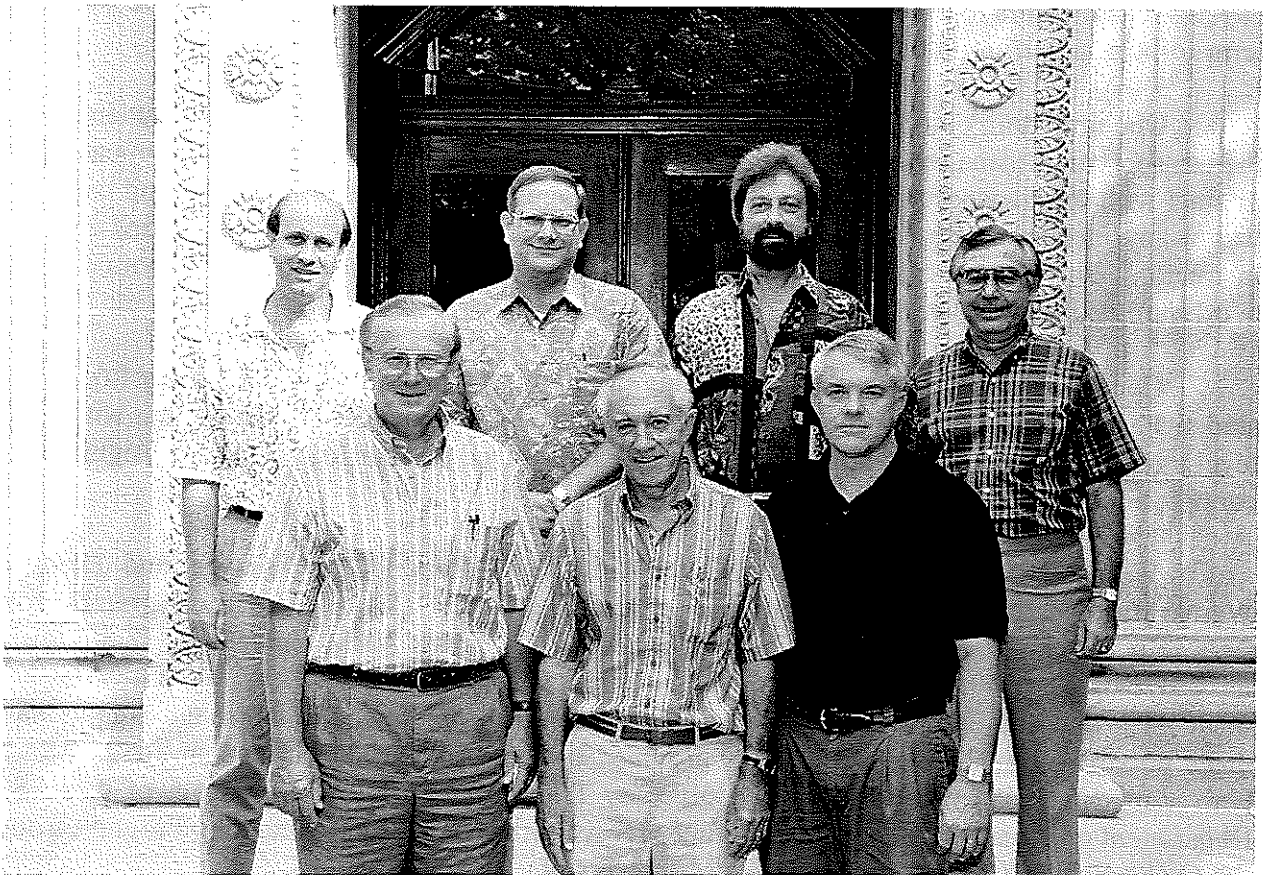


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**GRADUATE STUDENT PAPERS ON  
ADVANCED SURFACE TRANSPORTATION SYSTEMS  
AUGUST 1994**



