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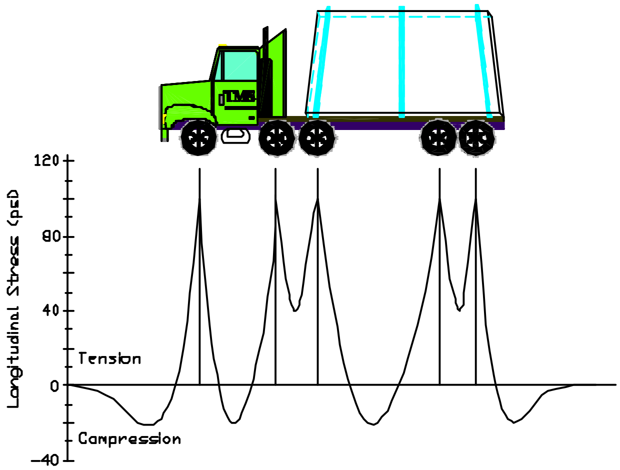
Non-Divisional Load Study

Appendix 1A



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Abstracts on Truck Weight and Relation to Fatigue

Tag	Year	Citation
Fatigue00	100	00/00/0000 FATIGUE OF BEAMS WITH WELDED COVER PLATES
Brennan98	98	00/00/1998 A COMPREHENSIVE FEDERAL PROGRAM ON COMMERCIAL MOTOR VEHICLE DRIVER FATIGUE AND HOURS-OF-SERVICE Conference: Traffic Safety on Two Continents AUTHOR(S): Brennan, PL Knipling, RR McLaughlin, BM Thomas, N
Canada98	98	11/00/1998 CANADA STUDIES CAUSES OF HEAVY TRUCK CRASHES Journal: TRANSAFETY REPORTER Vol: 16 No: 11
Chaverot98	98	00/00/1998 EVALUATION OF FATIGUE BEHAVIOR OF HOT MIX ASPHALT WITH THE LCPC NANTES TEST TRACK AND SHRP TESTING TOOLS Journal: Journal of the Association of Asphalt Paving Technologists Vol: 67 Conference: Asphalt Paving Technology 1998 AUTHOR(S): Chaverot, P De La Roche, C Hines, ML
Guralnick98	98	08/00/1998 Bridge Fatigue Life Estimation From Field Data Journal: Practice Periodical on Structural Design and Construction Vol: 3 No: 3 AUTHOR(S): Guralnick, SA Mohammadi, J Polepeddi, R
Boothby96	96	00/00/1996 PROBABILITY-BASED COST ALLOCATION OF BRIDGE FATIGUE DAMAGE Conference: Structural Reliability in Bridge Engineering: Design, Inspection, Assessment, Rehabilitation and Management. Proceedings of the Workshop AUTHOR(S): Boothby, TE Laman, JA
Laman96	96	07/00/1996 FATIGUE-LOAD MODELS FOR GIRDER BRIDGES Journal: JOURNAL OF STRUCTURAL ENGINEERING Vol: 122 No: 7 AUTHOR(S): Laman, JA Nowak, AS
Truck96	96	00/00/1996 TRUCK SAFETY: PERCEPTIONS AND REALITY
Ghosn95	95	05/00/1995 BRIDGE OVERSTRESS CRITERIA. FINAL REPORT AUTHOR(S): Ghosn, M Moses, F Runco, G Schilling, CG
Hogan94	94	05/00/1994 Summary Of Stress Evaluations Of Welded Steel Bridges On Coal-Haul Routes AUTHOR(S): Hogan, KJ Hopwood, T, II Oberst, CM
Laman94	94	02/00/1994 TRUCK LOADS ON SELECTED BRIDGES IN THE DETROIT AREA AUTHOR(S): Laman, JA Nowak, AS
Laman94a	94	12/00/1994 EFFECT OF TRUCK LOADING ON BRIDGES AUTHOR(S): Laman, JA Nassif, H Nowak, AS
Sebaaly94	94	00/00/1994 PAVEMENT STRAINS INDUCED BY SPENT-FUEL TRANSPORTATION TRUCKS Journal: Transportation Research Record No: 1448 AUTHOR(S): Sebaaly, PE Siddharthan, R Zafir, Z
Cebon93	93	00/00/1993 EFFECTS OF HEAVY-VEHICLE CHARACTERISTICS ON PAVEMENT RESPONSE AND PERFORMANCE Journal: NCHRP Report No: 353 AUTHOR(S): Cebon, D Ehsan, N Gillespie, TD Hansen, W Karamihas, SM Nasim, MA Sayers, MW
Itani93	93	00/00/1993 EFFECT OF ALTERNATIVE TRUCK CONFIGURATIONS AND WEIGHTS ON THE FATIGUE LIFE OF BRIDGES Journal: Transportation Research Record No: 1393 AUTHOR(S): Itani, RY Khaleel, MA
Albrecht92	92	09/00/1992 Advances In Weigh-In-Motion Using Pattern Recognition And Prediction Of Fatigue Life Of Highway Bridges: Volume I. Final Report AUTHOR(S): Albrecht, P Gagarine, N

Tag	Year	Citation
Crozier92	92	10/00/1992 EVALUATION AND REPAIR OF FATIGUE DAMAGE TO MIDLAND COUNTY BRIDGES. FINAL REPORT AUTHOR(S): Crozier, AR Keating, PB
Gagarine92	92	10/00/1992 Advances In Weigh-In-Motion Using Pattern Recognition And Prediction Of Fatigue Life Of Highway Bridges: Volume II. Data Report AUTHOR(S): Gagarine, N
Hahin92	92	12/00/1992 ACCURATE AND RAPID DETERMINATION OF FATIGUE DAMAGE IN BRIDGE SUPERSTRUCTURES. SPECIAL REPORT AUTHOR(S): Hahin, C South, JM
Laman92	92	12/00/1992 FATIGUE LOAD SPECTRA FOR STEEL GIRDER BRIDGES. RESEARCH REPORT AUTHOR(S): Laman, JA Nowak, AS
Moses92	92	07/00/1992 TRUCK WEIGHT EFFECTS ON BRIDGE COSTS. FINAL REPORT AUTHOR(S): Moses, F
Blanchard91	91	06/00/1991 MONSTER TRUCKS: DANGER AHEAD Journal: Trial Vol: 27 No: 6 AUTHOR(S): Blanchard, CF
Ghosn91	91	00/00/1991 RELIABILITY AND LOAD MODELING FOR BRIDGE MANAGEMENT Journal: Transportation Research Record No: 1290 AUTHOR(S): Ghosn, M Moses, F
Huang91	91	12/00/1991 A COMPUTER SYSTEM FOR BRIDGE RATING AND FATIGUE LIFE ANALYSIS. FINAL REPORT AUTHOR(S): Huang, J Wang, T-L
Nassif91	91	06/00/1991 EFFECT OF TRUCK LOADING ON BRIDGES. FIRST DRAFT REPORT AUTHOR(S): Nassif, H Nowak, AS
Southgate91	91	11/00/1991 SENSITIVITY STUDY OF 1986 AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES. FINAL REPORT AUTHOR(S): Southgate, HF
Chizewick90	90	07/00/1990 TRUCK WEIGHT DATA PROCESSING, STORAGE, AND REPORTING. FINAL REPORT AUTHOR(S): Chizewick, T Cunigan, W Sebaaly, P
Fu90	90	09/01/1990 A RELIABILITY ANALYSIS OF PERMIT LOADS ON BRIDGES. FINAL REPORT AUTHOR(S): Fu, GK Liu, YW Moses, F
Petreshock90	90	00/00/1990 Modeling Fatigue Loads For Steel Bridges Journal: Transportation Research Record No: 1275 AUTHOR(S): Petreshock, T Tallin, AG
Fatigue89	89	00/00/1989 FATIGUE MODEL TO ASSESS PAVEMENT DAMAGE Journal: Transportation Research Record No: 1227
Development88	88	07/00/1988 DEVELOPMENT OF DYNAMIC FATIGUE FAILURE CRITERION Journal: Journal of Transportation Engineering Vol: 114 No: 4
Heavy88a	88	00/00/1988 HEAVY TRUCKS, CLIMATE AND PAVEMENT DAMAGE
Hopwood88	88	10/00/1988 FATIGUE ANALYSIS OF THE I 75 BRIDGE OVER THE KENTUCKY RIVER AT CLAYS FERRY AUTHOR(S): Hopwood, T Oka, VG
Albrecht87	87	03/00/1987 RISK ANALYSIS OF FATIGUE FAILURE OF HIGHWAY STEEL BRIDGES Journal: Journal of Structural Engineering Vol: 113 No: 3 AUTHOR(S): Albrecht, P Yazdani, N
Fatigue87	87	11/00/1987 Fatigue Evaluation Procedures For Steel Bridges Journal: NCHRP Report No: 299

Tag	Year	Citation
Fatigue87a	87	00/00/1987 FATIGUE BEHAVIOR OF VARIABLE LOADED BRIDGE DETAILS NEAR THE FATIGUE LIMIT Journal: Transportation Research Record No: 1118
Hsia87	87	00/00/1987 CONSIDERATION OF SEASONAL PAVEMENT DAMAGE FOR TIMBER HAUL ROADS Journal: Transportation Research Record Vol: 1 No: 1106 AUTHOR(S): Hsia, FT Richter, HH
Deen85	85	05/00/1985 EFFECTS OF LOAD DISTRIBUTIONS AND AXLE AND TIRE CONFIGURATIONS ON PAVEMENT FATIGUE AUTHOR(S): Deen, RC Southgate, HF
Ghosn85	85	01/00/1985 A COMPREHENSIVE STUDY OF BRIDGE LOADS AND RELIABILITY - FINAL REPORT AUTHOR(S): Ghosn, M Moses, F
How84	84	00/00/1984 HOW VEHICLE LOADS AFFECT PAVEMENT PERFORMANCE Journal: Wisconsin Transportation Bulletin
Deen83	83	00/00/1983 STRAIN ENERGY ANALYSIS OF PAVEMENT DESIGNS FOR HEAVY TRUCKS Journal: Transportation Research Record No: 949 AUTHOR(S): Deen, RC Mayes, JG Southgate, HF
Frank83	83	05/00/1983 ESTIMATION OF THE FATIGUE LIFE OF A TEST BRIDGE FROM TRAFFIC DATA AUTHOR(S): Frank, KH Hoadley, PW Yura, JA
Albrecht82	82	00/00/1982 FATIGUE RELIABILITY ANALYSIS OF HIGHWAY BRIDGES Journal: Transportation Research Record No: 871 AUTHOR(S): Albrecht, P
Moses82	82	00/00/1982 LOAD SPECTRA FOR BRIDGE EVALUATION Journal: IABSE Reports Vol: 38 AUTHOR(S): Moses, F
Deen79	79	11/00/1979 TRUCK DESIGN AND USAGE AND HIGHWAY PAVEMENT PERFORMANCE AUTHOR(S): Deen, RC Southgate, HF
Effects78	78	10/00/1978 EFFECTS OF HOURS OF SERVICE, REGULARITY OF SCHEDULES, AND CARGO LOADING ON TRUCK AND BUS DRIVER FATIGUE
Mackie78	78	10/00/1978 EFFECTS OF HOURS OF SERVICE REGULARITY OF SCHEDULES, AND CARGO LOADING ON TRUCK AND BUS DRIVER FATIGUE AUTHOR(S): Mackie, RR Miller, JC
Reliability78	78	00/00/1978 RELIABILITY APPROACHES TO BRIDGE SAFETY AND TRUCK LOADING UNCERTAINTIES Journal: Transportation Research Record No: 664
Utilization78	78	00/00/1978 Utilization Of Stress History Data In Bridge Design Journal: Transportation Research Record No: 664
Derucher77	77	12/00/1977 TRUCK CHARACTERISTICS AND STRESS SPECTRA FOR STEEL HIGHWAY BRIDGES Journal: Public Roads Vol: 41 No: 3 AUTHOR(S): Derucher, KN Heins, CP
Daniels76	76	00/00/1976 FATIGUE DAMAGE IN THE LEHIGH CANAL BRIDGE FROM DISPLACEMENT-INDUCED SECONDARY STRESSES Journal: Transportation Research Record No: 607 AUTHOR(S): Daniels, JH Fisher, JW Yen, BT
Goodpasture76	76	06/30/1976 STRESS HISTORY OF HIGHWAY BRIDGES - II AUTHOR(S): Goodpasture, DW
Moses76	76	08/00/1976 PROBABILITY THEORY FOR HIGHWAY BRIDGE FATIGUE STRESSES PHASE II AUTHOR(S): Moses, F Pavia, AP

Tag	Year	Citation
Rimsritong76	76	00/00/1976 PAVEMENT RESPONSE AND EQUIVALENCES FOR VARIOUS TRUCK AXLE AND TIRE CONFIGURATIONS Journal: Transportation Research Record No: 602 AUTHOR(S): Rimsritong, S Terrel, RL
Garson74	74	00/00/1974 NEW PROCEDURE FOR FATIGUE DESIGN OF HIGHWAY BRIDGE GIRDERS Journal: Transportation Research Record No: 507 AUTHOR(S): Garson, R Moses, F
Heins74	74	03/00/1974 DESIGN PROCEDURE FOR FATIGUE DUE TO DAILY TRAFFIC AUTHOR(S): Heins, CP Yamada, K
Bowers73	73	00/00/1973 LOADING HISTORY OF SPAN 10 ON YELLOW MILL POND VIADUCT Journal: Highway Research Record, Hwy Res Board No: 428 AUTHOR(S): Bowers, DG
Carson73	73	07/00/1973 PROBABILITY THEORY FOR HIGHWAY BRIDGES FATIGUE STRESSES AUTHOR(S): Carson, C Moses, R
Garson73	73	07/00/1973 PROBABILITY THEORY FOR HIGHWAY BRIDGE FATIGUE STRESSES AUTHOR(S): Garson, RC Moses, F
Galambos72	72	00/00/1972 LOADING HISTORY STUDY OF TWO HIGHWAY BRIDGES IN VIRGINIA Journal: Highway Research Record, Hwy Res Board No: 382 AUTHOR(S): Galambos, CF Kinnier, HL Maddox, CE Mckeel, WT
Galambos72a	72	00/00/1972 CLOSING REMARKS AT SYMPOSIUM ON BRIDGES: LOADING HISTORY, ULTIMATE STRENGTHS, AND PERFORMANCE Journal: Highway Research Record, Hwy Res Board No: 382 AUTHOR(S): Galambos, CF
Manning72	72	04/01/1972 A LOADING HISTORY STUDY OF SELECTED HIGHWAY BRIDGES IN LOUISIANA AUTHOR(S): Manning, TK Turner, HT
Galambos71	71	00/00/1971 LOADING HISTORY OF HIGHWAY BRIDGES: COMPARISON OF STRESS- RANGE HISTOGRAMS Journal: Highway Research Record, Hwy Res Board AUTHOR(S): Galambos, CF Heins, CP
Cudney68	68	00/00/1968 THE EFFECTS OF LOADINGS ON BRIDGE LIFE Journal: Highway Research Record, Hwy Res Board AUTHOR(S): Cudney, GR
Heins68	68	06/00/1968 INDUCED BRIDGE LOADS AND MOMENTS DURING A TEN YEAR PERIOD: STUDY OF EFFECT OF NEW VEHICLE WEIGHT LAW ON STRUCTURES AUTHOR(S): Heins, CP Looney, CT Werner, JD
Heins68a	68	06/00/1968 INDUCED BRIDGE LOADS AND MOMENTS DURING A TEN YEAR PERIOD AUTHOR(S): Heins, CP Looney, CT Werner, JD
Cudney67	67	09/00/1967 THE EFFECT OF LOADING ON BRIDGE LIFE AUTHOR(S): Cudney, GR
White66	66	00/00/1966 FATIGUE AND DEFLECTION OF ASPHALTIC CONCRETE Journal: Highway Research Record, Hwy Res Board AUTHOR(S): White, OA
Manniche65	65	09/27/1965 VEHICLE LOADINGS AND BRIDGE DESIGN Journal: Canadian Good Roads Association Proc AUTHOR(S): Manniche, K Wright, DT
Stephenson63	63	00/00/1963 REPEATED STRESSES IN HIGHWAY BRIDGES Journal: Highway Research Record, Hwy Res Board AUTHOR(S): Stephenson, HK

Tag	Year	Citation
Fisher62	62	00/00/1962 BEHAVIOR OF AASHO ROAD TEST BRIDGE STRUCTURES UNDER REPEATED OVERSTRESS Journal: Highway Research Board Special Reports AUTHOR(S): Fisher, JW Viest, IM

Tag	Abstract
Albrecht82	Title: FATIGUE RELIABILITY ANALYSIS OF HIGHWAY BRIDGES Author(s): Albrecht, P Journal Title: Transportation Research Record Issue: 871 Publication Date: 00/00/1982 Pagination: pp 73-80 Report No: Features: FIGS: 5 Fig. TABS: 2 Tab. REFS: 15 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: A method of calculating the expected fatigue failure probability of a structural detail, given the distribution of resistance and load, is presented. The resistance data, in terms of cycles to failure, come from previous laboratory tests. The load data come either from stress-range histograms recorded on bridges or from loadmeter surveys. The proposed method replaces each histogram by an equivalent stress range and converts the latter into a distribution in terms of number of cycles. The problem is thus cast into the standard format for reliability analysis and allows one to calculate failure probabilities. Application of the method to designs in accordance with American Association of State Highway and Transportation Officials specifications showed that fatigue failure probabilities for redundant load-path (RLP) structures are inconsistent and vary greatly from P sub F = 9.2 x 10 to the power of -2 for category B to P sub F = 9.2 x 10 to the power of -10 for category E and for nonredundant load-path (NRLP) structures from P sub F = 5.1 x 10 to the power of -2 for category A to P sub F = 2.1 x 10 to the power of -22 for category E. It is proposed that the specifications be revised to include (a) allowable stress ranges for RLP and NRLP structures with uniform failure probabilities; (b) explicit formulation of the specifications in terms of the actual number of single fatigue trucks, each causing an equivalent stress range; and (c) continuous definition of allowable stress range versus truck traffic volume. An example illustrates the design of a bridge not covered by the specifications to a specified failure probability. (Author) Index Terms: Allowable, Bridge Design, Fatigue Failure, Reliability, Resistance, Specification, Stresses, Traffic Volume, Trucks Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	**Abstract**
Albrecht87	Title: RISK ANALYSIS OF FATIGUE FAILURE OF HIGHWAY STEEL BRIDGES Author(s): Albrecht, P: Yazdani, N Journal Title: Journal of Structural Engineering Volume: 113 Issue: 3 Publication Date: 03/00/1987 Pagination: pp 483-500 Report No: Features: FIGS: 15 Fig. TABS: 1 Tab. REFS: Refs. APPS: 1 App. Publisher/Corporate Author(s): American Society of Civil Engineers 345 East 47th Street NY 10017 USA Abstract: A probabilistic fracture mechanics model was developed for determining the risk of fatigue failure of steel highway bridges. The model consists of: (1) stochastic inputs for crack growth rate, fracture toughness, initial crack size, and load history; (2) a deterministic fracture mechanics calculation of crack growth; and (3) a Monte Carlo simulation to obtain the output variable, i.e., the fatigue life. The following effects on the risk of failure were examined: inspection interval, truck weight, truck traffic, system versus detail reliability, and length of service life extension. The model was applied to three bridges with cover-plated girders. It was found to predict well the short service life of the Yellow Mill Pond Bridge, Connecticut, in which the cover-plate end details began to fail 12 yrs after bridge opening. The model is particularly useful in determining the risk of extending the service life of a bridge beyond its intended design life. Index Terms: Crack Growth, Fatigue Failure, Fatigue Life, Fracture Mechanics, Mathematical Models, Monte Carlo Method, Prediction, Probabilistic Analysis, Risk Analysis, Service Life, Steel Bridges, Stochastic Processes Available from: American Society of Civil Engineers 345 East 47th Street New York NY 10017 USA

Tag	Abstract
Albrecht92	Title: ADVANCES IN WEIGH-IN-MOTION USING PATTERN RECOGNITION AND PREDICTION OF FATIGUE LIFE OF HIGHWAY BRIDGES: VOLUME I. FINAL REPORT Author(s): Albrecht, P:Gagarine, N Language: English Publication Date: 09/00/1992 Pagination: 98p Period Covered: 8906-9109 Report No: Publisher/Corporate Author(s): Contract DTFH61-89-P-40005 TRIS20 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 Maryland University, College Park Department of Civil Engineering MD 20742 USA Abstract: The two main objectives of the present study were to: (1) demonstrate the advantages of using the Weigh-in-Motion and Response (WIM+R) system to evaluate the fatigue life of existing bridges and (2) introduce pattern recognition methods in the analysis of WIM+R data. Four steel girder bridges were instrumented to obtain strain data at fatigue critical details, and at sections of maximum strain to compute the gross vehicle weight (GVW) of each truck. Two were simple spans, and two continuous spans. A comparative study of three of the four alternatives suggested by AASHTO showed that the fatigue life computed with direct measurements of the stress ranges were greater than those computed with the simplified approaches. The effect of secondary cycles was negligible for the four bridges. The damage equivalent secondary cycle factor for fatigue was defined. The applicability of three pattern recognition methods for WIM+R was investigated. The dynamic time warping, hidden Markov model, and feed forward neural network methods can classify trucks with the measured strain patterns alone. This new approach in the analysis of the data would remove the need to lay tapeswitches on the pavement, facilitating the field operations during a bridge test. An improved WIM+R system could be used to survey the truck traffic while monitoring fatigue critical details. This volume is the first in a series of two. The other volume is: Volume II, FHWA-RD-92-045, Data Report. Index Terms: Bridge Tests,Continuous Spans,Data Analysis,Fatigue Life,Girder Bridges,Gross Vehicle Weight,Highway Bridges,Pattern Recognition,Predictions,Simple Span,Steel Girders,Strains,Structural Response,Weigh-In-Motion And Response Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: FEDERAL HIGHWAY ADMINISTRATION

Tag	Abstract
Blanchard91	Title: MONSTER TRUCKS: DANGER AHEAD Author(s): Blanchard, CF Journal Title: Trial Volume: 27 Issue: 6 Publication Date: 06/00/1991 Pagination: pp 106-110 Report No: Publisher/Corporate Author(s): Association of Trial Lawyers of America 1050 31st Street, NW DC 20007 USA Abstract: Unless individuals--and lawyers representing victims--get involved, the monster trucks will soon take over the highways. Arrayed against those who speak for victims is a powerful lobby, not only in Washington but also in state capitals. The lobby is now trying to convince Congress and the state legislatures that, in order to increase productivity, the various jurisdictions should legalize monster triple- and longer double-trailer vehicles. This article points out some of the dangers that lie ahead if such trucks are legalized. In representing accident victims and their families, trial lawyers gather evidence about what causes many of these tragedies. Among this evidence are the following: driver fatigue - truck drivers are particularly vulnerable; drug and alcohol abuse - one out of three truckers killed on the roads died with excessive amount of illegal drugs or alcohol in the blood; bad tires, improper brakes, or other mechanical defects - drivers often avoided the check stations; an excessive load that caused the vehicle to become difficult to control; industry practice of paying the driver for the miles driven and not the hours worked; and collisions where laws of physics dictated that the truck would suffer little or no damage but the car would be demolished, its driver and passengers maimed or killed. Also pointed out are the economic considerations that argue against increasing truck size and weight, such as accelerated road deterioration that will require investment in either heavy-duty surfaces or more frequent maintenance, and the cost of redesigning highways to accommodate longer combination vehicles. Index Terms: Economic, Hazard, Highway Design, Highway Safety, Longer Combination Vehicles, Size And Weight Laws, Triple Trailer Trucks, Truck Highway Damage, Trucks Available from: Association of Trial Lawyers of America 1050 31st Street, NW Washington DC 20007 USA

Tag	Abstract
Boothby96	Title: PROBABILITY-BASED COST ALLOCATION OF BRIDGE FATIGUE DAMAGE Author(s): Boothby, TE: Laman, JA Editor(s): Frangopol, DM: Hearn, G Language: English Conference Title: Structural Reliability in Bridge Engineering: Design, Inspection, Assessment, Rehabilitation and Management. Proceedings of the Workshop Sponsored by: National Science Foundation, Federal Highway Administration, Colorado Department of Transportation Location: Boulder, Colorado Date Held: 19961002-19961004 Publication Date: 00/00/1996 Pagination: pp 207-212 Report No: ISBN: 0070277079 Features: FIGS: 3 Fig. TABS: 3 Tab. REFS: Refs. Publisher/Corporate Author(s): McGraw-Hill, Incorporated 1221 Avenue of the Americas NY 10020 USA Abstract: Federal Highway Administration (FHWA) highway cost allocation studies (HCAS) have been undertaken to determine the consumption of infrastructure by various classes of users as a function of the resources required to construct and maintain the system. An important consideration in the cost allocation of bridge expenditures is fatigue damage. Past HCAS have incorporated deterministic methodologies for fatigue damage evaluation of damage assigned to each of the truck vehicle classes and weight groups. Average weights and axle spacing are used to represent the distribution of vehicles in a particular class and weight group. Due to the large variation of several critical aspects of a fatigue evaluation for HCAS, a probability-based evaluation is a more rational approach. This paper develops the necessary probability-based HCAS framework to assess fatigue damage responsibilities. Vehicle load models, both currently available and required, are identified as well as highway bridge fatigue resistance models. Probabilistic evaluation techniques for structural reliability are then integrated into a new bridge HCAS evaluation methodology consistent with the established uncertainties. Index Terms: Bridges, Cost Allocations, Fatigue (Materials), Highway Bridges, Probability, Resistance Models, Structural Reliability, Vehicle Load Models, Workshops (Meetings) Available from: McGraw-Hill, Incorporated 1221 Avenue of the Americas New York NY 10020 USA

Tag	Abstract
Bowers73	Title: LOADING HISTORY OF SPAN 10 ON YELLOW MILL POND VIADUCT Author(s): Bowers, DG Journal Title: Highway Research Record, Hwy Res Board Issue: 428 Publication Date: 00/00/1973 Pagination: pp 64-71 Report No: Features: FIGS: 2 Fig TABS: 3 Tab Publisher/Corporate Author(s): Abstract: two simple-span structures on heavily traveled interstate 95 in bridgeport, connecticut, were tested electronically to determine the magnitude and frequency of stress ranges induced by normal live loading. The bridges were designed in accordance with composite- action techniques and consisted of 7 1/2-in. Concrete decking on rolled cover-plated beams. Strain gauges were mounted at the critical ends of cover plates and at midspan on selected beams and on one diaphragm. A computer-controlled data acquisition system made it possible to record strains continually. As a supplement to strain data, lane counts were made and truck classifications and weights and measurements obtained. Gross truck weights were distributed between 10, 000 and 70, 000 lb with maximum weight recorded at between 90, 000 and 100, 000 lb. Distribution of truck traffic was approximately 55 percent in the outer lane, 45 percent in the middle lane, and less than 1 percent in the inner lane. On the basis of current popular methods of fatigue analysis, which tend to neglect stress ranges below 3 ksi, fatigue failure of the beams tested would be considered a remote possibility for the near future. The numerous low stress ranges induced by live loading, although their effect on the integrity of coverplated beams is unknown, could perhaps drastically shorten the service lives of these members. /author/ Index Terms: Beam, Electronic Means, Fatigue Tests, Loading, Span, Stress Analysis, Truck Effects (Bridges) Available from:

Tag	Abstract
Brennan98	Title: A COMPREHENSIVE FEDERAL PROGRAM ON COMMERCIAL MOTOR VEHICLE DRIVER FATIGUE AND HOURS-OF-SERVICE Author(s): Brennan, PL: Knipling, RR: McLaughlin, BM: Thomas, N Language: English Conference Title: Traffic Safety on Two Continents Sponsored by: Swedish National Road and Transport Research Institute, Transportation Research Board, Forum of European Road Safety Research Institute, and Laboratorio Nacional de Engenharia Civil Location: Lisbon, Portugal Date Held: 19970922-19970924 Publication Date: 00/00/1998 Pagination: pp 169-171 Report No: Publisher/Corporate Author(s): Swedish National Road and Transport Research Institute Sweden Abstract: Driver drowsiness/fatigue and hours-of-service (HOS) are priority safety issues in U.S. commercial motor vehicle (CMV) transportation. In the area of Research and Technology (R&T), the FHWA Office of Motor Carriers (OMC) has completed or is currently performing nearly 20 projects. This paper will overview this R&T program and present its major findings. Final or interim results will be presented from the Driver Fatigue and Alertness Study, CMV Rest Area study, Multi-Trailer Combination Vehicle Driver Stress and Fatigue study, Driver Work/Rest Cycle study, Driver Sleep Apnea study, Fitness-for-Duty Testing field test, Shipper Involvement in HOS Violations study, and Loading/ Unloading and Fatigue study. OMC applies its research results to improve its regulations of the trucking industry. An Advance Notice of Proposed Rulemaking (ANPRM) on CMV HOS was issued on November, 1996. This rulemaking will result in the first substantive changes to the CMV HOS in nearly 60 years. The HOS ANPRM addresses both conventional HOS rules and performance-based alternatives, with the latter including both fleet management and individual monitoring approaches. This paper will identify the most salient and problematic issues under consideration in the rulemaking and major recent scientific findings relevant to key issues. Together with its industry partners, the OMC has undertaken an active fatigue education/outreach effort. This includes a multimedia program designed to inform a wide range of audiences - the general public, motor carriers, professional truck driver associations, and truckers themselves - about the hazards of driving while fatigued. In addition, OMC is developing both fleet-based and truck stop-based "wellness" programs promoting driver awareness of how sleep, diet, exercise, and lifestyle contribute to one's general state of health and level of driving performance. Finally, OMC and its state partners use a variety of enforcement tools to ensure that motor carriers and drivers comply with the hours-of-service and log book regulations prescribed in the Federal Motor Carrier Safety Regulations. This includes roadside driver/vehicle inspections, motor carrier compliance reviews, and related enforcement actions and criminal prosecutions. Index Terms: Commercial Drivers, Commercial Vehicles, Drowsiness, Fatigue (Physical Condition), Health, Hours Of Labor, Inspection, Loading And Unloading, Multimedia, Public Information Programs, Rest Periods, Roadside Rest Areas, Sleep Deprivation, Stress (Physiology), Stress (Psychology), Tractor Trailer Combinations, Truck Drivers Unused Terms: Compliance, Sleep Apnea Available from: Swedish National Road and Transport Research Institute S581 95 Linkoping Sweden

