

# MEMORANDUM OF AGREEMENT

## FOR THE ESTABLISHMENT AND OPERATION OF THE

## NATIONWIDE DIFFERENTIAL GLOBAL POSITIONING SYSTEM (NDGPS)

THIS AGREEMENT IS MADE AND ENTERED INTO BY AND AMONGST:

HEADQUARTERS U.S. AIR FORCE AIR COMBAT COMMAND AND THE U.S. ARMY CORPS OF ENGINEERS OF THE U.S. DEPARTMENT OF DEFENSE;

THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION OF THE U.S. DEPARTMENT OF COMMERCE; AND

THE FEDERAL RAILROAD ADMINISTRATION, THE FEDERAL HIGHWAY ADMINISTRATION, THE U.S. COAST GUARD, AND THE OFFICE OF THE SECRETARY OF TRANSPORTATION OF THE U.S. DEPARTMENT OF TRANSPORTATION

### **I. PURPOSE:**

- A. This Memorandum of Agreement (MOA), and such supplements as may be agreed to, provide the basis for cooperative efforts among the U.S. Air Force (USAF), the U.S. Army Corps of Engineers (USACE), the National Oceanic and Atmospheric Administration (NOAA), the Federal Railroad Administration (FRA), the Federal Highway Administration (FHWA), the U.S. Coast Guard (USCG), and the Office of the Secretary of Transportation (OST) in the establishment of the U.S. Department of Transportation's (USDOT) Nationwide Differential Global Positioning System (NDGPS) radionavigation service.
- B. This agreement provides for the maximum use of existing infrastructure and resources within each agency to the mutual benefit of all agencies and the general public. Specifically, this agreement establishes the overall policies, relationships, and responsibilities guiding interagency activities necessary to establish, operate, and manage the NDGPS as authorized by Section 346 of Public Law 105-66 of October 27, 1997 (Attachment A) including the temporary and permanent transfer of mutually selected USAF Ground Wave Emergency Network (GWEN) sites and equipment to USDOT.

## II. BACKGROUND:

- A. In Presidential Decision Directive NSTC-6, U.S. Global Positioning System Policy, (March 28, 1996), the President designated the USDOT as the Nation's, "lead agency for all Federal civil GPS matters." In addition, the President directed the USDOT to "develop and implement U.S. Government augmentations to the basic GPS for transportation applications." The USCG established the Maritime DGPS Service, a GPS augmentation providing service for coastal coverage of the continental U.S., the Great Lakes, Puerto Rico, portions of Alaska and Hawaii, and portions of the Mississippi River Basin. This service meets the requirements of U.S. harbor entrance and approach areas defined in the current version of the Federal Radionavigation Plan. Differential GPS (DGPS) corrections are broadcast on long-established international marine radiobeacon frequencies (285-325 kHz). The USCG Maritime DGPS Service is operated in cooperation with the USACE and the National Geodetic Survey.
- B. The Technical Report to the Secretary of Transportation on a National Approach to Augmented GPS Services (December 1994) recommended implementation of a Coast Guard-like system for use in land navigation and positioning applications in those sections of the nation not currently covered by the USCG Maritime DGPS Service. To accomplish this, the USDOT formed the DGPS Policy and Implementation Team under an Executive Steering Group. The NDGPS Policy and Implementation Team found that the current most viable GPS augmentation option which could satisfy most surface applications needs is the DGPS operated to the USCG DGPS Navigation Service Broadcast Standard, Commandant Instruction M16577.1.
- C. During its study, the NDGPS Policy and Implementation Team learned of the USAF plans to decommission the Ground Wave Emergency Network (GWEN). GWEN provides emergency communications using fifty-three transmitter sites located across the continental U.S. The Single Channel Anti-Jam Man Portable (SCAMP) is to replace GWEN. The GWEN sites operate on frequencies near the USCG DGPS radiobeacon frequencies. During 1997, the USAF loaned the GWEN site located near Appleton, Washington, to the FRA and USCG to be converted to a USCG DGPS station as a proof of concept. The Appleton station provided DGPS coverage to the navigable portions of the Columbia and Snake Rivers and the Positive Train Separation test-bed supported by the FRA. Based on the successful results of this prototype, the NDGPS Policy and Implementation Team determined that conversion of GWEN sites to civil DGPS use provided a cost-avoidance opportunity in the establishment of the NDGPS. The team presented its results to the Executive Steering Group on August 14, 1997. The consensus of the Executive Steering Group was to expand the Coast Guard's DGPS into a nationwide system.
- D. On October 27, 1997, Section 346 of Public Law 105-66 (Attachment A) authorized the USDOT to establish, operate, and manage the NDGPS including taking receipt of necessary GWEN sites and equipment. A coverage plan was developed to meet FRA