**Class mentors and instructor (front row, from left) Walter Kraft, David Roper, and Tom Werner, (back row) Les Jacobson, Gary Trietsch, Walt Dunn, Conrad Dudek.**

## PREFACE

This document is the culmination of the fourth offering of an innovative transportation engineering graduate course at Texas A&M University entitled, "Advanced Surface Transportation Systems," which was presented during the 1994 summer term. As part of the course, a Practitioner-In-Residence program provided the students with unique learning experiences. Six top-level managers/practitioners from state transportation departments and from transportation consulting firms were invited to Texas A&M University to present a 2-day Symposium on Advanced Surface Transportation Systems at the beginning of the summer term. Immediately following the Symposium, the students enrolled in the course participated in a Workshop with the transportation managers/practitioners and course instructor. Based on mutual interests, each student was assigned to one of the managers/practitioners who served as a mentor (along with the course instructor) to the student for the remainder of the summer term. Each student worked with his/her mentor and course instructor to identify a topic area and objectives for a term paper. In addition to discussions with the course instructor, the students (communicating via telephone, fax and mail) worked directly with the mentors throughout the term while preparing their term papers. The mentors returned to the Texas A&M University campus near the end of the summer term to hear and critique the students' presentations.

One important objective of the program was to develop rapport between the students and the transportation managers/practitioners. The opportunity for the students to communicate and interact with top transportation officials, who are recognized transportation engineering experts, was a key element to the students gaining the type of learning experiences intended by the instructor. Therefore, extra care was taken to encourage interaction through the Symposium, Workshop and social events.

Comparable to the previous years, this program was again extremely successful. The students had an excellent opportunity to interact directly for an extended period of time with top-level transportation managers/practitioners who are recognized for their knowledge and significant contributions both nationally and internationally.

Walter Dunn, Leslie Jacobson, Walter Kraft, Dave Roper, Gary Trietsch, and Thomas Werner devoted considerable time and energy to this program. We are extremely grateful for their valuable contributions to the educational program at Texas A&M University.

The opportunity to bring top-level transportation managers/practitioners to the campus was made possible through financial support provided by the "Advanced Institute" at Texas A&M University which is sponsored by the University Transportation Centers Program of the U.S. Department of Transportation, and from funds received from the Zachry Teaching Program from the College of Engineering at Texas A&M University.

Gratitude and appreciation are expressed to Dr. Carroll Messer, Professor of Civil Engineering, Texas A&M University, who helped me pioneer this innovative graduate course in transportation engineering. Dr. Messer was a co-instructor for the course during the first two years it was offered. Other teaching commitments required his attention during subsequent summer terms.

Sandra Mantey, Senior Secretary with the Texas Transportation Institute, once again coordinated the Symposium and Workshop in a very efficient and professional manner.

Congratulations are extended to the transportation engineering graduate students who participated in this course. Their papers are presented in this Compendium.



Conrad L. Dudek  
Professor of Civil Engineering

## WALT DUNN



Mr. Walt Dunn is recognized for his expertise in freeway corridor traffic management, freeway incident management, and intelligent vehicle highway systems (IVHS). He is the founder and principal partner of Dunn Engineering Associates, a firm he started in 1982, which specializes in traffic management for both the private and public sectors.

Currently, he provides consulting engineering services on IVHS projects for the Federal Highway Administration, the New York State Department of Transportation, New Jersey Department of Transportation, Pennsylvania Department of Transportation, Michigan Department of Transportation, and the Massachusetts Highway Department.

Prior to starting Dunn Engineering Associates, Mr. Dunn worked for the New York State Department of Transportation for 16 years where he was director of the INFORM (Information For Motorists) project from inception through final design. INFORM is a corridor traffic management system designed to obtain better utilization of existing highway facilities. INFORM has been implemented in a 40-mile long highway corridor on Long Island, N.Y. as an operational demonstration.

