

# CIVIL, CONSTRUCTION, AND ENVIRONMENTAL ENGINEERING

OREGON STATE UNIVERSITY

College of Engineering

**LAYTON, Robert D.**  
Professor

**BIRTH DATE**  
May 13, 1935

## DEGREES

B.S., Civil Engineering, Colorado State University, 1959  
M.S., Civil Engineering, Kansas State University, 1965  
Ph.D., University of California, 1970

## ACADEMIC POSITIONS

Instructor, Civil Engineering Dept., Kansas State University, 1963-1964  
Teaching Assistant, Civil Engineering Department, University of California, 1964-1966  
Instructor (1/3 time), Civil Engineering Department, University of California, 1968  
Acting Assistant Professor, Civil Engineering Department, University of California, 1968-1970  
Lecturer, Civil Engineering Department, University of California, 1970-1972  
Associate Professor, Oregon State University, December 1972-1987  
Professor, Oregon State University, 1987-present

## NON-ACADEMIC POSITIONS

Junior Engineer, Dept. of Public Works, Watertown, NY, June 1959-April 1961. Work in highway location, design and construction.  
Junior Engineer, Bureau of Public Roads, U.S. Dept. of Commerce, Gatlinburg, TN, and Topeka, KS, April 1961-September 1962. Work in highway location, design and construction and Federal Aid Administration.  
Junior Engineer, Bureau of Public Roads, U.S. Dept. of Commerce, Topeka, KS, June-September 1963. Planning and research studies.  
Assistant Research Engineers, Civil Engineering Department, Kansas State University, January-September 1964 (part-time). Traffic estimation model development.  
Transportation Analyst, Bay Area Transportation Study, Berkeley, CA, 1966-1968. Urban travel data analysis, traffic estimation process definition, and traffic estimation models development.  
Assistant Research Engineer, ITTE, University of California, 1968-1972. Research on urban travel demand and traffic estimation; transportation systems analysis, traffic estimation and systems evaluation for resource development; and highway generated air pollution modeling.

## FIELDS OF SPECIALIZATION

Transportation Systems Analysis  
Transportation Facility Design  
Traffic Operations and Control  
Traffic Engineering  
Highway Safety  
Transportation Energy and Economics  
Environmental Impact of Transportation  
Access Management

## **PROFESSIONAL ACTIVITIES**

### **Registration**

Registered Civil Engineer, Oregon, No. 12941 PE

### **Professional Societies**

Institute of Transportation Engineers  
Transportation Research Forum  
Adviser, ITE Student Chapter  
Professional Engineers of Oregon  
Traffic Research Forum

### **Professional Recognition**

Sigma Xi  
Chi Epsilon  
Recipient, Carter Award for Undergraduate Teaching, 1976  
Nominee, Carter Award for Undergraduate Teaching, 1984

### **Committees, Commissions and Boards**

ASCE, Committee on Energy and Environmental Aspects of Transportation  
Transportation Research Board  
TRB OSU Representative, 1975-1992  
TRB Committee, A2A02, Geometric Design Committee, 1979-1985  
TRB Committee, A1B04, Vehicle Size and Weight Committee, 1982-1992  
TRB Committee, , Highway Capacity Committee, 1995-2000, friend  
TRB Committee, A1D07, Access Management Committee, 1997-present  
Technical Advisory Committee, Oregon State Aviation Plan  
Research Advisory Committee, Oregon Highway Division  
Linn Benton C.O.G., Transit Advisory Committee, 1975-1978  
Northwest Roads and Streets Conference (N.W. Transportation Conf.)  
Coordinating Committee, 1974-1999  
Steering Committee, 1974-1999  
National Task Force, Evaluation of Truck Weight and Size Limits, TRB and US DOT  
Governor's Task Force, Transportation Energy  
Oregon State University  
Advisory Committee to Oregon DOT  
Campus Planning Committee, 1975-present  
Scholarships Committee, 1977-1979  
Financial Aid Committee, 1990-1993  
Consortium Task Force on Extension, Education and Research for Community and Public Issues  
College of Engineering  
Advancement of Teaching Committee, 1980-1981  
Graduate Committee, 1996-1997  
Department of Civil Engineering  
Curriculum Committee, 1975-1977, 1997  
Safety Committee, 1979-1990  
Graduate Committee, Chairman, 1990-1993 and 1998-present