requirements for use in its train-control initiatives. To complete the required coverage under this plan, many of the GWEN sites will be converted at their current locations, from other GWEN sites the equipment will be moved to locations better suited for optimum coverage to the nation, and some non-GWEN stations will be established.

- E. The NDGPS project plans to install 65 to 75 sites under the scope of this agreement. The final NDGPS will have 125 to 135 sites, including the current Coast Guard and Army Corps of Engineers sites and the sites installed under this MOA. These sites will be compatible with, and integrated into, the Maritime DGPS Service operated by the Coast Guard and the Continuously Operating Reference Station (CORS) network of the National Geodetic Survey. Plans based upon historical Congressional appropriations for the NDGPS project a completion date in Calendar Year 2003. The expected system life cycle is fifteen years.

### **III. IMPLEMENTATION AND FUNDING:**

- A. Implementation of this MOA will be performed by the appropriate elements of the USAF, USACE, NOAA, and participating USDOT agencies. For the USAF the responsible organization is the USAF Headquarters Air Combat Command. For NOAA the responsible organization is the National Geodetic Survey (NGS). For the USACE the responsible organizations are the individual field offices in coordination with their chain of command. For the FRA the responsible organization is the Office of the Associate Administrator for Railroad Development. For the FHWA the responsible organization is the Office of the Associate Administrator for Research and Development. For the USCG the responsible organization is the Director of Operations Policy.
- B. The NDGPS Policy and Implementation Team will conduct overall coordination of the NDGPS. The functions of the NDGPS Policy and Implementation Team are: to coordinate interagency actions affecting the NDGPS; to serve as a forum to raise, discuss, and resolve issues concerning the NDGPS; to monitor compliance with interagency memoranda of agreement regarding the NDGPS; and to advise agencies as appropriate. The team will consist of members from each of the organizations that are signatories to this agreement. Members will be designated in writing and each will be responsible for coordinating his or her organization's activities and reporting those activities to the team. The team chairman will be the representative from the USDOT OST.
- C. The FRA, in coordination with the NDGPS Policy and Implementation Team and the USCG, will submit and defend funding requests for the full cost of providing the NDGPS. These requests are to include implementation, operation, maintenance, and eventual decommissioning, including but not limited to real property disposal and environmental remediation, and the execution of the specified activities below. Agencies with funding requirements are required to submit their requirements and cost

estimates to the FRA in sufficient time to enter the Congressional budget cycle. The FRA shall specify submission dates as necessary.

- D. No fund transfers are required to or from the USAF under this MOA. Agencies will ensure adequate funding is available via direct appropriation, transfer, or reimbursable agreement prior to undertaking work associated with their responsibilities under this MOA. The Coast Guard will ensure adequate funding is available from all other agencies and/or Departments via direct appropriation, transfer, or reimbursable agreement prior to undertaking work associated with their responsibilities under this MOA. Agencies shall be responsible for compliance with all laws, regulations, and federal policies for obligation and management of funds as applicable.
- E. The Secretary of Transportation's authority to establish, operate, and manage the NDGPS pursuant to Section 346 of Public Law 105-66 is delegated to the USCG in a Federal Regulation issued to Part I of Title 49 of the Code of Federal Regulations (CFR). The delegation to the USCG does not include responsibility for determining the Federal requirements for the NDGPS. This authority is delegated to the FRA. The delegation to the USCG also does not include the responsibility for acting as lead USDOT agency for matters relating to the National Environmental Policy Act (NEPA). The FHWA is delegated authority for matters relating to NEPA and the NDGPS. Neither the delegation addressed here nor this MOA requires the Coast Guard to fund the NDGPS; rather the FRA is responsible for funding the NDGPS as per paragraph III.C.
- F. The parties agree that the FHWA will be the lead agency, as defined in 40 CFR 1501.5, for NEPA compliance related to the establishment of the NDGPS. The parties agree to use the FHWA implementing regulations (23 CFR 771) for environmental impact analysis and procedural compliance with NEPA. The FHWA will prepare NEPA documents for the entire NDGPS program as well as for specific sites and will distribute copies of all NEPA documents to the cooperating agencies participating in NDGPS deployment. The FHWA may request that cooperating agencies provide information and analysis in areas of the cooperating agencies special expertise. The FHWA will give the technical and environmental reviewers of each of the cooperating agencies the opportunity to review and comment on the programmatic and site-specific NEPA documents for technical accuracy and adequacy at the preliminary draft stage (i.e., prior to release of the draft document to the public) and at the preliminary final document stage (i.e., prior to release of the final document to the public).

