

GNSS Dependencies in Transportation

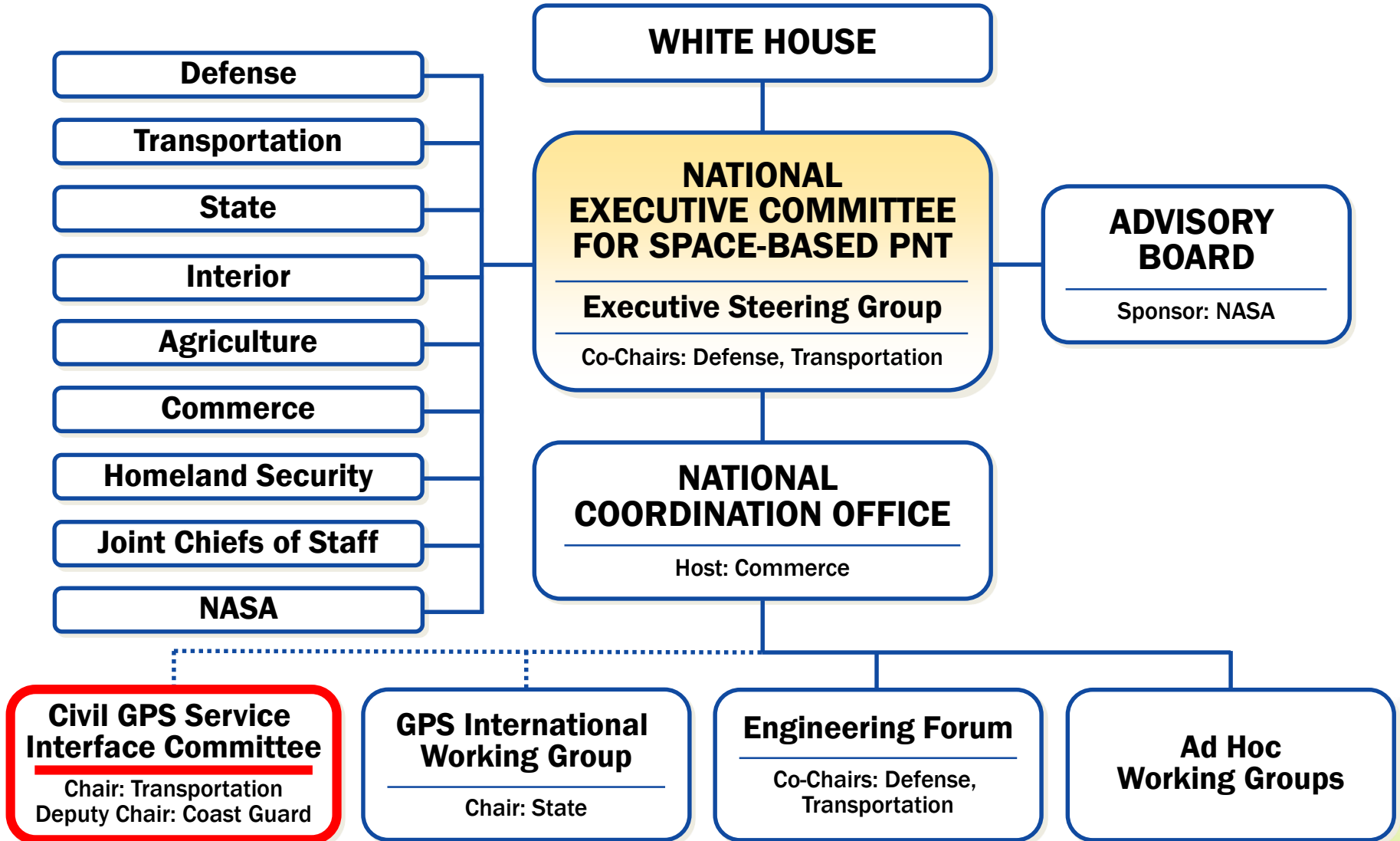
CGSIC Session

Munich Satellite Navigation Summit

March 27, 2019



U.S. Space-Based PNT Organization Structure



Safety Is Job #1

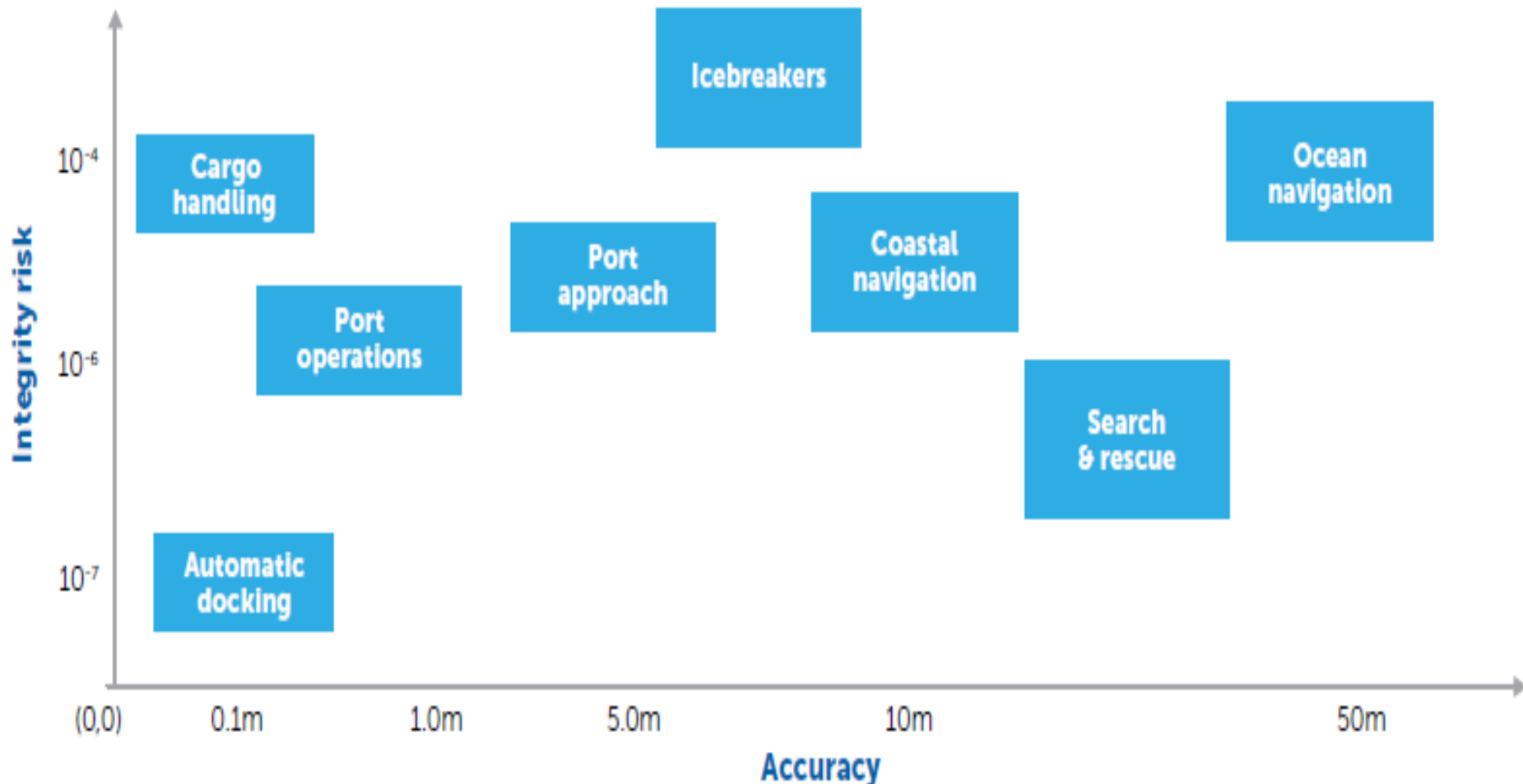
The mission of the U.S. Department of Transportation (DOT) is to ensure our Nation has the safest, most efficient and modern transportation system in the world, which improves the quality of life for all American people and communities, from rural to urban, and increases the productivity and competitiveness of American workers and businesses.

