weather and traffic data. / Equip vessels with satellite navigation systems / Integrate with ECDIS and AIS for dynamic route planning / Moderate to significant investment (system installation and subscription)

11. AI-Powered Collision Prediction & Autonomous Risk Avoidance
Predicts potential collisions and recommends avoidance maneuvers. / Equip fleet with AI-assisted navigation tools / Train crews to interpret AI-driven recommendations / Moderate to significant investment (software and integration)

12. Automated Emergency Collision Alerts with Decision Support
Provides real-time alerts and decision support for collision avoidance. / Install automated collision alert systems / Integrate with ECDIS and radar systems / Moderate investment (software and training)

13. Fleet-Wide Remote Monitoring Centers for Real-Time Risk Oversight
Enables shore-based monitoring of fleet movements and risk alerts. / Establish remote monitoring centers / Ensure vessels transmit real-time data / Significant investment (infrastructure and staffing)

14. Maritime Drones for Surveillance & Blind Spot Monitoring
Monitors blind spots and detects hazards around vessels. / Equip vessels with drones for surveillance / Integrate drone data into bridge systems / Moderate to significant investment (drone hardware and integration)

15. Standardized VHF Communication to Reduce Misunderstandings
Ensures clear and consistent communication between vessels. / Implement standardized VHF procedures / Train crews in proper radio communication / Minimal investment (training and procedural updates)

16. Collision Risk Mapping & Heatmaps for High-Risk Routes
Identifies high-risk areas and optimizes routes for safety. / Implement risk mapping software / Integrate with ECDIS for real-time alerts / Moderate investment (software and integration)

17. Digital Twin Simulations for Proactive Collision Avoidance
Creates virtual ship models to simulate scenarios and improve safety. / Adopt digital twin simulation software / Integrate with live vessel data / Significant investment (software and data integration)

18. Augmented Reality (AR) Bridge Displays for Enhanced Situational Awareness
Displays real-time data overlaid on transparent screens for better navigation awareness. / Equip vessels with AR bridge displays / Train crews to use AR systems effectively / Significant investment (hardware and software)

19. Standardized ARPA & AIS Data for Consistent Collision Avoidance Decisions
Ensures uniform collision avoidance decisions using standardized data interpretation. / Standardize ARPA and AIS settings fleet-wide / Train crews on consistent response protocols / Minimal to moderate investment (system calibration and training)

20. Automated Voyage Planning for Smarter, Safer Navigation
AI-driven route planning that dynamically adjusts based on traffic and weather data. / Implement AI-powered voyage planning software / Train crews on reviewing AI-generated routes / Moderate to significant investment (software and training)