Faculty Status Committee, Chairman, 1992-1993 and 1998-2000

#### **Administration**

Co-Director, Oregon Technology Transfer Center, 1984-1986

Director, OTSC/OSU Traffic Safety Short Course and Technical Assistance Program

#### **CONTINUING EDUCATION WORKSHOPS**

“School Zone Planning, Design and Operations,” offered through ODOT/OSU Short Course Project

“Traffic Engineering Fundamentals,” offered through ODOT/OSU Short Course Project

“Highway Capacity Fundamentals,” offered through ODOT/OSU Short Course program, TSPEED University of Washington program, C.T.A.P. University of California program, and NIATT University of Idaho program

“Advanced Highway Capacity Analysis,” offered through TSPEED, University of Washington program

“Geometric Design,” offered through ODOT/OSU program, TSPEED University of Washington program, and C.T.A.P. University of California program

“Advanced Geometric Design,” offered through TSPEED University of Washington program and C.T.A.P. University of California program

“Highway Safety Analysis and Evaluation,” offered through ODOT/OSU program, TSPEED University of Washington program, and C.T.A.P. University of California program

“Highway Engineering Economics and Decision Making,” offered through TSPEED University of Washington program

“Access Management,” offered through ODOT/OSU Access Management Project

“Site Access and Circulation Design,” offered through ODOT/OSU Access Management Project

#### **PUBLICATIONS**

##### **Books**

“Use of Meteorological Information for Surface Transportation,” A chapter in the *Handbook in Applied Meteorology*, John Wiley and Sons, Inc., 1984.

“Air Pollution,” A chapter in the *Fundamentals of Traffic Engineering*, 8th, 9th, 10th Editions, Institute of Transportation Studies, University of California, Berkeley, CA, 1984.

##### **Technical Journals**

“Transportation Analysis Techniques for National Forest Planning,” E. Sullivan, R. Layton, and A. Kanafani, *Highway Research Record 408*, HRB, 1972, pp. 1-725.

“The Role of Network Analysis Techniques in Resource Management Planning,” R. Layton, *Highway Research Record 408*, HRB, 1972, pp. 62-71.

“The Effect of Bike Lane Usage on Vehicles in the Adjacent Lane,” S. Loop and R. Layton, *Transportation Research Record 629*, Transportation Research Board, Washington, DC, January 1977, pp. 51-56.

“An Evaluation of Increased Truck Size and Weight on Pavement Life and Design Thickness,” R.G. Hicks, R. Layton, and S. Glover, *Transportation Research Record 671*, Transportation Research Board, Washington, DC, January 1978, pp.46-53.

“Vehicle Size and Weight Regulations Permit Operation and Future Trends,” R. Layton and W. Whitcomb, *Transportation Research Record 687*, Transportation Research Board, Washington, DC, January 1978, pp. 39-45.

- “Development of a Computerized Technique to Identify Effective Forest Roadway Networks,” D. Shunk and R. Layton, *Transportation Research Record 875*, Transportation Research Board, Washington, DC, February 1982, pp. 64-73.
- “Accident Experience of Flashing Traffic Signal Operation in Portland, Oregon,” F. Akbar and R. Layton, *Transportation Research Record*, Transportation Research Board, Washington, DC, April 1986, pp. 24-30.
- “Barriers and Safety Risks at Airports for Elderly and Handicapped Air Travelers,” (with Kate Hunter), *Transportation Research Record*, Transportation Research Board, Washington, DC, April 1986.
- “Making Better Tree-Bucking Decisions: A Network Solution,” J. Sessions, R. Layton, and L. Guangda, *The Compiler*, Vol. 6, Issue 1, January/February 1988.
- “A Method of Determining Offtracking of Multiple Units Vehicle Combinations,” T. Eckert, J. Sessions, and R. Layton, *Journal of Forest Engineering*, Vol. 1, No. 1, July 1989.