Tag	Abstract
Canada98	Title: CANADA STUDIES CAUSES OF HEAVY TRUCK CRASHES Language: English Journal Title: TRANSAFETY REPORTER Volume: 16 Issue: 11 Publication Date: 11/00/1998 Pagination: pp 6-8 Report No: Publisher/Corporate Author(s): TranSafety, Incorporated P.O. Box 3100 WA 98382-5006 USA Abstract: Transport Canada contracted with the University of New Brunswick accident research team to initiate a Level III (on-scene) study of heavy-truck collisions commencing in June 1993. By July 1996, the research team completed 53 in-depth investigations. The most significant finding was that truck drivers are poorly protected in the truck's cab during a rollover. Most of the crashes happened during the day, in clear weather, and on dry roads. Eight involved underriding of a passenger vehicle. Load security was a factor in several crashes. In only two of the crashes had the driver violated the hours-of-service regulations, and only one case was a direct result of driver fatigue. Index Terms: Accident Causes, Accident Data, Cabs (Vehicle Compartments), Heavy Duty Trucks, Loads, Physical Condition, Rollover Accidents, Truck Accidents, Truck Drivers, Trucking Safety, Underride Override Collisions, Weather Conditions Geographic Terms: Canada Available from: TranSafety, Incorporated P.O. Box 3100 Sequim WA 98382-5006 USA

Tag	Abstract
Carson73	Title: PROBABILITY THEORY FOR HIGHWAY BRIDGES FATIGUE STRESSES Author(s): Carson, C: Moses, R Publication Date: 07/00/1973 Pagination: 86 pp Report No: Features: FIGS: Figs TABS: Tabs REFS: Refs Publisher/Corporate Author(s): Ohio Department of Transportation USA Abstract: the recent concern for fatigue failure of highway bridge girders is due to heavier and more numerous trucks, lighter and more flexible bridges, high strength alloys, welded and continuous span sections, and reports of fatigue cracks. On the other hand, measurements of existing bridges usually show low stress levels under random traffic and thus there must presently be inconsistent safety levels against fatigue levels. This report describes an analytical project to calculate histograms of highway bridge loadings which can be used to predict fatigue and to properly size girder sections. A probabilistic load model is developed using truck volume and weight histogram, headway spacing distributions between trucks, impact factors and distribution analysis. A reliability or risk approach to choosing safety factors is also described. The computer data for truck loading and fatigue design comes from a literature study reported in appendices on fatigue, truck and traffic characteristics and dynamic bridge behavior. The calculated load histograms show good agreement with reported measurements. The methods are illustrated with single span bridges of different length, weld category, and truck records of different states, parallel and opposing flow bridges and three span continuous bridges. Index Terms: Fatigue Failure, Fatigue Tests, Girder Bridges, Histograms, Loading Tests, Model, Safety, Span, Traffic Flow, Truck Effects (Bridges), Weight Limits, Weldments Available from:

Tag	Abstract
Cebon93	Title: EFFECTS OF HEAVY-VEHICLE CHARACTERISTICS ON PAVEMENT RESPONSE AND PERFORMANCE Author(s): Cebon, D: Ehsan, N: Gillespie, TD: Hansen, W: Karamihas, SM: Nasim, MA: Sayers, MW Language: English Journal Title: NCHRP Report Issue: 353 Publication Date: 00/00/1993 Pagination: 132p Report No: ISBN: 030905351X Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 6 App. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The high wheel loads of heavy trucks are a major source of pavement damage by causing fatigue, which leads to cracking, and by permanent deformation, which produces rutting. Among heavy trucks, all do not cause equal damage because of differences in wheel loads, number and location of axles, types of suspensions and tires, and other factors. Further, the damage is specific to pavement properties, operating conditions, and environmental factors. The mechanics of truck-pavement interaction were studied to identify relationships between truck properties and damage (fatigue and rutting). Computer models of trucks were used to generate wheel load histories characteristic of the different trucks and operating conditions. Influence functions, obtained from rigid and flexible pavement structural models, were used to predict responses along the pavement resulting from the truck motions. The pavement responses were evaluated to estimate overall pavement damage caused by each truck. The study assessed the significance of truck, tire, pavement, and environmental factors as determinants of pavement damage. Maximum axle load and pavement thickness have the primary influences on fatigue damage. Truck properties, such as number and location of axles, suspension type, and tire type, are important but less significant. High temperatures in flexible pavements and temperature gradients in rigid pavements adversely affect the damage caused by truck wheel loads with a fairly strong interaction. The report discusses and quantifies the influence of these variables. Index Terms: Axle Loads, Computer Models, Deformation, Environmental Factors, Fatigue (Materials), Flexible Pavements, Heavy Vehicles, Pavement Cracking, Pavement Thickness, Rigid Pavements, Rutting, Temperature Effects, Truck Pavement Damage, Truck Tires, Vehicle Suspension Systems, Wheel Load Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Chaverot98	Title: EVALUATION OF FATIGUE BEHAVIOR OF HOT MIX ASPHALT WITH THE LCPC NANTES TEST TRACK AND SHRP TESTING TOOLS Author(s): Chaverot, P: De La Roche, C: Hines, ML Language: English Journal Title: Journal of the Association of Asphalt Paving Technologists Volume: 67 Conference Title: Asphalt Paving Technology 1998 Sponsored by: Association of Asphalt Paving Technologists Location: Boston, Massachusetts Date Held: 19980316-19980318 Publication Date: 00/00/1998 Pagination: pp 717-737 Report No: Features: FIGS: 6 Fig. TABS: 11 Tab. REFS: 23 Ref. Publisher/Corporate Author(s): Association of Asphalt Paving Technologists 400 Selby Avenue, Suite I MN 55102- USA Abstract: Understanding the ability of an asphalt pavement to resist fracture from repeated loads is essential for an engineering design of an asphalt concrete (HMA) pavement. However, reaching a better understanding of this fatigue behavior of asphalt pavements continues to challenge researchers all over the world, particularly as newer materials with more complex properties are being used in hot mix asphalt (HMA) pavements. One of the most ambitious recent efforts has taken place at a French Laboratoire Central Des Ponts et Chaussees (LCPC) test facility in the Brittany city Nantes. The test track was originally built in 1984. Between 1990 and 1994, twelve carefully constructed full scale pavement structural sections were loaded with millions of full-scale truck tire loads, and monitored with in-situ measurements of strains in three dimensions to study fatigue (1). During the Strategic Highway Research Program (SHRP) from 1987-1993, several laboratory tools were bought forth to evaluate the fatigue characteristics of both HMA and asphalt binders, including the Superpave Shear Tester (SST), the Superpave A003A Beam Fatigue Test, the Dynamic Shear Rheometer (DSR) and the Bending Beam Rheometer (BBR). Validation of the relationship between these tests and pavement performance is underway as part of the SHRP implementation program, notably on the full-scale WestTrack project, which will load 26 test pavement sections of HMA with 10 million standard axle loads. The results of these SHRP tests are compared with the performance results of the Nantes Fatigue Track, as well as the LCPC's mechanical tests of complex axial modulus and cantilever beam fatigue. Index Terms: Accelerated Tests, Asphalt Pavements, Fatigue Tests, Hot Mix Paving Mixtures, Laboratory Tests, Loading Facilities, Pavements Available from: Association of Asphalt Paving Technologists Secretary-Treasurer, 400 Selby Avenue, Suite I St Paul MN 55102- USA

Tag	Abstract
Chizewick90	Title: TRUCK WEIGHT DATA PROCESSING, STORAGE, AND REPORTING. FINAL REPORT Author(s): Chizewick, T: Cunigan, W: Sebaaly, P Publication Date: 07/00/1990 Pagination: 140p Period Covered: 8907-9007 Report No: Features: FIGS: 63 Fig. TABS: 6 Tab. REFS: 6 Ref. APPS: 4 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Pennsylvania Department of Transportation Office of Research & Special Studies, T&S Bldg, Rm 905 17120 Pennsylvania Transportation Institute Pennsylvania State University PA 16802 USA Abstract: This report documents the findings of the PennDOT Weigh-In-Motion research project, including the evaluation of PennDOT WIM units, the survey of PennDOT needs, analysis of the surveys and recommendations, and the development and testing of the computer programs. Based on an analysis of the responses to the survey questionnaire and an investigation of the existing computer programs provided through FHWA and the PAT, IRD, and Golden River firms, five computer analyses were developed. These are: (1) average truck weight, (2) equivalent single-axle loads, (3) number of trucks by weight range, (4) trucks exceeding standard weight limits, and (5) cumulative fatigue damage on bridge structures. Index Terms: Axle Load, Computer Programs, Data Processing, Data Storage, Overweight Loads, Questionnaire, Recommendations, Surveys (Data Collection), Truck Effects (Bridges), Truck Weights, Weigh-In-Motion Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Crozier92	Title: EVALUATION AND REPAIR OF FATIGUE DAMAGE TO MIDLAND COUNTY BRIDGES. FINAL REPORT Author(s): Crozier, AR: Keating, PB Language: English Publication Date: 10/00/1992 Pagination: 160p Period Covered: 9107-9203 Report No: Features: FIGS: Figs. TABS: Tabs. PHOT: Phots. REFS: 4 Ref. APPS: 4 App. Publisher/Corporate Author(s): Contract Study 2-5-91-1313 TRIS20 Texas Department of Transportation Transportation Planning Division, P.O. Box 5051 78763 Texas Transportation Institute Texas A&M University TX 77843 USA Abstract: The IH-20 Midland County bridge has experienced fatigue related problems due to the unintended interaction between the longitudinal girders and the cross-frame diaphragms. Fatigue cracks developed in unstiffened web gaps at the ends of the diaphragm connection plates and in the diaphragm cross frame members. This study investigated the cause of the fatigue cracking through field strain measurements and finite element analysis, and developed procedures for their repair. Web gaps fatigue cracks were caused by the distorition of the web gap by the diaphragm member forces. Under a single truck load condition, uneven load distribution between girders resulted in significant diaphragm member forces. The diaphragm member cracking was due to the eccentric connection used in the construction of the bridge. This resulted in bending stresses in the diaphragm members large enough to initiate the fatigue cracks. The effect of diaphragm removal on overall structural behavior of the bridge was studied. Removal of all diaphragms from the bridge was found to result in unacceptable increases in the longitudinal girder bending stresses. A staggered diaphragm pattern was selected that minimized the number of diaphragms needing repair while not significantly changing either the load distribution characteristics of the bridge nor member stresses. At remaining diaphragm locations, repair procedures were developed that included a welded attachment of the connection plates ends and an improved design for the diaphragms. Index Terms: Bending Stress, Diaphragms, Eccentric Connections, Fatigue Cracks, Finite Element Analysis, Highway Bridges, Load Distribution, Repairs, Strain Measurements, Webs (Structural) Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Cudney67	Title: THE EFFECT OF LOADING ON BRIDGE LIFE Author(s): Cudney, GR Publication Date: 09/00/1967 Report No: Publisher/Corporate Author(s): Michigan Dept State Highways USA Abstract: results are presented of an investigation involving the measurement of strains produced by truck traffic on eight selected highway bridges. The development of a sampling procedure is described along with the instrumentation used. Results are presented in the form of stress - frequency distributions, and are compared with the commercial truck traffic volumes and gross weights. Some studies involving loading with a controlled test vehicle are also reported. Based on certain assumptions and results of laboratory structural fatigue tests by others, the life expectancy of eight bridges is determined. The major conclusion is that apparently there is no great danger of fatigue damage to the bridges tested under loadings presently allowed in michigan. /bpr/ Index Terms: Fatigue Tests, Gross Weight, Highway Bridges, Loading, Sampling, Strain Measurement, Stress Distribution, Traffic Volume, Trucks Available from: Acknowledgement of Document Source: Bureau of Public Roads /US/
Cudney68	Title: THE EFFECTS OF LOADINGS ON BRIDGE LIFE Author(s): Cudney, GR Journal Title: Highway Research Record, Hwy Res Board Publication Date: 00/00/1968 Report No: Publisher/Corporate Author(s): Abstract: this study estimates the effects of traffic loadings on the fatigue life of longitudinal stringers of bridges, based on stress histories acquired at crucial points. A limited lateral stress distribution study with a special test vehicle was conducted for various speeds and lateral vehicle positions. Eight spans of 8 composite longitudinal stringer- slab type bridges were used (2 welded plate girders, 5 rolled beam with tapered end cover plated, and 1 prestressed concrete i-beam). The report includes frequency distributions of maximum live load stress, rebound stress, live load stress range, and vehicle type, also bridge dynamic characteristics (natural frequency damping factors, and decay time), dynamic amplification factors and dynamic stress increments for the various test vehicle speeds, and miscellaneous frequency distribution of gross vehicle load on 2 bridges and gross vehicle load according to truck type. This study indicates that the effect of current traffic loading on bridge life is insignificant, limited, of course, by the particular characteristics of the test structures, truck volumes, types and load distributions encountered, and interpretation and applicability of the fatigue strength data (munse-stallmeyer) and failure criteria (miner's hypothesis). /author/ Index Terms: Bridge Spans, Dynamic Characteristics, Failure, Fatigue, I Beams, Live Loads, Load Distribution, Loading, Plate Girders, Stress Distribution, Stresses, Stringers, Traffic, Vehicle Available from:

Tag	Abstract
Daniels76	Title: FATIGUE DAMAGE IN THE LEHIGH CANAL BRIDGE FROM DISPLACEMENT-INDUCED SECONDARY STRESSES Author(s): Daniels, JH: Fisher, JW: Yen, BT Journal Title: Transportation Research Record Issue: 607 Publication Date: 00/00/1976 Pagination: pp 56-62 Report No: Features: FIGS: 12 Fig. TABS: 1 Tab. REFS: 13 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Strains were measured at several structural steel details on one of the Lehigh Canal bridges under normal traffic. Inasmuch as these bridges have several fatigue cracks in the tie plates connecting the floor beams to the outrigger cantilever brackets, the primary focus was on the tie plates and the case of fatigue cracking. Strain gauges were mounted on five tie plates, on a stringer, and on the longitudinal girders. An automatic computer-controlled data acquisition system was used to record the strain range occurrences. In addition, an analog trace recorder was used to determine the live load strain variations with time. Stress ranges in the stringer and girders were comparable to those observed by others in girder bridges. However, the horizontal in-plane bending stresses in the tie plates were found to be two to three times as high. The higher stress range was attributed to differential displacements between the deck-stringer system and the girder, which were transmitted through the tie plates. The strain measurements on the tie plates and the volume of truck traffic during the structure's life were used to estimate the cumulative damage in several tie plates. Good correlation was obtained with the root mean square stress range and constant cycle laboratory fatigue test results. Miner's rule was also found to provide a good correlation. /Author/ Index Terms: Analog Systems, Bridge, Cantilever, Computer Programs, Cracks, Data Acquisition, Displacement, Fatigue (Materials), Girder Bridges, Loads, Secondary Stresses, Strain Gages, Stringers, Structural Steels, Ties, Trucks Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Deen79	Title: TRUCK DESIGN AND USAGE AND HIGHWAY PAVEMENT PERFORMANCE Author(s): Deen, RC: Southgate, HF Publication Date: 11/00/1979 Pagination: 17 p. Report No: Features: FIGS: 8 Fig. Publisher/Corporate Author(s): Kentucky Department of Transportation Bureau of Highways, Div of Research, 533 South Limestone KY 40508 USA Abstract: Trucks, by virtue of their loads, profoundly affect pavement performance. Vehicle designers and manufacturers play an important role in this respect. Tires are a major factor in the loading of the pavement: the width of the tire, the number of tires, spacing between tires, tire pressure, and design of tire treads are all important. The number and spacing of axles are also important. This report reviews relevant principles of pavement design such as the concept of load distribution. The Kentucky DOT has developed a computer model based on elastic theory to obtain a first approximation of stresses and strains within a pavement system under various loading configurations. Fatigue concepts are discussed, and the importance of fatigue failure in pavement design is noted. Kentucky DOT work in this area is described. Figures are shown which illustrate how pavement damage increases with total loads on various axle groups, the increase of damage factors with increase of payload with increase of percentage damage. Other aspects briefly covered by the report include bridge loadings, operate damage. Other aspects briefly covered by the report include bridge loadings, operating costs, safety, economic considerations, and enforcement. Efforts must be made, by statute, to encourage the use of vehicles which are less damaging to highway pavements. Index Terms: Axle, Axle Load, Bridge, Damage, Failure, Law, Load Distribution, Loading, Mathematical Models, Operating Costs, Pavement Design, Pavement Performance, Payloads /Highway Construction/, Safety, Tires, Trucks, Vehicle Design Available from: Acknowledgement of Document Source: National Technical Information Service

Tag	**Abstract**
Deen83	Title: STRAIN ENERGY ANALYSIS OF PAVEMENT DESIGNS FOR HEAVY TRUCKS Author(s): Deen, RC: Mayes, JG: Southgate, HF Journal Title: Transportation Research Record Issue: 949 Publication Date: 00/00/1983 Pagination: pp 14-20 Report No: Features: FIGS: 7 Fig. TABS: 5 Tab. REFS: 9 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Classical concepts of work, or strain energy, as applied to the analysis of stresses, strains, and deflections under various vehicular load configurations on pavement systems are summarized and controlling equations for strain energy density are presented. When considering strain energy density, strain energy, or work, all components of stresses or strains must be taken into account so that total internal behavior can be evaluated. Previously, pavement thickness design systems have been developed using only one component of strain, typically at the bottom of the asphaltic concrete layer or at the top of the subgrade. Strain energy concepts permit modifications to thickness design systems to account for the net effect of all components of strains or stresses. Effects of loads and distribution of loads on vehicles are summarized. One startling result shows the large increase in fatigue rate due to unequal distribution of loads between the two axles of a tandem group relative to the fatigue rate caused by an equal load distribution. Damage factors and pavement thickness designs for heavily loaded trucks exceeding legal load limits are also discussed. The effects of those vehicles on Interstate pavements are compared to the effects of more normally loaded vehicles. (Author) Index Terms: Heavy Vehicle, Load Distribution, Pavement Deflection, Pavement Design, Pavement Thickness, Strains, Stresses Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Deen85	Title: EFFECTS OF LOAD DISTRIBUTIONS AND AXLE AND TIRE CONFIGURATIONS ON PAVEMENT FATIGUE Author(s): Deen, RC: Southgate, HF Publication Date: 05/00/1985 Pagination: 37p Report No: Features: FIGS: 15 Fig. TABS: 17 Tab. REFS: 7 Ref. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Kentucky Transportation Cabinet State Office Building, Clinton and High Streets 40622 Kentucky University Kentucky Transportation Research Program KY 40506 USA Abstract: Damage factor relationships for axle and tire configurations are presented. Adjustment factors are provided to account for variations in load distributions within axle groups, distances between axles of a tandem, and variations in tire pressure for both dual and flotation tire configurations. Properly accounting for accumulated fatigue of a pavement requires an accurate measure of traffic volume, proportions of vehicle styles (classifications) within the traffic stream, dates of service, estimate of the average damage factor for each classification, and estimate of the tire contact pressure. Weigh-in-motion equipment in its current form provides all of the above ingredients except for the tire contact pressure. A survey of tire pressures may be made and an average calculated to obtain a rough estimate of the effects of load concentrated on a smaller area than assumed in the past. Such data described above may be used to determine trends in the use of vehicle styles as well as changes in truck volumes and load distributions. Adjusting for actual conditions of usage may indicate a pavement design thought to last 20 years may last only 14 to 16 years. Such findings affect both new pavement designs and rehabilitation strategies with accompanying effects upon fiscal plans and policies. Adjusted design EALs might require a different pavement template for new designs and a resulting change in costs. Likewise, rehabilitation strategies may change, for example, from a simple overlay to milling and overlay or to complete rehabilitation because of overhead clearance problems, involving additional costs for shoulder paving and replacement or resetting of guard rails, etc, Therefore, estimating EAL requirements may be far more significant and important than previously recognized. Efforts should include the best method to determine the most accurate fatigue history possible. All adjustment factors presented are based on the analyses of a limited number of structures and should be used with caution. The accuracy of these analyses are not in question, but the range of structures investigated was limited. They are intended to indicate the trend, shape, and sensitivity of various inter-relationships and their relative magnitudes. Modifications may have to be made upon the analyses of additional pavement structures. Kentucky traffic may differ from that in other areas in the United States, both in types of vehicles in the traffic stream and the type and direction cargo is being transported. (Author) and direction cargo is being transported. (Author) Index Terms: Axle Load, Estimating, Fatigue (Materials), Load Distribution, Rehabilitation, Requirement, Tires, Traffic Loads, Traffic Volume, Truck Pavement Damage Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Derucher77	Title: TRUCK CHARACTERISTICS AND STRESS SPECTRA FOR STEEL HIGHWAY BRIDGES Author(s): Derucher, KN: Heins, CP Journal Title: Public Roads Volume: 41 Issue: 3 Publication Date: 12/00/1977 Pagination: pp 132-139 Report No: Features: FIGS: 6 Fig. TABS: 5 Tab. PHOT: 1 Phot. REFS: 23 Ref. Publisher/Corporate Author(s): Federal Highway Administration, Office of R&D 400 7th Street, SW DC 20590 USA Abstract: This article summarizes the results of tests conducted on various types of steel highway bridges to ascertain the induced stresses on various elements caused by random traffic. Vehicle characteristics obtained include truck type, dimensions, and weights. This article further clarifies the experimental and data reduction procedures that were used to collect this information. Bridge types examined include single, three, four and five span bridges, end anchor bridges, suspended-span and semisuspended-span bridges. Stress response of a bridge is influenced by the vehicle crossing the bridge. Observations of truck characteristics and their frequency of distribution during a given time interval were made during most of the load history tests. Data is then used to develop typical truck types. During the load history field tests, the induced strains on various elements of the bridges were monitored. The recording and reduction of strains (stresses) were accomplished by various techniques and equipment such as a computer system, signal conditioning modules, amplifiers, analog-to-digital converter, a 14-channel oscillograph, a light beam oscillograph, and a 7-channel analog 7-tape recorder. The determination of vehicle loads were generally performed by portable weighing scales or at a permanent weighing station. The vehicle distribution by classification was generally noted visually and recorded. Results of the tests conducted indicate that the recorded stresses are much lower than the design values, and the characteristics of the vehicles which induce such stress also differ from the AASHTO truck loadings. These differences suggest a possible revision in the fatigue design codes. Alternate procedures, which include the information collected from field tests, have been suggested. Index Terms: ANCHORS, BRIDGE SPANS, COMPUTER APPLICATIONS, DATA ACQUISITION, DATA REDUCTION, HIGHWAY BRIDGES, LOADS, OSCILLOGRAPHS, STRESSES, SUSPENSION BRIDGE, TRUCK WEIGHTS, TRUCKS Available from:

Tag	Abstract
Development88	Title: DEVELOPMENT OF DYNAMIC FATIGUE FAILURE CRITERION Journal Title: Journal of Transportation Engineering Volume: 114 Issue: 4 Publication Date: 07/00/1988 Pagination: pp 450-464 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Abstract: When a truck wheel moves on the road, stress pulses develop within the pavement layers. These pulses are primarily functions of load magnitude, tire pressure, and vehicle speed. In this study, dynamic analysis is used to predict stresses and deflections that develop when a moving wheel load is applied. The method considers the inertial forces and assumes pulsating loads that accurately simulate actual wheel loading. The method is applied on AASHO road test sections to predict their theoretical response. The change of stresses and deflections at varous loading times and at different speeds is computed and verified versus actual field data. Very close agreement was found between field deflections and theoretical predictions. The evaluated pavement response is used to develop a fatigue failure criterion for a speed of 30 mph, which is the mean speed at the AASHO road test. The use of accurate prediction models and valid failure functions may lead to better methods of design and rehabilitations of pavements. Available from: Acknowledgement of Document Source: American Society of Civil Engineers
Effects78	Title: EFFECTS OF HOURS OF SERVICE, REGULARITY OF SCHEDULES, AND CARGO LOADING ON TRUCK AND BUS DRIVER FATIGUE Publication Date: 10/00/1978 Pagination: 285p Report No: Features: FIGS: Figs. REFS: Refs. Publisher/Corporate Author(s): Abstract: No Abstract. Available from:

Tag	Abstract
Fatigue00	Title: FATIGUE OF BEAMS WITH WELDED COVER PLATES Publication Date: 00/00/0000 Report No: Publisher/Corporate Author(s): Abstract: the increased use of welded members as bridge elements, together with trends toward heavier truck gross weights and traffic volumes, necessitates the study of the behavior of welded cover-plated girders subjected to conditions of varying load amplitudes. A survey of the literature indicated the effect of the various factors which influence fatigue behavior under both constant amplitude and variable amplitude. A hypothesis, based on the assumption that the plastic strain amplitude during any given cycle of stress is an index of the induced fatigue damage, is presented. The hypothesis is shown to yield an exponential cycle to failure-stress range relationship and a stress dependent damage-cycle ratio equation. A series of constant amplitude tests were conducted which were designed to yield the material constants necessary for the application of the hypothesis to variable amplitude cases. Both multi-level and repeated block tests were also conducted. The purpose of these tests was to study the process of damage accumulation due to variable loading and also check the endurance predictions based on the hypothesis. The tests were also designed to indicate the dependence of damage accumulation on the order of loading and the influence of the number of consecutive cycles of a given stress range level upon the endurance of members subjected to repeated block loading. The predictions of the hypothesis were within 3-14% of the test results. Preliminary design equations are presented and their application to an existing bridge element is illustrated. The use of the hypothesis for final design is also outlined. Conclusions based on the results of this study and those of previous investigations are presented and used as a basis for proposed changes in code provisions dealing with fatigue. /author/ Available from: Acknowledgement of Document Source: Federal Highway Administration

Tag	**Abstract**
Fatigue87	Title: FATIGUE EVALUATION PROCEDURES FOR STEEL BRIDGES Journal Title: NCHRP Report Issue: 299 Publication Date: 11/00/1987 Pagination: 100p Report No: ISBN: 0-309-04568-1 Features: FIGS: Figs. TABS: Tabs. REFS: 251 Ref. APPS: 6 App. Publisher/Corporate Author(s): Abstract: This report presents a fatigue evaluation procedure for existing steel highway bridges and a compatible fatigue design procedure for new steel highway bridges. Both procedures realistically characterize the actual fatigue stress and cyclic conditions in bridges. Both procedures use the same detail categories and corresponding fatigue strength data as the present AASHTO specifications; they also use methods of calculating stress ranges that are similar to present AASHTO methods. The evaluation procedure, which is recommended for inclusion in the AASHTO Manual for Maintenance-Inspection of Bridges, gives accurate estimates of the remaining mean and safe fatigue lives and permits these estimates to be updated in the future to reflect changes in traffic conditions. An alternative procedure is also given for monitoring the accumulated fatigue damage during the life of the bridge; it is intended for use in conjunction with the routine inspections that are normally conducted at two-year intervals. An assessment of remaining fatigue life is needed in bridge management systems to assist in scheduling inspection, maintenance, rehabilitation and replacement. It is also useful in evaluating administrative and legislative policies such as truck-weight and overload policies. The design procedure, which is recommended for inclusion in the AASHTO Standard Specifications for Highway Bridges, is consistent with the evaluation procedure and utilizes many of the same concepts. However, it is presented in a format convenient for design; a calculated design stress range is compared with a permissible stress range corresponding to a desired safe design life. The procedure is much more flexible than present AASHTO fatigue procedures; it permits rigorous analysis methods and designs for any desired design life, initial truck volume, and truck-volume growth rate.