#### **IV. RESPONSIBILITIES OF THE PARTIES:**

The parties agree that they will carry out their respective responsibilities listed herein and those which they subsequently agree to be responsible for in any supplements to this agreement.

- A. **OFFICE OF THE SECRETARY OF TRANSPORTATION** will perform, or arrange to have performed, the following actions:

1. Designate a representative to serve as chairperson of the NDGPS Policy and Implementation Team.
2. Coordinate interagency funding and seek transfer authority as appropriate as determined through the budget process.
3. Resolve issues, as required, including those associated with the early termination of a party's participation in this agreement, if need be, as indicated in Section V.
4. Coordinate the decommissioning of the NDGPS at the appropriate time.

**B. UNITED STATES AIR FORCE, HEADQUARTERS AIR COMBAT COMMAND (HQ ACC) will perform, or arrange to have performed, the following actions:**

1. Provide two points of contact, a primary and an alternate, to provide for a GWEN Program liaison to the NDGPS Policy and Implementation Team.
2. Continue as the lead command within the USAF for coordination of GWEN and GWEN-related issues.
3. Identify specific GWEN sites and spare hardware available for transfer during the GWEN decommissioning phases. The NDGPS project will bear the cost of deinstallation, shipping and storage of spare hardware for installation at new NDGPS broadcast locations. NDGPS may utilize the following GWEN hardware components:
  - a) 299-foot guyed antenna with hazard lighting system,
  - b) Backup Power Group (BUPG),
  - c) Electronics equipment shelter, and
  - d) Antenna Tuning Unit (ATU)
4. Coordinate with U.S. Strategic Command (STRATCOM) on issues concerning total GWEN system performance as a result of removing sites from the network.
5. Remove and dispose of the GWEN equipment not required for NDGPS use at an existing GWEN broadcast site prior to site transfer for NDGPS use. The U.S. Coast Guard, as advised by the NDGPS Policy and Implementation Team, will identify GWEN equipment not required.

6. Coordinate with the USACE for the transfer to the USDOT of real property accountability for the GWEN sites that will be converted to NDGPS broadcast sites.
  7. Retain responsibility for all GWEN properties and equipment not transferred for use by the NDGPS service.
  8. Complete baseline environmental assessments for each GWEN site being transferred for NDGPS use. The assessments will include a survey that identifies the potential for contamination of the properties and an inventory of any protected areas or species located at or adjacent to the GWEN site. Provide one copy of the baseline environmental assessment reports to the USDOT OST representative.
- C. **U.S. ARMY CORPS OF ENGINEERS** will perform, or arrange to have performed, on a reimbursable basis and subject to the availability of funds made available via a separate written agreement between the USACE and the FRA, the following actions:
1. Provide two points of contact, a primary and an alternate, to provide for agency liaison on real estate and other engineering or construction management services to the NDGPS Policy and Implementation Team.
  2. Provide real-estate services and property-management services including, but not limited to, real property, planning, appraisal, acquisition, leasing, management, and disposal requested by the USCG or the NDGPS Policy and Implementation Team. Site locations for any new NDGPS broadcast sites will be identified by the NDGPS Policy and Implementation Team with such input from the USACE as may be requested.
  3. Provide engineering, design, environmental assessment, maintenance, or construction management services requested by the USCG or the NDGPS Policy and Implementation Team.
- D. **FEDERAL RAILROAD ADMINISTRATION** will perform, or arrange to have performed, subject to the availability of funds, the following actions:
1. Designate two agency representatives, a primary and an alternate, for participation on the NDGPS Policy and Implementation Team.
  2. Provide liaison to U.S. railroad owners and operators regarding the NDGPS and provide their documented NDGPS requirements to the NDGPS Policy and Implementation Team.
  3. Coordinate with the USCG to develop NDGPS notification methods and lists to notify NDGPS users of any service outages and planned service outages.