Mr. Dunn successfully handled the traffic management of the 1986 U.S. Golf Open special event in Shinnecock Hills, New York. He is a co-author of the Freeway Incident Management Handbook and Communications Handbook for Traffic Control Systems for FHWA, Freeway Operations Project for the Transportation Research Board and "Freeway Management Systems for Transportation Efficiency and Energy Conservation" for Transport Canada.

On the national level, he is a member of the Freeway Operations Committee of the Transportation Research Board (TRB). He served as 1990 President of the Institute of Transportation Engineers (ITE) Met Section of New York and New Jersey, is a member of the American Society of Civil Engineers and Chi Epsilon and a licensed Professional Engineer in New York and New Jersey. Mr. Dunn is a Graduate of New Jersey Institute of Technology (B.S. in Civil Engineering) and Polytechnic University (M.S. Transportation Planning and Engineering).

## LES JACOBSON



Mr. Les Jacobson is an expert in traffic management systems, especially freeway management and high occupancy vehicle systems. He received his Bachelor's degree in Civil Engineering from the University of Washington and his Master's Degree in Civil Engineering at the University of California at Berkeley.

Mr. Jacobson is the Traffic Systems Manager for the Seattle District (District 1) of the Washington State Department of Transportation. He is responsible for all traffic engineering and electronic maintenance functions in the District. He has been with the WSDOT since 1977 and has spent most of his career dealing with traffic management issues, especially freeway operations, HOV systems and more recently IVHS. He was an integral member of the team that implemented the ramp metering system in Seattle in 1981 and supervised the operation of the Traffic Systems Management Center (TSMC) from 1983 through 1984. It was during his tenure at the TSMC that the first major HOV lane was opened on Interstate 5 in Seattle.

Mr. Jacobson spent five years at the Washington State Transportation Center (TRAC) at the University of Washington where he managed the WSDOT's Urban Systems Branch. He developed the WSDOT's Freeway and Arterial Management Effort (FAME). The program focused on research and implementation in the area of HOV systems, incident management and traffic management systems. He initiated WSDOT's IVHS program, Venture Washington, during his tenure at TRAC.

Mr. Jacobson is responsible for the operation of the Seattle area's freeway HOV system. He sits on the WSDOT HOV Policy Task Force and was one of the major contributors to the WSDOT HOV Policy. He is currently involved in several HOV planning efforts. He is a registered professional engineer in Washington State. He is a member of the Institute of Transportation Engineers and the IVHS Council, and the TRB HOV Systems Committee. He was recently named chair of the IVHS America ATMS Committee and is a member of the Coordinating Council. He chairs or sits on several NCHRP research panels, and teaches Traffic Flow Theory at the University of Washington.

## WALTER H. KRAFT



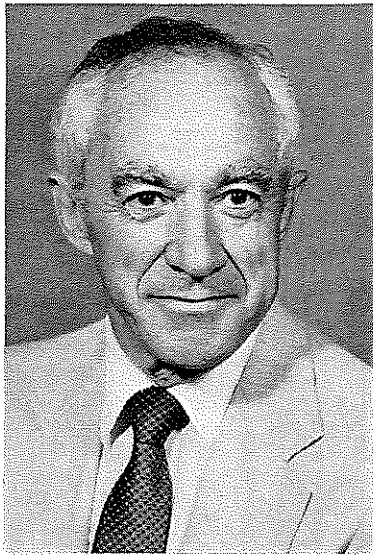
Dr. Walter H. Kraft is an international expert in the planning and design of improvements to reduce congestion and increase roadway capacity. He received his Bachelor of Science and Master of Science Degrees in Civil Engineering for Newark College of Engineering in 1962 and 1965, respectively, and his Doctor of Engineering Science in Civil Engineering from the New Jersey Institute of Technology in 1975. He is registered as a professional engineer in 16 states including Texas and is also a registered Professional Engineer in New Jersey.