Tag	Abstract
Fatigue87a	Title: FATIGUE BEHAVIOR OF VARIABLE LOADED BRIDGE DETAILS NEAR THE FATIGUE LIMIT Journal Title: Transportation Research Record Issue: 1118 Publication Date: 00/00/1987 Pagination: pp 56-64 Report No: Features: FIGS: 13 Fig. TABS: 2 Tab. REFS: 16 Ref. Publisher/Corporate Author(s): Abstract: The findings of the current NCHRP Project 12-15(5), "Fatigue Behavior of Variable Loaded Details Near the Fatigue Limit, " are highlighted. The main focus of the research is the examination of welded bridge details in the high-cycle, long-life regime. Large-scale plate girders with coverplate, web attachment, and web stiffener details are subjected to fatigue loading that simulates actual truck traffic. A Rayleigh type stress spectrum is used with the inclusion of an occasional overload exceeding the constant-amplitude fatigue limit. The frequencies of occurrence being considered for the overloads are 0.1, 0.05, and 0.01 percent. Prior research indicated that fatigue crack propagation occurred even when the effective stress range was below the constant-amplitude fatigue limit and the exceedance rate of the limit was as low as 0.1 percent. The current test specimens also allow for a detailed study of distortion-induced fatigue cracking at a connection plate web gap detail. Results indicate that the retrofit method of drilled holes at the crack tip is inadequate at high levels of distortioon. In addition to the experimental work, a review of fatigue test data generated around the world since the AASHTO fatigue provisions were adopted in 1974 was completed. This study has allowed for a reassessment of the provisions. A summary of the proposed revisions to the specifications is given. Available from:

Tag	Abstract
Fatigue89	Title: FATIGUE MODEL TO ASSESS PAVEMENT DAMAGE Journal Title: Transportation Research Record Issue: 1227 Publication Date: 00/00/1989 Pagination: pp 88-96 Report No: ISBN: 0-309-04822-2 Features: FIGS: 5 Fig. TABS: 8 Tab. REFS: 19 Ref. Publisher/Corporate Author(s): Abstract: This paper attempts to derive a general model for fatigue failure. Initially, the problem studied is the relation between the displacement response of a pavement system and the stresses generated by the dynamic application of a load. This is carried out through an analytical model using the theory of wave propagation in an elastic medium. The ultimate objective is forecasting fatigue damage to pavement systems caused by the passage of large trucks. In this regard, a theory is developed to relate fatigue damage to applied stresses. The fatigue model is calibrated by pavement performance data obtained from the AASHO Road Test. Equivalent fatigue damage is computed on a linear damage scale for different axle weights. Available from:

Tag	Abstract
Fisher62	Title: BEHAVIOR OF AASHO ROAD TEST BRIDGE STRUCTURES UNDER REPEATED OVERSTRESS Author(s): Fisher, JW: Viest, IM Journal Title: Highway Research Board Special Reports Publication Date: 00/00/1962 Report No: Publisher/Corporate Author(s): Abstract: eighteen slab and beam bridges were subjected to road traffic at the aasho road test. Each test bridge was assigned only one type of truck. Eight bridges had single-axle and 10 bridges had tandem-axle vehicles operating over them. To determine the combined cumulative effects of time and traffic, a number of measurements and observations were made on bridges with no load other than their weight. Strain measurements, deflection measurements, determination of the degree of cracking of concrete beams, measurements of longitudinal and transverse slab profiles and condition surveys were used. Additional measurements on unloaded structures included the strains caused by slab weight and those caused by variations in temperature. The bridge beams were instrumented for measures of transient strains and deflections caused by vehicles. The transient deflections were measured at mid-span of all bridges. The strains were measured at the rolled sections off the ends of cover plates, at mid-span and at other locations. The accumulation of vehicle trips with time are shown on a graph. Environmental conditions at the test road were observed at a centrally located weather station. Fatigue strength of the steel bridges with partial-length cover plates was found to be in agreement with laboratory tests. Major yielding was found to occur with the first few hundred vehicle passages. The maximum stresses in pre-stressed beams occured in mid-span. None of the prestressed concrete bridges failed during the period of regular test traffic or the acceleration fatigue tests. Three of the prestressed bridges were subjected to 1.5 million cycles of stress without any indication of fatigue failure of the prestressing wire or strand. The applied load cycle shown had no appreciable effect on the cracking of the concrete. Major cracking found in the prestressed beams was because applied stresses exceeded the tensile strength of the concrete. The maximum stresses occurred near mid-span in the reinforced concrete beams. The investigation of reinforced concrete bridges was concerned mainly with the fatigue behavior of the deformed bars and the effect of repeated stressing on the width and spacing of tensile cracks. The fatigue behavior of the deformed bars shows that the bar deformations influenced the fatigue strength as if fatigue fractures formed at the deformations. All 4 reinforced bridges survived the period of regular test traffic during which over 556, 000 trips of the test vehicle were made over each bridge. No satisfactory correlation was found between the stress cycles at which cracks were first noticed in the concrete of individual prestressed beams and available laboratory data for the fatigue strength of plain and concrete beams. Index Terms: Aasho Road Test, Beam, Bridge Beam Construction, Concrete Beams, Condition Survey, Deflection Tests, Fatigue Tests, Highway Bridges, Loading Tests, Moving Vehicles, Prestressed Beams, Prestressed Concrete, Reinforced Concrete Bridges, Slab, Steel Bridges, Strain Measurement, Tandem Axle Load, Tensile Strength, Transient Stress Available from:

Tag	Abstract
Frank83	ID: 00387383 Title: ESTIMATION OF THE FATIGUE LIFE OF A TEST BRIDGE FROM TRAFFIC DATA Author(s): Frank, KH: Hoadley, PW: Yura, JA Publication Date: 05/00/1983 Pagination: 140p Report No: Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Texas State Department of Highways & Public Transp Transportation Planning Division, P.O. Box 5051 78763 Texas University, Austin Center for Transportation Research TX 78712 USA Abstract: Fatigue studies were conducted on a twin-girder, multilaned highway bridge. Two types of stress histories were measured at several locations on the bridge. One type of stress history was measured during the passage of a test truck of known weight. Stress histories were measured for velocities of the test truck of 5, 35, and 50 m.p.h. The second type of stress history was measured under normal traffic conditions. An effective stress range, S sub RE, and number of cycles were computed from each measured stress history using the Rainflow Cycle Counting method in conjunction with Miner's linear damage rule. Other cycle counting methods are considered and compared with the Rainflow Cycle Counting method. The values of S sub RE and number of cycles are used to compute fatigue-life estimates for the bridge. The fatigue-life estimates were computed as a function of the amount of fatigue damage occurring per hour and per day, and future increases in traffic and axle loads were considered. The longitudinal-transverse stiffener intersection, LTSI, detail was found to control the fatigue life of the bridge. The estimated fatigue life for this detail was 50 to 85 years. A modified LTSI detail increased the fatigue life by a factor of three. (FHWA) Index Terms: Axle Load, Damage, Fatigue Life, Girder Bridges, Loading History, Longitudinal-Transverse Stiffener Intersection, Stresses, Traffic, Trucks Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Fu90	ID: 00611096 Title: A RELIABILITY ANALYSIS OF PERMIT LOADS ON BRIDGES. FINAL REPORT Author(s): Fu, GK: Liu, YW: Moses, F Publication Date: 09/01/1990 Pagination: 120p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 16 Ref. APPS: 1 App. Publisher/Corporate Author(s): Case Western Reserve University Department of Civil Engineering OH 44106 USA Federal Highway Administration 400 7th Street, SW 20590 Ohio Department of Transportation 25 South Front Street, P.O. Box 899 43216-0899 Abstract: Most states, including Ohio, have recently seen increasing numbers of overweight permit trucks and requests for even heavier and more frequent overloads. A major concern is the effect of such loads on the safety and remaining life of highway bridges. The study used a statistical data base for bridge loadings and simulated the effects of permit overloads. The simulation included distributions of truck weights, volumes, multiple lane occupancy and vehicle spacings. The output was a distribution (mean and coefficient of variation) of maximum load effect for a specified time duration ranging from a single vehicle crossing to a two-year inspection interval. A reliability model of bridge safety consistent with recent AASHTO code developments was broadened to cover permit loadings. Three categories of permit trucks were considered including a) routine frequent permits, b) special-single passage permits and c) escorted vehicles. For each permit category, load factors were derived to produce target reliability levels. Examples are included. The recommendations for reviewing permit loads were implemented in a specification format. These provisions are being incorporated in the proposed new AASHTO Maintenance Inspection Manual now under review. In addition, to facilitate permit issuance "bridge formulas" were derived which relate the permit vehicles subgroup weight and wheel base to the bridge rating factor preset as a percentage of the Ohio legal load. Also, formulas were derived to convert all bridges to an equivalent HS level. To assist in developing a permit fee structure, the study reviewed fatigue damage models. Several results are given based on a cost per bridge or a cost per route mile to assess different weight permits. Index Terms: Bridge Inspection, Damage, Fatigue (Materials), Fees, Highway Bridges, Overweight Loads, Permits, Recommendations, Safety, Specification, Statistical Analysis, Truck Effects (Bridges), Truck Load Limits Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Gagarine92	ID: 00627303 Title: ADVANCES IN WEIGH-IN-MOTION USING PATTERN RECOGNITION AND PREDICTION OF FATIGUE LIFE OF HIGHWAY BRIDGES: VOLUME II. DATA REPORT Author(s): Gagarine, N Language: English Publication Date: 10/00/1992 Pagination: 475p Period Covered: 8906-9109 Report No: Publisher/Corporate Author(s): Contract DTFH61-89-P-40005 TRIS20 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 Maryland University, College Park Department of Civil Engineering MD 20742 USA Abstract: The two main objectives of the present study were to: (1) demonstrate the advantages of using the Weigh-in-Motion and Response (WIM+R) system to evaluate the fatigue life of existing bridges and (2) introduce pattern recognition methods in the analysis of WIM+R data. Four steel girder bridges were instrumented to obtain strain data at fatigue critical details, and at sections of maximum strain to compute the gross vehicle weight (GVW) of each truck. Two were simple spans, and two continuous spans. A comparative study of three of the four alternatives suggested by AASHTO showed that the fatigue life computed with direct measurements of the stress ranges were greater than those computed with the simplified approaches. The effect of secondary cucles was negligible for the four bridges. The damage equivalent secondary cycle factor for fatigue was defined. The applicability of three pattern recognition methods for WIM+R was investigated. The dynamic time warping, hidden Markov model, and feed forward neural network methods can classify trucks with the measured strain patterns alone. This new approach in the analysis of the data would remove the need to lay tapeswitches on the pavement, facilitating the field operations during a bridge test. An improved WIM+R system could be used to survey the truck traffic while monitoring fatigue critical details. This volume is the second in a series of two. The other volume is: Volume I, FHWA-RD-92-046, Final Report. Index Terms: Bridge Tests,Continuous Spans,Data Analysis,Fatigue Life,Girder Bridges,Gross Vehicle Wieght,Highway Bridges,Pattern Recognition,Predictions,Simple Span,Steel Girders,Strains,Structural Response,Weigh-In-Motion And Response Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: FEDERAL HIGHWAY ADMINISTRATION

Tag	Abstract
Galambos71	Title: LOADING HISTORY OF HIGHWAY BRIDGES: COMPARISON OF STRESS- RANGE HISTOGRAMS Author(s): Galambos, CF: Heins, CP Journal Title: Highway Research Record, Hwy Res Board Publication Date: 00/00/1971 Report No: Publisher/Corporate Author(s): Abstract: the results of a loading history field test on a rural highway bridge in maryland are presented. Two ways of data reduction are compared: one technique notes only one stress event per truck passage, while the other techniques produces several events for each vehicle. The composition and weight of the truck traffic are presented, along with a number of occurrences of multiple crossing. Several methods of estimating the fatigue life of the bridge are also attempted. Some conclusions are that significant differences in the shape of stress-range histograms can result, depending on the inclusion or exclusion of the several secondary stress ranges, but that for stress ranges above 3.0 ksi no significant differences in the histograms are found. Higher average stress ranges were produced by multiple crossings than by single crossings. It was also concluded that the main load-carrying members of this bridge are not likely to suffer from traffic-induced fatigue distress. /author/ Index Terms: Bridge, Data Reduction, Distress, Fatigue Life, Field Tests, Histograms, Loading Period, Rural Highways, Truck Effects (Bridges), Types, Weight Available from:

Tag	**Abstract**
Galambos72	ID: 00209705 Title: LOADING HISTORY STUDY OF TWO HIGHWAY BRIDGES IN VIRGINIA Author(s): Galambos, CF: Kinnier, HL: Maddox, CE: Mckeel, WT Journal Title: Highway Research Record, Hwy Res Board Issue: 382 Publication Date: 00/00/1972 Pagination: pp 27-37 Report No: Features: FIGS: 6 Fig TABS: 6 Tab REFS: 6 Ref Publisher/Corporate Author(s): Abstract: an evaluation was made of the stress ranges in 2 typical highway bridge spans, a 76-ft steel beam composite span and a 60-ft prestressed concrete beam span, under service loadings. The strains at selected points on the superstructure elements of the spans were recorded continuously for periods of 4 and 5 days under normal traffic conditions by an automatic computer controlled data acquisition system and converted to stress on the basis of assumed moduli of elasticity. The weights, axle spacings, and lateral positions of trucks crossing the instrumented spans during the test periods were also recorded. The magnitudes of all stress ranges measured in the 2 simply supported test spans were low, and it was concluded that both structures were safe from fatigue distress under current load limitations. Stress ranges of a magnitude comparable to that in the main supporting elements were recorded in the midspan diaphragm of the steel beam span, and higher stress ranges were recorded in the deck reinforcement. /author/ Index Terms: Concrete Bridges, Instrumentation, Loading History, Loading Intensity, Loading Rate, Steel Bridges, Strain Measurement, Truck Effects (Bridges), Weight Measurement Available from:

Tag	Abstract
Galambos72a	ID: 00209708 Title: CLOSING REMARKS AT SYMPOSIUM ON BRIDGES: LOADING HISTORY, ULTIMATE STRENGTHS, AND PERFORMANCE Author(s): Galambos, CF Journal Title: Highway Research Record, Hwy Res Board Issue: 382 Publication Date: 00/00/1972 Pagination: p 64 Report No: Publisher/Corporate Author(s): Abstract: the one recurring theme from all of the papers presented at the symposium was that measured stresses were small and well below the live-load design stresses, and that therefore, there is no need to be concerned about fatigue problems in highway bridges. But while there have been few reported cases of traffic-induced fatigue problems, the recent discovery of several cracked beams on a relatively young bridge (12 years of service) on the connecticut turnpike has raised the question of how relevant such bridge-loading history tests are to the very high-volume, heavy-truck arteries in the congested urban areas of the country. It is urged, therefore, that extensive loading history tests be made on the bridges in these high-traffic urban areas and that the owners of the bridges make especially close inspections of those details likely to suffer fatigue damage. Since there may well be more fatigue damage than has been heretofore recognized, it is urged that there be established a more open line of communication between bridge maintenance engineers and the bridge design and research community. Index Terms: Bridge Failures, Fatigue Failure, Loading History, Loading Intensity, Loading Rate, Truck Effects (Bridges), Urban Areas Available from:

Tag	Abstract
Garson73	ID: 00208096 Title: PROBABILITY THEORY FOR HIGHWAY BRIDGE FATIGUE STRESSES Author(s): Garson, RC: Moses, F Publication Date: 07/00/1973 Pagination: 260 pp Report No: Publisher/Corporate Author(s): Case Western Reserve University /Div of Solid Mech, Stru & Mech Des USA Abstract: the recent concern for fatigue of highway bridge girders is due to heavier and more numerous trucks, lighter and more flexible bridges, high strength alloys, welded and continuous span sections, and reports of fatigue cracks. On the other hand, measurements of existing bridges usually show low stress levels under random traffic and thus there must presently be inconsistant safety levels against fatigue levels. This report describes an analytical project to calculate histograms of highway bridge loadings which can be used to predict fatigue and to properly size girder. Sections. A probabilistic load model is developed using truck volume and weight histogram, headway spacing distributions between trucks, impact factors and distribution analysis. A reliability of risk approach to choosing safety factors is also described. The computer data for truck loading and fatigue design comes from a literature study reported in appendices on fatigue, truck and traffic characteristics and dynamic bridge behavior. The calculated load histograms show good agreement with reported measurements. The methods are illustrated with single span bridges of different length, weld category, and truck records of different states, parallel and opposing flow bridges and three span continuous bridges. /fhwa/ Index Terms: Alloy, Bridge Design, Bridge Dynamics, Bridge Engineering, Bridge Spans, Computer Applications, Continuous Spans, Fatigue Failure, Girder Bridges, Highway Bridges, Histograms, Loading, Probability Theory, Safety Factor, Truck Effects (Bridges) Available from: Acknowledgement of Document Source: Ohio Department of Transportation Federal Highway Administration

Tag	Abstract
Garson74	ID: 00265552 Title: NEW PROCEDURE FOR FATIGUE DESIGN OF HIGHWAY BRIDGE GIRDERS Author(s): Garson, R: Moses, F Journal Title: Transportation Research Record Issue: 507 Publication Date: 00/00/1974 Pagination: pp 58-67 Report No: Features: FIGS: 1 Fig. TABS: 2 Tab. REFS: 6 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The wide variety of heavy truck traffic and bridge girder weld conditions combined with reported low measured stress levels under random traffic suggests there must currently be inconsistent safety margins against bridge fatigue. This paper discusses a probabilistic load model that forecasts histograms of highway bridge loading and that can be used to predict fatigue life and to properly size girder sections. A reliability of risk approach to choosing safety factors on material and load is also described. The simplified design procedure based on the truck loading model permits cross sections to be designed or checked against fatigue by a simple formula that also includes as parameters truck volume, span length, weld category, and location. Index Terms: Bridge Design, Fatigue Life, Girder, Highway Bridges, Histograms, Loading, Model, Prediction, Safety, Truck Effects (Bridges) Available from: Transportation Research Board 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Ghosn85	ID: 00454398 Title: A COMPREHENSIVE STUDY OF BRIDGE LOADS AND RELIABILITY - FINAL REPORT Author(s): Ghosn, M: Moses, F Publication Date: 01/00/1985 Pagination: 189p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 55 Ref. Publisher/Corporate Author(s): Case Western Reserve University Department of Civil Engineering OH 44106 USA Federal Highway Administration 400 7th Street, SW 20590 Ohio Department of Transportation P.O. Box 899 43216 Abstract: The provision of safe bridge structures is an activity that occupies many engineers and design agencies. The loading features in current AASHTO provisions for short and medium sppan bridges were based on truck data recorded almost a half century ago. Recent development of discrete and unbiased weigh-in-motion systems have provided an opportunity to revise the specifications to use current data base including truck weights, configurations and headway, girder distribution and impact values. This data is incorporated in the present study with a reliability analysis. This provides uniform and consistent reliabilities over a variety of bridge spans and configurations. The reliability model incorporates prediction of extreme loads and the uncertainties in loading variables, strength and failure consequences. Maximum load spectra are compared with simulation, theoretical and approximate modelling. Two extensive examples are illustrated including fatigue design of steel attachments and static strength design. Recommended design provisions are given for each example. In each application, design loading vehicles are derived with measured characteristics to provide uniform reliability over a complete range of application. This includes simple and continuous spans. Allowable stresses are adjusted to provide consistent component reliabilities. Load factors are introduced to incorporate truck weight intensities and volume. Numerous examples and sensitivity studies are discussed on the impact of the data base on the recommended design provisions. Further discussion is made on extending the loading model to evaluation and rating of existing bridges and decisions regarding posting, permit vehicle and legal load changes. Index Terms: Allowable Stress, Bridge Design, Design Load, Girder, Headway, Model, Prediction, Reliability, Sensitivity Analysis, Span Bridges, Specification, Traffic Loads, Truck Weights Available from: Case Western Reserve University Department of Civil Engineering Cleveland OH 44106 USA

Tag	Abstract
Ghosn91	ID: 00611725 Title: RELIABILITY AND LOAD MODELING FOR BRIDGE MANAGEMENT Author(s): Ghosn, M: Moses, F Journal Title: Transportation Research Record Issue: 1290 Publication Date: 00/00/1991 Pagination: pp 176-184 Report No: ISBN: 0-309-05067-7 Features: FIGS: 4 Fig. TABS: 4 Tab. REFS: 19 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Managing the nation's bridge infrastructure requires major decisions on design and construction of new bridges, replacement, strengthening or posting of deficient bridges, issuing permits for truck overloads, and the implementation of truck weight regulations. These decisions have to be made after a careful review of the safety of the affected bridges. This paper illustrates how structural reliability theory can be used to provide tools for bridge management decisions. Using a reliability index as safety criteria, this paper describes reliability-based methods for the development of: a) Criteria for selection of load and resistance factors for a new LRFD bridge design code; b) Flexible load capacity evaluation or rating techniques for existing bridges; c) Fatigue evaluation procedures for steel bridges; and d) New bridge formulas for establishing truck weight regulations. Index Terms: Bridge Capacity, Bridge Design, Bridge Management Systems, Decision Making, Design Criteria, Fatigue (Materials), Formulas, Highway Bridges, Loads, Mathematical Models, Safety, Steel Bridges, Structural Reliability, Weight Limits Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Ghosn95	ID: 00680890 Title: BRIDGE OVERSTRESS CRITERIA. FINAL REPORT Author(s): Ghosn, M: Moses, F: Runco, G: Schilling, CG Language: English Publication Date: 05/00/1995 Pagination: 213p Period Covered: 8810-9209 Report No: Features: FIGS: 18 Fig. TABS: 70 Tab. REFS: 88 Ref. Publisher/Corporate Author(s): City College of the City University of New York Department of Civil Engineering NY 10031- USA Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 Abstract: This report presents a reliability-based procedure to determine the optimal allowable loads on highway bridges considering both static and dynamic effects. A truck weight (bridge) formula was developed to provide acceptable levels of safety for bridges designed according to the 15th edition of the AASHTO specifications. Using the safety index as a measure of safety, the truck weight formula was developed to produce a safety index value of 2.5. Twelve bridges of different material types, span lengths and configurations were analyzed for truck loads corresponding to the proposed truck weight formula. The results of the rating evaluation of these bridges showed large variations between the rating values for LFD and WSD procedures and inventory or operating stresses. Application of the higher truck weight limits to a large sample of bridges from the National Bridge Inventory indicated an increase in the number of deficient bridges if the inventory rating stress is used in the evaluation procedure. However, very few of the existing bridges would be considered deficient if the operating ratings are used. A fatigue analysis determined the relative fatigue damage caused by various new truck types and traffic scenarios that might result from changes in truck regulations. The fatigue calculations for actual bridges suggest that many existing bridges would not be affected by the possible truck regulation changes. Even for bridges with fatigue stresses above the fatigue limit, the reduced fatigue lives with the new regulations may still be sufficient for practical requirements. Index Terms: Fatigue Analysis, Fatigue Life, Fatigue Limit, Fatigue Stress, Highway Bridges, Loads, Ratings, Size And Weight Laws, Truck Effects (Bridges), Truck Laws & Regulations, Truck Weight Formula Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Goodpasture76	ID: 00151239 Title: STRESS HISTORY OF HIGHWAY BRIDGES - II Author(s): Goodpasture, DW Publication Date: 06/30/1976 Pagination: 75 pp Period Covered: 730000-76 Report No: Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Tennessee Department of Transportation Office of Research and Planning 37219 Tennessee University, Knoxville Department of Civil Engineering TN 37916 USA Abstract: A stress and loading history study of two bridge sites, Knoxville and Harriman, was conducted by the University of Tennessee over a three year period. A data collection system developed on an earlier investigation, was used to obtain the stress history data. Problems in data acquisition precluded data collection at the Harriman bridge site, therefore all results are for the Knoxville bridges. Load history data was obtained at a weigh station approximately ten miles from the Knoxville bridge site. The Knoxville bridges were selected on the basis of high truck traffic volumes present. The data obtained was used in a proposed design procedure based on fatigue of the main bridge girders. The lives of the bridges were predicted using Miner's hypothesis, the root-mean-square method and the root-mean-cube method. Each method verified that fatigue was not a problem at the Knoxville bridge site even if traffic volumes or weights are increased within certain limits. The correlation of truck weight to summation of girder stresses appears to be high. Controlled load tests were performed and these results are reported in detail. Index Terms: *Fatigue Materials, *Highway Bridges, Bridge Design, Data Acquisition, Fatigue (Materials), Fatigue Life, Girder, Highway Bridges, Loading History, Loading Tests, Loads Forces, Roots /Mathematical/, Stress Analysis, Stress Concentration, Stresses, Tennessee, Truck Effects (Bridges), Truck Weights, Vehicular Traffic Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Guralnick98	ID: 00753270 Title: BRIDGE FATIGUE LIFE ESTIMATION FROM FIELD DATA Author(s): Guralnick, SA:Mohammadi, J:Polepeddi, R Language: English Journal Title: Practice Periodical on Structural Design and Construction Volume: 3 Issue: 3 Publication Date: 08/00/1998 Pagination: pp 128-133 Report No: Features: FIGS: 9 Fig. TABS: 2 Tab. REFS: 7 Ref. APPS: 1 App. Publisher/Corporate Author(s): American Society of Civil Engineers 345 East 47th Street NY 10017-2398 USA Abstract: This paper presents the application of field data to condition assessment and prediction of service life of highway bridges. The study examined 15 bridges located in Illinois for damage evaluation purposes. The example bridges were all composed of steel girders with reinforced concrete deck slabs. Only the superstructure was investigated for potential fatigue damage to the critical structural details of the main steel girders. The current condition of each bridge was assessed based on fatigue damaged induced in the critical components of the bridge and the bridge fatigue life. The critical components investigated were steel girders with welded cover plates. The field stress range data compiled for each bridge was used along with a probabilistic method to estimate fatigue life. The results were then used to investigate the significance of truck weight increase and traffic growth on fatigue life. Index Terms: Bridge Decks,Bridge Superstructures,Condition Monitoring,Cover Plates,Damage Assessment,Estimation,Fatigue Life,Field Data,Girders,Highway Bridges,Illinois,Prediction Analysis Techniques,Reinforced Concrete Bridges,Service Life,Traffic Density,Truck Weights,Welded Plates Available from: American Society of Civil Engineers 345 East 47th Street New York NY 10017-2398 USA

Tag	Abstract
Hahin92	ID: 00629103 Title: ACCURATE AND RAPID DETERMINATION OF FATIGUE DAMAGE IN BRIDGE SUPERSTRUCTURES. SPECIAL REPORT Author(s): Hahin, C: South, JM Language: English Publication Date: 12/00/1992 Pagination: 96p Period Covered: 9105-9212 Report No: Features: FIGS: 41 Fig. TABS: 10 Tab. REFS: 21 Ref. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW DC 20590 Illinois Department of Transportation Bureau of Materials & Physical Research, 126 East Ash IL 62706 USA Abstract: Fifteen representative steel bridges throughout the State of Illinois were instrumented with foil strain gages to determine their frequencies of loading and the magnitudes of stresses induced by traffic over a 3 to 8-hour period, depending on traffic volume. Reinforced prestressed or post-tensioned concrete bridges were not included in this study. Fatigue prone details, such as cover plated wide flanges, were instrumented. For each stress range increment gathered by the data acquisition system, the cumulative damage sustained over an extended number of years was compared with the number of available fatigue cycles for that stress range using published S-N data for various details and the Palmgren Miner linear damage rule. A new equation for factor of safety for structural details subject to fatigue is described, taking dead load, live load, and bridge detail fatigue strengths into account. A new histogram-linear damage method of assessing future fatigue damage in bridges which takes traffic growth and increased truck weights into account is also described. Other non-welded designs to main load carrying members were examined for susceptibility to fatigue effects, including riveted beams, weathering steels, reinforced concrete in air (without severe cracking), and post-tensioned beams through a review and discussion of the literature. The actual effect of an increase in gross vehicle weight on the measured maximum stress range response of a particular bridge was measured. The histogram-linear damage method favorably compared with the root mean cube-linear damage method and to the fatigue damage procedures given in NCHRP 299. Index Terms: Bridge Superstructures, Cumulative Damage, Fatigue Failure, Gross Vehicle Weight, Steel Bridges, Stresses, Traffic Loads, Truck Weights Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Heavy88a	ID: 00478063 Title: HEAVY TRUCKS, CLIMATE AND PAVEMENT DAMAGE Publication Date: 00/00/1988 Pagination: 176p Report No: ISBN: 92-64-13150-7 Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 5 App. Publisher/Corporate Author(s): Abstract: The objective of this study was to prepare a report which describes the effect of recent technical developments of heavy vehicle configurations on road pavement performance and to assess the separate and combined effects of loading and climate as causes of pavement distress. The Report's Introduction presents the various heavy freight vehicle factors and climatic parameters to be taken into account, defines the major pavement categories -- flexible, semi-rigid and rigid -- and reviews the predominant types of surface and structural distress which may occur under the action of both traffic and climate. Chapter II describes recent empirical research on the effects of loads on pavement fatigue life and results of theoretical and experimental studies on the mechanical properties of road materials and on needed pavement thicknesses. A short subsection deals with dynamic loads. Chapter III discusses the climatic factors influencing pavement behaviour and their role in pavement deterioration -- frost/thaw damage, rutting, thermal cracking, etc. Chapter IV presents the economic and policy issues associated with heavy loads and gives three typical technico-economic assessments illustrating this problem under extreme climatic conditions. Chapter V discusses research philosophy, key areas of research and proposes directions for future research to limit the economic consequences of the combined action of heavy vehicle traffic and climate on road pavements. Five annexes provide technical information on truck characteristics, surface distress types, the load equivalence law, models for predicting temperature distributions in pavements and pavement distress models. As a whole this report constitutes an up-to-date compendium of recent research and practical expertise on loading and climatic effects providing a reference basis for future national and/or international highway and freight transport policies. Available from:

Tag	Abstract
Heins68	ID: 00209006 Title: INDUCED BRIDGE LOADS AND MOMENTS DURING A TEN YEAR PERIOD: STUDY OF EFFECT OF NEW VEHICLE WEIGHT LAW ON STRUCTURES Author(s): Heins, CP: Looney, CT: Werner, JD Publication Date: 06/00/1968 Report No: Publisher/Corporate Author(s): Maryland University /Civil Eng Dept USA Abstract: study was conducted to determine the present and future effects of the increase in the legal vehicle weight limits on the existing bridge structures throughout the state of maryland. Statistical study involved the determination of the yearly traffic picture and the maximum moments induced on bridges of various span lengths by this traffic. From the moments and traffic volumes, the stress histories and consequently the fatigue damage to these bridges can be obtained. A method is presented for estimating the cumulative fatigue damage on highway structures due to the random loading of heavy truck traffic. This method is subdivided into three separate operations: (1) expansion of the 24-hour truck loadometer data to yearly values, (2) determination of the magnitude and frequency of occurrence of the maximum bending moments induced by the yearly heavy truck traffic, and (3) transformation of the range of moments into a range of stresses by utilizing the conventional flexural stress-moment relationship and the section properties of a typical section of the structure under investigation. The first operation can be accomplished by two different procedures: (1) utilizing expansion factors developed at a state-wide level, (2) developing factors which account for variations in traffic conditions throughout the state. The procedure to be used is determined by the amount of data to be expanded and the availability of facilities to handle it. From the distributions obtained in the second operation the range of moments are found included within plus and minus two standard deviations from the mean, and the number of trucks which cause moments within this range. After obtaining the third operation data, the fatigue left of the structure under this range of stresses is then determined from modified goodman diagrams for the critical fatigue condition which is present in the structure. The cumulative fatigue damage of the structure is obtained by calculating the cycle ratios and applying miner's cumulative damage hypothesis. This method of estimating cumulative fatigue damage was applied to eight highway bridges of various types and in various locations in maryland. Results of the analysis indicated that the cumulative fatigue damage caused by heavy truck traffic during the ten year period was of such a small percentage of the estimated fatigue life that there is no fear of fatigue failure for a sustained period of time. It appears that the weight law shows no visible influence on these specific structures. Index Terms: Average Daily Traffic, Bending Moments, Bridge Spans, Fatigue, Fatigue Life, Highway Bridges, Loading, Loadometer, Mathematical Analysis, Statistical Methods, Stresses, Traffic Volume, Truck Effects (Bridges), Vehicle, Weight Limits Available from:

Tag	Abstract
Heins68a	ID: 00207900 Title: INDUCED BRIDGE LOADS AND MOMENTS DURING A TEN YEAR PERIOD Author(s): Heins, CP: Looney, CT: Werner, JD Publication Date: 06/00/1968 Report No: Publisher/Corporate Author(s): Bureau of Public Roads /US/ Maryland State Roads Commission Maryland University USA Abstract: a method is presented of estimating the cumulative fatigue damage on highway structures due to the random loading of heavy truck traffic. The method is a three-part procedure: first, 24-hour truck loadometer data is expanded to yearly values. Second, the frequency and magnitude of maximum bending moments are determined for specific span lengths. Third, the moments are transformed into a range of stresses, using conventional stress-moment relationships and the sectional properties of a typical structure under investigation. The fatigue life of the structure is determined from modified goodman diagrams for the critical fatigue condition. The cumulative fatigue damage is obtained by calculating the cycle ratios and applying miner's cumulative damage hypothesis. The method was applied to eight highway bridges of various types and various locations throughout the state of maryland. Results indicated that the cumulative fatigue damage caused by the heavy truck traffic during the ten-year period from 1955-1964 was of such a small percentage of the estimated fatigue life, that there is no fear of fatigue failure for a long time to come. /bpr/ Index Terms: Bending Moments, Bridge Spans, Cumulative Distributions, Damage, Fatigue, Fatigue Life, Highway Bridges, Loading, Loadometer, Stresses, Trucks Available from: Acknowledgement of Document Source: Bureau of Public Roads /US/

Tag	Abstract
Heins74	ID: 00137347 Title: DESIGN PROCEDURE FOR FATIGUE DUE TO DAILY TRAFFIC Author(s): Heins, CP: Yamada, K Publication Date: 03/00/1974 Pagination: 62 pp Period Covered: 6906-7406 Report No: Publisher/Corporate Author(s): Federal Highway Administration Maryland Division 21022 Maryland Department of Transportation 2323 West Joppa Road Maryland University, College Park Department of Civil Engineering MD 20742 USA Abstract: This report in part presents a design procedure by which the fatigue response of butt and fillet welded and plane beams may be checked for fatigue. The loading is obtained from typical trucks (five classes) as observed on actual bridges. The amount of damage in one year is calculated, and an average life is then determined. The second part of this report presents the results of fatigue tests which have been performed on butt and fillet welded elements due to block loading. These results indicate the reliability of using Miner's Theory or RMS Theory. Index Terms: *Butt Welds, *Fillet Welds, *Girder Bridges, *Welded Joints, Bridge Design, Butt Welds, Design Criteria, Fatigue (Materials), Fatigue Life, Fillets, Loads Forces, Maryland, Stresses, Traffic Loads Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Hogan94	ID: 00738949 Title: SUMMARY OF STRESS EVALUATIONS OF WELDED STEEL BRIDGES ON COAL-HAUL ROUTES Author(s): Hogan, KJ:Hopwood, T, II:Oberst, CM Language: English Publication Date: 05/00/1994 Pagination: 57p Report No: Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Kentucky Transportation Cabinet State Office Building, Clinton and High Streets 40622 Kentucky University Kentucky Transportation Center, College of Engineering KY 40506-0281 USA Abstract: Stress analyses were performed on continuous girder welded steel bridges on extended-weight coal-haul routes. The tests were intended to determine whether extended-weight coal trucks pose fatigue problems to those bridges. Measurements were performed by strain gaging selected bridges subject to high coal transport tonnages with strain gages. Strains induced by routine traffic including coal trucks were monitored for periods of one to two weeks. Unattended monitoring of the variable amplitude strain data was performed using rainflow counting. Eighteen successful tests were performed on 15 coal-haul route bridges and one interstate bridge. The derived strain data are provided as stress histograms. Fatigue analyses were performed by expressing the stress histogram data as single-value equivalent stresses. The accumulated number of stress cycles was estimated using 3 different assumptions based upon variations in traffic. Accumulated stress cycles were determined over the current age of each weld detail and a projected service life of 75 years. Susceptibility to fatigue was determined by superimposing the equivalent resolved stresses and total number of cycles as accumulated damage on AASHTO fatigue design curves for the applicable structural details. The fatigue analyses indicate that none of the test bridges with fatigue-prone weld details is susceptible to fatigue cracking either at their current age or over their projected 75-year service lives. While coal trucks may induce high live stresses on those bridges, the number of those stress applications was not sufficient to pose fatigue problems. The equivalent resolved stresses measured on the interstate bridge were similar in magnitude to those measured on coal-haul routes. However, the number of stress cycles was greater for the interstate bridge than most of the coal-haul route bridges. Index Terms: Coal Trucks,Fatigue Analysis,Haul Roads,Overweight Loads,Strain Gages,Stress Analysis,Stress Cycles,Tensile Stress,Welded Steel Bridges Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: KENTUCKY TRANSPORTATION CENTER, KENTUCKY UNIVERSITY

Tag	Abstract
Hopwood88	ID: 00738913 Title: FATIGUE ANALYSIS OF THE I 75 BRIDGE OVER THE KENTUCKY RIVER AT CLAYS FERRY Author(s): Hopwood, T: Oka, VG Language: English Publication Date: 10/00/1988 Pagination: 37p Period Covered: 8806-8810 Report No: Publisher/Corporate Author(s): Kentucky University Kentucky Transportation Center, College of Engineering KY 40506-0043 USA Law Engineering 11125 Decimal Drive 40299- Abstract: Fatigue analysis was performed on AASHTO category E welded connections on the southbound I 75 bridge over the Kentucky River at Clays Ferry, Kentucky. That analysis was based on the stress-range histogram data provided by Law Engineering of Louisville, Kentucky. The data were obtained from strain gages installed at 6 test locations on the downstream truss. The fatigue analyses consisted of safe-life and fatigue-crack growth analyses. Safe-life predictions were based on AASHTO fatigue design (SN) curves. To use those curves, equivalent constant-amplitude stresses were derived from the stress histograms. Those stresses and loading frequencies were modified to reflect anticipated increases in traffic volume and loading over the life of the structure by appropriate multiplicative adjustment factors. Four different methods of load prediction were used with combinations of the stress summing methods, total traffic, and truck traffic. In the majority of cases, the safe-life estimates exceeded 50 years. One overly conservative load-prediction method provided safe-life estimates as low as 15 years. Index Terms: FATIGUE ANALYSIS, HISTOGRAMS, PREDICTIONS, SERVICE LIFE, STRESSES, TRUSS BRIDGES Available from: Kentucky University Kentucky Transportation Center, College of Enginee Lexington KY 40506-0043 USA Acknowledgement of Document Source: KENTUCKY TRANSPORTATION CENTER, KENTUCKY UNIVERSITY

Tag	Abstract
How84	ID: 00769547 Title: HOW VEHICLE LOADS AFFECT PAVEMENT PERFORMANCE Language: English Journal Title: Wisconsin Transportation Bulletin Publication Date: 00/00/1984 Pagination: 4p Report No: Features: FIGS: 5 Fig. Publisher/Corporate Author(s): Abstract: Why keep roads in good condition? The economy of any area depends on shipping and receiving products and materials; trucks are the most common form of transport. The condition of area roads directly affects the speed, efficiency, and ultimately the costs of transportation. Considering the huge cost of maintaining and rebuilding roads, local governments have great incentive to protect pavements. Three elements work to cause road deterioration: traffic loads, the environment, and aging. While we have little or no control over the environment and aging, we can control traffic loads. This bulletin describes pavement fatigue and discusses how wheel loads, number of truck axles, number of truck tires, quality of subgrade, pavement thickness and changing seasons contribute to pavement fatigue. Available from:

Tag	Abstract
Hsia87	ID: 00473106 Title: CONSIDERATION OF SEASONAL PAVEMENT DAMAGE FOR TIMBER HAUL ROADS Author(s): Hsia, FT: Richter, HH Journal Title: Transportation Research Record Volume: 1 Issue: 1106 Publication Date: 00/00/1987 Pagination: pp 132-139 Report No: ISBN: 0-309-04454-5 Features: FIGS: 10 Fig. TABS: 2 Tab. REFS: 8 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Timber haul roads are subjected to severe use conditions that make them highly susceptible to seasonal impacts. They are located in areas of extreme terrain and environmental conditions, are constructed with minimal investment in the pavement section, and support extensive traffic from heavily loaded timber trucks. This multiyear study was undertaken to evaluate relative, traffic-induced damage to roads used at different times of the year and to provide rationally based road management alternatives. The field evaluation of the pavement section was performed by using periodic surface deflection measurements that were obtained with a Benkelman Beam, and included pavement temperature measurements at the test locations. The laboratory material characterization included the determination of resilient modulus relationships for cored asphalt concrete samples and for aggregate and subgrade materials. The assessment of laboratory and field data was performed by using computerized mechanistic analysis techniques, in which the pavement structure was considered a linear elastic multilayered system and the layered materials were characterized by their resilient modulus and dynamic strain ratios. The evaluation criterion was the fatigue life of the asphalt concrete as correlated with limiting elastic strains. Relative damage ratios were established for different seasons and were found to be significant and predictable for the roads under study. Index Terms: Asphaltic Concrete, Benkelman Beam, Data Analysis, Fatigue Life, Field Performance, Haul Roads, Laboratory Tests, Low Volume Roads, Modulus Of Resilience, Pavement Deflection, Pavement Management, Seasonal Pavement Damage, Temperature Measurement, Traffic Loads, Truck Pavement Damage, Trucks Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Huang91	ID: 00627229 Title: A COMPUTER SYSTEM FOR BRIDGE RATING AND FATIGUE LIFE ANALYSIS. FINAL REPORT Author(s): Huang, J: Wang, T-L Language: English Publication Date: 12/00/1991 Pagination: 140p Period Covered: 9001-9109 Report No: Features: FIGS: 37 Fig. TABS: 4 Tab. REFS: 14 Ref. APPS: 2 App. Publisher/Corporate Author(s): Contract|HP&R C-3376|Proj No. 0510523 TRIS20 Federal Highway Administration 400 7th Street, SW 20590 Florida Department of Transportation Haydon Burns Building, 605 Suwannee Street 32301 Florida International University Department of Civil and Environmental Engineering, University Park FL 33199- USA Abstract: In order to insure bridge safety for the traveling public and to protect the initial investment, the bridge capacity rating and the prediction of remaining service life of highways were studied in this project. The objectives of this project were (1) the development of a computer package for highway bridge rating based on new AASHTO specifications and (2) the prediction of fatigue life for highway steel bridges by using the stress range and average daily truck traffic. Eight different truck loads and the equivalent lane loading were introduced as vehicle models. Beam/girder, longitudinal concrete deck/slab, and transverse deck/slab bridges in simple or continuous span structures were developed as bridge models. Fatigue life analysis for steel bridges was predicted by using the average daily truck traffic and the design stress range calculated from the static stress-time history. Finally, ten typical examples were studied. In addition, user's manuals for Bridge Rating and Fatigue Life Analysis (BRAF) and BRAF data plotting (BRAF-P) Programs are given in Appendixes. This computer package will be a very powerful tool in evaluating the existing highway bridges. Index Terms: AASHTO, Average Daily Truck Traffic, Bridge Capacity, Case Studies, Computer Systems, Fatigue Life, Highway Bridges, Predictions, Specifications, Steel Bridges, Stress Range, User Manuals Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Itani93	ID: 00637829 Title: EFFECT OF ALTERNATIVE TRUCK CONFIGURATIONS AND WEIGHTS ON THE FATIGUE LIFE OF BRIDGES Author(s): Itani, RY: Khaleel, MA Language: English Journal Title: Transportation Research Record Issue: 1393 Publication Date: 00/00/1993 Pagination: pp 112-118 Report No: ISBN: 0309054664 Features: FIGS: 7 Fig. TABS: 4 Tab. REFS: 9 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The life of a bridge is principally influenced by repetitive loading resulting from vehicular traffic. The service data on the fatigue life of concrete, reinforcing bars, and prestressing steel show considerable scatter in their service life. This is due to both the stochastic nature of the imposed loading and the variability in their strengths as determined by the quality control in their manufacture. The fatigue life of partially prestressed concrete girder bridges, subjected to a spectrum of traffic imposed by the Poisson arrival of various categories is investigated. Each category examined has a different expected frequency of arrivals per unit time and a different distribution of gross weight. The allocation of the live load to the girders in skew and normal bridges is determined using the finite element method. The girders of the bridge are each assumed to be part of a series system consisting of four components: prestressing strands, reinforcing bars, cast-in-place concrete slab, and precast girder. The nine-axle B-train double trucks were found to be most damaging, whereas two-axle single trucks were least damaging. The incremental damage caused by each truck depends on the truck configuration, gross weight, axle-load distribution, and lateral load distribution. The median life of ordinary reinforcing bars is the lowest among the girder components. Index Terms: Axle Loads, Fatigue Life, Gross Vehicle Weight, Lateral Loads, Live Loads, Load Distribution, Partially Prestressed Concrete Girder Bridges, Reinforcing Bars, Service Life, Truck Effects (Bridges), Vehicle Configurations Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Laman92	ID: 00628904 Title: FATIGUE LOAD SPECTRA FOR STEEL GIRDER BRIDGES. RESEARCH REPORT Author(s): Laman, JA: Nowak, AS Language: English Publication Date: 12/00/1992 Pagination: 61p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): University of Michigan Transp Research Institute Great Lakes Center for Truck Transportation Research, 2901 Baxter Road MI 48109-2150 USA Abstract: The project objective is to develop the procedure for evaluation of live load spectra on Michigan bridges. Evaluation procedures are also provided for steel girder bridges subjected to fatigue. The study involves both analytical and experimental efforts. The live load model is developed on the basis of weigh-in-motion (WIM) measurements, truck counts, truck surveys, and statistical analysis. Fatigue analysis focuses on the prediction of live load spectra. Field testing equipment included two data acquisition systems, two portable computers, a van, a power generator, and other hardware. Most of the field equipment was specially purchased for this project. There is very little truck weight data available. Studies performed in other states did not provide reliable results, therefore in this project the major source of actual truck loads is WIM measurements. This progress report summarizes the load measurements performed on two bridges in 1992. The equipment was calibrated using trucks provided by the University of Michigan Transportation Research Institute (UMTRI). Results indicate a relatively large number of heavy trucks, in excess of 200, 000 pounds gross vehicle weight. Dynamic stress/strain data have been collected at two bridges and at one of the bridges the stress spectra were collected simultaneously with the WIM data. This information will be useful in correlating the WIM information with dynamic stress/strain data for fatigue evaluation of highway girder bridges. Fatigue cracks are a common form of deterioration. Structural behavior depends on load frequency and magnitude, therefore fatigue load spectra are determined on the basis of ADTT, WIM measuremnets, and dynamic stress/strain histories. Index Terms: Fatigue Cracks, Fatigue Load Spectra, Field Tests, Live Loads, Measurements, Steel Girder Bridges, Stress Strain Data, Structural Behavior, Truck Weights, Weigh-In-Motion Available from: University of Michigan Transp Research Institute Great Lakes Center for Truck Transportation Resear Ann Arbor MI 48109-2150 USA

Tag	Abstract
Laman94	ID: 00668935 Title: TRUCK LOADS ON SELECTED BRIDGES IN THE DETROIT AREA Author(s): Laman, JA: Nowak, AS Language: English Publication Date: 02/00/1994 Pagination: 41p Report No: Features: FIGS: 33 Fig. TABS: 3 Tab. Publisher/Corporate Author(s): Great Lakes Center for Truck and Transit Research 201 UMTRI Building, 2901 Baxter Road 48109-2150 Michigan Department of Transportation Transportation Building, 425 West Ottawa, P.O. Box 30050 48909 Michigan University, Ann Arbor Department of Civil and Environmental Engineering MI 48109 USA Abstract: Several bridges in the Metropolitan Detroit Area show signs of serious deterioration. In particular, spalling concrete can be observed, which may cause accidents or other traffic problems. In order to correct this situation, a considerable number of bridges must be evaluated to determine actual strength and predict remaining life. This involves the measurement of truck weights and strains in bridge components. The recorded parameters include axle loads, axle spacings, vehicle speed, and vehicle position (right or left lane). The system is not visible to the bridge users, which results in unbiased traffic measurements. The strains are collected and processed using the rainflow algorithm, which is the accepted method for fatigue analysis. The results can be used to determine component-specific load effects, load distribution factors, and fatigue load spectra. The overloaded fatigue-prone components can then be identified and subjected to a more rigorous field inspection. This progress report summarizes measurements completed on two bridges in 1993 and presents the format for a future final report. Bridge weigh-in-motion (BWIM) data are presented for the bridge on Wyoming Road over I-94 in Detroit. Fatigue strain data are presented for the bridge on US-23 southbound over the Saline River in Monroe County. Index Terms: ALGORITHMS, AXLE LOADS, AXLE SPACINGS, BRIDGE INSPECTION, DETROIT (MICHIGAN), FATIGUE ANALYSIS, FATIGUE LOADING, LOAD DISTRIBUTION, SPALLING, STRAIN MEASUREMENTS, STRAINS, TRUCK EFFECTS (BRIDGES), VEHICLE SPEED, WEIGH-IN-MOTION Available from: Great Lakes Center for Truck and Transit Research 201 UMTRI Building, 2901 Baxter Road Ann Arbor MI 48109-2150 USA

Tag	Abstract
Laman94a	ID: 00712490 Title: EFFECT OF TRUCK LOADING ON BRIDGES Author(s): Laman, JA: Nassif, H: Nowak, AS Language: English Publication Date: 12/00/1994 Pagination: 358 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: Apps. Publisher/Corporate Author(s): Great Lakes Center for Truck and Transit Research 201 UMTRI Building, 2901 Baxter Road 48109-2150 Michigan Department of Transportation State Highways Building, 425 West Ottawa, P.O. Box 30050 48909 Michigan University, Ann Arbor Department of Civil and Environmental Engineering MI 48109 USA Abstract: The objective of this project was to develop a procedure for evaluation of live load spectra on Michigan bridges. Truck weights, including axle loads and spacing, were measured to determine the statistical parameters of the actual live load. The deteriorating capacity of corroded steel bridges was evaluated as a function of the rate of corrosion. An evaluation procedure was developed for steel girder bridges with regard to fatigue. The measurements provided data for the analysis and verification of the theoretical model of the dynamic load on bridges. The results indicate that dynamic load (measured with the static load) decreases with increasing truck weight. Dynamic load was also considered as a function of vehicle speed and length. Index Terms: Bridges, Dynamic Loads, Measurements, Statistics, Truck Weights, Trucks Available from: Michigan University, Ann Arbor North Campus Ann Arbor MI 48109 USA

Tag	Abstract
Laman96	ID: 00728767 Title: FATIGUE-LOAD MODELS FOR GIRDER BRIDGES Author(s): Laman, JA: Nowak, AS Language: English Journal Title: JOURNAL OF STRUCTURAL ENGINEERING Volume: 122 Issue: 7 Publication Date: 07/00/1996 Pagination: pp 726-733 Report No: Features: FIGS: 22 Fig. TABS: 3 Tab. REFS: 17 Ref. APPS: 3 App. Publisher/Corporate Author(s): American Society of Civil Engineers 345 East 47th Street NY 10017-2398 USA Abstract: The authors of this technical paper develop a fatigue-live-load model for steel girder bridges. The database for the model is created from weigh-in-motion (WIM) measurements. Five bridge structures were chosen for testing to establish the site-specific truck parameters and component-specific stress spectrum. The database includes 22, 000 truck files, each consisting of gross vehicle weight (GVW), axle weights, and axle spacing. Measurements of the stress cycles were taken at midspan of all bridge girders and are presented as cumulative distribution functions. Through the WIM measurements, the authors confirm that truck loads are strongly site-specific. The findings also reveal a significant variation in stress spectrum between girders. A three-axle truck is proposed to represent truck traffic; for sites with 10- and 11-axle trucks, an additional four-axle truck is proposed. The newly developed model is verified using fatigue-damage analysis to compare the model with measured results. Index Terms: Fatigue Loading, Girder Bridges, Measurements, Models, Parameters, Stress Cycle, Truck Effects (Bridges), Weigh-In-Motion Available from: American Society of Civil Engineers 345 East 47th Street New York NY 10017-2398 USA

Tag	Abstract
Mackie78	ID: 00191398 Title: EFFECTS OF HOURS OF SERVICE REGULARITY OF SCHEDULES, AND CARGO LOADING ON TRUCK AND BUS DRIVER FATIGUE Author(s): Mackie, RR: Miller, JC Publication Date: 10/00/1978 Pagination: 282 p. Period Covered: 750500-7810 Report No: Publisher/Corporate Author(s): Human Factors Research, Incorporated 6780 Cortona Drive CA 93017 USA National Highway Traffic Safety Administration 400 7th Street, SW DC 20590 Abstract: A literature review, a nationwide survey of commercial truck and bus driver work patterns, an analysis of accident data, and three extensive field experiments were conducted to establish evidence concerning driver fatigue as a function of regularity or irregularity of work schedules, duration of on-duty cycles, participation in supplemental cargo loading work, and type of operation (relay versus sleeper). Data are presented concerning the relative amounts of fatigue experienced by truck and bus drivers under these various conditions, as reflected in their subjective ratings, in various measures of physiological status and in the quality of their driving performance. The results are related to accident data in which fatigued, drowsy or inattentive drivers were reportedly involved. Conclusions are drawn regarding current DOT regulations on hours of service. Index Terms: *Fatigue Biology, *Motor Vehicle Operators, *Performance Human, *Stress Physiology, Accident, Bus Drivers, Buses Vehicles, Cargo, Circadian Rhythms, Experimental Data, Fatigue, Freight Handling, Humans, Recommendations, Regulation, Reviews, Safety, Scheduling, Subjective, Surveys (Data Collection), Truck Drivers, Trucks, Working Hours Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Manniche65	ID: 00208161 Title: VEHICLE LOADINGS AND BRIDGE DESIGN Author(s): Manniche, K: Wright, DT Journal Title: Canadian Good Roads Association Proc Publication Date: 09/27/1965 Report No: Publisher/Corporate Author(s): Abstract: this paper provides a critical review of the present state of the art of highway bridge design with particular reference to vehicle loads and bases for design. The authors point of view is that of the design of a transportation system. It is argued that bridge design loadings and licensing regulations should reflect an optimum solution of the joint problem of economics and technical design. It is recognized that ordinary truck combinations are tending to become longer and heavier. Heavy loads, now covered only under special permit, should become part of the design regime. The problem of bases for design is considered with a requirement for substantial increases in nominal load carrying capacity. Bridges should be designed on two bases' that of plastic ultimate strength for very heavy vehicles operating under controlled conditions, and that of repeated loading - fatigue strength for lesser loads. Bridges should be made to behave more as three dimensional structures. Considering this aspect, the combination of greatly increased design loads with more rational design bases would probably not lead to very great increases in costs. /cgra/ Index Terms: Bridge Design, Bridge Dynamics, Bridge Engineering, Cost, Dead Loads, Deflections, Design Load, Design Specifications, Fatigue, Highway Bridges, Impact, Overweight Loads, Plastic Design, Repeated Loading, Residual Stress, Safety, State Of The Art Studies, Stress, Three Dimensional, Transportation Systems, Ultimate Strength, Vibration, Weight Limits Available from:

Tag	Abstract
Manning72	ID: 00208097 Title: A LOADING HISTORY STUDY OF SELECTED HIGHWAY BRIDGES IN LOUISIANA Author(s): Manning, TK: Turner, HT Publication Date: 04/01/1972 Report No: Publisher/Corporate Author(s): Louisiana State Univ & Agr & Mech Coll USA Abstract: the live load stresses which occur due to service loads in the steel stringers of eight selected highway bridges in Louisiana were evaluated. The selected structures include continuous span members with non-composite decks, simple spans with non-composite decks, and simple spans with composite decks. Details of both total traffic and truck volume (including type and weight) consistent with the strain data were obtained. Data is presented for a twenty four hour period obtained from samples recorded intermittently over a period of four to five days. The results indicate that the fatigue life expectancy of the steel supporting members is a matter of hundreds of years under present traffic conditions. Temperature differences are low and would be associated with stress levels of less than half the live load values for indeterminate structures. The instrumentation system is designed around an intermittent sampler (multiplexer) and tape recorder with subsequent processing of the antilog data for decoding, digitizing and evaluation. /fhwa/ Index Terms: Bridge Deck, Bridge Design, Bridge Spans, Composite Beam Bridge Decks, Continuous Sampling, Data Recorders, Deflection, Fatigue Life, Live Loads, Loads, Simple Span, Stresses, Stringers, Traffic Volume, Truck Effects (Bridges) Available from: Acknowledgement of Document Source: Louisiana Department Highways Federal Highway Administration

Tag	Abstract
Moses76	ID: 00142559 Title: PROBABILITY THEORY FOR HIGHWAY BRIDGE FATIGUE STRESSES PHASE II Author(s): Moses, F: Pavia, AP Publication Date: 08/00/1976 Pagination: 183 pp Report No: Publisher/Corporate Author(s): Case Western Reserve University Department of Civil Engineering OH 44106 USA Abstract: Recent years have seen an increased presence of factors which relate to the occurrence of fatigue cracks on steel highway bridge girders. The 1963 modifications in AASHTO fatigue specifications often caused fatique limits to govern section sizes and in some cases causing changes in design usage of high strength steel and certain weld attachments. This study combined statistical data on truck loads, bridge behavior and measurements and laboratory tests of steel attachments to develop a model of fatigue life prediction. A fatigue design specification was derived from the study which permits truck volume and loadometer survey data to be considered in calculating the allowable design stresses. This can lead to more economic girder sections. To illustrate the proposed design procedure several single and multi-span bridges are analyzed and compared in detail using the proposed method and current AASHTO fatigue specifications including modification of the distribution factor. The fatigue design loading proposed herein represents the actual behavior conditions with respect to truck dimensions and weights, girder distribution factors, headway spacing between trucks and dynamic impact. This work resulted from examination of the Ohio bridge measurement project which recorded over 20, 000 truck passages on 10 bridges. The data is described in the current report. Based on this study it is possible to specify a load and design technique so that fatigue damage has a small chance of occurrence under proper detailing and inspection procedures. Economic optimization methods based on a risk model including damage consequences are also discussed and may be used for rating and evaluation of possible increased truck load limits. Index Terms: DESIGN STANDARDS, FATIGUE LIFE, GIRDER BRIDGES, HIGHWAY BRIDGES, MODEL, PROBABILITY THEORY, TRUCK LOAD LIMITS Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service Federal Highway Administration

Tag	Abstract
Moses82	ID: 00370613 Title: LOAD SPECTRA FOR BRIDGE EVALUATION Foreign Title: SPECTRE DE CHARGES POUR L'EVALUATION DES PONTS Author(s): Moses, F Journal Title: IABSE Reports Volume: 38 Publication Date: 00/00/1982 Pagination: pp 63-73 Report No: Features: FIGS: 3 Fig. REFS: 18 Ref. Publisher/Corporate Author(s): International Assoc for Bridge and Structural Eng ETH-Hoenggerberg Switzerland Abstract: Evaluating existing bridges can be more complex then designing new structures. It is suggested herein that bridge inspections should include load history as well as bridge condition. A recently developed weigh-in-motion technology reduces uncertainty by accurately determining records of truck weights, bridge response and repetitive stress-spectra. Reliability predictions can further assist decision-making by modelling fatigue failure and overall fail-safe capacity. Applications include inspection, posting, legal limits, enforcement, rating and permit assessments. Such evaluation-related problems can all benefit from improved load modelling and site-specific loading statistics formulated into a reliability model. Index Terms: Bridge, Condition Survey, Evaluation, Fail Safe, Fatigue, Law, Loading History, Model, Rating, Reliability, Stresses, Structural Behavior, Truck Weights, Weigh-In-Motion Available from:

Tag	Abstract
Moses92	Title: TRUCK WEIGHT EFFECTS ON BRIDGE COSTS. FINAL REPORT Author(s): Moses, F Language: English Publication Date: 07/00/1992 Pagination: 163p Report No: Feastures: FIGS: 14 Fig. TABS: 17 Tab. REFS: 11 Ref. Publisher/Corporate Author(s): Case Western Reserve University Department of Civil Engineering OH 44106 USA Contract State Job No. 14485(0) TRIS20 Federal Highway Administration 400 7th Street, SW 20590 Ohio Department of Transportation 25 South Front Street, P.O. Box 899 43216-0899 Abstract: States are facing strong pressure to allow heavier truck weights. Such increases in weight place a heavy burden on the bridge system which already suffers many structural deficiencies. Ohio is considering increases in weight through a permit system which would allow the collection of funds to maintain the safety and service life of the existing bridge system. This study has examined the statistics of both the Ohio State and non-State owned bridges under a very large variety of possible changes in truck weight regulations. Bridge cost models have been derived to cover new bridge construction, rehabilitation of capacities of existing bridges and reduced service life due to fatigue. For each portion of the bridge cost, the entire population of Ohio's bridges have been surveyed. Current legal ratings have been analyzed and expected changes due to weight law scenarios have been computed using simple span and continuous span bridge behavior analyses for bending moments. For each weight scenario, the overall required AASHTO HS design level required was assessed along with added construction cost. Further, the number of bridges that will need to be strengthened along with these costs was determined. Finally, a fatigue cost was estimated to be assessed for each crossing of a bridge by either a truck using a new weight regulation or falling into the superload class. Total bridge costs are computed for several hundreds of permit weight types and combined for both State and non-State bridges. The report also discusses the effects of heavier trucks on bridge design practices, permit fees, truck weight enforcement needs and implementation. Index Terms: Bending Moments, Bridge Capacity, Bridge Construction, Bridges, Cost Models, Costs, Fatigue Life, Law Enforcement, Ohio, Permits, Rehabilitation, Service Life, Strengthening, Truck Effects (Bridges), Truck Laws & Regulations, Truck Weights Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Nassif91	ID: 00674256 Title: EFFECT OF TRUCK LOADING ON BRIDGES. FIRST DRAFT REPORT Author(s): Nassif, H: Nowak, AS Language: English Publication Date: 06/00/1991 Pagination: 177p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 2 App. Publisher/Corporate Author(s): Michigan University, Ann Arbor Department of Civil and Environmental Engineering MI 48109 USA Abstract: A procedure for evaluation of live load spectra on highway bridges was developed and tested, and a weigh-in-motion (WIM) measurement system was calibrated during field testing on three Michigan bridges. Other equipment considered in this project included electronic theodolite, fleximeter, and Culway system. The project deals with experimental and analytical parts and the live load model was developed on the basis of WIM measurements, truck counts, truck surveys, and statistical analysis. There is a considerable difference between the results of truck surveys using weigh stations and WIM. For a large number of trucks on I-94 gross vehicle weight exceeds 200, 000 lb. The evaluation procedure for corroded bridges is developed using sensitivity functions relating the load carrying capacity, corrosion patterns, and material loss. Fatigue analysis is further focused on the estimation and prediction of live load spectra. Structural behavior depends on load frequency and magnitude. Therefore fatigue load spectra are determined using the results of WIM measurements, truck survey data, and truck counts. Index Terms: Corrosion, Fatigue Analysis, Field Tests, Gross Vehicle Weight, Highway Bridges, Live Loads, Load Carrying Capacity, Overweight Loads, Truck Effects (Bridges), Weigh-In-Motion Available from: Great Lakes Center for Truck and Transit Research 201 UMTRI Building, 2901 Baxter Road Ann Arbor MI 48109-2150 USA