Get There Fast, Get There Safe

Transportation Critically Dependent on GNSS

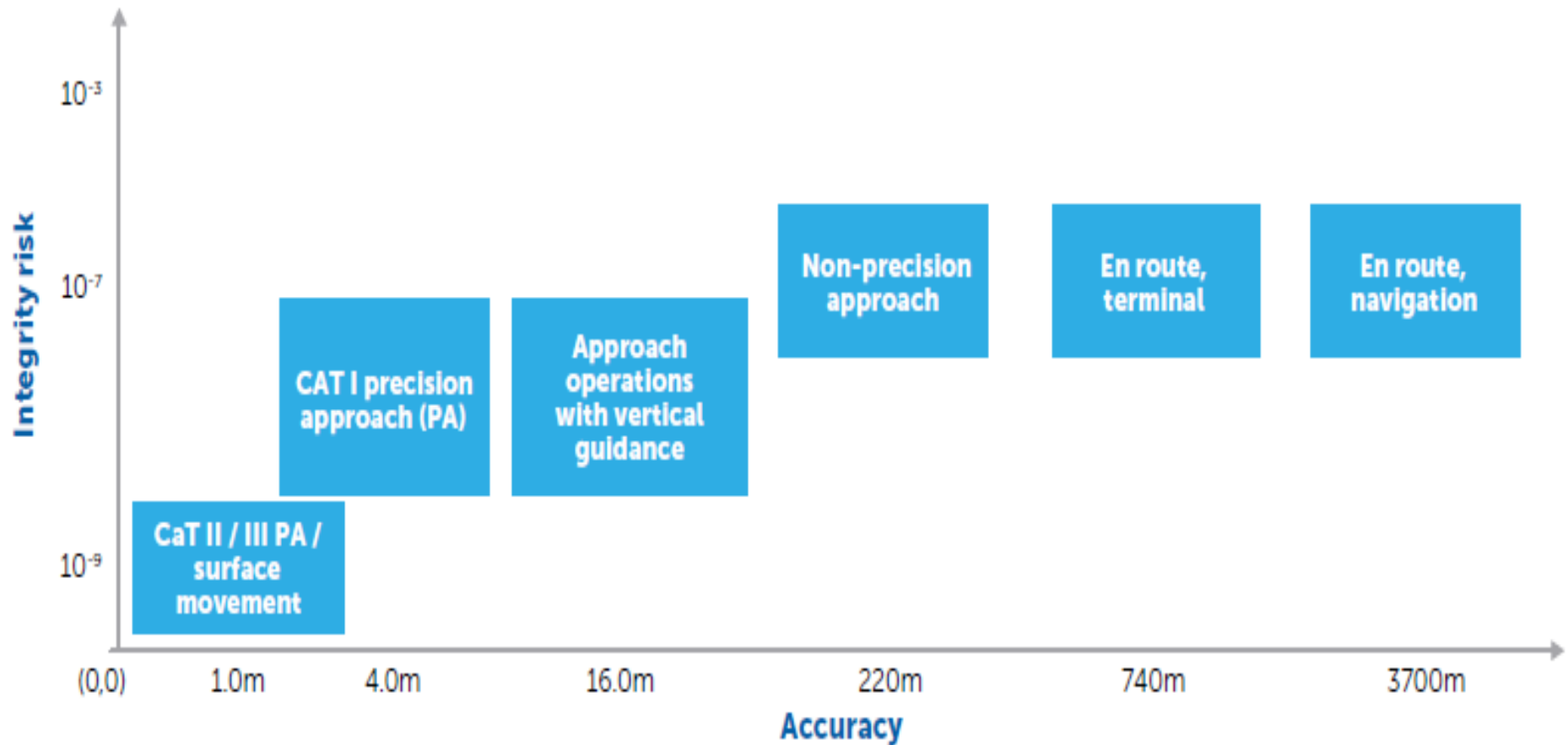


Positioning Accuracy and Integrity for Maritime Applications



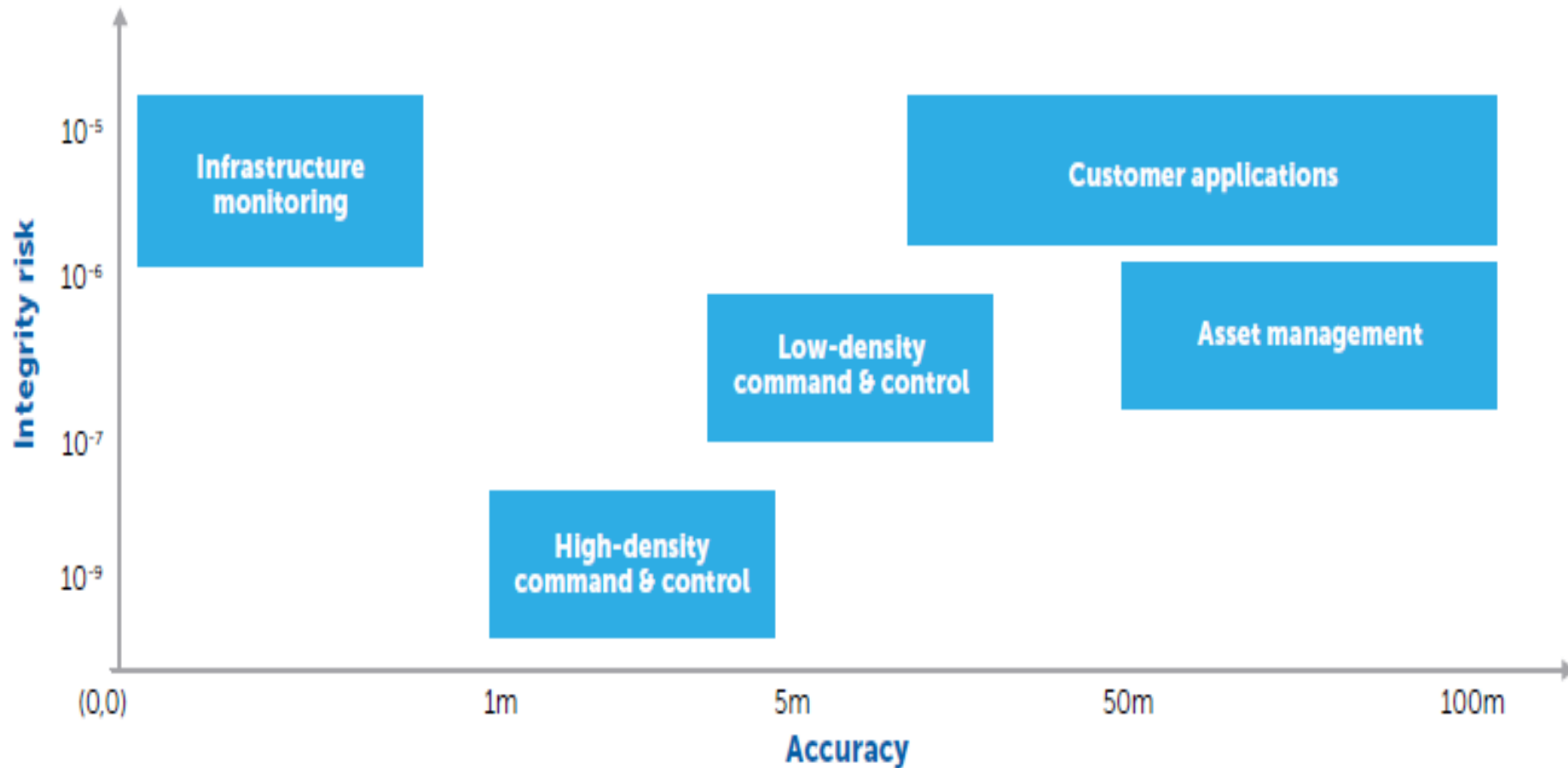