4. Complete the NDGPS operational requirements document (ORD) and submit it to the NDGPS Policy and Implementation Team for review prior to final approval by the FRA Administrator.
5. In coordination with the NDGPS Policy and Implementation Team and the USCG, submit and defend funding requests for implementation, operation, maintenance, and decommissioning of the NDGPS.
6. Verify that NDGPS broadcast coverage and performance is meeting the requirements of railroad users.
7. Acquire commercial engineering services as required to complement the USCG's installation responsibilities. Commercial services may also be used to deinstall, ship, store, and refurbish, as needed, spare GWEN hardware which is moved to a new location for reuse as a NDGPS site.

E. **FEDERAL HIGHWAY ADMINISTRATION** will perform, or arrange to have performed, on a reimbursable basis and subject to the availability of funds made available via a separate written agreement between FHWA and the FRA, the following actions:

1. Identify an agency representative for participation on the NDGPS Policy and Implementation Team. The total staff months shall not exceed four per year.
2. Complete the appropriate NEPA environmental impact analyses and documentation and any environmental requirements identified during the NEPA process for the NDGPS service. NEPA-process documentation will be submitted to the NDGPS Policy and Implementation Team.
3. Provide liaison to state transportation agencies regarding the NDGPS.
4. Coordinate with the USCG to develop NDGPS notification methods and lists to notify NDGPS users of any service outages and planned service outages.
5. Refine the design for the broadcast site network to provide for the required service coverage. This specifically involves:
  - a) Selecting approximate site locations based on signal coverage needs.
  - b) Selecting a candidate broadcast frequency in the marine radiobeacon band and broadcast range for each site.
  - c) Providing preliminary coordination of the selected candidate frequencies and ranges with the radiobeacon frequency managers of the Federal

Aviation Administration (FAA) and Canada to ensure noninterference. Formal coordination will be performed by the USCG.

- d) Coordinating with the FAA to move interfering aerobeacons to new frequencies. Formal coordination will be performed by the USCG. Funding for the cost of changing aerobeacon frequencies will be in accordance with Section III of this MOA.
6. Assist in coordination efforts with state and local governments to identify candidate sites suitable to support NDGPS broadcast facilities in the approximate locations selected that do not have existing GWEN broadcast facilities. Generic NDGPS site selection criteria will be provided by the USCG.
  7. Provide management for the coverage measurement of each NDGPS broadcast site after each site becomes operational. If there are any unexpected coverage gaps or localized interference problems, provide OST with data, supporting rationale, and recommendations on how to resolve the issue.
- F. **U.S. COAST GUARD** will perform, or arrange to have performed, on a reimbursable basis and subject to the availability of funds made available via a separate written agreement between USCG and the FRA, the following actions:
1. Designate two agency representatives, a primary and alternate, for participation on the NDGPS Policy and Implementation Team.
  2. Acquire administrative control over and maintain real property, including land and improvements, as may be necessary to establish, maintain, and operate the NDGPS.
  3. Provide maritime safety requirements for NDGPS to the NDGPS Policy and Implementation Team.
  4. Furnish technical expertise and support as required to ensure that each NDGPS broadcast site installation will meet USCG DGPS broadcast signal specifications. This may include, but is not limited to, providing:
    - a) Generic DGPS broadcast site selection criteria;
    - b) Engineering specifications, drawings, and instructions for the installation of the same type of DGPS equipment and broadcast transmitter as used in the USCG's Maritime DGPS service;
    - c) Technical advice on alternative engineering solutions to environmental concerns that may be found during site assessments;