### **Refereed Conference Proceedings**

- “A Framework for Comprehensive Evaluation of the Energy and Cost Efficiency of Increased Vehicle Size and Weight,” R. Layton and R.G. Hicks, *Proceedings, Fourth Intersociety Conference on Transportation*, Los Angeles, CA, July 1976.
- “Microcomputer Program to Analyze Unsignalized Intersections,” William Wagner and R. Layton, *Proceedings, 54th Annual Meeting, ITE*, San Francisco, CA, September 1984.
- “Evaluation of Alternate Surfacing for Forest Roads,” M.B. Takallou, R. Layton, and R.G. Hicks, submitted for the *4th International Conference on Low Volume Roads*, Transportation Research Board, August 1987.
- “Alternate Surfacing for Forest Roads - An Overview,” M.B. Takallou, R.G. Hicks, R. Layton, and J.W. Lund, submitted for the *4th International Conference on Low Volume Roads*, Transportation Research Board, August 1987.
- “Development of a Prototype Expert System for Roadside Safety,” H. Zhou and R. Layton, *Proceedings, First International Conference on Applications of Advanced Technologies in Transportation Engineering*, San Diego, CA, February 1989.
- “Scheduling of Maintenance Activities Using Scheduling Software,” P. Field and R. Layton, *6th International Conference on Low Volume Roads*, Minneapolis, MN, July 1995.
- “Interchange Access Management,” R. Layton, *3rd National Conference on Access Management*, Transportation Research Board, Ft. Lauderdale, FL, October 1998.
- “Right-In Right-Out Channelization,” R. Layton, *3rd National Conference on Access Management*, Transportation Research Board, Ft. Lauderdale, FL, October 1998.
- “Integration Access Management into Design of Pedestrian and Bicycle Facilities,” *3rd National Conference on Access Management*, Transportation Research Board, Ft. Lauderdale, FL, October 1998.

### **Conference Proceedings**

- “A Framework for Transportation Planning in Lightly Populated Areas,” R. Layton, *Proceedings, Seventh Annual Nevada Street and Highway Conference*, Reno, NV, March 8, 1972, 22 pages (presented by R. Layton).
- “Transportation Energy Conservation and Environmental Impact,” R. Layton, *Proceedings, Oregon State University's Transportation and the Energy Crisis Conference*, December 1973 (presented by R. Layton).
- “Transportation and the Energy Crisis,” R. Layton, A paper presented at the *1974 Northwest Roads and Streets Conference*, February 1974 (presented by R. Layton).

- “Analysis of Pavement Maintenance and Rehabilitation Costs Under Increased Loading,” R. Layton, R. Phelps and R.G. Hicks, a paper accepted in committee at the Transportation Research Board, Washington, DC, January 1979 (presented by R. Layton).
- “Effective Transportation Systems for the Management of New Forests,” G. Brown, R. Layton and J. Studier, Presented at the *1983 National Convention*, Society of American Foresters, Portland, Oregon, October 1983.
- “A Perspective on Road Surfacing,” R.G. Hicks, R. Layton, and M.B. Takallou, *Forest Roads Conference Proceedings*, Oregon State University, Corvallis, OR, May 1984 (presented by R. Layton).

