

High Accuracy Nationwide Differential Global Positioning System Merging Concepts and Techniques from the Past and Present

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This paper describes the development and of the High Accuracy Nationwide Differential Global Positioning System (NDGPS), which augments GPS, providing a 10 centimeter positioning accuracy in real time. As a low frequency broadcast using the groundwave technique to broadcast corrections to users on the surface, the broadcast overcomes obstructions commonly limiting use of satellite based services. It was developed to meet the demands of surface based safety related transportation services in both the maritime and land based modes including the Intelligent Transportation System. HA-NDGPS is intended to support a wide range of current and future positioning and navigation requirements for federal, state and local government agencies. Some of the current and future needs of the private sector may also be satisfied, but this is not the primary purpose of the system. Dual coverage will improve system availability from 99.7%-99.9%, meeting the accuracy, integrity, and availability requirements of many safety applications.