

MEMORANDUM OF UNDERSTANDING

Between the Federal Highway Administration of the  
Department of Transportation of the  
United States of America and the  
Department of Road Construction of the  
Federal Ministry of Transport of the  
Federal Republic of Germany

Concerning Highway Engineering and Operations Research

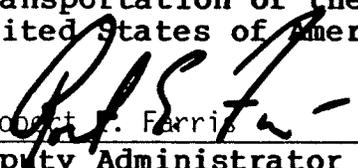
Having benefitted from the activities conducted under the Project Agreement between the Department of Transportation of the United States of America and the Federal Ministry of Transport of the Federal Republic of Germany, dated October 22, 1985; and

Having agreed in principle to continue it in effect for an additional two-year period, without lapse;

It is hereby confirmed that the Project Agreement will continue until October 22, 1989.

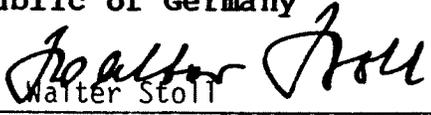
Done at Washington, D.C. and at Bonn, by correspondence, in duplicate, in the English and German languages, both texts being equally authentic.

For the Department of  
Transportation of the  
United States of America

  
Robert F. Ferris  
Deputy Administrator  
Federal Highway Administration

Date : Jan. 15, 1988

For the Federal Ministry  
of Transport of the Federal  
Republic of Germany

  
Walter Stoll  
Director General  
Department of Road Construction

Date : 29. Februar 1988

## PROJECT AGREEMENT

BETWEEN THE DEPARTMENT OF TRANSPORTATION OF THE  
UNITED STATES OF AMERICA AND THE FEDERAL MINISTRY  
OF TRANSPORT OF THE FEDERAL REPUBLIC OF GERMANY

### CONCERNING HIGHWAY ENGINEERING AND OPERATIONS RESEARCH

#### 1. AUTHORITY

This Project Agreement (hereinafter referred to as this Agreement) constitutes a revision of the Project Agreement dated February 16, 1972, and is entered pursuant to the Memorandum of Understanding regarding Cooperation in the Field of Transportation between the Department of Transportation of the United States of America and the Federal Ministry of Transport of the Federal Republic of Germany (hereinafter referred to as the Parties) signed at Washington, D.C., September 3, 1975.

#### PURPOSE

This Agreement is intended to continue and expand cooperation under the Project Agreement, dated February 16, 1972, between the Department of Transportation and the Federal Ministry of Transport in the following highway engineering and operations research and development areas:

- a. alternate routing systems in freeway corridors;
- b. urban network signal control systems;
- c. integrated urban traffic area management systems;
- d. motorist information systems;
- e. improved accident analysis and safety evaluations;
- f. coatings for structural steel;
- g. fatigue and corrosion of cables in bridges; and
- h. experimental verification of pavement design methodology.

The cooperation is directed toward exchanging information on most effective technology so as to avoid unnecessary duplications of effort and minimize costs to both Parties. In carrying out the terms of this Agreement, project management responsibility for the Department of Transportation will continue to be assigned to the Federal Highway Administration (FHWA) and project management responsibility for the Federal Ministry of Transport will continue to be assigned to the Department of Road Construction (Abteilung Strassenbau, STB).

### 3. PROJECT OFFICERS

- a. Designation. Within thirty days of the entry into force of this Agreement, the Parties will each designate a Project Officer to conduct cooperative activities described in the Annex.
- b. Responsibilities. Project Officers will be responsible for the accomplishment of the tasks and objectives set out in this Agreement, and will be the principal points of contact between the Parties for detailed arrangements and exchanges related to this Agreement. Direct contact on technical matters may be made through the contractors (see paragraph 4).

### 4. CONTRACTORS

In the event that either Party employs a contractor to conduct or participate on its behalf in exchanges pursuant to this Agreement, the name of the contractor and the scope of its assignment and authority shall be notified to the other party.

5. SCOPE OF WORK

The scope of work to be accomplished by the Parties, individually and jointly, is set out in detail in the Annex.

6. FUNDING

- a. The participation of each Party in the project is subject to the availability of appropriated funds.
- b. Each Party will bear the direct costs (e.g., salary, travel, subsistence) associated with the participation of its own personnel in the project, as well as the costs of any language services it may require.
- c. Except as may be agreed in supplemental specific arrangements, transfers of funds between the Parties are not envisaged in connection with the project.

DISCLAIMER

Each Party will exercise its best efforts to ensure the accuracy of all data transmitted to the other Party pursuant to this Agreement, but the accuracy of such data is not guaranteed. Each Party will use the other's data at its own risk and may not hold the other Party responsible in the event of claims arising from the use of such data.

8. DURATION

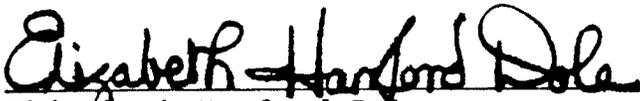
- A. This Agreement shall enter into force on the date of signature thereof and shall remain in force for a period of two years. It may be renewed by mutual agreement of the Parties in writing.

b. This Agreement may be terminated by either Party on written notice; the termination becomes effective sixty days after the other Party has received the notice of termination.