### Reports and Others

- “Gravity Model Distribution of Truck Trips in Two Small Cities,” R. Layton and B.L. Smith, Civil Engineering Department, Kansas State University, Kansas Highway Commission and BPR, October 1964.
- “Factoring of Trip Tables by Direction and Time of Day, BM853/00/00 W.I., 3.13, San Francisco Bay Area Transportation Study, R. Layton, Interoffice Memo, September 1967.
- “A Transportation Planning Process for National Forests: Phase I Report,” R. Layton, Unpublished report, U.S. Forest Service Project, ITTE, Berkeley, CA, November 1969, 30 pp.
- “The Influence of Household Characteristics on Trip Lengths,” R. Layton, ITTE, Dissertation Series, University of California, Berkeley, CA, September 1970.
- “A Transportation Planning Process for National Forests,” E. Sullivan, A. Kanafani, and R. Layton, Unpublished report, U.S. Forest Service Project, April 1971, 28 pages.
- “Transportation Analysis Procedures for National Forest Planning: Project Report,” E. Sullivan, A. Kanafani, and R. Layton, U.S. Forest Service Project, ITTE, Berkeley, CA, July 1971, 200 pages.
- “Transportation Analysis Procedures for National Forest Planning: A Process Overview,” A. Kanafani, R. Layton, and E. Sullivan, U.S. Forest Service Project, ITTE, Berkeley, CA, July 1971, 25 pages.
- “A Model for Simulating River and Reservoir Temperatures With Applications for Anadromous Fish Management,” J.W. Currie, A.N. Halter, and R. Layton, Water Resources Research Institute, Oregon State University, September 1974, 195 pages.
- Oregon State Simulation Model, *Interim Report*, November 1974.
- “The Development of a Priority Rating System for County Highways,” R. Layton, Prepared for presentation to Comm. A3CO2, Transportation Research Board, January 1976.
- “The Study Framework for Analysis and Evaluations of the Consequences of Increased Vehicle Size and Weight,” R. Layton, U.S. Department of Transportation Project Working Paper No. 1, 70 pages, January 1976.
- “Transportation of Residues of Renewable Resources for Energy Production,” Final Report, NSF Research Project, Oregon State University, August 1976.
- “Field Manual for Identifying Highway Safety Hazards,” R. Kehr, J. Kizer, and R. Layton, Oregon Traffic Safety Commission Project, OSU Transportation Research Institute, January 1978.
- “Development of a Safety Priority Rating System for Local Jurisdictions,” R. Layton, F. Iranitalab and R.G. Hicks, Oregon Traffic Safety Commission Project, OSU Transportation Research Institute, April 1978.
- “Computerized Safety Analysis Technique for Secondary Highways,” K. Nichols and R. Layton, Oregon Traffic Safety Commission Project, OSU Transportation Research Institute, April 1979.
- “The Evaluation and Selection of Highway Safety Improvements for Local Jurisdictions,” Asif Haq and R. Layton, Oregon Traffic Safety Commission Project, OSU Transportation Research Institute, September 1979.

- “Manual for Analysis, Evaluation and Selection of Highway Safety Improvements in Local Jurisdictions,” R. Layton, Oregon Traffic Safety Commission Project, OSU Transportation Research Institute, January 1981.
- “Technology Transfer at Oregon State University,” *Proceedings*, R. Hicks and R. Layton, Presented at the FHWA/T2 Workshop, Portland, OR, June 1983 (*Transportation Engineering Report 83-10*).
- “Compendium of Demonstration Projects for USDA Forest Service Project on Alternate Surfacing,” R. Hicks, K. Johansen, R. Layton, J. Lund, and M. Takallou, Transportation Research Institute, Oregon State University, 1985.
- “Evaluation of Alternate Systems for Surfacing Forest Roads,” R.G. Hicks, R. Layton, J.W. Lund, M. Takallou, and K. Johansen, *Transportation Research Report 85-6*, Transportation Research Institute, Oregon State University, June 1985, 256 pps.
- “Field Guide for Alternative Systems for Surfacing Forest Roads,” M. Takallou, R. Layton, and R.G. Hicks, *Transportation Research Report 85-7*, Transportation Research Institute, Oregon State University, March 1985, 92 pps.
- “ALTSURF Program Documentation,” R.T. Riedel and R. Layton, USDA Forest Service Project, *Transportation Research Report 86-10*, Transportation Research Institute, Oregon State University, September 1986.
- “Study of Human Factors in Public Transportation Safety, R. Layton, K. Hunter, and R. Safford, UMTA Universities Research and Training Program, UMTA, USDOT, March 1989, 202 pp.
- Conference Presentation: “A Knowledge Based System for Highway Safety Analysis in PROLOG,” H. Zhou, R. Layton, and H. Takallou, presented 1989 Annual Meeting of the Transportation Research Board, Washington, DC, January 1989.
- “Access Management Classification and Spacing Standards,” Background Paper #5, ODOT Access Management Project, August 1996.
- “Interchange Access Management,” Background Paper #2, ODOT Access Management Project, November 1996.
- “Stopping and Decision Sight Distance,” Background Paper #8A, ODOT Access Management Project, February 1997.
- “Intersection Sight Distance,” Background Paper #8B, ODOT Access Management Project, February 1997.
- “Functional Integrity of the Highway System,” Policy #1, ODOT Access Management Project, March 1997.
- “Interchange Access Management,” Policy #2, ODOT Access Management Project, March 1997.
- “Access Management Classification and Spacing Standards Policy,” Policy #5, ODOT Access Management Project, March 1997.
- “Access Spacing Standards,” Background Paper #5B, ODO Access Management Project, November 1997.
- “Stopping Sight Distance as a Criteria for Driveway Spacing,” Background Paper #5C, ODOT Access Management Project, November 1997.
- “Right-In Right-Out Channelization,” Background Paper #13, ODOT Access Management Project, November 1997.