Tag	Abstract
Petreshock90	ID: 00603589 Title: MODELING FATIGUE LOADS FOR STEEL BRIDGES Author(s): Petreshock, T:Tallin, AG Journal Title: Transportation Research Record Issue: 1275 Publication Date: 00/00/1990 Pagination: pp 23-26 Report No: ISBN: 0-309-05061-8 Features: FIGS: 1 Fig. TABS: 3 Tab. REFS: 8 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Histograms of the gross vehicle weight (GVW) of trucks obtained from weigh-in-motion data for seven states are analyzed. These histograms are modeled by two bimodal distributions consisting of mixed pairs of lognormal distributions and a lognormal and a Type III largest extreme value distribution. Fatigue lifetimes for AASHTO categories A, B, C, and E details are calculated from these models of the distribution of GVW by approximating the Miner's stress as a linear function of the mth root of the mth expected moment of the GVW. The lifetimes based on the two models are compared with each other and with the results obtained by assuming a single lognormal distribution. The results show that the lifetimes estimated using the bimodal distributions differ little from each other but are significantly shorter than the lifetimes estimated from the single lognormal distribution. It was also noted that there are large differences between the estimated lifetimes of different AASHTO categories. Index Terms: Estimating,Fatigue (Materials),Fatigue Life,Gross Vehicle Weight,Histograms,Loads,Mathematical Models,Steel Bridges,Trucks Available from: Transportation Research Board Publications Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Reliability78	ID: 00183765 Title: RELIABILITY APPROACHES TO BRIDGE SAFETY AND TRUCK LOADING UNCERTAINTIES Journal Title: Transportation Research Record Issue: 664 Publication Date: 00/00/1978 Pagination: pp 198-206 Report No: Features: FIGS: 6 Fig. TABS: 2 Tab. REFS: 27 Ref. Publisher/Corporate Author(s): Abstract: Design decisions for highway structures can utilize probability and statistics to express uncertainties in vehicle loading, analysis, strength and construction control. Structural reliability research is described to provide design codes with consistent risk levels and optimal designs. A detailed reliability approach is presented for deriving load and performance factors for steel element fatigue design. The uncertainties in truck weight, volume, headway, strength distribution (analysis), impact and fatigue life are included. The fatigue load model is extended to strength design by considering two behavior levels. The first level utilizes a limit state format with element-oriented load and performance factors derived for components with failure criteria such as maximum moment. Ultimate strength is recognized in a second level check with system coefficients based on the ratio of the load causing significant bridge distress to the limit state load. Code oriented research is described to derive system coefficients for various types of bridge structures using nonlinear and ultimate load analysis. The goal is to utilize the load margin between an element limit state and major bridge damage to contain load uncertainties in future load growth and overweight vehicle operations. The sparce load data available has inhibited introduction of reliability oriented specifications. A project is desribed for undetected weighing of vehicles in motion using instrumented highway bridge girders. The field results show its feasibility and opportunities for filling in missing data on load history and overweight vehicles. /Author/ Available from:

Tag	**Abstract**
Rimsritong76	ID: 00155999 Title: PAVEMENT RESPONSE AND EQUIVALENCES FOR VARIOUS TRUCK AXLE AND TIRE CONFIGURATIONS Author(s): Rimsritong, S: Terrel, RL Journal Title: Transportation Research Record Issue: 602 Publication Date: 00/00/1976 Pagination: pp 33-38 Report No: Features: FIGS: 5 Fig. REFS: 15 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Many changes in allowable loading and operating procedure for trucks are under consideration in Washington and other states. For example, daul tires and single "flotation" tires for heavy truck loads may have varying damaging effects on pavements. Furthermore, at least for asphalt pavements, time of year and vehicle speed may also influence the analysis for special heavy load permits. This paper is a brief attempt to consider some of these variables on a relative basis. This paper is intended to be a limited approach to answer several pertinent questions from a theoretical study based on hypothetical pavements and loads and also on reasonable material characteristics and pavement behavior from previous research. The computer program was used to compute structural behavior. Maximum allowable numbers of load applications were determined by use of known fatigue and failure design curves. The results are a series of relationships based on pavement life that can be used to determine any number of equivalences. These equivalences can be used to compare the relative destructive effects of various sizes of single and dual tires, axle loads, pavement thicknesses, speeds, and temperatures. The general nature of these relationships provides a wide range of conditions for comparison. Within reason, interpolation is valid. One must keep firmly in mind, however, that these relationships are for assumed conditions (although reasonable) and do not represent actual pavements. /Author/ Index Terms: Asphalt Pavement, Axle Load, Computer Programs, Pavement, Pavement Life, Pavement Thickness, Response, Structural Behavior, Temperature, Tires, Traffic Loads, Truck Pavement Damage, Vehicle Speed Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Saccomanno96	ID: 00738476 Title: TRUCK SAFETY: PERCEPTIONS AND REALITY Editor(s): Saccomanno, F: Shortreed, J Language: English Publication Date: 00/00/1996 Report No: ISBN: 0969674775 Publisher/Corporate Author(s): Waterloo University, Canada Institute for Risk Research Canada Abstract: This book features current issues, trends, and future directions on the following topics: Carrier management practices to improve safety and profitability; Driver fatigue and accident risk; Causes and consequences of truck accidents; New technologies in vehicle and roadway design; Regulation and policy in Canada, U.S. and Mexico; Load security issues; Industry stakeholder consensus on critical truck safety issues and proposed initiatives. Twenty-six papers are organized into the following six chapters: Overview; Perspectives on Truck Safety; Harmonization; Driver Fatigue and Accident Risk; Profitability and Safety; and Causes and Consequences of Truck Accidents. Index Terms: Accident Risks, Canada, Carriers, Driver Fatigue, Mexico, Truck Accidents, Trucking Industry Available from: Waterloo University, Canada Publications, Institute for Risk Research Waterloo Ontario N2L 3GI Canada

Tag	Abstract
Sebaaly94	ID: 00674324 Title: PAVEMENT STRAINS INDUCED BY SPENT-FUEL TRANSPORTATION TRUCKS Author(s): Sebaaly, PE: Siddharthan, R: Zafir, Z Language: English Journal Title: Transportation Research Record Issue: 1448 Publication Date: 00/00/1994 Pagination: pp 8-15 Report No: ISBN: 0309060575 Features: FIGS: 12 Fig. TABS: 1 Tab. REFS: 22 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Four types of vehicles are being considered for the transportation of spent-fuel casks to the high-level nuclear waste repository that is to be located in Yucca Mountain, Nevada. The use of a finite-layer moving-load model to compute the pavement strains is described. Pavement strains are required to compare the relative pavement damage caused by each of the spent-fuel trucks and to estimate the increased cost associated with the increase in maintenance and rehabilitation on pavements caused by the spent-fuel trucks. The strain response induced by the spent-fuel trucks for a site near Reno, Nevada, is reported. The asphalt concrete layer and the unbound materials are assumed viscoelastic and elastic, respectively. Pavement material properties were deduced from falling-weight deflectometer testing. The study reveals that the strain response is affected strongly by the axle configuration and by the speed of the vehicle. Increased vehicle speed reduces the pavement strains substantially; longitudinal strains in the asphalt concrete layer decrease by as much as 33% when the speed of the vehicle increases from 30 to 60 km/hr. A substantial compressive strain component is also present when tandem and tridem axle loading are considered. The difference in contribution to pavement distress between the two legal-weight trucks and between the two overweight trucks is minimal. Laboratory fatigue and cyclic triaxial tests are being evaluated to compare the effects of legal-weight and overweight axle loading. Index Terms: Asphalt Pavements, Axle Configuration, Fatigue Tests, Highway Transportation, Maintenance Costs, Nuclear Wastes, Overweight Loads, Pavement Distress, Spent Fuel Casks, Strains, Triaxial Tests, Truck Pavement Damage, Vehicle Speed Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Southgate91	ID: 00624982 Title: SENSITIVITY STUDY OF 1986 AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES. FINAL REPORT Author(s): Southgate, HF Language: English Publication Date: 11/00/1991 Pagination: 150p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 15 Ref. APPS: 5 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 HP&R KYHPR-88-125 TRIS20 Kentucky Transportation Cabinet State Office Building, Clinton and High Streets 40622 Kentucky University Kentucky Transportation Center, College of Engineering KY 40506 USA Abstract: A sensitivity study of 14 items added to the 1986 AASHTO Guide for Design of Pavement Structures indicated: (1) Variations in percent reliability were most influential on the design EAL for the same pavement structure while (2) variations in standard deviations had minimal effects. (3) Resilient moduli for base and subbase materials are very dependent upon stress state (or bulk stress). (4) A method was developed to quantify the effect of drainage capabilities for various soils and its effect upon reduction in structural coefficients for base and subbase materials. (5) Literature review revealed 13 relationships to define soil stiffness. The 1986 Guide has two equations for subgrade resilient modulus that yield results differing by factors of 2 to 10. Caution in their use cannot be over emphasized. (6) A method to account for environmental changes in subgrade materials is included in the 1986 Guide. (7) Temperature effects upon asphaltic concrete stiffness are not included. Sensitivity studies showed that temperature effects on pavement stiffness and variations in Structural Number far overshadow variations in subgrade stiffness. (8) The amount of material pumped from under rigid pavements appears to be a function of the number of axles passing over the spot rather than the number of groups of axles. (9) Kentucky and AASHTO load equivalencies were compared for the same stream of truck traffic. Fatigue data from the AASHO Road Test were used to compare the Kentucky and AASHTO thickness designs for the same soil stiffness. (10) The inclusion of mechanistic principles in pavement design was evaluated and discussed. (11) A value of 3.1 is recommended for the load transfer coefficient, J, because trucks travel with their tires located at the pavement-shoulder joint. (12) Kentucky employs most of the recommended rehabilitation procedures, or has more sophisticated procedures for those not being used. In some cases, economics has ruled out one, or more, of these procedures. (13) Kentucky thickness design methods include low volume roads. (14) Life cycle costs and pavement management were not included in this study because they are subjects of individual studies currently in progress. Index Terms: AASHTO, Base Courses, Coefficients, Comparisons, Drainage, Environmental Effects, Equations, Guide (Recommendation), Kentucky, Literature Surveys, Load Transfer, Mechanistic Design, Modulus Of Resilience, Pavement Design, Rehabilitation, Reliability, Soil Stiffness, Standard Deviation, Stiffness, Subbase, Subgrades, Temperature Effects, Thickness Design, Truck Pavement Damage, Variations Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Stephenson63	ID: 00207695 Title: REPEATED STRESSES IN HIGHWAY BRIDGES Author(s): Stephenson, HK Journal Title: Highway Research Record, Hwy Res Board Publication Date: 00/00/1963 Report No: Publisher/Corporate Author(s): Abstract: a method for predicting the frequencies of various levels of stress to which various members of highway bridges may be subjected as a result of individual or vehicle group loads encountered in the various compositions and volumes of traffic for given periods of time or throughout the life of a given structure is being developed. This method will be used in the design criteria for fatigue of highway bridges the proposed method takes into account'the frequency distribution of heavy truck loads measured in terms of their h-equivalencies on various spans, the lateral placement of vehicles in highway traffic, and the relative frequencies of the stress-producing effects of these loadings at any selected point in a given bridge. Index Terms: Bridge, Bridge Members, Bridge Spans, Coefficient, Design Criteria, Fatigue, Frequencies, Frequency Distribution, Highway Bridges, Lateral Placement, Life Span, Loading, Methods, Prediction, Stress, Traffic Volume, Trucks, Vehicle Available from:
Truck96	Title: TRUCK SAFETY: PERCEPTIONS AND REALITY Editor(s): Saccomanno, F: Shortreed, J Language: English Publication Date: 00/00/1996 Report No: ISBN: 0969674775 Publisher/Corporate Author(s): Waterloo University, Canada Institute for Risk Research Canada Abstract: This book features current issues, trends, and future directions on the following topics: Carrier management practices to improve safety and profitability; Driver fatigue and accident risk; Causes and consequences of truck accidents; New technologies in vehicle and roadway design; Regulation and policy in Canada, U.S. and Mexico; Load security issues; Industry stakeholder consensus on critical truck safety issues and proposed initiatives. Twenty-six papers are organized into the following six chapters: Overview; Perspectives on Truck Safety; Harmonization; Driver Fatigue and Accident Risk; Profitability and Safety; and Causes and Consequences of Truck Accidents. Index Terms: Accident Risks, Canada, Carriers, Driver Fatigue, Mexico, Truck Accidents, Trucking Industry Available from: Waterloo University, Canada Publications, Institute for Risk Research Waterloo Ontario N2L 3GI Canada

Tag	Abstract
Utilization78	ID: 00183770 Title: Utilization Of Stress History Data In Bridge Design Journal Title: Transportation Research Record Issue: 664 Publication Date: 00/00/1978 Pagination: pp 239-245 Report No: Features: FIGS: 3 Fig. TABS: 3 Tab. REFS: 13 Ref. Publisher/Corporate Author(s): Abstract: A method for checking the adequacy of steel stringer highway bridges for fatigue is presented. Truck types and weights are utilized with stress analyses to predict the fatigue life of bridges. The distributions of truck weights, axle weights and truck types were based on recent field measurements. A simplified method of establishing stress ranges due to typical trucks is summarized and an example is presented. However, any method may be used to obtain the stress ranges and the procedure outlined in the paper may be used. The method may be used in design or in checking existing bridges. /Author/ Available from:
White66	ID: 00206243 Title: FATIGUE AND DEFLECTION OF ASPHALTIC CONCRETE Author(s): White, OA Journal Title: Highway Research Record, Hwy Res Board Publication Date: 00/00/1966 Report No: Publisher/Corporate Author(s): Abstract: fatigue and deflection properties of asphaltic concrete were studied for the purpose of evaluating pavement characteristics and design criteria. Deflection tests using a benkelman beam and truck loaded to 18, 000 lb on a single rear axle were made in the field. Static measurements were made at 2 points 50 ft apart in each wheel track for each area of test. Three beams, 4 in wide by 28 in long, were cut from each of the projects measured for deflection under load . Two of each set of beams were tested in the laboratory for fatigue of repeated flexure. The third beam was tested to determine the coefficient of thermal expansion and beam strength at minus 10 degrees f. Reclaimed asphalt tests, and tests to determine asphalt content, void content, and gradation were performed on samples cut from the flexed and broken beams. Tests to determine fatigue of deflection at two constant deflection amounts, void content, linear coefficient of thermal expansion, modulus of rupture at minus 10 degrees f, and tests on reclaimed asphalt were performed using 75 sets of specimens made in the laboratory. Index Terms: Asphalt Content, Asphaltic Concrete, Beam, Benkelman Beam, Deflection, Deflection Test, Design Criteria, Fatigue, Field Tests, Flexure, Laboratory Tests, Loading Tests, Modulus Of Rupture, Pavement Evaluation, Test Specimens, Thermal Expansion, Trucks, Void, Wheel Path Available from:

Abstracts on Relation of Truck Weight to Costs, Economics

Tag	Year	Citation
Lill00	100	00/00/0000 FUTURE TRUCK DESIGNS AUTHOR(S): Lill, RA
Solomon00	100	00/00/0000 ECONOMICAL AXLE LOAD PART I. TRUCK OPERATING COSTS IN RELATION TO VEHICLE SIZE AUTHOR(S): Solomon, KT
Brooks99	99	01/00/1999 EFFECT OF TRUCK PAYLOAD WEIGHT ON PRODUCTION Journal: Journal of Construction Engineering and Management Vol: 125 No: 1 AUTHOR(S): Brooks, BT Schexnayder, C Weber, SL
Harris99	99	06/00/1999 FUEL ECONOMY EFFECTS AND INCREMENTAL COST, WEIGHT, AND LEADTIME IMPACTS OF EMPLOYING A CONTINUOUSLY VARIABLE TRANSMISSION (CVT) IN MID-SIZE PASSENGER CARS OR COMPACT LIGHT TRUCKS AUTHOR(S): Harris, RL Patterson, DJ Stockton, TR
Hewitt99	99	02/00/1999 IMPACT OF CHANGES IN TRUCK WEIGHT REGULATIONS ON MONTANA'S ECONOMY AUTHOR(S): Hewitt, J Menuez, N Smith, K Stephens, J
Hewitt99a	99	00/00/1999 INFRASTRUCTURE AND ECONOMIC IMPACTS OF CHANGES IN TRUCK WEIGHT REGULATIONS IN MONTANA Journal: Transportation Research Record No: 1653 AUTHOR(S): Hewitt, J Menuez, N Smith, K Stephens, J
Lave99	99	00/00/1999 FUEL ECONOMY AND AUTO SAFETY REGULATION: IS THE CURE WORSE THAN THE DISEASE? Journal: Essays in Transportation Economics and Policy. A Handbook in Hono AUTHOR(S): Lave, C Lave, L
Truck99	99	03/17/1999 TRUCK SAFETY: EFFECTIVENESS OF MOTOR CARRIERS OFFICE HAMPERED BY DATA PROBLEMS AND SLOW PROGRESS ON IMPLEMENTING SAFETY INITIATIVES. TESTIMONY
Clayton98	98	00/00/1998 TRUCK SIZE AND WEIGHT POLICY IN THE MIDCONTINENT CORRIDOR Journal: Transportation Quarterly Vol: 52 No: 3 AUTHOR(S): Clayton, A Montufar, J
ElGindy98	98	09/00/1998 EFFECTS OF WHEEL-LOAD SPATIAL REPEATABILITY ON ROAD DAMAGE: A LITERATURE REVIEW AUTHOR(S): El-Gindy, M Kenis, W Mrad, N
Hajek98	98	00/00/1998 ALLOCATION OF PAVEMENT DAMAGE DUE TO TRUCKS USING A MARGINAL COST METHOD Journal: Transportation Research Record No: 1613 AUTHOR(S): Hajek, JJ Hutchinson, BG Tighe, SL
Hajek98	98	00/00/1998 ALLOCATION OF PAVEMENT DAMAGE DUE TO TRUCKS USING A MARGINAL COST METHOD Journal: Transportation Research Record No: 1613 AUTHOR(S): Hajek, JJ Hutchinson, BG Tighe, SL

Tag	Year	Citation
Harrison98	98	00/00/1998 IMPACT OF 44 000-KG (97,000-LB) SIX-AXLE SEMITRAILER TRUCKS ON BRIDGES ON RURAL AND URBAN U.S. INTERSTATE SYSTEM Journal: Transportation Research Record No: 1624 AUTHOR(S): Harrison, R Weissmann, J
Harrison98b	98	00/00/1998 INCREASING U.S. TRUCK SIZE AND WEIGHT REGULATIONS UNDER NAFTA: THE BRIDGE DIMENSION Journal: Journal of the Transportation Research Forum Vol: 37 No: 1 AUTHOR(S): Harrison, R Weissman, J
Isotalo98	98	00/00/1998 SPRING LOAD RESTRICTIONS IN FINLAND: CURRENT POLICY AND RESEARCH IMPLICATIONS Journal: Transportation Research Record No: 1615 AUTHOR(S): Isotalo, J
Jasek98	98	09/00/1998 AN OVERVIEW OF DEVELOPMENT OF A STRATEGIC PLAN FOR COMMERCIAL VEHICLE OPERATIONS IN TEXAS AUTHOR(S): Jasek, D Middleton, D Montufar, J
Jones98	98	01/00/1998 1998 HIGHWAY COST ALLOCATION UPDATE: TECHNICAL REPORT AUTHOR(S): Jones, SS Pigman, JG
Kenis98	98	09/00/1998 OECD DIVINE ELEMENT 1: ACCELERATED DYNAMIC PAVEMENT TESTING AUTHOR(S): Kenis, WJ Wang, W
Khazanovich98	98	00/00/1998 MECHANISTIC-BASED MODEL FOR PREDICTING REFLECTIVE CRACKING IN ASPHALT CONCRETE-OVERLAID PAVEMENTS Journal: Transportation Research Record No: 1629 AUTHOR(S): Khazanovich, L Owusu-Antwi, EB Titus-Glover, L
Lestina98	98	00/00/1998 ALLOCATING THE COSTS OF MOTOR VEHICLE CRASHES BETWEEN VEHICLE TYPES Journal: Transportation Research Record No: 1635 AUTHOR(S): Lestina, DC Levy, DT Miller, T Spicer, RS
Meyburg98	98	02/00/1998 THE ECONOMIC IMPACTS OF A DIVISIBLE-LOAD PERMIT SYSTEM FOR HEAVY VEHICLES Journal: Transportation Research. Part A: Policy and Practice Vol: 32 No: 2 AUTHOR(S): Meyburg, AH Saphores, J-D Schuler, RE
Berg97	97	00/00/1997 REDUCING DAMAGE TO LOW-VOLUME ROADS BY USING TRUCKS WITH REDUCED TIRE PRESSURES Journal: Transportation Research Record No: 1589 AUTHOR(S): Berg, RL Kestler, MA Moore, TL
Dealba97	97	00/00/1997 MOST CONVENIENT NAFTA TRUCKS FOR OPERATING ON THE MEXICAN ROADS Conference: XIIIth World meeting of the International Road Federation AUTHOR(S): De Alba, M Mendoza, A
Duke97	97	12/00/1997 A QUALITATIVE ASSESSMENT OF THE ROLE OF SHIPPERS AND OTHERS IN DRIVER COMPLIANCE WITH FEDERAL SAFETY REGULATIONS AUTHOR(S): Duke, ME Morris, SW Swinehart, J Weppner, M

Tag	Year	Citation
Federal97	97	08/00/1997 1997 FEDERAL HIGHWAY COST ALLOCATION STUDY
Fekpe97	97	03/00/1997 VEHICLE SIZE AND WEIGHT REGULATIONS AND HIGHWAY INFRASTRUCTURE MANAGEMENT Journal: Journal of Infrastructure Systems Vol: 3 No: 1 AUTHOR(S): Fekpe, ESK
Gutierrez97	97	00/00/1997 MEXICAN FIELD STUDY TO OBTAIN BASIC INFORMATION ON TRUCK TRANSPORT Journal: Transportation Research Record No: 1602 AUTHOR(S): Gutierrez, JL Mayoral, E Mendoza, A Rico, A
Harmonization97	97	10/00/1997 HARMONIZATION OF VEHICLE WEIGHT AND DIMENSION REGULATIONS WITHIN THE NAFTA PARTNERSHIP
Hoel97	97	06/00/1997 EXCLUSIVE LANES FOR TRUCKS AND PASSENGER VEHICLES ON INTERSTATE HIGHWAYS IN VIRGINIA: AN ECONOMIC EVALUATION AUTHOR(S): Hoel, LA Vidunas, JE
Humphrey97	97	00/00/1997 OVERSIZE/OVERWEIGHT TRANSPORTATION STUDY AUTHOR(S): Humphrey, TF
John97	97	05/00/1997 SIZE-WEIGHT REBELLION Journal: HEAVY DUTY TRUCKING, AUTHOR(S): JOHN BENDEL.
Mendoza97	97	00/00/1997 COMPARATIVE EFFICIENCY OF DIFFERENT REPRESENTATIVE MEXICAN TRUCKS Conference: XIIIth World Meeting of the International Road Federation AUTHOR(S): Mendoza, A Rico, A
Pearson97	97	01/00/1997 ASSESSING THE IMPACT OF RESEARCH - THE CANADIAN EXPERIENCE WITH HEAVY VEHICLE WEIGHTS AND DIMENSIONS Conference: Development and Evaluation of Road Transport Research Programmes AUTHOR(S): Pearson, JR
Boothby96	96	00/00/1996 PROBABILITY-BASED COST ALLOCATION OF BRIDGE FATIGUE DAMAGE Conference: Structural Reliability in Bridge Engineering: Design, Inspection, Assessment, Rehabilitation and Management. Proceedings of the Workshop AUTHOR(S): Boothby, TE Laman, JA
Maze96	96	00/00/1996 STATEWIDE TRUCK TRANSPORTATION PLANNING: METHODOLOGY AND CASE STUDY (WITH DISCUSSION) Journal: Transportation Research Record No: 1522 AUTHOR(S): Maze, TH Smadi, A
Meyburg96	96	00/00/1996 COLLECTING USAGE DATA FOR ANALYZING A HEAVY-VEHICLE, DIVISIBLE-LOAD PERMIT SYSTEM Journal: Transportation Research Record No: 1522 AUTHOR(S): Meyburg, AH Saphores, J-DM Schuler, RE
Sanderson96	96	00/00/1996 TRUCK IMPACTS ON TRAFFIC OPERATION AND GEOMETRIC DESIGN FOR TWO-LANE TWO-WAY ROADS Conference: Truck Safety: Perceptions and Reality AUTHOR(S): Sanderson, RW

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Agent95	95	12/00/1995 IMPACTS OF THE EXTENDED-WEIGHT COAL HAUL ROAD SYSTEM AUTHOR(S): Agent, K Crabtree, J Deacon, J Graves, C Pigman, J
Chatti95	95	11/00/1995 VEHICLE/PAVEMENT INTERACTION AT THE PACCAR TEST SITE. FINAL REPORT AUTHOR(S): Chatti, K Kramer, SL Mahoney, JP Monismith, CL Moran, TJ Winters, BC
Chenoweth95	95	00/00/1995 NEXT-GENERATION VEHICLES (BREAKOUT SESSION) Journal: CONFERENCE PROCEEDINGS 9 Conference: Forum on Future Directions in Transportation R&D AUTHOR(S): Chenoweth, A Cihak, F Kelley, J Kerrebrock, J Sperling, D
Clayton95	95	00/00/1995 EVALUATING PAVEMENT IMPACTS OF TRUCK WEIGHT LIMITS AND ENFORCEMENT LEVELS Journal: Transportation Research Record No: 1508 AUTHOR(S): Clayton, AM Fekpe, ESK Haas, RCG
Comprehensive 95	95	02/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 6 - TRAFFIC OPERATIONS AND TRUCK SIZE AND WEIGHT REGULATIONS
Comprehensive 95a	95	02/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 3 - PAVEMENTS AND TRUCK SIZE AND WEIGHT REGULATIONS
Comprehensive 95b	95	02/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 4 - BRIDGES AND TRUCK SIZE AND WEIGHT REGULATIONS
Comprehensive 95c	95	05/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY: SUMMARY REPORT FOR PHASE I-SYNTHESIS OF TRUCK SIZE AND WEIGHT (TS&W) STUDIES AND ISSUES
Comprehensive 95d	95	02/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 7 - TRUCK COSTS AND TRUCK SIZE AND WEIGHT REGULATIONS
Comprehensive 95e	95	02/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 10 - ENFORCEMENT AND TRUCK SIZE AND WEIGHT REGULATIONS
Comprehensive 95f	95	02/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 13 - PERMITS AND PRICING MECHANISMS AND TRUCK SIZE AND WEIGHT REGULATIONS

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Duleep95	95	00/00/1995 EXPANDING METROPOLITAN HIGHWAYS: IMPLICATIONS FOR AIR QUALITY AND ENERGY USE. APPENDIX A: EMISSION AND ENERGY CHARACTERISTICS OF HEAVY-DUTY DIESEL-POWERED TRUCKS AND BUSES Journal: Transportation Research Board Special Report No: 245 AUTHOR(S): Duleep, KG
Fan95	95	00/00/1995 TRANSPORTATION ENERGY INTENSITY TRENDS: 1972-1992 Journal: Transportation Research Record No: 1475 AUTHOR(S): Fan, Y Greene, DL
Isotalo95	95	00/00/1995 SEASONAL TRUCK LOAD RESTRICTIONS: MITIGATING EFFECTS OF SEASONAL ROAD STRENGTH VARIATIONS Journal: CONFERENCE PROCEEDINGS 6 Vol: 1 Conference: Sixth International Conference on Low-Volume Roads AUTHOR(S): Isotalo, J
Russell95	95	00/00/1995 HIGHWAY USE TAX ALTERNATIVES FOR HEAVY TRUCKS IN OREGON Journal: Transportation Research Record No: 1498 AUTHOR(S): Russell, RE
Truck95a	95	09/00/1995 TRUCK SIZE AND WEIGHT MODELING WORKSHOP. U.S. DEPARTMENT OF TRANSPORTATION COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY REPORT NO. 3, ACTIVITY II: TASK C REFINE FREIGHT DIVERSION MODELS FOR ALL MODES
Bronzini94	94	11/00/1994 PRODUCTIVITY EFFECTS OF TRUCK SIZE AND WEIGHT POLICIES: FINAL REPORT AUTHOR(S): Bronzini, MS Middendorf, DP
Deacon94	94	01/00/1994 ALLOCATION OF HIGHWAY COSTS AND REVENUES AUTHOR(S): Deacon, JA Pigman, JG
Effects94	94	00/00/1994 EFFECTS OF LOWER TIRE PRESSURE ON FROST WEAKENED ROADS
Ervin94	94	00/00/1994 EFFICIENT, SAFE, AND ACCEPTABLE TRUCK DESIGNS AND CONFIGURATIONS, PAPER: LINKING TRUCK DESIGN TO PUBLIC AND PRIVATE LIFE-CYCLE COSTS Journal: CONFERENCE PROCEEDINGS 3 Conference: International Symposium on Motor Carrier Transportation AUTHOR(S): Ervin, RD
Hallenbeck94	94	01/00/1994 TRUCK FLOWS AND LOADS FOR PAVEMENT MANAGEMENT. FINAL REPORT AUTHOR(S): Hallenbeck, ME O'Brien, AJ
Hallenbeck94a	94	01/00/1994 TRUCK FLOWS AND LOADS FOR PAVEMENT MANAGEMENT AUTHOR(S): Hallenbeck, ME O'Brien, AJ
Highway94	94	06/00/1994 HIGHWAY USER FEES: UPDATED DATA NEEDED TO DETERMINE WHETHER ALL USERS PAY THEIR FAIR SHARE
Maze94	94	11/00/1994 POLICY ISSUES OF AN IOWA LONGER COMBINATION VEHICLE NETWORK AUTHOR(S): Maze, T Smadi, A Walter, CK