*UK Government Office of Science Satellite-Derived Time and Position Report

Positioning Accuracy and Integrity for Aviation Applications



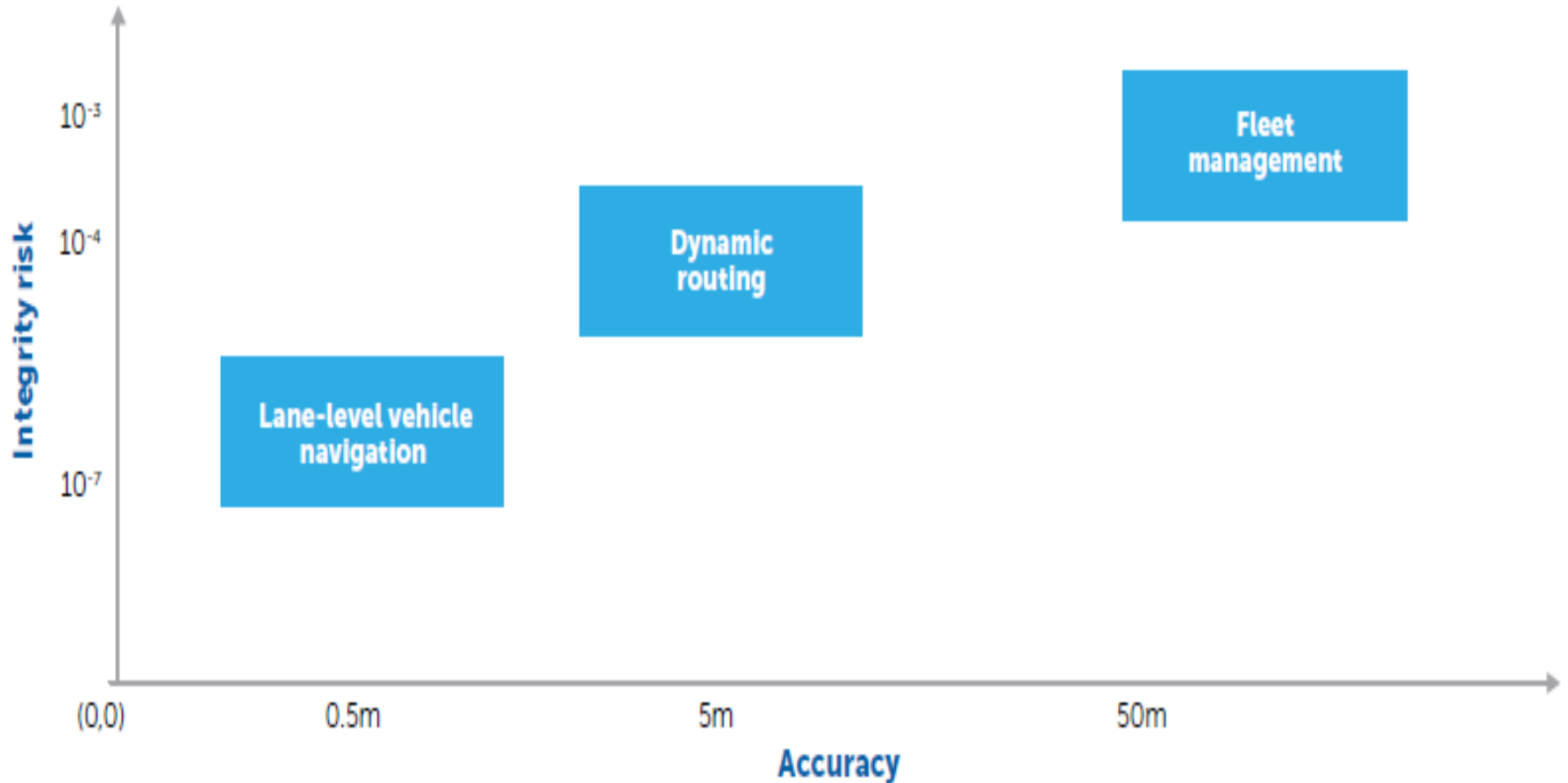
*UK Government Office of Science Satellite-Derived Time and Position Report