Currently, he is a Partner and Senior Vice President of Edwards and Kelcey, Inc. in New Jersey. Dr. Kraft has been the Principal-in-Charge, Technical Consultant or Project Director of numerous study and design projects. He has been an Adjunct Professor at the New Jersey Institute of Technology and the Polytechnic Institute of New York. He has also lectured at the International Conference on Traffic Engineering and Planning in Beijing, People's Republic of China, and at the Sino-American-British Urban Transport Planning Seminar, Beijing, People's Republic of China.

He has authored many published technical articles including his doctoral thesis entitled, "An Analysis of the Passenger Vehicle Interface of Street Transit Systems with Application to Design Optimization," 1975; "How to Optimize Traffic Signals, Public Work Magazine, December, 1985, translated into Chinese, November 1986; and the Traffic Signal Installation and Maintenance Manual, Institute of Transportation Engineers (ITE), 1989.

Dr. Kraft is very active in professional organizations and has received numerous awards. He has held several positions within the International Institute of Transportation Engineers, including International President (1987), Tour Leader for the Third Annual International ITE, IVHS Council's Study Tour, "IVHS Europe '93, Netherlands, Germany and France, September 23rd to October 2nd, 1993, Chairman, IVHS Advisory Committee (1992), and currently Chairman, IVHS Council. He is currently a member of the TRB Freeway Operations Committee. Dr. Kraft is also a member of IVHS-America. Among the many awards and honors he received, includes the ASCE Frank Masters Award (1982), ITE Ivor S. Wispart Transportation Engineer Award (1986) and the ITE Burton W. Marsh Award (1992).

## DAVID ROPER



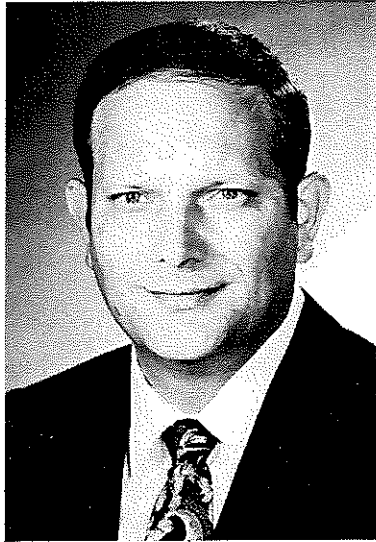
Mr. David Roper is an international expert in freeway corridor transportation management and control systems and traffic management during special events. He received his B.S. from the University of Arizona, Tucson, in 1951, and his M.S. from the University of Southern California, Los Angeles, in 1960, both in Civil Engineering.

A leader in the development and implementation of the Los Angeles Freeway Surveillance and Control Project, Mr. Roper had over 40 years' experience with the California Department of Transportation (Caltrans) in transit planning, system operation, transportation and environmental planning, construction, design and route selection activities. He spent two years on special assignment as Executive Director of the Commuter Computer Ridesharing Program and was Director of the Caltrans Olympics Transportation Program. Immediately prior to his retirement in February 1992, Mr. Roper served as Deputy District Director, Operations, California Department of Transportation. He is now a private consultant, and is involved in a variety of Freeway Traffic Management projects in New Jersey, Atlanta, Orlando, Salt Lake City, St. Louis, Israel, and in Guangdong Province in South China. He is part of a team recently selected by FHWA to carry out research on Automated Highway Systems. Over the past 28 years, he has taught a variety of transportation engineering and highway design courses at the University of California, Los Angeles, California State University, Fullerton, and California State University, Los Angeles.

Mr. Roper has, at various times throughout his career, been a member of the Transportation Research Board, Freeway Operations Committee; Professional Engineers in California Government (Past Director); Planning Commission, City of Santa Monica (Chairman, 1973); General Advisory Board, Santa Monica College; the American Public Works Association; and the Institute of Transportation Engineers.