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Prasad94	94	00/00/1994 COMPUTERIZED OVERLOAD PERMITTING PROCEDURE FOR INDIANA Journal: Transportation Research Record No: 1448 AUTHOR(S): Prasad, NBR Ramirez, JA White, DW White, TD Zaghloul, SM
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Billingsley63	63	00/00/1963 DIRECT COSTS AND FREQUENCIES OF 1958 ILLINOIS MOTOR-VEHICLE ACCIDENTS Journal: Highway Research Record, Hwy Res Board AUTHOR(S): Billingsley, CM Jorgenson, DP

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Firey62	62	01/00/1962 PREDICTING FUEL CONSUMPTION AND TRAVEL TIME OF MOTOR TRANSPORT VEHICLES Journal: Highway Research Board Bulletin AUTHOR(S): Firey, JC Sawhill, RB
Kent60	60	00/00/1960 FUEL AND TIME CONSUMPTION RATES FOR TRUCKS IN FREIGHT SERVICE Journal: Highway Research Board Bulletin AUTHOR(S): Kent, MF
McCarthy60	60	00/00/1960 ECONOMIC COST OF TRAFFIC ACCIDENTS IN RELATION TO THE VEHICLE Journal: Highway Research Board Bulletin AUTHOR(S): Mccarthy, JF
Sawhill60	60	00/00/1960 MOTOR TRANSPORT FUEL CONSUMPTION RATES AND TRAVEL TIME Journal: Highway Research Board Bulletin AUTHOR(S): Sawhill, RB
Stevens60	60	00/00/1960 LINE-HAUL TRUCKING COSTS IN RELATION TO VEHICLE GROSS WEIGHTS Journal: Highway Research Board Bulletin AUTHOR(S): Stevens, H
Baker59	59	00/00/1959 FUNDAMENTAL PROBLEMS IN RELATING VEHICLE SIZE TO HIGHWAY COSTS Journal: Highway Research Board Bulletin AUTHOR(S): Baker, RF
Hennes58	58	00/00/1958 WASHINGTON STATE HIGHWAY COST ALLOCATION STUDY Journal: Highway Research Board Bulletin AUTHOR(S): Hennes, RG Mylroie, WW
Ross56	56	00/00/1956 INCREMENTAL METHOD OF ALLOCATING HIGHWAY COSTS Journal: Highway Research Board Bulletin AUTHOR(S): Ross, WD
Breed35	35	00/00/1935 THE EFFECT OF HEAVY MOTOR VEHICLES ON HIGHWAY COSTS Journal: Highway Research Board Proceedings AUTHOR(S): Breed, CB DISCUSSER Downs, WS DISCUSSER Fairbank, HS DISCUSSER Lavis, F Marston, A DISCUSSER Pope, CS DISCUSSER Thompson, JT DISCUSSER

Tag	Abstract
Abdel85	Title: AXLE LOAD LIMITS IN ONTARIO: LONG-TERM ANALYSIS Author(s): Abdel Halim, AO: Saccomanno, FF Journal Title: Transportation Research Record Issue: 1038 Publication Date: 00/00/1985 Pagination: pp 26-40 Report No: ISBN: 4-1 Features: FIGS: 7 Fig. TABS: 2 Tab. REFS: 13 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Overloaded axles contribute significantly to the deterioration of road structures. Protection against severe pavement deterioration is provided in most jurisdictions by limiting permissible axle loads for commercial traffic. Within most provincial jurisdictions in Canada, axle load limits have been set arbitrarily with little reference to economic viability. In practice, axle load limits have been established from past experience based essentially on two conditions: (a) the need to maintain a reasonable level of serviceability on the road network and (b) available monies for annual rehabilitation and maintenance programs. The financing of rehabilitation and maintenance programs is supported from general revenues for each jurisdiction, and this allocation of funds may have little relevance to the incidence of costs and benefits to users of the road system or to the responsible transportation agency. In this study two actual axle load distributions are investigated to assess the effects of changing the axle load limits on transportation costs. These costs include pavement rehabilitation and maintenance and commercial and noncommercial vehicle operating expenditures. In Ontario the vehicle operating costs for commercial traffic are the dominant cost component that influences the economic viability of axle load limits. The increased operating costs of noncommercial traffic from reduced pavement serviceability appear to mitigate against increases in the maximum allowable axle load. Furthermore, long-term changes in truck fleet composition, resulting in a more efficient distribution of axle loads, may produce conditions under which higher axle load limits are economically justified. Index Terms: Axle Load, Benefit Cost Analysis, Economic Impact, Feasibility, Increase, Maintenance Costs, Size And Weight Laws, Vehicle Operating Cost Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	**Abstract**
Adams85	Title: COST EVALUATION OF FEDERAL MOTOR VEHICLE SAFETY STANDARD (FMVSS) 105-83. FINAL REPORT Author(s): Adams, GJ: Carlson, LE: Firth, BW Publication Date: 09/00/1985 Pagination: v.p. Report No: Features: FIGS: Figs. TABS: Tabs. APPS: 2 App. Publisher/Corporate Author(s): Mobility Systems and Equipment Company 6151 West Century Boulevard, Suite 912 CA 90045 USA National Highway Traffic Safety Administration 400 7th Street, SW DC 20590 Abstract: For FMVSS 105-83, a representative sample of brake system components for the year prior to and following the implementation of the standard (i.e., 1983 and 1984). The consumer cost and weight change due to the implementation of the standard were estimated and weighted by sales volume to develop industry average costs. Costs and weight increase generally after the implementation of the standard, with the exception of the G.M.C. 7 ton truck which decreased significantly. Index Terms: Brakes (For Arresting Motion), Costs, Economic Evaluations, Standards, Vehicle Weight, Vehicular Safety Available from: National Highway Traffic Safety Administration 400 7th Street, SW Washington DC 20590 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Agent95	Title: IMPACTS OF THE EXTENDED-WEIGHT COAL HAUL ROAD SYSTEM Author(s): Agent, K: Crabtree, J: Deacon, J: Graves, C: Pigman, J Language: English Publication Date: 12/00/1995 Pagination: 130p Report No: Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Kentucky Transportation Cabinet State Office Building, Clinton and High Streets 40622 Kentucky University Kentucky Transportation Center, College of Engineering KY 40506-0043 USA Abstract: The Extended-Weight Coal Haul Road System, created by the Kentucky Legislature in 1986, consists of all roads which carry over 50, 000 tons of coal in a calendar year. Trucks hauling coal on this system are authorized to exceed normal weight limits through the payment of an annual decal fee. A research study was initiated in July of 1992 to analyze the impacts of the extended-weight system. Analyses in this report are based on the following: historical data on coal production and transportation; data from coal decal applications; interviews of legislators, transportation officials, coal company representatives, and coal trucking representatives; newspaper articles; vehicle classification data; analyses of pavement costs; pavement rideability data; and accident data. Primary conclusions include: 1) The extended-weight system has apparently been somewhat successful in accomplishing the objective of enhancing the competitiveness and economic viability of the Kentucky coal industry; 2) Overall accident rates did not increase as a result of implementation of the extended-weight system, but the fatal accident injury rates were significantly higher on the extended-weight system and for trucks operating with the coal decal; 3) Advance-warning flashers have been evaluated and recommended as a means of reducing intersection accidents involving heavy/coal trucks; 4) The coal-decal fee structure results in a net annual loss in Road Fund revenue of approximately $2 million; 5) Forty percent of revenue from decal fees are allocated to counties even though county-maintained roads comprise only eight percent of the extended-weight system; 6) Heavier weights of coal-decal trucks add approximately $9 million annually to the pavement overlay costs; 7) Road users throughout the state are subsidizing the movement of Kentucky coal by participating in the cost of maintaining and improving the highway system; and 8) Possibly reflecting the increased funding of extended-weight roads, the rideability index has risen to a level above the statewide average. The primary recommendation was that the extended-weight system should evolve into a comprehensive trucking network. A "Resource and Commodity Highway System" was evaluated as a separate study and found to be a feasible and desirable means of providing a trucking highway network that is fully compatible with the dimensions and characteristics of large trucks. Index Terms: Accident Rates, Coal Transportation, Costs, Economic Impacts, Extended-Weight Road System, Fatal Accidents, Fees, Flashers, Fund Allocations, Intersections, Kentucky, Recommendations, Ride Quality, Truck Pavement Damage, Trucking Highway Network, Warning Systems Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: KENTUCKY TRANSPORTATION CENTER, KENTUCKY UNIVERSITY

Tag	**Abstract**
Albalbissi91	Title: ECONOMICS OF PAVEMENT CONDITION, AXLE LOAD, AND VEHICLE OPERATING COSTS Author(s): Al-Balbissi, AH Journal Title: ITE Journal Volume: 61 Issue: 5 Publication Date: 05/00/1991 Pagination: pp 22-24 Report No: Features: FIGS: Figs. TABS: 1 Tab. REFS: Refs. Publisher/Corporate Author(s): Institute of Transportation Engineers 525 School Street, SW, Suite 410 DC 20024-2729 USA Abstract: The total cost of moving goods by truck over a highway system involves 2 basic components: the public costs associated with construction and maintenance of the road network, and the privately financed costs of acquiring, operating and maintaining a fleet of trucks. These public and private costs are linked in many ways. To ensure that these 2 components of the transportation system - the vehicles and roads - are compatible with each other, and to attempt to keep the overall private and public expenditures of the total system to a minimum, it is necessary to establish design and maintenance standards for the roads and limits to the weights, and dimensions of trucks. The article discusses vehicle operating costs, road construction and maintenance costs, and weight-control enforcement. It is noted that vehicle-weight regulation is an essential part of any highway management system, and that enforcements of the regulations requires a commitment of resources for apropriate scales and staff, as well as meaningful penalties. Index Terms: Axle Load, Highway Economics, Highway Maintenance, Pavement Condition, Private Sector, Public Sector, Traffic Law Enforcement, Truck Laws & Regulations, Truck Weights, Trucks, Vehicle Operating Cost Available from: Institute of Transportation Engineers 525 School Street, SW, Suite 410 Washington DC 20024-2729 USA

Tag	Abstract
American73	Title: AMERICAN TRUCKING AND THE ENERGY CRISIS Publication Date: 00/00/1973 Pagination: 12 pp Report No: Publisher/Corporate Author(s): American Trucking Associations, Inc USA Abstract: The proposal that intercity freight be shifted from trucks to railroads is studied in its proper perspective, and pitfalls, involved in its implementation are pointed out. The study shows that intercity trucks are not major contributors to the energy crisis and that shifting freight from trucks to rail are limited and would only downgrade transportation service. In 1971 trucks used 13.2 percent of the total petroleum consumed. This includes the 3.3 percent diesel fuel used by intercity trucks. Railroads are primarily long haul carriers of bulk commodities while motor carriers handle smaller shipments and manufactured commodities. Thus the two are not readily substitutable one for the other. Earlier studies reveal that only 40 percent of the traffic is truly competitive if it is assumed that shipment size can be altered without additional cost to the shipper and consignee. If such alteration is not possible, the percentage of competitive traffic falls to only 25 percent. The bases for these conclusions are presented in appended tables. Studies lead to the conclusion that the areas of competition between railroads and motor carriers is limited to shipments weighing between 10, 000 and 60, 000 pounds. Listed are the reasons why fuel saving through transfer of traffic to rail piggyback is in question. The tranfer of traffic to piggyback would involve origin and destination movements in congested urban areas and would be the most inefficient type of movement from a fuel standpoint. It is concluded that the use of fuel in heavy duty operations is extremely small in terms of total petroleum and fuel consumption and that the service performed through utilization of this relatively small percentage of total needs is enormous. Various possible energy saving means are listed. Updating of vehicle size and weight laws could significantly reduce diesel fuel requirements of the trucking industry. Index Terms: Crude Oil, Diesel Fuel, Energy, Freight Transportation, Fuel Consumption, Intercity Transportation, Law, Piggyback, Rail Transportation, Trucks, Vehicle, Weight Available from:

Tag	Abstract
Analysis73	Title: AN ANALYSIS OF THE ECONOMICS OF TRUCK SIZES AND WEIGHTS IN RELATION TO STATE AND FEDERAL REGULATIONS Publication Date: 09/00/1973 Pagination: 117 pp Report No: Publisher/Corporate Author(s): Voorhees (Alan M) and Associates, Incorporated Westgate Research Park VA 22101 USA Abstract: A survey of the literature was performed to identify the state of the art with respect to the impacts of changes in truck weight and size limits. It was found that techniques for evaluating impacts on transportation and highway costs have been developed. Data were available which indicate accident frequency and severity as a function of vehicle weight. Impact of vehicle size and weight limits on the energy crisis was not documented. Two voids in the state of the art were found: impact on consumer prices and impact on environmental elements. Until these data are filled, it is doubtful that a cost-benefit analysis can be performed which will be sensitive to important issues of impact incidence. /NTIS/ Index Terms: Accident Rate, Accident Severity, Competitive Modes, Energy, Highway Costs, Intermodal Systems, Motor Carriers, Piggyback, Size, Transportation Economics, Truck Laws & Regulations, Truck Transportation Economics, Trucks, Weight Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22151 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Analysis80	Title: ANALYSIS OF THE COSTS OF TRUCKLOAD FREIGHT OPERATIONS Journal Title: Transportation Research Record Issue: 758 Publication Date: 00/00/1980 Pagination: pp 44-50 Report No: Features: FIGS: 1 Fig. TABS: 8 Tab. REFS: 11 Ref. Publisher/Corporate Author(s): Abstract: This paper examines the impacts on truck costs of the most-critical financial and operational variables in long-haul, truckload freight movements. By using a truck cost model developed by the Association of American Railroads (AAR), the paper analyzes the sensitivity of truck costs to changes in fuel price, cost of capital, driver wages, tractor price, trailer price, depreciation method, and insurance cost. The effects of changes in operational factors such as truck speed, annual mileage, cargo weight, equipment type, fuel mileage, and percentage of empty backhaul are also shown. Data are drawn from various sources, which include truck-auctioneer data, truck-leasing company reports, U.S. government publications, and the AAR's field survey of rail-competitive truck movements. The principal finding of the analysis is that a reasonable minimum for mid-1979 rail-competitive truck costs is $0.83/revenue (loaded) mile and $0.055/ton-mile. It is also shown that marketing intelligence is of critical importance for making cost estimates, particularly with respect to equipment price and use fuel price and mileage, and driver type and wages. Recent cost increases in these areas (particularly in fuel prices) have reopened some freight markets to rail competition. Available from:

Tag	Abstract
Analysis88	Title: ANALYSIS OF HEAVY DUTY TRUCK USE IN URBAN AREAS Publication Date: 06/30/1988 Pagination: 82p Report No: Publisher/Corporate Author(s): Abstract: The National Truck Trip Information Survey includes data on mileage by road class, engine characteristics, fuel economy measures, cargo types and weights, and vehicle weights, as well as many other variables that provide a more detailed look at the operation of medium and heavy trucks in urban areas. In the report, the NTTIS sample and survey methodology are discussed. Variables in the study particularly relevant to urban diesel truck emissions are defined. The bulk of the report is devoted to tables examining the operations of medium and heavy-duty trucks in urban areas. The tables show the structure of the U.S. truck population, the breakdown of truck travel between urban and rural areas by road type, engine horsepower, and gross combination weight. Available from: Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Andon81	Title: REVIEW AND EVALUATION OF AUTOMOTIVE FUEL CONSERVATION TECHNOLOGIES Author(s): Andon, J: Falk, R: Gaines, R: Gerstenberger, T: Kollars, G: Renick, S: Schwarz, R: Siegel, HM Publication Date: 12/00/1981 Pagination: v.p. Report No: Features: FIGS: Figs. TABS: Tabs. APPS: Apps. Publisher/Corporate Author(s): National Highway Traffic Safety Administration 400 7th Street, SW DC 20590 South Coast Technology Incorporated 793 Airport Boulevard MI 48104 USA Abstract: To support the Office of Research and Development of the National Highway Traffic Safety Administration with focused studies in areas affecting automotive fuel economy and related safety issues, a series of in-depth studies were conducted during the time frame of the contract. In total, eight specific studies were carried out. These studies included: (1) Fuel Consumption Estimates of Stratified Charge Rotary Engines Installed in Five Vehicles; (2) Oldsmobile Omega X Body Baseline Weight Data; (3) GM X Body Material Substitution Weight Reduction/Cost Effectiveness Study; (4) Calspan RSV Restraint System Cost Study; (5) FMVSS No. 208 Extension to Light Trucks, Vans, and MPV's--Cost Lead Time Study; (6) Multipiece Rims for Trucks, Buses, and Trailers; (7) Identifying Design Changes, Cost Impacts and Manufacturing Lead Times to Upgrade FMVSS 114 for Passenger Cars, Trucks, and MPV's; and (8) Ford Escort GL Baseline Weight Data. Index Terms: Automobile, Buses (Vehicles), Cost Effectiveness, Fuel Consumption, Lead Time, Light Trucks, Manufacturing, Material, Multiple Purpose Vehicles, Rims, Stratified Charge Engine, Trailer, Trucks, Vans, Vehicle Design, Vehicle Weight Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	**Abstract**
Araucto93	Title: TRUCK RESTRICTION EVALUATION: THE PUGET SOUND EXPERIENCE Author(s): Araucto, J: Koehne, JL: Mannering, FL Language: English Publication Date: 08/00/1993 Pagination: 183p Report No: Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW DC 20590 Washington State Transportation Center 15700 Dayton Avenue WA 98133- USA Abstract: Large trucks are often perceived to restrict the free flow of general traffic and present a safety hazard. In addition, the delay caused by trucks is thought to detrimentally affect the economy, and repetitive heavy loads increase pavement deterioration. Truck lane restrictions attempt to achieve one or more of four purposes: 1) improve highway operations, 2) improve the level of safety, 3) facilitate more even pavement wear, and 4) ensure better operation and safety through construction zones. Three study sites and a control site were selected in the Puget Sound region to test the effectiveness of truck lane restrictions in achieving these purposes. Three types of analyses were performed: 1) an in-depth analysis to determine how the implementation of a lane restriction would impact the operation, safety, and life of the facility and the economic impacts for the region, 2) a site comparison analysis to determine whether the results from the in-depth analysis could confidently be applied to other areas in the region, and 3) a survey analysis to determine the opinions of truckers, motorists, industry, and enforcement officials with respect to lane restrictions. Index Terms: Lane Restrictions, Restrictions, Safety Factors, Traffic Flow, Truck Effect On Highway Capacity, Truck Highway Damage, Truck Lanes, Truck Pavement Damage Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Ashtakala75	Title: ENERGY-INTENSIVE ANALYSIS OF TRUCK TRANSPORTATION Author(s): Ashtakala, B Journal Title: ASCE Journal of Transportation Engineering Volume: 101 Issue: TE2 Publication Date: 05/00/1975 Pagination: pp 225-236 Report No: Publisher/Corporate Author(s): American Society of Civil Engineers 345 East 47th Street NY 10017 USA Abstract: The efficient use of gasoline and diesel fuels in transportation is a step in the direction of conservation of the nonrenewable resource. The energy-intensive analysis presented in this paper develops the concept of energy efficiency in truck transportation and examines its economic implications. Theoretically, energy efficiency (payload, in ton miles per British thermal units) tends to have an upper limit corresponding to the maximum gross vehicle weight allowed under a set of vehicle weight regulations. Energy efficiencies of tractor semitrailers and tractor trailers in Alberta are reasonable, whereas the energy efficiencies of straight trucks are significantly lower by comparison. The benefit in terms of saving fuel by an incremental increase in energy efficiency could result in a corresponding economic benefit if the payload hauled by a truck could be increased by more efficient operation. Index Terms: Diesel Fuel, Energy, Fuel Consumption, Gasoline, Tractor Trailers, Truck Laws & Regulations, Truck Transportation Economics, Truck Weights Available from:

Tag	Abstract
Assessment81	Title: AN ASSESSMENT OF CHANGES IN TRUCK DIMENSIONS ON HIGHWAY GEOMETRIC DESIGN PRINCIPLES AND PRACTICES Publication Date: 06/00/1981 Pagination: 168p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 27 Ref. APPS: 2 App. Publisher/Corporate Author(s): Abstract: Among the many issues surrounding motor vehicle size and weights, specifically an increase in truck size and weights, is the concern of the impact any change would have on the operational characteristics of rural highways. Today's highway network in any given area is the result of an evolutionary process representing among other things a mix of geometric design principles and practices. Any significant change in the vehicular operating characteristics should require an assessment of the geometric design practices and the impact on the existing highway system in terms of operational aspects and safety. Also needed would be an estimate of the cost required to redesign and modify the current network or segments of the network to accommodate the larger vehicles. This report represents one element of an ongoing study to assess the various issues and effects of an increase in truck size and/or weights on the rural highways in Texas. The purpose of this report is to summarize a study of the effects that an increase in legal truck limits would have on highway geometric design elements, and the cost implications, should various segments of the Texas highway system require redesign and modification to facilitate their safe and efficient operation. (Author) Available from:

Tag	Abstract
Assessment82	Title: AN ASSESSMENT OF RECENT STATE TRUCK SIZE AND WEIGHT STUDIES Publication Date: 07/00/1982 Pagination: 164p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 37 Ref. APPS: 10 App. Publisher/Corporate Author(s): Abstract: With the growing interest nationally in the effects of increased size and weight of motor carriers on the existing highway infrastructure, there is a need to remain current on the various studies being conducted by the various states. This report documents the status of current legislation of each state with respect to laws governing truck size and weight. Emphasis was placed on laws pertinent to the operation of larger motor carriers such as "doubles" and "triples, " overall vehicle length, width, axle weight, and gross vehicle weight. A survey of all states was made to ascertain the current status of truck size and weight studies and highway cost allocation studies. The survey results as well as details of the studies are summarized herein. Ten states were found to have conducted studies for which reports, papers, or some documentation was available. The documents were analyzed to determine the objective and scope, methodology, data sources, findings, and summary. Efforts were made to gain insight into national implications from the aggregated findings of the individual studies. Many interesting findings surfaced regarding pavement and bridge costs aspects of increased truck size and weight. Other pertinent findings regarding data sources and methodology were found to be useful in furthering aspects of the comprehensive Texas study. Available from: Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Assessment83	Title: AN ASSESSMENT OF THE ENFORCEMENT OF TRUCK SIZE AND WEIGHT LIMITATIONS IN TEXAS Publication Date: 04/00/1983 Pagination: 140p Report No: Features: FIGS: 27 Fig. TABS: 36 Tab. REFS: 14 Ref. APPS: 4 App. Publisher/Corporate Author(s): Abstract: The current state regulations affecting motor vehicle sizes and weights, agencies involved directly or indirectly in the enforcement of these regulations, characteristics of oversize-overweight vehicle movements within the state (both legal and illegal movements), and the cost of these vehicle movements to the state were developed and are presented in this report. The characterization of oversize-overweight movements in the state is emphasized. To study the economic effects to the state a 100 percent compliance case was set up to compare with the actual case. The study showed that, while the current oversize-overweight movements may save the trucking industry up to 1.4 billion dollars over the next twenty years at current conditions, these movements are estimated to cost the state an additional 261 million dollars over the same twenty-year period. Similarly, enforcement of the state laws is estimated to result in only 84 million dollars if the current fine and permit fee structure is maintained. It is recommended that the current fine and fee structure be revised so that violators would pay for their share of the estimated damage to highways. A highway cost allocation study is also recommended. Available from: Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
ATA89	Title: ATA DECRIES DETERIORATING HIGHWAYS - CALLS FOR MORE SPENDING Journal Title: TRANSAFETY REPORTER Volume: 7 Issue: 12 Publication Date: 12/00/1989 Pagination: p 6 Report No: Publisher/Corporate Author(s): TranSafety, Incorporated 5811 Oak Leather Drive VA 22015 USA Abstract: In an address to the San Francisco Rotary Club on November 16, 1989, Tom Donahue, president of the American Trucking Associations, called for more spending from the Highway Trust Fund to repair deteriorating highways which, he says, are restraining economic growth. He claimed that federal spending for highways remains at about the same level as it was 30 years ago, even though traffic volume has tripled. He also called for increased weight loads and new roads built to accommodate such an increase. He cited a Brookings Institution report that maintains that a small increase in pavement thickness can dramatically increase pavement performance. Index Terms: Economic Impact, Highway Maintenance, Highway Trust Fund, Pavement Thickness, Trucking Industry Available from: TranSafety, Incorporated 5811 Oak Leather Drive Burke VA 22015 USA

Tag	Abstract
Automotive87	Title: AUTOMOTIVE FUEL ECONOMY PROGRAM. ELEVENTH ANNUAL REPORT TO THE CONGRESS JANUARY 1987 Publication Date: 01/00/1987 Report No: Features: TABS: Tabs. Publisher/Corporate Author(s): National Highway Traffic Safety Administration 400 7th Street, SW DC 20590 USA Abstract: This report summarizes the activities of the National Highway Traffic Safety Administration (NHTSA) during 1986 regarding implementation of applicable Sections of title V: "Improving Automotive Fuel Efficiency, " of the Motor Vehicle Information and Cost Savings Act as amended. NHTSA's responsibilities in the fuel economy area are set forth, and the report goes on to consider fuel economy improvement by manufacturers, 1985 rulemaking activities, and the impact of domestic content amendment. The use of advanced technology is also considered. It is noted that several new models of passenger cars and light trucks were introduced in 1986 with better fuel economy than their predecessors due to lighter weight, improved aerodynamics, and/or new engines and transmissions. Applications of alternative materials for lighter weight continued to increase as did electronic engine controls. Overall, the fuel economy of every sector of passenger cars and light trucks improved in MY 1986. Index Terms: Automobile, Fuel Consumption, Light Trucks, Lightweight Materials, National Highway Traffic Safety Administration, Regulation, Technology, Vehicle Characteristics Available from: National Highway Traffic Safety Administration 400 7th Street, SW Washington DC 20590 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Backlund90	Title: HEAVY TRUCKS ON THE HIGHWAYS: AN IMPORTANT PAVEMENT ISSUE Author(s): Backlund, RE: Gruver, JE Journal Title: Transportation Research Record Issue: 1272 Publication Date: 00/00/1990 Pagination: pp 114-121 Report No: ISBN: 0-309-05051-0 Features: FIGS: 5 Fig. TABS: 1 Tab. REFS: 9 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: With the completion of the Interstate system, attention has shifted from building a national highway network to improving, operating, and managing the highway system. Movement has been from construction to cost-effective management of highways. Truck movements are an important issue of concern because of the damaging effects that loads from heavy trucks (five-axle and larger) contribute to pavements over time. It has been determined that heavy trucks contribute, on average, 92% of loads applied to rural Interstate highways. However, it has been determined that there is great variance with respect to heavy-truck traffic by route and by region of the country. Use of visual presentations such as maps to highlight the differences in levels of heavy-truck traffic by route becomes an important consideration to pavement managers concerned with maintaining existing pavements and planning for pavements in future projects. Topics also discussed include the importance and methods of predicting previous and future volumes of heavy-truck traffic in the estimation of design loadings for highways of concern, future economic trends in the heavy-truck industry, comparisons of loads imposed by truck type, and the development of load maps using load factors sensitive to roadway type and vehicle classification. Index Terms: Economic Impact, Heavy Vehicle, Maintenance Planning, Pavement Management, Prediction, Traffic Volume, Trends, Truck Pavement Damage, Trucks Available from: Transportation Research Board Publications Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Baker59	Title: FUNDAMENTAL PROBLEMS IN RELATING VEHICLE SIZE TO HIGHWAY COSTS Author(s): Baker, RF Journal Title: Highway Research Board Bulletin Publication Date: 00/00/1959 Report No: Publisher/Corporate Author(s): Abstract: Research on the problem of determining the relationship between highway costs and vehicle size has been in progress at the ohio state university for more than four years under the sponsorship of four trucking firms and the ohio trucking association. This paper covers the following philosophies that can be utilized in cost assignment problems: (1) use of theoretical vs empirical relations between vehicle parameters and cost items, (2) theoretical vs engineering solutions wherein single-valued results are obtained, (3) direct or indirect sources of cost responsibility, and (4) distribution of indirect costs, classically designated as engineering or administration. Several practical difficulties that must be overcome in assessing cost responsibility also are discussed, such as: (1) combining capital improvement costs with annual costs for maintenance and operations, (2) combining of cost factors controlled by weight requirements with those controlled by factors other than weight, (3) influences of traffic data on the assignment of costs to various highway user groups, and (4) extrapolation of empirical data to include vehicle sizes greater than currently authorized. The paper concludes that the general shape of the curve for cost vs vehicle-size is available. Based on a given annual expenditure by a highway department, reasonable estimates of differential cost can be obtained. However, theoretical answers to the cost-size problem will not be available until the establishment of more rational methods for design, particularly for highway geometrics and the related cost factors. /author/ Index Terms: Cost Allocation, Cost Comparison, Curves, Geometric Design, Highway Costs, Highway Maintenance, Motor Vehicle, Size, Weight Available from:

Tag	**Abstract**
Barros85	Title: ANALYSIS OF PAVEMENT DAMAGE ATTRIBUTABLE TO OVERWEIGHT TRUCKS IN NEW JERSEY Author(s): Barros, RT Journal Title: Transportation Research Record Issue: 1038 Publication Date: 00/00/1985 Pagination: pp 1-9 Report No: ISBN: 4-1 Features: FIGS: 5 Fig. TABS: 4 Tab. REFS: 6 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: A study was undertaken to quantify the magnitude of the pavement damage done by overweight trucks in New Jersey. This was accomplished using the AASHTO 18-kip equivalent axle load parameter, established engineering-economic procedures, and data obtained from the New Jersey State Police. Questions specifically addressed include (a) How much pavement damage is attributable to overweight trucks? (b) What are the costs associated with this damage? (c) Are these costs adequately covered by the revenues collected from the overweight violators? (d) Is mandatory off-loading (requiring violators to immediately lighten their loads at the ticketed location) justifiable? It was found that detected overweight trucks cause a relatively small shortening of pavement life and, had they been successfully offloaded, a negligible savings would have resulted. However, there is serious concern that the number of overweight trucks actually detected represents only a small fraction of the total number of overweight violators. Attempts to estimate the total overweight truck population suggest that the total pavement damage attributable to all overweight trucks may approach $20 million per year. It was therefore concluded that a substantial increase in the revenue generated by overweight trucks may be appropriate. Index Terms: Benefit Cost Analysis, Highway User Costs, Maintenance Costs, Off-Loading, Overweight Loads, Quantifying, Revenue, Truck Pavement Damage Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Batts82	Title: IMPACT OF INCREASED TRUCK WEIGHTS ON RELATIVE COSTS OF MOTOR CARRIERS AND RAILROADS AND POTENTIAL MODAL DIVERSION (ABRIDGMENT) Author(s): Batts, LR: Kolins, RW: Selva, RT Journal Title: Transportation Research Record Issue: 889 Publication Date: 00/00/1982 Pagination: pp 37-39 Report No: Features: TABS: 1 Tab. REFS: 11 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The relative costs per ton-mile for rail boxcar, trailer-on-flatcar (TOFC), irregular-route motor carriers, and exempt owner-operators for the period 1977-1985 are examined. A specific rate of inflation was applied to each category of cost in 1977 for the four types of transportation service to determine the effect of inflation to 1985. The relative average freight costs per unit of output were than compared at truck gross vehicle weight limits of 73, 280 and 80, 000 lb. The principal finding of the study is that any shift in the average costs per ton-mile resulting from an increase in the truck weight limit is influenced by the impact of inflation on the various cost components. A comparison of the relative costs by type of service and mode suggests that inflation may have a more adverse impact on the railroads than on motor carriers of truckload freight. The analysis also indicates that, over the long term, the position of TOFC relative to truckload motor carriage could deteriorate because TOFC costs have been increasing faster than comparable truckload costs. Based on the economic factors specified and analyzed in this study, TOFC is not the preferred transport option over the 1981-1985 period. (Author) Index Terms: Cost Comparison, Impact Studies, Increase, Inflation, Modal Diversion, Motor Carriers, Rail Transportation, Truck Weights Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Berg97	Title: REDUCING DAMAGE TO LOW-VOLUME ROADS BY USING TRUCKS WITH REDUCED TIRE PRESSURES Author(s): Berg, RL: Kestler, MA: Moore, TL Language: English Journal Title: Transportation Research Record Issue: 1589 Publication Date: 00/00/1997 Pagination: pp 9-18 Report No: ISBN: 030906161X Features: FIGS: 9 Fig. TABS: 3 Tab. REFS: 16 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Heavy-volume highways in seasonal frost areas are designed to resist the effects of spring thaw. However, timber access roads, county roads, and other low-volume roads with thin bituminous surfaces can be quite susceptible to pavement damage during midwinter- and spring-thaw periods. To reduce damage to low-volume roads, towns, cities, and states typically either post reductions in allowable load or completely prohibit hauling during damage-susceptible periods. Associated economic impact can be significant. To evaluate the effects of tire pressure on cumulative road damage, a mechanistic pavement design procedure developed by the U.S. Army Corps of Engineers for use in seasonal frost areas was used on a matrix of tire pressures, low-volume pavement cross sections, and environmental conditions. A series of computer simulations showed (a) trucks operating with conventional tire pressures can cause excessive damage, particularly in the form of cracking, to low-volume roads with thin bituminous surfaces during relatively short thaw periods; (b) pavement damage could be reduced substantially by restricting hauling to trucks operating with reduced tire pressures; and (c) there are "threshold" tire pressures under which only minimal damage occurs, even during critical spring thaw. These results could influence guidelines for hauling restrictions and, in turn, associated economics. Index Terms: Bituminous Surfacing, Computer Simulations, Economic Impacts, Low Volume Roads, Pavement Damage, Reduced Tire Pressures, Seasonally Frozen Ground, Spring Breakup, Thawing, Tire Inflation Pressure, Trucks Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Bertram89	Title: CHANGING COSTS AND CHARACTERISTICS FOR EXEMPT MOTOR CARRIERS Author(s): Bertram, LM: Dooley, FJ: Wilson, WW Journal Title: Journal of the Transportation Research Forum Volume: 30 Issue: 1 Publication Date: 00/00/1989 Pagination: pp 170-177 Report No: Features: TABS: 7 Tab. REFS: Refs. Publisher/Corporate Author(s): Transportation Research Forum 1600 Wilson Boulevard, Suite 905 VA 22209 USA Abstract: Performance of the North Dakota grain trucking industry has been mixed during the past decade. Grain shipments by truck have declined in absolute and relative terms. Much of the decline can be attributed to the introduction of multiplecar rail rates and the ensuing changes in the grain elevator industry. The grain trucking firms which have survived the industry decline have improved operationally and lowered costs. From an operations perspective, evidence suggests that grain trucking firms have improved the utilization of their equipment. Increases in the percentage of loaded miles (i.e., revenue generating miles) and the average payload are both indicators of a healthy trucking industry. Using an economic engineering costing model, the typical firm's average total operating costs are estimated to be 0.8990 dollars per mile. Expressed in 1986 dollars, this represents a 27.3 percent drop in total operating costs between 1979 and 1986. Index Terms: Costs, Economic Analysis, Grain, Mathematical Models, Motor Carriers, North Dakota, Operating Costs, Performance, Trucking Industry Available from: Transportation Research Forum 1600 Wilson Boulevard, Suite 905 Arlington VA 22209 USA

Tag	Abstract
Billingsley63	Title: DIRECT COSTS AND FREQUENCIES OF 1958 ILLINOIS MOTOR-VEHICLE ACCIDENTS Author(s): Billingsley, CM: Jorgenson, DP Journal Title: Highway Research Record, Hwy Res Board Publication Date: 00/00/1963 Report No: Publisher/Corporate Author(s): Abstract: Accident experience of owners and operators of illinois registered passenger cars and trucks during the study year 1958 is related, in terms of costs incurred and accident frequencies, to the various highway systems of the state and to the use of the systems by passenger cars and trucks of different sizes and weights. A portion of the paper compares accident occurrence and costs in urban vs rural areas, and discusses the impact of the large metropolitan area of chicago with respect to the total direct cost determination for the state. An analysis of the various cost elements /property damage, injury treatment costs, value of time lost, legal fees, etc. / that make up the total direct costs of motor vehicle accidents is included. /author/ Index Terms: Accident Investigation, Accident Rate, Chicago, Comparison, Costs, Economic Analysis, Illinois, Injuries, Legal Fees, Metropolitan Areas, Motor Vehicle Accidents, Property Damage, Rural Area, State Highways, Time, Treatment, Urban Areas, Work Available from:

Tag	Abstract
Bisson85	Title: HIGHWAY COST ALLOCATION METHODOLOGY FOR PAVEMENT REHABILITATION AND CAPACITY-RELATED COSTS OCCASIONED BY AN INCREMENT IN HEAVY TRUCK TRAFFIC Author(s): Bisson, BG: Brander, JR: Innes, JD Journal Title: Transportation Research Record Issue: 1038 Publication Date: 00/00/1985 Pagination: pp 10-16 Report No: ISBN: 4-1 Features: FIGS: 4 Fig. TABS: 4 Tab. REFS: 7 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: A methodology is outlined for estimating incremental pavement rehabilitation and capacity-related costs that would be occasioned by loading an increment of bulk commodity traffic on a highway link. The cost estimates are referred to as "build-sooner costs" because they represent the financial impact of the increment of traffic on the future timing of pavement rehabilitation and capacity improvement projects. The analysis encompasses eight bulk commodity truck movement scenarios in the Province of New Brunswick, Canada. The build-sooner costs are compared with incremental user fee revenues that would be generated by these movements if they were to be captured by the truck mode. Index Terms: Cost Allocation, Highway Costs, Highway Improvements, Project Planning, Rehabilitation, Timing, Traffic Capacity, Traffic Loads, Truck Pavement Damage Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Blanchard91	Title: MONSTER TRUCKS: DANGER AHEAD Author(s): Blanchard, CF Journal Title: Trial Volume: 27 Issue: 6 Publication Date: 06/00/1991 Pagination: pp 106-110 Report No: Publisher/Corporate Author(s): Association of Trial Lawyers of America 1050 31st Street, NW DC 20007 USA Abstract: Unless individuals--and lawyers representing victims--get involved, the monster trucks will soon take over the highways. Arrayed against those who speak for victims is a powerful lobby, not only in Washington but also in state capitals. The lobby is now trying to convince Congress and the state legislatures that, in order to increase productivity, the various jurisdictions should legalize monster triple- and longer double-trailer vehicles. This article points out some of the dangers that lie ahead if such trucks are legalized. In representing accident victims and their families, trial lawyers gather evidence about what causes many of these tragedies. Among this evidence are the following: driver fatigue - truck drivers are particularly vulnerable; drug and alcohol abuse - one out of three truckers killed on the roads died with excessive amount of illegal drugs or alcohol in the blood; bad tires, improper brakes, or other mechanical defects - drivers often avoided the check stations; an excessive load that caused the vehicle to become difficult to control; industry practice of paying the driver for the miles driven and not the hours worked; and collisions where laws of physics dictated that the truck would suffer little or no damage but the car would be demolished, its driver and passengers maimed or killed. Also pointed out are the economic considerations that argue against increasing truck size and weight, such as accelerated road deterioration that will require investment in either heavy-duty surfaces or more frequent maintenance, and the cost of redesigning highways to accommodate longer combination vehicles. Index Terms: Economic, Hazard, Highway Design, Highway Safety, Longer Combination Vehicles, Size And Weight Laws, Triple Trailer Trucks, Truck Highway Damage, Trucks Available from: Association of Trial Lawyers of America 1050 31st Street, NW Washington DC 20007 USA

Tag	Abstract
Blumenfeld85	Title: DISTRIBUTION STRATEGIES THAT MINIMIZE TRANSPORTATION AND INVENTORY COSTS Author(s): Blumenfeld, DE: Burns, LD: Daganzo, CF: Hall, RW Journal Title: Operations Research Volume: 33 Issue: 3 Publication Date: 05/00/1985 Pagination: pp 469-490 Report No: Features: REFS: 18 Ref. Publisher/Corporate Author(s): Operations Research Society of America 428 East Preston Street MD 21202 USA Abstract: This paper develops an analytic method for minimizing the cost of distributing freight by truck from a supplier to many customers. It derives formulas for transportation and inventory costs, and determines the optimal trade-off between these costs. The paper analyzes and compares two distribution strategies: direct shippihng (i.e., shipping separate loads to each customer) and peddling (i.e., dispatching trucks that deliver items to more than one customer per load). The cost trade-off in each strategy depends on shipment size. Results indicate that, for direct shipping, the optimal shipment size is given by the economic order quantity (EOQ) model, while for peddling, the optimal shipment size is a full truck. Index Terms: Freight Transportation, Goods Movement, Inventories, Operating Costs, Optimization, Trade Offs Available from: Linda Hall Library 5109 Cherry Street Kansas City MO 64110-2498 USA Acknowledgement of Document Source: Engineering Information, Inc

Tag	Abstract
Boothby96	Title: PROBABILITY-BASED COST ALLOCATION OF BRIDGE FATIGUE DAMAGE Author(s): Boothby, TE: Laman, JA Editor(s): Frangopol, DM: Hearn, G Language: English Conference Title: Structural Reliability in Bridge Engineering: Design, Inspection, Assessment, Rehabilitation and Management. Proceedings of the Workshop Sponsored by: National Science Foundation, Federal Highway Administration, Colorado Department of Transportation Location: Boulder, Colorado Date Held: 19961002-19961004 Publication Date: 00/00/1996 Pagination: pp 207-212 Report No: ISBN: 0070277079 Features: FIGS: 3 Fig. TABS: 3 Tab. REFS: Refs. Publisher/Corporate Author(s): McGraw-Hill, Incorporated 1221 Avenue of the Americas NY 10020 USA Abstract: Federal Highway Administration (FHWA) highway cost allocation studies (HCAS) have been undertaken to determine the consumption of infrastructure by various classes of users as a function of the resources required to construct and maintain the system. An important consideration in the cost allocation of bridge expenditures is fatigue damage. Past HCAS have incorporated deterministic methodologies for fatigue damage evaluation of damage assigned to each of the truck vehicle classes and weight groups. Average weights and axle spacing are used to represent the distribution of vehicles in a particular class and weight group. Due to the large variation of several critical aspects of a fatigue evaluation for HCAS, a probability-based evaluation is a more rational approach. This paper develops the necessary probability-based HCAS framework to assess fatigue damage responsibilities. Vehicle load models, both currently available and required, are identified as well as highway bridge fatigue resistance models. Probabilistic evaluation techniques for structural reliability are then integrated into a new bridge HCAS evaluation methodology consistent with the established uncertainties. Index Terms: Bridges, Cost Allocations, Fatigue (Materials), Highway Bridges, Probability, Resistance Models, Structural Reliability, Vehicle Load Models, Workshops (Meetings) Available from: McGraw-Hill, Incorporated 1221 Avenue of the Americas New York NY 10020 USA

Tag	Abstract
Bowman89	Title: EXAMINATION OF TRUCK ACCIDENTS ON URBAN FREEWAYS. FINAL REPORT Author(s): Bowman, BL: Hummer, JE Publication Date: 12/00/1989 Pagination: 101p Period Covered: 870700-8907 Report No: Publisher/Corporate Author(s): Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 Goodell-Grivas, Incorporated 17320 West Eight Mile Road MI 48075 USA Abstract: The objective of this study was to determine the nature and extent of urban freeway accidents involving trucks, over 10, 000 lb gross vehicle weight, and their consequences as a function of vehicle type and traffic and roadway characteristics. The study was limited to urban freeways and expressways with large total volumes (minimum 100, 000 average daily traffic) and a significant percentage of large truck traffic (minimum 5%). The primary tasks involved a review of the literature, and the analysis of accident and operational data from selected urban freeway sites. A total of 2, 221 verified truck accidents were included in the study occurring during 3.75 years on 46.5 miles of freeway. The study determined the characteristics of truck accidents, developed comparisons between truck and passenger vehicle accidents, and estimated the operational and economic consequences of truck accidents. An estimate of the total annual cost of urban freeway accidents was determined to be $634, 000 per freeway mile. Applying this estimate to the total 2, 497 Interstate and freeway miles, with volumes greater than 100, 000 vehicles per day, that exist nationwide results in a nationwide annual cost of 1.6 billion dollars due to truck accidents on urban freeways. Index Terms: Accident, Accident Costs, Heavy Duty Trucks, Reviews, Traffic Accident Analyses, Urban Freeways Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: Federal Highway Administration

Tag	**Abstract**
Breed35	Title: THE EFFECT OF HEAVY MOTOR VEHICLES ON HIGHWAY COSTS Author(s): Breed, CB DISCUSSER: Downs, WS DISCUSSER: Fairbank, HS DISCUSSER: Lavis, F: Marston, A DISCUSSER: Pope, CS DISCUSSER: Thompson, JT DISCUSSER Journal Title: Highway Research Board Proceedings Publication Date: 00/00/1935 Report No: Publisher/Corporate Author(s): Abstract: This paper is a discussion of the relative effects of heavy and light vehicles upon the various items that affect design and cost. Included in the discussion are statistics on the number of vehicles in each class, taxes paid by motor vehicles, weights and dimensions of trucks and buses, mileage of roads and pavements, and freight ton-miles handled by the various transportation agencies. The conclusion is that widths, gradients, alignments and all other elements of design of modern highways, except possibly the thickness of pavement, are determined by the requirements of private passenger automobiles which comprise over 80 percent of all motor vehicles. The heavier vehicles, having a rated capacity of 1 1/2 tons or more, comprise about 2.5 to 3 percent of all motor vehicles using the roads and city streets. The presence of these heavier vehicles may require some additional thickness of pavement but it is probable that this increased thickness of pavement but it is probable that this increased thickness may be economically justified by longer life and reduced maintenance. In any event the additional cost of the extra thickness for high type pavements cannot be estimated at over $2000 to $4000 per mile. /author/ Index Terms: Construction Costs, Highway Costs, Highway Design, Maintenance Costs, Pavement Thickness, Vehicle, Weight Available from:

Tag	Abstract
British90	Title: BRITISH TRUCK OPERATING COSTS FOR 1990 Journal Title: Transport Engineer Publication Date: 01/00/1990 Pagination: pp 22-23 Report No: Features: TABS: 2 Tab. Publisher/Corporate Author(s): Institute of Road Transport Engineers 1 Cromwell Place England Abstract: This article predicts truck operating costs for 1990 in the United Kingdom. How these costs will be affected by company overhead increases, by the Government Budget (due out in March), and by trends in the economy that transport serves are discussed, and tables are included showing the costs by gross vehicle weight. Index Terms: Great Britain, Operating Costs, Prediction, Trucking Industry Available from: Institute of Road Transport Engineers 1 Cromwell Place London SW7 2JF England

Tag	Abstract
Bronzini94	Title: PRODUCTIVITY EFFECTS OF TRUCK SIZE AND WEIGHT POLICIES: FINAL REPORT Author(s): Bronzini, MS: Middendorf, DP Language: English Publication Date: 11/00/1994 Pagination: 96p Report No: Publisher/Corporate Author(s): Oak Ridge National Laboratory TN 37830 USA Abstract: While previous studies have indicated that increases in truck size and weight limits could improve motor carrier productivity, the question of whether or not freight shippers will also benefit has not been adequately addressed. It is generally assumed that competitive conditions in the motor carrier industry will result in cost savings being passed to shippers in the form of lower freight rates. Transportation costs, however, are only one component of shipper total logistics cost. Warehousing cost, inventory holding cost, order processing cost, and other categories of business logistics cost may also change as a result of the less frequent but larger shipments typically associated with the use of longer combination vehicles (LCVs). If switching from single trailer truckload shipments to LCVs causes shipper non-transport logistics costs to increase more than the savings available from lower freight rates, then productivity gains may be lost to the firm and the economy as a whole. This research was undertaken to determine the net effect of truck size and weight policy changes on shipper total logistics cost and how these effects might influence the demand for alternative tractor-trailer configurations. Index Terms: Cost Analysis, Freight Transportation, Longer Combination Vehicles, Productivity, Truck Load Limits, Truck Weights Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Brooks99	Title: EFFECT OF TRUCK PAYLOAD WEIGHT ON PRODUCTION Author(s): Brooks, BT: Schexnayder, C: Weber, SL Language: English Journal Title: Journal of Construction Engineering and Management Volume: 125 Issue: 1 Publication Date: 01/00/1999 Pagination: pp 1-7 Report No: Features: FIGS: 8 Fig. TABS: 1 Tab. PHOT: 1 Phot. REFS: 14 Ref. APPS: 1 App. Publisher/Corporate Author(s): American Society of Civil Engineers 1801 Alexander Bell Drive VA 20191-4400 USA Abstract: Most constructors intuitively understand that there is a relationship between payload weight and haul unit performance. At the same time, project managers constantly push the limits of rated truck payload as they seek increased productivity. This is because it is believed that increased productivity translates into reduced project cost. These ideas are quantitatively examined using payload data from seven Caterpillar 785B off-highway haul trucks working on an earth/rockfill dam in California. Caterpillar's Vital Information Management System was used to collect load data from 54, 300 truck cycles representing aproximately 14, 419 operating hours and haulage of more than 7.25 million metric tons (8 million tons) of material. There was a diminished productivity increase when the load weight exceeded the truck's rated gravimetric capacity. Adding sideboards actually caused the average monthly production of the fleet to decrease. The plot of load times versus load weight appears to indicate a human factors relationship between load time and providing the shovel operator load weight information with indicator lights mounted on the trucks. Index Terms: Construction, Cost Effectiveness, Costs, Earth Dams, Earthwork, Gravimetric Analysis, Human Factors, Loads, Productivity, Rockfill Dams, Trucks, Weight Geographic Terms: California Available from: American Society of Civil Engineers 1801 Alexander Bell Drive Reston VA 20191-4400 USA

Tag	Abstract
Brown78	Title: EFFECTS OF HEAVY TRUCKS ON TEXAS HIGHWAYS Author(s): Brown, JL: Burke, D: Roberts, FL: Walton, CM Publication Date: 09/00/1978 Pagination: 63 p. Period Covered: 780400-7809 Report No: Features: FIGS: 15 Fig. TABS: 2 Tab. REFS: 29 Ref. APPS: 1 App. Publisher/Corporate Author(s): Texas State Department of Highways & Public Transp P.O. Box 5051 TX 78763 USA Texas Transportation Institute Texas A&M University 77843 Texas University, Austin Center for Highway Research 78712 Abstract: The objective of this study was to assess the effects of projected truck traffic on the highway system of Texas in consideration of the social and economic vitality of the State. The study included the evaluation of the costs and benefits for a twenty-year planning horizon. Alternative scenarios of future truck traffic were assessed. The study did not consider the effects of changes in the size of trucks, only increases in the gross weights and axle loads. /Authors/ Index Terms: Axle Load, Benefit Cost Analysis, Economic, Impact Studies, Transportation Planning, Truck Weights, Trucks Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Brown79	Title: HEAVY TRUCKS ON TEXAS HIGHWAYS: AN ECONOMIC EVALUATION Author(s): Brown, JL: Burke, D: Walton, CM Journal Title: Transportation Research Record Issue: 725 Publication Date: 00/00/1979 Pagination: pp 8-15 Report No: Features: FIGS: 12 Fig. TABS: 2 Tab. REFS: 24 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: A study undertaken to assess the effects of projected truck traffic on the highways system of Texas is described. The study included the evaluation of costs and benefits for a 20-year planning horizon. Alternative scenarios of future truck traffic were assessed. The study considered only an increase in gross vehicle weights and axle loads and not the effects of changes in the size of trucks or the effects of heavy trucks on county roads and city streets. The major approach to the study involved estimating the comparative pavement maintenance and rehabilitation costs of perpetuating the state highway system under current weight limitations and of future use under different weight conditions. It is concluded that, if changes in weight laws are undertaken, further analysis will be needed to select those routes that would carry relatively large freight tonnages and cost relatively less to upgrade. Index Terms: Economic Impact, Heavy Vehicle, Increase, Maintenance Costs, Pavement Construction, Rehabilitation, Traffic Loads, Truck Laws & Regulations, Truck Load Limits Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Burke80	Title: TRUCK SIZES AND WEIGHTS: A SCENARIO ANALYSIS Author(s): Burke, D: Walton, CM Journal Title: Transportation Research Record Issue: 747 Publication Date: 00/00/1980 Pagination: pp 78-83 Report No: Features: FIGS: 3 Fig. TABS: 7 Tab. REFS: 10 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The findings of a current study in the state of Texas to evaluate some of the effects of allowing large and heavier trucks to operate on the highway system are presented. Four scenarios, each of which includes four to six vehicle classes, were studied to determine the effects each would have on highway bridge costs, truck operating costs, and fuel consumption over a 20-year planning period. One scenario represents that existing legal situation, and the other three range from a weight-only increase to variations in size and weight. City streets and county roads are not included in the analysis. One scenario that includes eastern-region double-trailer and triple-trailer combinations compares favorably with the current situation in terms of estimated highway costs. This scenario is characterized by truck units that have a maximum length of 32 m (105 ft), maximum width of 2.59 m (102 in), and gross vehicle weight (axle) of 468.9 kN (105, 500 lbf) and retains the current bridge formula. A maximum truck unit height of 4.11 m (13.5 ft) is also retained. Savings in track operating costs and fuel consumption are estimated to be significant. The full results for each scenario and highway class are given. The highway costs used in the analysis reflect costs related to pavements and bridges; they do not include any consideration of changes in geometric design conditions or costs asociated with public safety. (Author) Index Terms: Costs, Highway Pavements, Increase, Size And Weight Laws, Truck Effects (Bridges), Truck Laws & Regulations, Truck Weights Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Burke81	Title: COMPUTERIZED METHOD OF PROJECTING REHABILITATION AND MAINTENANCE REQUIREMENTS DUE TO VEHICLE LOADINGS. VOLUME 4: USERS MANUAL Author(s): Burke, D: Garcia-Diaz, A: Lytton, RL: McCullough, BF: Walton, CM Publication Date: 08/00/1981 Pagination: 271p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 11 Ref. APPS: 1 App. Publisher/Corporate Author(s): Texas State Department of Highways & Public Transp P.O. Box 5051 TX 78763 USA Texas Transportation Institute Texas A&M University 77843 Texas University, Austin Center for Transportation Research 78712 Abstract: Instructions are provided for users of the program RENU which provides methodology for determining the effects of changes in truck size, weight, and configuration on pavement performance and for relating these effects to pavement maintenance and rehabilitation needs and costs. This manual summarizes the evaluation procedure, describes all input parameters and data sources, and describes RENU usage together with examples. The procedure evaluates the effect of legal load limit changes on the life cycle costs of flexible, rigid, and/or composite pavements. Eighty representative design sections are grouped by system classifications of highways. A maximum of 10 different truck types are allowed along with various axle and tire configurations. While truck axle weight and configuration are the major variables considered, new trucks, such as triple trailer units can be included in the procedure. A computerized gross vehicle weight and axle load distribution shifting procedure to assess the impact of changes in current legal load limits is provided. Users may select different maintenance and rehabilitation cost models. The procedure also allows evaluation of a small road network, district, or state. Index Terms: Axle, Change, Computer Programs, Computer Simulation Models, Maintenance Costs, Manuals, Pavement Evaluation, Pavement Maintenance, Pavement Performance, Rehabilitation, Size And Weight Laws, Tires, Truck Load Limits, Truck Weights Available from:

Tag	Abstract
Burke85	Title: SOME MEASURES OF ACCESSIBILITY OF LARGE TRUCKS TO THE TEXAS HIGHWAY SYSTEM. FINAL REPORT Author(s): Burke, D: Fesenmaier, J Publication Date: 06/00/1985 Pagination: 61p Period Covered: 8309-8506 Report No: Features: FIGS: 15 Fig. TABS: 18 Tab. REFS: Refs. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Texas State Department of Highways & Public Transp Transportation Planning Division, P.O. Box 5051 DC 78763 Texas Transportation Institute Texas A&M University TX 77843 USA Abstract: The Surface Transportation Assistance Act (STAA) of 1982 established a nationally uniform maximum limit to the length, width, and weight of commercial vehicles. In accordance with the act, a national network of routes that could safely and structually accomodate the large and heavier vehicles was established. The objective of this study was to develop procedures for identifying truck routes and for determing accessibility to the selected network. This goal was accomplished in two stages. First potential demand for access to the network was identified. Emphasis was placed on counties that have large economic and demographic bases, and on areas that are currently small yet have exhibited recent growth trends. The second stage focused on the network or the spatial structure of routes. Ahierarchy of four coverage patterns was evaluated in terms of the amount of demand satisfied by the network. The four network varied in degree of complexity. (Author) Index Terms: Accessibility, Heavy Vehicle, Optimization, Road Network, Truck Route Available from: Texas Transportation Institute Texas A&M University College Station TX 77843 USA

Tag	Abstract
Butler86	Title: SYSTEMWIDE PAVEMENT DETERIORATION ANALYSIS. FINAL REPORT Author(s): Butler, BC, Jr: Halbach, DS Publication Date: 03/00/1986 Pagination: 173p Period Covered: 8403-8603 Report No: Publisher/Corporate Author(s): ARE, Incorporated 2600 Dellana Lane TX 78746 USA Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 Abstract: The EAROMAR 2 (Economic Analysis of Roadway Occupancy for Maintenance and Rehabilitation) computer program was updated to make network level cost estimates. The new EAROMAR SW version has a data base consisting of information from the Highway Performance Monitoring System (HPMS), FHWA truck weight data distributions, and nationwide environmental factors. The new pavement damage models which have been incorporated into EAROMAR SW come from the latest work by the World Bank to update its Highway Design and Maintenance Standards Model (HDM) and the FHWA cost allocation study. The new program retains its original capability of evaluating project level conditions of roadway occupancy. Sensitivity results and regional estimates for the Interstate system demonstrate the system capabilities. Index Terms: Computer Programs, Costs, Deterioration, Economic Analysis, Estimates, Pavement Maintenance Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: Federal Highway Administration