## RESEARCH

### Current Research

- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Office, ODOT, Principal Investigator, \$134,377, 10/00-9/01.

“Access Management Policies, Standards and Guidelines Development,” Transportation System Section, ODOT, Principal Investigator, \$25,000, 7/00-6/01.

### **Prior Research**

- “Consequences of Oversized and Overweight Trucks,” Universities Research Program, U.S. Department of Transportation, Co-Investigator (R.G. Hicks, Principal Investigator), \$100,000, 1976.
- “Development of a Priority System for Safety Improvements,” Oregon Traffic Safety Commission, Principal Investigator, \$100,000, 1976.
- “Evaluation Process for Forest Arterial and Collector Networks,” U.S. Forest Service, Principal Investigator, \$5,500, 1978.
- “Traffic Engineering and Highway Safety Fundamentals Short Courses,” Oregon Traffic Safety Commission, Principal Investigator, \$34,371, 7/79-6/80.
- “Transportation Analysis and Training Materials for Forest Planning,” U.S. Forest Service, Principal Investigator, \$50,769, 7/79-6/80.
- “Traffic Engineering and Highway Safety Fundamentals Short Courses,” Oregon Traffic Safety Commission, Principal Investigator, \$43,834, 7/80-6/81.
- “Transportation Analysis and Training Materials for Forest Planning,” U.S. Forest Service, Principal Investigator, \$48,095, 7/80-6/81.
- “Traffic Engineering and Highway Safety Fundamentals Short Courses,” Oregon Traffic Safety Commission, Principal Investigator, \$45,000, 7/81-6/82.
- “Transportation Analysis and Training Materials for Forest Planning,” U.S. Forest Service, Principal Investigator, \$38,924, 7/81-6/82.
- “Traffic Engineering and Highway Safety Fundamentals Short Courses,” Oregon Traffic Safety Commission, Principal Investigator, \$50,000, 7/82-6/83.
- “Traffic Engineering and Highway Safety Fundamentals Short Courses,” Oregon Traffic Safety Commission, Principal Investigator, \$55,000, 7/83-6/84.
- “Traffic Engineering and Highway Safety Fundamentals Short Courses,” Oregon Traffic Safety Commission, Principal Investigator, \$45,000, 7/84-6/85.
- “Study of Alternative Systems for Surfacing Forest Roads,” U.S. Forest Service, Co-Investigator (R.G. Hicks, Principal Investigator), \$139,998, 10/83-4/85.
- “Oregon Technology Transfer Center,” F.H.W.A., U.S. Department of Transportation, Co-Investigator (R.G. Hicks, Principal Investigator), \$60,952, 11/84-6/86.
- “Traffic Engineering and Highway Safety Fundamentals Short Courses,” Oregon Traffic Safety Commission, Principal Investigator, \$86,652, 7/85-6/86.
- “Traffic Engineering and Highway Safety Fundamentals Short Courses and Technical Assistance,” Oregon Traffic Safety Commission, Principal Investigator, \$89,000, 7/86-6/87.
- “Traffic Engineering and Highway Safety Fundamentals Short Courses and Technical Assistance,” Oregon Traffic Safety Commission, Principal Investigator, \$95,000, 1/87-12/87.
- “Study of Human Factors in Public Transportation Safety,” U.M.T.A. University Research and Training Program, U.M.T.A., U.S.D.O.T., Principal Investigator, \$86,631, 8/87-7/88.
- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Commission, Principal Investigator, \$103,606, 1/88-9/88.
- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Commission, Principal Investigator, \$108,186, 10/88-9/89.
- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Commission, Principal Investigator, \$80,000, 10/89-9/90.

- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Commission, \$80,000, 10/90-9/91.
- “Freeway Surveillance and Communications,” TRANSNOW, USDOT, and University of Washington, Seattle, WA, \$20,000, 1/91-8/91.
- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety System, ODOT, \$80,000, 10/91-9/92.
- “Freeway Surveillance and Communications,” TRANSNOW, USDOT and University of Washington, Seattle, WA, \$30,000, 9/91-8/92.
- “Highway Engineering and Safety: Short Courses,” Oregon Traffic Safety Section, ODOT, \$56,000, 10/92-9/93.
- “Highway Engineering and Safety: Technical Assistance,” Oregon Traffic Safety Section, ODOT, \$35,000, 10/92-9/93.
- “Highway Engineering and Safety: Technical Assistance,” Oregon Traffic Safety Office, ODOT, \$44,000, 10/93-10/94.
- “Highway Engineer and Safety Short Courses,” Oregon Traffic Safety Office, ODOT, \$57,000, 10/93-10/94.
- “Access Management Policies, Standards, and Guidelines,” Transportation Systems Section, ODOT, \$97,821, 11/94-6/95.
- “Evaluation of Portland’s Traffic Safety Program,” City of Portland Traffic Bureau, Portland, OR, \$9,900, 11/94-4/95.
- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Office, ODOT, \$115,000, 10/95-9/96.
- “Pedestrian Safety, Design and Operations,” Oregon Traffic Safety Office, ODOT, \$20,000, 10/95-9/96.
- “Determination of Driver Behavior and Speeding,” Oregon Traffic Safety Office, ODOT, \$17,923, 1/96-9/96.
- “Development of ODOT Safety Priority System,” Traffic Management Section, ODOT, \$17,757, 6/96-9/96.
- “Evaluation of the Corridor Safety Improvement Program,” Oregon Traffic Safety Office, ODOT, \$123,600, 7/95-6/97.
- “Access Management Policies, Standards and Guidelines Development,” Transportation Systems Section, ODOT, Principal Investigator, \$300,000, 10/95-6/97.
- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Office, ODOT, Principal Investigator, \$80,000, 10/96-9/97.
- “ ‘Bluestar’ Weather Information System Evaluation,” ODOT, \$41,150, 11/96-9/97.
- “Traffic Surveillance and IMHS Workshops,” Transportation System Section, ODOT, Principal Investigator.
- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Office, ODOT, Principal Investigator, \$83,600, 10/97-9/98.
- “Access Management Policies, Standards and Guidelines Development,” Transportation System Section, ODOT, Principal Investigator, \$320,000, 7/97-6/99.
- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Office, ODOT, Principal Investigator, \$128,288, 10/98-9/99.
- “Access Management Impacts on Pedestrians and Transit,” TRANSNOW, University of Washington.
- “Highway Engineering and Safety: Short Courses and Technical Assistance,” Oregon Traffic Safety Office, ODOT, Principal Investigator, \$134,377, 10/99-9/00.



LAYTON, Robert D.  
Professor

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“Access Management Policies, Standards and Guidelines Development,” Transportation System  
Section, ODOT, Principal Investigator, \$300,000, 7/99-6/01.

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