- d) Quality assurance reviews of site design and installation plans;
  - e) Engineering teams to visit candidate sites as required for final site selection;
  - f) Engineering team visits to the NDGPS sites as required to select and mark the placement of the two required GPS antenna mast locations;
  - g) Installation quality assurance visits to check and certify the NDGPS broadcast sites prior to initial operation.
5. Procure additional DGPS equipment to support installations at NDGPS broadcast sites. Equipment procurement by the USCG will be standard USCG DGPS equipment; i.e., GPS reference stations with antennas, DGPS integrity monitors with antennas, radiobeacon transmitter, network interface unit, and uninterruptible power supply. This equipment would be stored and maintained by the USCG DGPS Depot until issued for installation.
6. Arrange for construction and/or equipment installation as required at the NDGPS control station and at each NDGPS broadcast site.
7. Provide operational control and monitoring of NDGPS transmissions. This would require the following actions:
- a) Staff the NDGPS control station with trained personnel;
  - b) Establish control communication service between the NDGPS control station and each NDGPS broadcast site;
  - c) Initiate requests for immediate and priority technical responses as necessary to meet site operations to USCG DGPS Broadcast Standards;
  - d) Coordinate with FRA and FHWA to develop NDGPS notification methods and lists;
  - e) Notify NDGPS users of any service outages and planned service outages;
  - f) Coordinate with OST, FRA, FHWA, NOAA, and USACE, on any issues or concerns affecting the operations, maintenance, or safety of the NDGPS;
  - g) Develop the NDGPS Concept of Operations to meet the NDGPS operational requirements and submit it to the NDGPS Policy and Implementation Team for approval.

8. Provide depot support of the GPS reference stations, DGPS integrity monitors, radiobeacon transmitters, network interface units, and uninterruptible power supplies. The USCG ability to provide this depot support would be dependent on NDGPS use of standard USCG DGPS equipment.
9. Provide electronics system life-cycle support through the USCG DGPS System Management and Engineering Facility (SMEF). The USCG ability to provide SMEF support is dependent on NDGPS use of standard USCG DGPS equipment.
10. Contract or provide organizational/intermediate level support which includes casualty response and preventive maintenance for NDGPS broadcast sites.
11. As frequency manager:
  - a) Obtain frequency and range authorization for NDGPS transmissions for each broadcast site. USCG action to gain authorization will be advised by a network frequency plan from the NDGPS Policy and Implementation Team.
  - b) Develop radio frequency interference protection standards for NDGPS.
12. In cooperation with the Department of Defense, ensure that the use of the NDGPS is denied to any enemy of the United States.
13. In cooperation with industries, universities, and state governments, develop standards for the NDGPS.
14. At the request of OST, develop plans and prepare funding estimates required to perform the following additional provisions of Public Law 105-66, Section 346:
  - a) In cooperation with industries, universities, and state governments:
    - (1) Investigate improvements to the NDGPS;
    - (2) Sponsor the development of new applications for the NDGPS.
  - b) Provide for the continual upgrading of the NDGPS to improve the performance of the system and to address the needs of the federal, state and local governments and the general public.
15. At the end of the life of the system, or as necessary, dispose of standard USCG DGPS equipment; i.e., GPS reference stations with antennas, DGPS integrity monitors with antennas, radiobeacon transmitter, network interface unit, and uninterruptible power supply.

G. **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)** will perform, or arrange to have performed, on a reimbursable basis and subject to the availability of funds made available via a separate written agreement between NOAA and the FRA, the following actions:

1. Identify two agency representatives, a primary and an alternate, for participation on the NDGPS Policy and Implementation Team.
2. Provide surveying and shipping industry requirements for NDGPS to the NDGPS Policy and Implementation Team.
3. Establish and maintain coordinates in the official datum of the United States for each NDGPS broadcast site's reference station. The official datum, at the time of this MOA is North American Datum of 1983 (NAD 83).
4. Integrate each NDGPS reference station into the Continuously Operating Reference Stations (CORS) system.
5. Coordinate the investigation of the use of NDGPS reference stations in the Integrated Precipitable Water Vapor System with NOAA's Forecast Systems Laboratory. If successful, add Integrated Precipitable Water Vapor System equipment to NDGPS reference stations as necessary.

