



SPACE-BASED POSITIONING
NAVIGATION & TIMING
NATIONAL ADVISORY BOARD

PNT ADVISORY BOARD REFAAT RASHAD SURFACE TRANSPORTATION REPORT



Subcommittee Membership

- Member 1: Mr. Shields
- Member 2 ; Refaat Rashad



- **Based on the PNT AB Topics Paper to develop Recommendations**



Road Transportation

- **Scope**
- GPS and other GNSS are in practice the only source of PNT data for surface navigation, road transportation including smart vehicles, traffic information, mapping and guidance public transportation, V2V communication and automated driving presents dependents on GNSS is a single point of failure.
- **Recommendation**
- Keep spectrum for ground communication adequately distant from GPS spectrum.



Maritime Transportation

Scope

The International Convention for the Safety of Life at Sea (SOLAS), which mandates a range of safety systems for ships, including those that depend on GPS for functionality such as AIS, voyage data recorders (VDRs), emergency positioning indicating radio beacons (EPIRBs), and the Global Maritime Distress Safety System (GMDSS), thus ships' safety systems depends on GNSS for positioning and precise timing. Port operations include logistics, cargo, cranes and containers movements are hinged to GPS

Recommendation

eloran is approved by IMO and IALA and considered the best GNSS back-up option for PNT.



- **Scope**

- Commercial benefits motivate receivers manufactures to make less robust receivers vulnerable to interferences

- **Recommendation**

- Adopt manufacture code of ethics to harden GPS devices to recognize cyber attacks and counteract them.

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- **Scope**

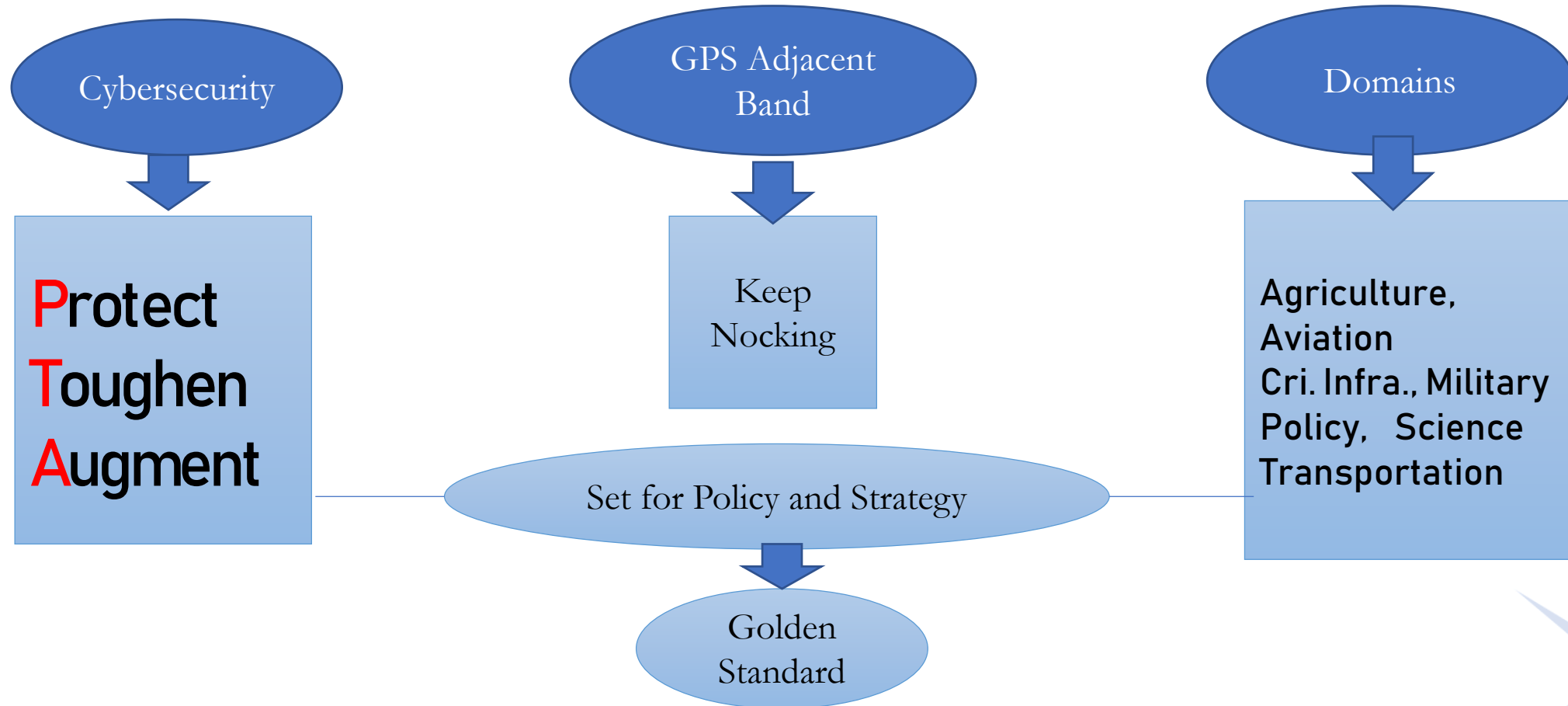
- PNTAB is well positioned to act as the bridge between the USG and industry as an education campaign is initiated and feedback is solicited from users.

- **Recommendation**

- PNTAB Chairs members to participate in similar clusters such as UAG, RPNT and CGSIC to tie and extend the cooperation for PNT Assurance.



FUTURE ACTIVITIES



The background features a series of overlapping triangles in shades of blue and grey. A large, dark blue triangle is the central focus, with several lighter blue and grey triangles layered behind it, creating a sense of depth and movement. The triangles are oriented in various directions, some pointing towards the center and others towards the corners of the frame.

Thank you