

# Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2017-733

Topic # AF141-253

System-Of-Systems Open Architecture PNT (SOAP) Solution for Assured PNT in a GPS Denied Environment

NAVSYS Corporation

## WHO

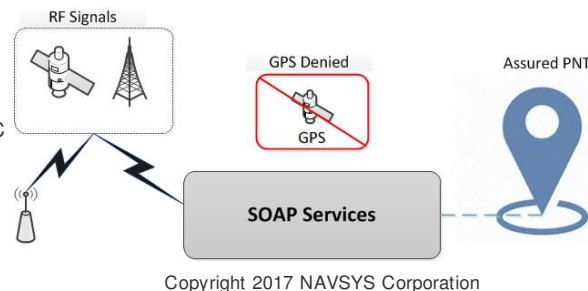
**SYSCOM:** NAVAIR

**Sponsoring Program:** PEO U&W / PMA 201

**Transition Target:** Common Radio Enhancement (CoRE) Program FNC

**TPOC:**  
(760)939-0380

**Other transition opportunities:**  
Department of Defense programs with a requirement to operate in a GPS denied environment



## WHAT

**Operational Need and Improvement:** Threats against the Global Positioning Systems (GPS) require innovative solutions to enable US forces to continue to operate in its absence. While advances in inertial navigation systems allow operation for extended period of times without updates, additional solutions are necessary to sustain an advantage over our adversaries. Existing systems cannot support precision navigation if GPS is denied for extended periods.

**Specifications Required:** PEO U&W identified a need for Anti-Access/ Area Denial (A2/D2) communications, assured navigation, and non-GPS navigation. This includes next generation Position, Navigation, and Timing (PNT) solutions using augmentation from next generation A2/D2 communication networks and software defined radio (SDR) capabilities. This game-changing technology enabling positioning, navigation and timing with equivalent capability to GPS in the event of its denial or destruction. The urgency for this type of solution is rapidly growing as the jamming and spoofing of RF signals has frequently occurred in current conflicts across the globe.

**Technology Developed:** NAVSYS technology provides a system-of-systems, open architecture PNT (SOAP) software solution that utilizes augmentation signals and next generation sensors to provide precision, Assured PNT (A-PNT). This software solution leverages Signal of Opportunity (SoOPs) and SDRs to provide A-PNT. It can be integrated into platforms requiring an A-PNT solution.

**Warfighter Value:** This technology provides viable alternative to GPS to receive PNT. This data is absolute essential in today's dynamic environment in which our adversaries electronic and cyber warfare capabilities are rapidly closing the technological supremacy the United States has maintained for decades. This solution will provide the warfighter a significant advantage in opening against near peer adversaries with growing advantage in the cyber domain.

## WHEN

**Contract Number:** N68936-17-C-0019 **Ending on:** February 18, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Complete System Design	Low	Complete Overall System Design and downselect key subcomponents	4	August 2017
Conduct Satellite Communication Link Test	Low	Generate and Recieve C-Band position and timing information using Commerical Satellite Bandwidth	4	December 2017
Complete Prototype System Build	Med	Complete verification of system and functional testing	4	February 2017
System Test and Analsys	Med	Complete System test Plan. Perform Data Collectiona and Analysis	4	July 2018
Perform A-PNT Demonstration	Med	Successful Demonstration of Overall System	5	August 2018

## HOW

**Projected Business Model:** Our business model involves the maturation of the technology and the establishment of a strong relationship with a commercial satellite vendor. We already have established this relationship and are focused on achieving technical milestones. As technical risk surrounding the solution continues to decline, NAVSYS will be pursuing partnerships with prime contractors and software defined radios manufacturers to enable the implementation of the software solution across a broad array of applications and military platforms. We are currently working with prime partner SDR manufacturer on an adjacent technology, so we understand integration challenges and necessity in clearly defining requirements. Ultimately, NAVSYS will be a software solution provider with the expertise to support integration of the solution with government and industry partners.

**Company Objectives:** NAVSYS short term focus is on developing the technology ready for demonstration, test and integration. The solution has applicability across a wide spectrum of military programs. We will work closely with Navy program managers to clearly articulate requirements necessary in the next generation of software defined radios to support wide spread adoption and use of this technology. This approach is consistent with NAVSYS' 30-year mission of providing specialized navigation products and services for our customers by leveraging our core technologies, innovative engineering, and high standards of excellence. In order to reach the full potential of this solution, NAVSYS recognizes the need to form a broad alliance between government, industry, and commercial satellite partners to provide a complete solution.

**Potential Commercial Applications:** The NAVSYS solution has the potential to provide a commercial augmentation to GPS for use in unmanned vehicles.

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