Positioning Accuracy and Integrity for Rail Applications



*UK Government Office of Science Satellite-Derived Time and Position Report

Positioning Accuracy and Integrity for Vehicle Applications



*UK Government Office of Science Satellite-Derived Time and Position Report



U.S. Department of Transportation

Automated Vehicles 3.0

PREPARING FOR THE FUTURE OF TRANSPORTATION



National Timing System Backup to GPS

- The Frank LoBiondo Coast Guard Authorization Act of 2018 (P.L. 115-282) includes Sec. 514, “Backup National Timing System”, also known as National Timing Resilience and Security Act of 2018.
(Signed by President Trump December 4, 2018)
- The Act requires the Secretary of Transportation to develop, construct, and operate a land-based backup timing system within two years, with a 20 year operational life.

GPS Backup/Complementary PNT

In December 2016, Section 1618 of the 2017 National Defense Authorization Act (NDAA), “Backup and Complementary Positioning, Navigation and Timing Capabilities of Global Positioning System” required the Secretaries of Transportation, Defense, and Homeland Security to:

- 1) Identify PNT requirements to backup and complement PNT capabilities dependent on GPS for national security and critical infrastructure;
- 2) Conduct an analysis of appropriate technology options;
- 3) Conduct an analysis of the viability of a public-private partnership to establish a complementary PNT system;
- 4) Conduct an analysis of the viability of service level agreements to operate a complementary PNT system;
- 5) Determine the estimated costs, schedule, and system level technical considerations, including end user equipment and integration considerations; and
- 6) Identify appropriate resourcing for each such Department in accordance with the respective requirements of the Department, including domestic or international requirements.

GPS Backup/Complementary PNT (Cont.)

In December 2017, Section 1606 of the 2018 National Defense Authorization Act (NDAA), “Demonstration of Backup and Complementary Positioning, Navigation, and Timing Capabilities of Global Positioning System” additionally required the Secretaries of Transportation, Defense, and Homeland Security to:

- 1) Jointly develop a plan for carrying out a backup GPS capability demonstration for critical infrastructure sectors
- 2) Subject to appropriations, carry out the GPS backup demonstration within 18 months

\$10M appropriated to carry out GPS backup demonstration
- Plans underway to conduct demonstration

2019 Federal Radionavigation Plan

Items Considered in Update

- GPS Adjacent Band Compatibility Results
- Termination of Nationwide Differential GPS (NDGPS)
- GPS Civil Signal Roadmap: IOC and FOC
- PNT Resiliency
 - Mitigation of Disruptions to GPS
 - Backup/Complementary PNT Technologies
 - Interference Detection
 - DHS Best Practices

Thank You