



January 27, 2023

Public Wireless Supply Chain Innovation Fund Implementation

ref: DOC/NTIA Docket No. 221202-0260 / Regulations.gov Docket No. NTIA-2022-0003
submitted via Regulations.gov

INTRODUCTION

Satelles appreciates the opportunity to provide input to the NTIA regarding the implementation of the Public Wireless Supply Chain Innovation Fund. We feel we are uniquely qualified to offer input and feedback as Satelles has been actively selling PNT (positioning, navigation, and timing) solutions for several years to private industry in the finance and telecom sectors and would therefore be able to offer significant contributions to the effort to promote and deploy more widely across the industry. In these comments, Satelles proposes that its timing synchronization solution should be considered as one of the recommended sources of time for 5G networks and that the U.S. Government should use the Public Wireless Supply Chain Innovation Fund for a pilot of the technology.

FEEDBACK AND RECOMMENDATIONS: TECHNOLOGY DEVELOPMENT AND STANDARDS

Satelles recommends that the U.S. Government increase the use of GPS (Global Positioning System) alternatives to accelerate 5G deployment and enhance the resiliency of critical infrastructure. STL (Satellite Time and Location) from Satelles is one of the technologies that should be considered for implementation with support from the Public Wireless Supply Chain Innovation Fund.

Positioning and timing solutions (portion of PNT) for 5G networks are a critical part of securing our national critical infrastructure. GPS is the primary source of time and position for 5G networks today, and it is widely known that GPS augmentation is required for resiliency. Additionally, there are 5-10 times the number of nodes in a 5G telecom network than there were 4G nodes, and most of these are now located indoors.

GPS does not work indoors, and therefore it requires an outdoor antenna with a clear view of the open sky. It is very often not permissible to core through concrete floors of high-rise buildings and run cabling to gain roof access. Even in those circumstances in which floor-drilling and cabling are allowed, securing roof rights from landlords is time consuming, complicated, and costly.

In those instances where GPS and other GNSS (Global Navigation Satellite Systems) are unavailable indoors, many operators have relied on PTP (Precision Time Protocol) to distribute timing synchronization to GPS-unavailable indoor nodes. However, as wireless operators have migrated their networks from FDD (Frequency Division Duplex) to TDD (Time Division Duplex), the timing accuracies have become too strict for many such PTP time transfer solutions to work consistently. This is just being realized by wireless operators today as they continue to roll out their 5G networks.

STL is a preferred choice for timing today when distributed PTP networks that synchronize RAN frequencies are unable to achieve these accuracies. With the onset of real threats and vulnerabilities to the security of GPS/GNSS, STL is a single source to solve both indoor challenges as well as to safeguard critical infrastructure from threats to the security of GPS.

The STL solution should be contemplated by the Public Wireless Supply Chain Innovation Fund because it is a ubiquitous and scalable means of increasing 5G resiliency throughout the nation. STL is easy to

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deploy and connect as a resilient offering and also very easily configured in tandem so that GPS and STL can seamlessly complement each other, with GPS being used, STL being used, or a combination of one rolling to the other in the event of a disruption. Additionally, STL can be used anywhere, including rural areas. This is important as rural areas are often later to benefit from new technologies. **To ensure that rural America is protected in a meaningful way, Satelles recommends that NTIA should include both rural and urban areas in the deployment of GPS alternatives.**

FEEDBACK AND RECOMMENDATIONS: TRIALS, PILOTS, USE CASES, AND MARKET DEVELOPMENT

The U.S. Government has done an excellent job at raising awareness of the risks to our national security due to our nation's reliance on GPS for so much of our national critical infrastructure. However, many of the critical infrastructure operators have not yet prioritized the deployment of resilient PNT. Many have stated this is a direct result of their desire to first see a commitment demonstrated by the U.S. Government. The use of trials and pilots is an excellent way to kick-start the private sector adoption of the necessary resilient solutions.

One of the important elements that NTIA should consider is the criticality of widescale adoption. If critical infrastructure operators opt to provide resiliency to only a small portion of their operations, it leaves our nation vulnerable. Utilizing trials and pilots will enable industry to understand firsthand exactly what is involved and necessary so that fully informed decisions can be made vs. asking for adoption based on proposals and future capabilities. Structuring the pilots and trials to fund based on progressively larger scales of adoption will allow NTIA to foster the long-term goals of complete resilience.

Satelles recommends a demonstration to show how STL protects critical infrastructure as a resilient and accurate source of time for 5G wireless networks both as a complement to GPS and as an alternative technology to safeguard in cases where GPS is compromised.

The Solution

STL from Satelles offers a resilient backup to GPS that: (1) is globally accessible by mimicking the GPS paradigm of portability for users; (2) is proven through demonstrations around the world to meet the need for 1-sigma, sub-100-nanosecond accuracy; (3) is ready for installation today in infrastructure that currently relies on GPS for timing synchronization, and (4) does not require any additional investment or deployment of infrastructure for Satelles' solution.

Using STL instead of GPS is often a more cost-effective solution for critical infrastructure providers that normally install a rooftop antenna to ensure indoor GPS receivers can access GPS signals. This is because STL signals are approximately 30 dB (1,000 times) stronger at the surface of the Earth than GPS signals, so they can penetrate deep into indoor environments, avoiding any need to use a rooftop antenna.

Some companies choose STL over GPS simply for this reason: it is often easier and/or more cost-effective to deploy STL with its indoor antenna than it is to run lengthy coaxial cable or fiber from an indoor GPS or GNSS receiver to an antenna on the roof. Additionally, many sites are finding that there are prohibitive landlord costs and constraints in addition to zoning restrictions that simply make rooftop GPS antennas not possible.

The Pilot/Trial Opportunity – Details of Proposed Demonstration

Satelles proposes to demonstrate the ease with which STL receivers can be integrated into pre-existing national critical infrastructure which relies today on the availability of accurate Coordinated Universal Time from GPS. Our recommendation is to replace 1,000 GPS receivers used in 5G-based critical infrastructure settings with GPS+STL receivers for a 12-month trial period. The demonstration could begin immediately, and receivers can be installed by critical infrastructure owners and operators.

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Satelles would deliver commercially available GPS+STL receivers to NTIA or directly to critical infrastructure operators selected by NTIA. Delivery of GPS+STL receivers to operators in one or more critical infrastructure sectors would include STL broadcast service anywhere in the United States.

Satelles would support the demonstration with dedicated engineering and customer support to critical infrastructure owners and operators to aid in implementation and ongoing utilization through the 12-month term. Satelles would also support real-time monitoring, data collection, and analysis of data throughout the term of the demonstration. Findings from the demonstration would be reported to NTIA and partnering critical infrastructure operators.

No significant changes to operational infrastructure would be required. The pilot would only rely on the replacement of GPS receivers with GPS+STL receivers and/or the addition of GPS+STL receivers.

SUMMARY

Satelles has an existing solution that is being utilized as an alternative to GPS/GNSS around the world today. We are uniquely positioned to offer trials and pilots immediately to help NTIA kick-start this initiative. While Satelles has business in this area today, the participation in such a trial or pilot would be a valuable endorsement and the kind of validation that the critical infrastructure operators are eager to receive prior to their widespread adoption.

Very truly yours,

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