9. LAND BERLIN

This Agreement shall also apply to Land Berlin, provided that the Government of the Federal Republic of Germany does not make a contrary declaration to the Government of the United States of America within three months of the date of entry into force of this Agreement.

ne at Washington, D.C., on October 22, 1985, in duplicate, in the English and German languages, both texts being equally authentic.



Elizabeth Hanford Dole  
The Secretary of the Department  
of Transportation of the United  
States of America



Werner Dollinger  
The Federal Minister of Transport  
of the Federal Republic of Germany

## DESCRIPTION OF RESEARCH AREAS OF INTEREST

Alternate Routing Systems in Autobahn/Freeway Corridors

The overall objective is to reduce traffic congestion on certain multi-lane, divided highways with limited access, during peak periods, through the development of a safe, economical system of alternate routing. The potential scope includes both the urban freeway with heavy weekday morning and evening work trips by local repeat drivers, and the intercity freeway with long distance holiday and weekend trips by infrequent users. However, the immediate scope will pertain to the intercity freeway problem at specific locations in the United States and in Germany.

B. Urban Network Signal Control Systems

The objective of this research is to reduce delay, congestion and fuel consumption in urban networks and arterial streets. Four topics are of particular interest:

1. Strategic concepts for network and arterial control.
2. Optimization methodology for networks and arterials.
3. System performance evaluation techniques.
4. System design and development.

C. Integrated Urban Area Traffic Management Systems

The objective of the research is to determine the feasibility of extensive use of integrated systems for the control of traffic in the central areas of cities.

The subsystems to be included in the integrated system are (1) computer-based network signal control; (2) motorist information and diversion; (3) roadway and lane assignment; (4) bus monitoring and priority; and (5) parking guidance and information.

Research necessary to achieve an integrated system which includes the above subsystems will be required in the areas of real-time control programs; off-line simulation programs; vehicle detection and communications technology; motorist information transfer techniques; and retrofitting of existing subsystems.

D. Motorist Information Systems

The objective of this research is to advance the technology for providing highway-related information to motorists within their vehicles. The scope includes both visual and audio techniques. A major concern is the cost of such systems to the individual user and the system operator.

### E. Improved Accident Analysis and Safety Evaluations

The overall objective of the research is to provide improved methodology, procedures and training for the conduct of safety evaluations at both the national and local level. Areas of consideration include improved accident data collection; improved traffic records systems; techniques for the conduct of evaluations; identification and validation of appropriate surrogate measures (such as conflicts); definition and validation of exposure measures (measures of risk); and validation of analysis techniques. Also included are improved resource allocation procedures and specialized training to assist State and local authorities in the management of safety programs.

### F. Coatings for Structural Steel

The following problems should be addressed:

#### 1. General aspects

- More precise determination of corrosion distress.
- Effects on materials and techniques of extensive environmental and workers' safety requirements.

#### 2. Coatings and protection systems

- Development of high-quality, environmentally compatible and easily maintainable materials and protection systems.

#### 3. Implementation of work

- Taking into consideration the conditions of implementation by more detailed surveys and appropriate protection measures.
- Development of environmentally compatible surface preparation and coating application techniques as well as of corresponding equipment for environmental protection and workers' safety.

#### 4. Development of new techniques

- Anti-corrosion measures in the factory.
- Optimization of testing and maintenance methods.

### G. Fatigue and Corrosion of Cables for Bridges

This subject should be subdivided into the following topics:

#### 1. High-strength tension members for suspension and cable-stayed bridges

- Tension members consisting of locked-coil cables.
- Tension members consisting of parallel prestressing cables.

- (a) Corrosion protection for the cables
  - The issues and problems to be discussed are identical with those mentioned under the topic "corrosion protection for steel structures."
- (b) Fatigue behavior of cables
  - Ascertainment of the dynamic stress under live loads and vibration due to wind.
  - Ascertainment of the characteristic values of materials with the aid of fatigue tests.
- (c) Development of improved anchoring systems of cables
  - Design of interlocking cones and other methods.
  - Capping materials.
- (d) Possibilities of influencing the vibration behavior of bridges
- (e) Development of non-destructive test methods for the assessment of the condition of the cables including but not limited to
  - Inductive test methods, and
  - Radiographic methods.

2. Prestressed steels (and prestressed strands) used for the construction of prestressed concrete bridges

- prestressed concrete
- post-tensioned prestressed concrete
- non-composite prestressed concrete

With respect to prestressed concrete, the following problems should be discussed:

- (a) Improvement of methods for early recognition of damage to existing structures, and in particular new and further development of non-destructive test methods.
- (b) Improvement of repair techniques, including the methodology of accumulation, evaluation and practical application of experience.
- (c) Development of testable manufacturing techniques and easily reparable bridges unsusceptible to distress. In view of bridge distress which increasingly burdens the road construction agency in terms of cost, efforts should be made to exploit all possibilities of instituting improvements concerning the prevention and minimization of distress, by mutual exchange of knowledge and experience in the field of protection and maintenance measures.

#### H. Experimental Verification of Pavement Design Methodology

Previous contacts between FHWA and BAST (Bundesanstalt für Strassenwesen) have developed strong interest in experimental work to verify and refine pavement design methods based on an understanding of the mechanisms of failure. The continued efforts along this line are vital to design of both new and rehabilitated pavements.