V. **MODIFICATION AND TERMINATION:**

- A. This MOA will be reviewed as deemed necessary by any party. It is subject to modification at any time upon joint written approval of all parties. Supplements to this MOA are allowed between all or some of the parties to further clarify agreements made herein or to address additional aspects of the project not foreseen in this MOA. Signatory level may be as deemed appropriate by the participants in the supplement. At a minimum, the points of contact of the agencies participating in this MOA must be informed of the supplement and given a copy when it is made effective. The Chairman of the Policy and Implementation Team shall maintain this MOA and any of its supplements.
- B. The participation in this agreement by any agency may be terminated by written notice to the other parties 180 days prior to the desired termination. Agencies seeking termination that have unfulfilled responsibilities under the MOA, such as disposal of equipment or property, must arrange for those responsibilities to be completed, to the reasonable satisfaction of all the remaining parties in the agreement. In the event that an agency wishes to terminate their participation in this agreement, but cannot reasonably satisfy one or more of the remaining parties, the agency seeking termination may forward an appeal to the Deputy Assistant Secretary for Transportation Policy for resolution.

**VI. OTHER PROVISIONS:**

- A. Any activities undertaken by the parties pursuant to this MOA are subject to the availability of appropriated funds and proper authorization.
- B. Nothing herein is intended to conflict with current directives of any participating agency. If the terms of this MOA are inconsistent with existing directives of any of the parties entering into the MOA, then those portions of the MOA which are determined to be inconsistent shall be invalid. The remaining terms and conditions that are not affected by inconsistency shall remain in full force and effect. At the first opportunity for review of the MOA, such changes as deemed necessary will be accomplished by either an amendment to this MOA or by entering into a new agreement, whichever is deemed expedient and in the interests of all parties.

**VII. EFFECTIVE DATE:**

- A. The effective date of this agreement shall be the last date of the last signature affixed on the following page.

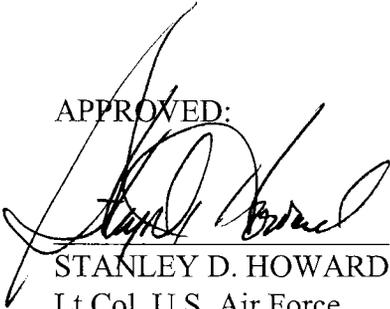
**VIII. EXECUTION OF AGREEMENT:**

- A. This agreement is being executed in seven (7) counterpart originals.

Nationwide Differential Global Positioning System (NDGPS)

Memorandum of Agreement

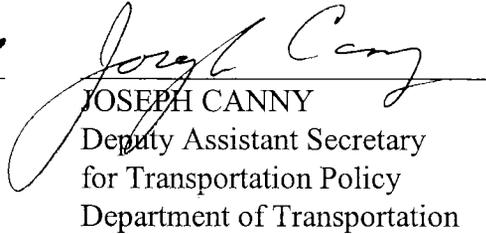
APPROVED:



STANLEY D. HOWARD  
Lt Col, U.S. Air Force  
Chief, Readiness and  
Sustainment Division  
Directorate, Communi-  
cations and Information  
U.S. Air Force

24 Feb 99  
Date

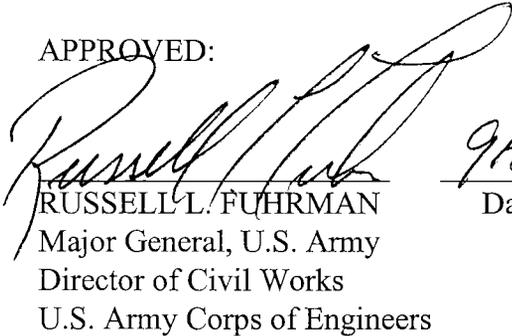
APPROVED:



JOSEPH CANNY  
Deputy Assistant Secretary  
for Transportation Policy  
Department of Transportation

2/11/99  
Date

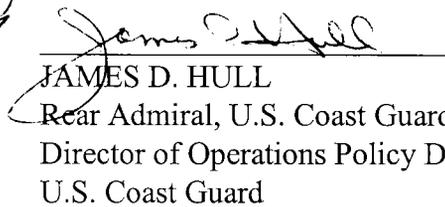
APPROVED:



RUSSELL L. FUHRMAN  
Major General, U.S. Army  
Director of Civil Works  
U.S. Army Corps of Engineers

9 Feb 99  
Date

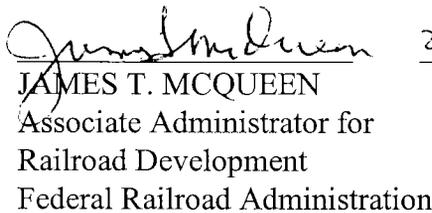
APPROVED:



JAMES D. HULL  
Rear Admiral, U.S. Coast Guard  
Director of Operations Policy Directorate  
U.S. Coast Guard

2/12/99  
Date

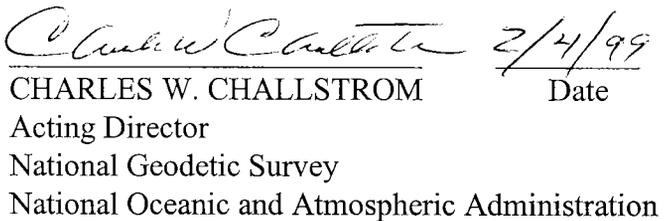
APPROVED:



JAMES T. MCQUEEN  
Associate Administrator for  
Railroad Development  
Federal Railroad Administration

2/3/99  
Date

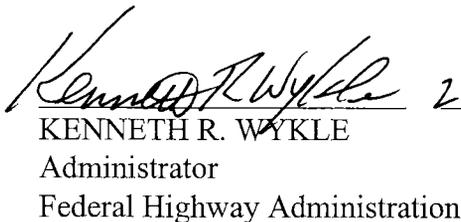
APPROVED:



CHARLES W. CHALLSTROM  
Acting Director  
National Geodetic Survey  
National Oceanic and Atmospheric Administration

2/4/99  
Date

APPROVED:



KENNETH R. WYKLE  
Administrator  
Federal Highway Administration

2-23-99  
Date

**ATTACHMENT A**  
**TO MEMORANDUM OF AGREEMENT**  
**FOR THE ESTABLISHMENT OF THE**  
**NATIONWIDE DIFFERENTIAL GLOBAL POSITIONING SYSTEM**

**PUBLIC LAW 105-66, October 27, 1997**

SEC. 346. (a) As soon as practicable after the date of enactment of this Act, the Secretary of Transportation, acting for the Department of Transportation, may take receipt of such equipment and sites of the Ground Wave Emergency Network (referred to in this section as "GWEN") as the Secretary of Transportation determines to be necessary for the establishment of a nationwide system to be known as the "Nationwide Differential Global Positioning System" (referred to in this section as "NDGPS").

(b) As soon as practicable after the date of enactment of this Act, the Secretary of Transportation may establish the NDGPS. In establishing the NDGPS, the Secretary of Transportation may--

- (1) if feasible, reuse GWEN equipment and sites transferred to the Department of Transportation under subsection (a);
- (2) to the maximum extent practicable, use contractor services to install the NDGPS;
- (3) modify the positioning system operated by the Coast Guard at the time of the establishment of the NDGPS to integrate the reference stations made available pursuant to subsection (a);
- (4) in cooperation with the Secretary of Commerce, ensure that the reference stations referred to in paragraph (3) are compatible with, and integrated into, the Continuously Operating Reference Station (commonly referred to as "CORS") system of the National Geodetic Survey of the Department of Commerce; and
- (5) in cooperation with the Secretary of Commerce, investigate the use of the NDGPS reference stations for the Global Positioning System Integrated Precipitable Water Vapor System of the National Oceanic and Atmospheric Administration.

(c) The Secretary of Transportation may--

- (1) manage and operate the NDGPS;
- (2) ensure that the service of the NDGPS is provided without the assessment of any user fee; and
- (3) in cooperation with the Secretary of Defense, ensure that the use of the NDGPS is denied to any enemy of the United States.

(d) In any case in which the Secretary of Transportation determines that contracting for the maintenance of 1 or more NDGPS reference stations is cost-effective, the Secretary of Transportation may enter into a contract to provide for that maintenance.

(e) The Secretary of Transportation may--

- (1) in cooperation with appropriate representatives of private industries and universities and officials of State governments--
  - (A) investigate improvements (including potential improvements) to the NDGPS;
  - (B) develop standards for the NDGPS; and
  - (C) sponsor the development of new applications for the NDGPS; and
- (2) provide for the continual upgrading of the NDGPS to improve performance and address the needs of--
  - (A) the Federal Government;
  - (B) State and local governments; and
  - (C) the general public.