

- b) Advances in technology will make possible the detection, identification, and precise tracking of vessels beyond conventional “monitored” areas (e.g., existing VTS areas, VHF radio coverage, etc.), including long-range identification and tracking (LRIT) as well as terrestrial and satellite-based reception of automatic identification systems (AIS).
  - c) Comprehensive and effective risk assessment will increasingly become the basis for the safe management of enhanced navigation.
  - d) As the quality and accuracy of vessel tracking improves, the option to “control” shipping by means of “directions”, rather than passing information and advice, will possibly be used more widely as a mechanism for reducing risk, particularly as regards security measures
  - e) The need to assure and certify the competency of shoreside operators and supervisors in order to reduce any exposure to increased liability is likely to add to the scope and priority of such training.
  - f) The need to manage recreational and other small craft by shoreside authorities and other means in order to ensure the safety of navigation in areas where security issues demand it and commercial and high-density recreational traffic co-exist is likely to increase.
  - g) There is a compelling need to specify requirements for electronic Positioning, Navigation, and Timing (PNT) capabilities to supplement Global Navigation Satellite Systems (GNSS) as part of an *integrated electronic PNT capability*.
3. In contributing to the development of a high-level “IALA Vision”, the above may be distilled from an E-Nav perspective into the following:

***“IALA recognises that the trends in maritime operations towards enhanced navigation, safety, security, efficiency, accountability and environmental responsibility, together with anticipated technical advances, will result in significant future change. As a consequence, IALA will monitor these trends and developments constantly for any impact on the use or management of enhanced aids to navigation. IALA will develop a robust e-navigation outlook to embrace the ever growing and complex set of technological aids that already exist and are yet to be developed. Where appropriate IALA will also influence debate, and produce relevant recommendations and guidelines.”***