## GARY TRIETSCH



Mr. Gary Trietsch is Director of the Traffic Operations Division of the Texas Department of Transportation (TxDOT). The division has statewide responsibilities for highway operations including traffic safety, traffic engineering, traffic management, and railroad coordination.

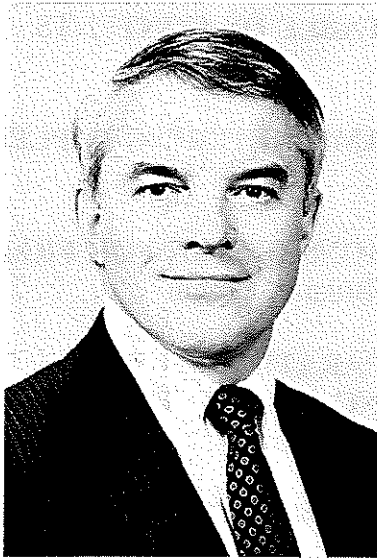
Mr. Trietsch earned his bachelor's and master's degrees in Civil Engineering from the University of Texas at Arlington. He began his career with the department as a summer employee in 1967 in the Tarrant County construction section in the Fort Worth District. He worked summers and part time in this section until he graduated from college and then spent three years in the Tarrant County design section. For the next five years he worked in the Fort Worth district traffic engineering section. Mr. Trietsch then spent nine years in various increasingly responsible design capacities in the Fort Worth District office and was promoted to assistant district design engineer.

In July 1987, he transferred to Austin when he was named director of the safety and traffic operations section of the Safety and Maintenance Operations Division. The division was restructured and renamed the Maintenance and Operations Division in November 1988. At that time, he was assigned the duties of assistant division director for operations, which included, traffic safety, traffic engineering traffic management systems, and the central permit operations section.

In recognition of outstanding service, Mr. Trietsch received the 1991 Dewitt C. Greer Award, one of two top awards presented annually by TxDOT for engineering leadership and excellence.

Mr. Trietsch is a member of the Institute of Transportation Engineers, American Association of State Highway and Transportation Officials, Transportation Research Board, National Association of Governors' Highway Safety Representatives, and IVHS America. Mr. Trietsch is president of IVHS Texas for 1994.

## THOMAS C. WERNER



Mr. Thomas C. Werner is expert in traffic engineering and safety management, with a strong professional interest in freeway operations and IVHS. He attended Canisius College in 1962 and received his Bachelors Degree in Civil Engineering at the University of Detroit in 1965 and MBA at State University of New York, Buffalo in 1973 and is a registered professional engineer in New York State.

Mr. Werner is the Director of the Traffic Engineering and Safety Division of the New York State Department of Transportation headquartered in Albany. He is the manager and administrator of vehicle safety programs for the main office and eleven regional offices. Mr. Werner has nineteen years experience with the main office Traffic Engineering and Safety Division of NYSDOT. Prior to the Albany assignment, Mr. Werner served nine years in the Buffalo Regional Planning, Design and Traffic Safety offices working on traffic analyses for major expressway projects in the Western New York area. Mr. Werner has been involved in all phases of the Information for Motorists (INFORM) project on Long Island-- a state of the art freeway corridor traffic surveillance and control system. He also currently manages ATMS, ATIS, ARTS, and AVCS elements of NYSDOT's Intelligent Vehicle Highway Systems (IVHS) program.

Mr. Werner is active in many professional organizations including TRB Freeway Operations Committee and several AASHTO Committees. He has served on the FHWA Expert Panel for Operations and Maintenance of Traffic Control System and was the recipient of an FHWA scholarship for participation in the 1991 ITE European IVHS study tour. Mr. Werner is the NYSDOT representative on TRANSCOM and the I-95 Corridor Coalition. He currently serves as Panel Chairman to NCHRP Project 7-13, "Quantifying Congestion" and is Vice-Chairman of the AASHTO Standing Committee on Highway Traffic Safety. Prior to his current assignment, he served as Regional Director for the eight county Albany Capital District area.

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