Tag	**Abstract**
Cantwell78	Title: THE ENERGY AND ENVIRONMENTAL CONSEQUENCES OF INCREASED VEHICLE SIZE AND WEIGHT. VOLUME I Author(s): Cantwell, WC: Hicks, RG: Layton, RD: Mingle, JG: Phelps, RE Publication Date: 01/00/1978 Pagination: 173 p. Period Covered: 760700-7801 Report No: Publisher/Corporate Author(s): Department of Transportation Office of University Research DC 20590 Oregon State University Transportation Research Institute OR 97331 USA Abstract: The study objectives are to determine whether increased size and weight vehicles would be energy efficient and cost effective and to investigate operational and environmental consequences resulting from their use. Not all the objectives were obtained since only Phase I of a proposed two-phase study was completed, and lack of data restricted work in cost responsibility, safety and bridges. Findings include (1) non-uniformity in size and weight regulations between states which creates artificial barriers to economic truck operation, (2) increasing axle loads by 33 percent could reduce pavement surface life by 80 percent unless thickness is increased by 2 1/2 inches, (3) further work is needed to define the effect of heavier trucks on bridges, (4) the effect of larger, heavier trucks on the traffic stream can be quantified using a computer program developed in the study, (5) the data base for safety effects is inadequate, (6) operating costs are less for heavier, larger trucks, (7) environmental effects appear to be less significant than effects on bridges, etc., (8) incremental fuel requirements for different size and weight trucks can be quantified while assessment of energy requirements for highway construction and maintenance needs further work and (9) considerable additional work is needed to define how the costs and benefits attributed to vehicles of various sizes are distributed to impacted or benefitting groups. Index Terms: *Size Determination, *Trucks, Axle Load, Benefit Cost Analysis, Bridge, Computer Programming, Computer Programs, Computerized Simulation, Cost Effectiveness, Energy, Environmental Impact, Fuel Consumption, Highway Construction, Highway Maintenance, Maintenance, Operating Costs, Pavement, Pavement Thickness, Regulation, Safety, Size, Truck Transportation Economics, Truck Weights, Vehicle Operating Cost, Weight Mass Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Cantwell78a	Title: THE ENERGY, ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF INCREASED VEHICLE SIZE AND WEIGHT. VOLUME II. COMPENDIUM OF APPENDICES Author(s): Cantwell, WC: Hicks, RG: Layton, RD: Mingle, JG: Phelps, RE Publication Date: 01/00/1978 Pagination: 404 p. Period Covered: 7607-7801 Report No: Publisher/Corporate Author(s): Department of Transportation Office of University Research DC 20590 Oregon State University Transportation Research Institute OR 97331 USA Abstract: This compendium supplements the 'Final Report' and consists of an Introduction, a review of factors affected by increased vehicle size and weight (energy, costs, operations, environmental) including whether these factors are treated from a qualitative, quantitative, or analytical standpoint in the report. (Summary given in eight tables). Appendices A through J give detailed findings and include a summary of a workshop, review of size and weight regulations and permit operations, evaluation of effect of heavier, larger trucks on pavement life, bridge performance, highway costs, truck performance, traffic operations, truck costs, safety and environmental. The detailed information in this compendium is summarized in the companion Volume I, Final Report. Index Terms: *Size Determination, *Trucks, Benefit Cost Analysis, Bridge, Computer Programming, Computerized Simulation, Cost Effectiveness, Costs, Economic Impact, Energy, Environmental Impact, Highway Costs, Maintenance, Operating Costs, Pavement, Pavement Life, Regulation, Safety, Size, Truck Transportation Economics, Truck Weights, Vehicle Operating Cost, Vehicle Performance, Weight Mass Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Carmichael79	Title: PROCEDURE FOR EVALUATING THE EFFECTS OF LEGAL LOAD LIMITS ON PAVEMENT COSTS Author(s): Carmichael, RF, III: Roberts, FL: Treybig, HJ Journal Title: Transportation Research Record Issue: 725 Publication Date: 00/00/1979 Pagination: pp 1-8 Report No: Features: FIGS: 4 Fig. TABS: 3 Tab REFS: 11 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: A computer program that evaluates the effect of changes in legal load limits on the life-cycle costs of flexible, rigid, and composite pavements is described. The methodology of the NULOAD program for determining the effects of changes in truck size, weight, and configuration on pavement performance is examined, and these effects are related to maintenance and rehabilitation and their related costs. A sample problem from NULOAD is also discussed. Fifty representative sections can be grouped by type of system (such as Interstate sections) to reflect the effect of traffic loadings on the different classes of highways. The procedure permits inclusion of a maximum of 10 different truck types along with various axle and tire configurations, such as single axles with single tires and tridem-axle, single-axle, and tandem-axle configurations. Truck axle weight and configuration are the major variables considered, but the procedure can also handle new sizes of trucks, such as the triple-trailer units. The procedure also includes a computerized shifting procedure for gross vehicle weight and axle-load distribution. (Author) Index Terms: Axle Load, Composite Pavements, Computer Programs, Flexible Pavement, Life Cycle Planning, Load Distribution, Maintenance Costs, Pavement Construction, Rehabilitation, Rigid Pavement, Traffic Loads, Truck Laws & Regulations, Truck Load Limits Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Casavant82	Title: CHANGING COSTS AND CHARACTERISTICS OF OPERATING MOTOR CARRIERS: A CASE STUDY OF GRAIN TRUCKING FIRMS IN NORTH DAKOTA Author(s): Casavant, KL Journal Title: Transportation Research Forum Proceedings Volume: 23 Issue: 1 Publication Date: 00/00/1982 Pagination: pp 294-299 Report No: Features: TABS: 13 Tab. Publisher/Corporate Author(s): Cross (Richard B) Company, Incorporated P.O. Box 405 47971 USA Abstract: Selected motor carriers carrying North Dakota grain were surveyed by mail in late 1980. The data from this survey were compared with those from studies carried out in 1966 and 1978. Overall, the state's grain trucking industry appears to have become more efficient over the last five years. Annual mileage per vehicle as well as the percentage of return trips that are loaded has increased. Also, the industry has stabilized after a substantial increase in entry of new firms in the 1966-76 period. By 1980 large, older firms seem to have regained market share. Because of internal scale economies, these larger firms have a 4 cent per mile cost advantage over smaller firms which could yield a competitive advantage in pricing that may result in even higher concentration ratios in the longer run. Index Terms: Case Studies, Costs, Freight Transportation, Grain, Surveys (Data Collection), Truck Transportation Economics, Trucking Industry Available from: Cross (Richard B) Company, Incorporated P.O. Box 405 Oxford, Indiana 47971 USA

Tag	Abstract
Chatti95	Title: VEHICLE/PAVEMENT INTERACTION AT THE PACCAR TEST SITE. FINAL REPORT Author(s): Chatti, K: Kramer, SL: Mahoney, JP: Monismith, CL: Moran, TJ: Winters, BC Language: English Publication Date: 11/00/1995 Pagination: 166p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 1 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Washington State Department of Transportation, Transportation Building, MS 7370 98504-7370 Washington State Transportation Center Washington University, 1107 NE 45th Street, Suite 535 WA 98105- USA Abstract: The condition of the U.S. highway system has been and continues to be a major concern of both the highway and trucking communities. This is understandable given the fact that in 1990, combination vehicles with five or more axles accounted for 91% of the 18, 000 pound equivalent axle loads (ESALs) on rural Interstate highways. This heavy vehicle traffic and the pavement system it travels on combine to generate a perpetual cycle of pavement deterioration and rehabilitation. Increasing truck traffic leads to predictable pavement damage that in turn contributes to potentially increasing dynamic loading of the pavement. This cycle continues until some form of pavement rehabilitation is undertaken. The trucking community alters the design and operation of their vehicles largely due to economic considerations (profit) but also in response to the ride quality (or lack thereof) of the infrastructure to which they are bound. On the other hand, the pavement community is constantly updating design and construction practice to improve pavement performance. Unfortunately, both parties develop a form of "technical tunnel vision" and work to resolve some of the same concerns without the benefit of a possible mutual effort. As such it was recognized that there was a need to improve our mutual understanding of truck pavement interaction. Often, but not always, a beneficial change in one community (such as smoother pavements) benefits the other (less truck/cargo damage). This report is part of a multiphased research project entitled "Truck/Pavement Interaction" conducted jointly by the University of Washington, University of California-Berkeley, Washington State Department of Transportation (WSDOT), California Department of Transportation (Caltrans), and PACCAR, Inc. This is an attempt to promulgate a mutually beneficial dialog between the pavement and trucking communities. The objective of the research is to investigate how different truck suspensions, tire/axle combinations, tire loads, and tire pressures affect pavement response and conversely how pavement condition affects truck performance and damage. These objectives will be accomplished by operating instrumented trucks over an instrumented pavement section. Index Terms: Cargo Damage, Instrumentation, Ride Quality, Test Sections, Test Vehicles, Testing, Truck Damage, Truck Pavement Damage, Vehicle/Pavement Interaction Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Chenoweth95	Title: NEXT-GENERATION VEHICLES (BREAKOUT SESSION) Author(s): Chenoweth, A: Cihak, F: Kelley, J: Kerrebrock, J: Sperling, D Language: English Journal Title: CONFERENCE PROCEEDINGS 9 Conference Title: Forum on Future Directions in Transportation R&D Sponsored by: Transportation Research Board; and National Science and Technology Council. Location: Washington, D.C. Date Held: 19950306-19950307 Publication Date: 00/00/1995 Pagination: pp 70-73 Report No: ISBN: 0309061679 Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Participants of the breakout session on next-generation vehicles split into four subgroups to discuss personal motor vehicles, aerospace vehicles, trucks and buses, and rail vehicles. The personal motor vehicles subgroup's discussion focused on the National Science and Technology Council's Strategic Implementation Plan and the following changes were recommended: add Partnership for a New Generation of Vehicles (PNGV) Goal 2, which is to implement commercially viable innovation from ongoing research on conventional vehicles, for incremental improvements; add the need for long-range research and development (R&D); and include energy storage technologies. The aerospace subgroup also focused on the Strategic Implementation Plan, agreeing that the plan, in general, represents a valid statement of objectives for aerospace R&D. However, the following deficiencies were noted: the plan does not include any requirement for the development of new wind tunnel facilities; the plan does not place sufficient emphasis on the need to maintain aerospace R&D programs during the current economic downturn and in light of the downsizing of aerospace organizations; and the plan does not sufficiently emphasize air traffic control. The trucks and buses subgroup believed that these vehicles should not be grouped together for discussion or R&D activities, and that the Strategic Implementation Plan does not adequately discuss trucks or buses. The subgroup agreed that the bus industry requires targeted R&D, specifically with regard to designing lightweight vehicles using aerospace materials, and that the cost of several components used in U.S. buses needs to be addressed. The rail vehicles subgroup discussed the close linkage of railcars to the infrastructure, railcar weight and opportunities for reducing it, rail safety at grade crossings, the use of alternative fuels in locomotives and electrification as opportunities for energy and air quality improvements, and the need for R&D in the heavy-haul freight and intermodal container areas. Index Terms: Aerospace Vehicles, Buses (Vehicles), Conferences, Personal Motor Vehicles, Rail Vehicles, Research And Development, Transportation, Trucks Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Chira85	Title: CAUSAL ANALYSIS OF ACCIDENT INVOLVEMENTS FOR THE NATION'S LARGE TRUCKS AND COMBINATION VEHICLES Author(s): Chira-Chavala, T: Cleveland, DE Journal Title: Transportation Research Record Issue: 1047 Publication Date: 00/00/1985 Pagination: pp 56-64 Report No: ISBN: 3-0 Features: FIGS: 1 Fig. TABS: 6 Tab. REFS: 8 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The chance of accident involvements of the Interstate Commerce Commission-authorized, large, single-unit trucks and tractor-trailers was investigated using the 1977 Bureau of Motor Carrier Safety accident and the Highway Cost Allocation Study exposure data. The model used was discrete-multivariate and capable of simultaneously analyzing both the accidents and the exposure. The variables that were found to be important predictors of accident involvements include trailer style, vehicle configuration, number of axles of power unit, trip length, road class, road surface condition, loading status, day/night, driver experience, and driver age. Particularly high accident involvement rates, of 200 involvements per 10 to the 8th power mi or higher, were shown by all van singles in local service, 3-axle-tractor singles in local service, 2-axle straight trucks in local service, and flatbed doubles in over-the-road service. Low accident involvement rates, less than 50 involvements per 10 to the 8th power mi, were shown by all 3-axle straight trucks and 2-axle straight trucks in over-the-road service. Van singles and tanker singles in over-the-road service showed moderate involvement rates (less than 100 involvements per 10 to the 8th power mi), while 2-axle-tractor van doubles and 2-axle-tractor tanker doubles showed higher rates (120 to 200 involvements per 10 to the 8th power mi). Index Terms: Accident Rate, Axle Load, Driver Age, Heavy Vehicle, Highway Classification, Multivariate Analysis, Pavement Condition, Tractor Trailers, Traffic Accident Analyses, Traffic Accident Causes, Trip Length, Vehicle Classification Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Chu73	Title: CHANGES IN LEGAL VEHICLE WEIGHTS AND DIMENSIONS: SOME ECONOMIC EFFECTS ON HIGHWAYS Author(s): Chu, TY: Cosby, JC: Whitaker, RC: Whiteside, RE: Winfrey, R Journal Title: NCHRP Report Issue: 141 Publication Date: 00/00/1973 Pagination: 184 pp Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 7 App. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: This report which was prepared from a review of literature, contains information on the principal factors involved in the construction, operation and maintenance of the highway system that are related to vehicle weights and dimensions, as well as presentes an analysis of these factors for their impacts on benefits and disbenefits to highway users and non-users. Methods have been assembled from the state of the art that permit projection of estimated use of highway facilities by various classes of commercial vehicles, the division of motor freight among vehicle classes on principal types of highways, and estimated payloads these vehicles will transport. Details are given of two separate estimates that are proposed. One estimate projects the foregoing factors on the assumption that no change is made in present legal limits the second estimate repeats the process, with the assumption that the proposed limits are put into use. Pavement structural weakening is estimated by using equivalent 19-kip simple-axle equivalence factors developed in the AASHO Road Test and modified to conform to local conditions where such correlations have been established. Two methods for estimating cost impacts on existing and planned pavement structures, varying in scope and detail, are recommended. A numerical example is presented of the application of each method. A method is also presented for estimating the accident incidence rate for vehicles whose speed distribution is different from average highway speed, originially applied as warrants for truck climbing lanes. Highway classification and needs studies and methods of highway costs allocation are reviewed, as well as, oversize and overweight permit operations. The benefits resulting from changes in legal limits are identified and disbenefits, penalties that may be imposed on other users of the highways as a result of the increases in legal limits, are dicussed. Based on this study, the observation is made that a cost/benefit analysis method can be applied as a limited decision factor within the present state of the art. The method for this application would scale the costs required to construct one mile of new highway, including a pro rate share of bridge structures to the benefits of the track operator in reducing the operating costs of moving motor freight over the hypothetical mile. Index Terms: AASHO Road Test, Accident Rate, Axle Load, Benefit Cost Analysis, Change, Cost Allocation, Dimensional Measurement, Economic, Estimates, Freight Transportation, Highway Construction, Highway Maintenance, Law, Limits, Line Haul Transport, Open Hearth Furnaces, Pavement, Reviews, Speed, Truck Effect On Highway Capacity, Truck Effects (Bridges), Truck Laws & Regulations, Truck Transportation Economics, Vehicle Characteristics, Vehicle Operating Cost, Weight Control Available from: Transportation Research Board 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Clayton91	Title: GROSS VEHICLE WEIGHT DISTRIBUTIONS AS A FUNCTION OF WEIGHT LIMITS Author(s): Clayton, AM: Thom, RG Journal Title: Transportation Research Record Issue: 1313 Publication Date: 00/00/1991 Pagination: pp 11-19 Report No: ISBN: 0-309-05124-X Features: FIGS: 9 Fig. TABS: 4 Tab. REFS: 15 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Weight limits are a principal determinant of the weight characteristics of large trucks. They provide a logical and practical base from which these weight characteristics can be predicted. Such predictions are necessary for evaluating the relative benefits and costs of alternative weight and dimension policies. During the past 20 years, Canada has had a weight limit policy that has stipulated a variety of different weight limit regimes to the same truck type. This has provided an on-road experiment of how weight limits translate into actual truck weights. This experiment has created a large and unique data set that permits relating actual truck weights to governing weight limits spanning a broad range. On the basis of this data set, empirical models linking the distribution of gross vehicle weights (GVWs) of three of Canada's most common large truck combinations to the GVW limit governing these trucks are developed. They assume an idealized complete compliance condition, with no violation of the limit. The three truck types for which models are developed are the 5-axle (3-S2) tractor-semitrailer, the 7-axle (3-S2-S2) B-train combination, and the 7-axle (3-S2-2) A-train combination. The complete compliance condition is of course violated if weight limits are not enforced or overweight operations are allowed by special permit. The predictive capability of the 3-S2 model is examined in relation to the GVW distribution of a sample of 3-S2s operating under a GVW limit different from those used in constructing the model. The predicted and actual distributions compare favorably. Index Terms: Canada, Comparison, Empirical Methods, Field Observation, Gross Vehicle Weight, Longer Combination Vehicles, Mathematical Models, Prediction, Size And Weight Laws, Tractor Semitrailers, Truck Weights, Weight Distribution, Weight Limits Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Clayton95	Title: EVALUATING PAVEMENT IMPACTS OF TRUCK WEIGHT LIMITS AND ENFORCEMENT LEVELS Author(s): Clayton, AM: Fekpe, ESK: Haas, RCG Language: English Journal Title: Transportation Research Record Issue: 1508 Publication Date: 00/00/1995 Pagination: pp 39-44 Report No: ISBN: 0309062004 Features: FIGS: 3 Fig. TABS: 1 Tab. REFS: 10 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Efforts to compare truck productivity and pavement loading impacts of alternative truck weight limits have met with limited success because of the uncertainty surrounding the important inputs. In addition, the effects of enforcement on the resulting vehicle weights have not been adequately addressed. Parameters for evaluating pavement loading impacts of alternative truck weight limits and enforcement levels are presented. It is indicated that enforcement is a critical factor in assessing pavement impacts of alternative weight limits. For a given weight limit, the effects of enforcement on pavement loading for flexible and rigid pavements differ, with rigid pavements being more sensitive. Parameters measuring total pavement loading and taking into account the amount of payload provide a more objective assessment than the average load per truck alone. In terms of pavement costs resulting solely from axle loads, substantial savings are achievable if strict enforcement schedules are implemented. Index Terms: Axle Loads, Cost Saving, Costs, Flexible Pavements, Law Enforcement, Pavement Loading, Payloads, Rigid Pavements, Size And Weight Laws, Truck Load Limits, Truck Pavement Damage, Truck Weights Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Clayton98	Title: TRUCK SIZE AND WEIGHT POLICY IN THE MIDCONTINENT CORRIDOR Author(s): Clayton, A: Montufar, J Language: English Journal Title: Transportation Quarterly Volume: 52 Issue: 3 Publication Date: 00/00/1998 Pagination: pp 69-78 Period Covered: Summer Report No: Features: FIGS: Figs. REFS: Refs. Publisher/Corporate Author(s): Eno Transportation Foundation, Incorporated One Farragut Square South, 1634 I Street, NW, Suite 500 DC 20006-4003 USA Abstract: Truck size and weight (TS&W) policies and regulations have an effect on the types of trucks that move on highways, and underlie the impact of those vehicles on the infrastructure, the economy, the environment, and roadway safety. Understanding trucking activity and freight movement is also necessary for evaluating the effects of policies in a region or along a corridor. This article provides insights regarding the current situation of TS&W regulations in the midcontinent corridor, with a view to assist decisionmakers in addressing policy questions from the perspective of this corridor. Index Terms: Midwest, Truck Effects (Bridges), Truck Laws & Regulations, Vehicle Size, Vehicle Weight Available from: Eno Transportation Foundation, Incorporated One Farragut Square South, 1634 I Street, NW, Suit Washington DC 20006-4003 USA

Tag	Abstract
Cohen79	Title: ASSESSMENT OF THE EFFECTS OF INCREASED TRUCK SIZE AND WEIGHT LIMITS ON SHIPPERS AND STATES Author(s): Cohen, S: Holcomb, C Publication Date: 05/14/1979 Pagination: 80 p. Report No: Features: TABS: Tabs. REFS: Refs. APPS: Apps. Publisher/Corporate Author(s): Automated Sciences Group, Incorporated 8555 16th Street, Suite 713 MD 20910 USA Abstract: The first phase is reported of a research project to assess the impacts of two proposed federal uniform truck size and/or weight (TSW) increases in tractor-trailer combinations in two groups: shippers or the users of transport services; and state transportation departments and legislatures. The first TSW alternative would be to increase the length of the trailer combinations without changing federally regulated gross vehicle weight (GVW) and axle loadings. The second proposed alternative would be to increase both the length and GVW of tractor trailer combinations without changing federally regulated axle loadings. This first phase consisted of a literature search and review of existing relevant studies on truck sizes and weight. The literature search covered both state issues (costs of TSW, on highway construction and maintenance, economic benefits of TSW, financing of highway costs, safety of heavier and larger trucks, increase in traffic flows, energy conservation, environmental impacts, and shipper issues (characteristics of the product, location of markets, choice of carrier, physical distribution, equipment, and on/off loading facilities). The search revealed that research of TSW impacts, including the operation of 27-foot trailers, is inconclusive due to the fragmentation of the research efforts. There is little definitive work on the subject, but there have been many attempts to analyze each aspect of the problem. The information base is very poor. Index Terms: Axial Loads, Length, Research, Reviews, Shippers, Size And Weight Laws, State Government, State Transportation Department, Tractor Trailers, Truck Weights, Trucks Available from:

Tag	Abstract
Cohen87	Title: INCREASING TRUCKING PRODUCTIVITY WITHIN THE CONSTRAINTS OF HIGHWAY AND BRIDGE DESIGN Author(s): Cohen, H: Godwin, SR: Morris, JR: Skinner, RE, Jr Journal Title: Transportation Quarterly Volume: 41 Issue: 2 Publication Date: 05/00/1987 Pagination: pp 133-150 Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/Corporate Author(s): Eno Foundation for Transportation, Incorporated P.O. Box 2055, Saugatuck Station CT 06880 USA Abstract: This article considers the Turner proposal for heavy truck regulation: allow higher gross weights while simultaneously lowering the allowable weight on each axle. The article estimates the economic feasibility of the proposal by first identifying the alternate vehicles that meet the criteria laid out in the proposal and then providing estimates of the effects that adoption of these vehicles would have on shipping costs, pavement wear and bridge stress. The article then proceeds to raise safety and other public policy questions that remain to be answered in future research. Alternate truck types considered include the straight truck; the three-axle tractor semitrailer; the five-axle tractor-trailer; the twin trailer truck; and the straight truck with full trailer. The attraction of carriers to Turner doubles and their appeal to truckload carriers are noted. The amount of truck travel affected by the optional approach, the impact of payload advantage and mode shift on total vehicle miles traveled, cost savings due to reduced pavement wear, productivity gains for motor carriers, and reduced freight shipment costs are discussed. The total capital costs of shifting to Turner doubles could be high for both highway agencies and motor carriers, but the net benefits would outweigh these costs. The many concerns likely to be raised by state agencies, motor carriers and the public are also considered. Research to address uncertainities is recommended. Index Terms: Axle Load, Bridge Design, Double Trailers, Economic Impact, Freight Transportation, Highway Design, Highway Safety, Motor Carriers, Productivity, Regulation, Research, Savings, State Highway Administration, Tractor Trailers, Transportation Economics, Trucks, Vehicle Design Available from: Eno Foundation for Transportation, Incorporated P.O. Box 2055, Saugatuck Station Westport CT 06880 USA

Tag	Abstract
Comprehensive 95	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 6 - TRAFFIC OPERATIONS AND TRUCK SIZE AND WEIGHT REGULATIONS Language: English Publication Date: 02/00/1995 Pagination: 45p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 1 App. Publisher/Corporate Author(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: Truck size and weight regulations affect the numbers, physical characteristics, load characteristics, and operating capabilities of trucks on highways. These factors affect highway capacity (expressed in terms of the total number of vehicles a facility can handle) and the level of service experienced by highway users. This paper examines these effects. Topics covered include truck speeds on grades; merging, weaving, and lane changing; capacity effects and passenger car equivalents by truck type and grade; marginal costs to other vehicles; signalized intersections; longitudinal barriers; and sign placement. Index Terms: Barriers (Roads), Highway Capacity, Highway Grades, Lane Changing, Level Of Service, Marginal Costs, Merging Traffic, Operations, Passenger Car Equivalence, Regulations, Signalized Intersections, Signs, Size, Speed, Truck Traffic, Trucks, Weaving Traffic, Weight

Tag	Abstract
Comprehensive 95a	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 3 - PAVEMENTS AND TRUCK SIZE AND WEIGHT REGULATIONS Language: English Publication Date: 02/00/1995 Pagination: 30p Report No: Features: FIGS: Figs. TABS: 1 Tab. REFS: Refs. Publisher/Corporate Author(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: Pavement related effects of changes in truck size and weight regulations include the following: (1) Increased traffic loadings require thicker pavements which, in turn, increase the construction cost of pavements. (2) For existing pavements, increases in traffic loadings would affect pavement rehabilitation in two ways. First, an increase in traffic loadings would shorten the time interval to the next resurfacing, which would increase the real cost for resurfacing. Second, at the time resurfacing is required, higher traffic loadings would either increase overlay thickness or require more frequent resurfacing in the future. (3) Costs for routine maintenance might also be affected by changes in traffic loadings. A pavement in new or very good condition requires relatively little expenditures for maintenance. However, as pavement condition worsens expenditures for activities such as filling cracks and patching potholes increase. (4) If traffic loadings are increased and highway agencies do not increase pavement-related expenditures to compensate for the increase, then pavement condition will deteriorate, in turn forcing users to travel over worse roads. Truck characteristics affecting pavements include the following: axle weights; tire characteristics; suspension systems; axle spacing; liftable axles; and tridems. These truck characteristics and their effects on policy are further discussed in the paper. Index Terms: Axles, Construction, Costs, Maintenance, Overlays (Pavements), Pavement Performance, Regulations, Rehabilitation (Maintenance), Resurfacing, Size, Spacing, Suspension Systems, Thickness, Tires, Traffic Loads, Trucks, Vehicle Characteristics, Weight Candidate Terms: Pavement Condition Unused Terms: Liftable Axles, Tridem Axles Available from:

Tag	Abstract
Comprehensive 95b	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 4 - BRIDGES AND TRUCK SIZE AND WEIGHT REGULATIONS Language: English Publication Date: 02/00/1995 Pagination: 29p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Battelle Team e 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: The fourth working paper in Phase 1 of the Comprehensive Truck Size and Weight Study discusses the technical relationships of policy consequence concerning bridges. It presents information on bridge design considerations, truck characteristics affecting bridges, recommended bridge formulae for computing the maximum weights for axle group to protect bridges, and estimates from recent studies of changes in bridge costs associated with changes in truck size and weight limits. Index Terms: Axles, Bridges, Costs, Design, Regulations, Size, Trucks, Vehicle Characteristics, Weight Available from:

Tag	Abstract
Comprehensive 95c	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY: SUMMARY REPORT FOR PHASE I-SYNTHESIS OF TRUCK SIZE AND WEIGHT (TS&W) STUDIES AND ISSUES Language: English Publication Date: 05/00/1995 Pagination: 58p Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/Corporate Author(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: This is the Summary Report of Phase I of the Comprehensive Truck Size and Weight (TS&W) Study announced by the Federal Highway Administrator in June 1994. It summarizes 13 working papers prepared during Phase I. The study is to be completed in three phases: Phase I - Synthesis of TS&W Studies and Issues - assessed past policy studies and technical research. Technical knowledge about relationships between TS&W policy controls and relevant evaluation and decision criteria was synthesized. State and Federal TS&W regulations were summarized. Research needs for later phases were identified. Thirteen working papers were prepared examining the regulations and TS&W policy controls and: truck accidents, vehicle stability and control, pavements, bridges, roadway geometry, traffic operations, truck costs, shipper logistics costs, truck travel and mode share, enforcement, environment, energy, permits and pricing mechanisms. Phase II - a Preliminary Option Analysis - will evaluate specific policy options using existing databases and analytical tools (completion summer 1995). Phase III - an Extended Impact Analysis - will expand the scope and depth of the policy analysis of Phase II using new databases and analytical capabilities becoming available in late 1995 with projected completion by the end of 1996. Index Terms: Bridges, Control, Costs, Decision Making, Energy, Environment, Evaluation, Geometric Design, Logistics, Pavements, Permits, Policy, Pricing, Regulations, Research, Shipping, Size, Stability (Mechanics), Technical Reports, Travel, Truck Accidents, Truck Traffic, Trucks, Weight Candidate Terms: Enforcement Unused Terms: Mode Share Available from:

Tag	Abstract
Comprehensive 95d	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 7 - TRUCK COSTS AND TRUCK SIZE AND WEIGHT REGULATIONS Language: English Publication Date: 02/00/1995 Pagination: 44p Report No: Features: TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: The Federal Highway Administration has recently embarked on a major study of potential changes in federal policy relating to truck size and weight. The intention of this working paper is to provide researchers and policy analysts involved in this study with as much information about estimating the effects of potential policy changes on truck transport costs as it is practical to assemble within a limited period of time. The first section of the paper contains an extended discussion of the ways in which size and weight policy affects truck transport costs and sources of data for estimating these effects. The second section provides a brief discussion of several areas requiring more investigation. The concluding section contains a bibliography of material relating to issues addressed in this paper. Index Terms: Operating Costs, Policy, Regulations, Size, Trucks, Weight Available from:

Tag	Abstract
Comprehensive 95e	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 10 - ENFORCEMENT AND TRUCK SIZE AND WEIGHT REGULATIONS Language: English Publication Date: 02/00/1995 Pagination: 19p Report No: Features: REFS: Refs. Publisher/Corporate Author(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: This paper gives particular attention to the importance of enforcement actions as an integral part of Truck Size and Weight Regulations, and to the potential impacts of changes in TS&W regulations, on the costs and effectiveness of enforcement activities. A great deal of recent research has been conducted on the problems of overweight travel and enforcement strategies to reduce overweight travel. Because of the relative importance of the economic consequences of overweight travel, such as pavement damage and industry costs and revenues, less attention has been given to vehicle dimension or vehicle specification enforcement issues. Little attention has been given to the specifics of whether and how potential changes in TS&W regulations will impact enforcement. Enforcement activities related to combined weight and safety enforcement are discussed in this paper. Index Terms: Costs, Law Enforcement, Regulations, Size, Trucks, Vehicle Weight, Weight Unused Terms: Effectiveness, Overweight Available from:

Tag	Abstract
Comprehensive 95f	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 13 - PERMITS AND PRICING MECHANISMS AND TRUCK SIZE AND WEIGHT REGULATIONS Language: English Publication Date: 02/00/1995 Pagination: 39p Report No: Features: TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: This paper (1) summarizes the most relevant current experience and practice regarding permits (provisions, administrative requirements) and highway use pricing mechanisms (use taxes, permit fees, tolls) of importance for truck size and weight (TS&W) policy considerations; (2) examines implications for TS&W policy; and (3) identifies knowledge gaps and related research needed to address policy objectives and questions. Most heavier and longer combination trucks currently operate under some form of overweight and/or oversize permit system, and arguments have been made that the most promising approach to achieve improvements in motor carrier productivity, safety, and other goals is through substantially improved permit systems. In addition, truck size and weight policy improvements could be used as a means to develop a more rational relationship between (a) size and weights of vehicles and the costs they impose, and (b) the pricing system for highway use. That rational relationship can be achieved through the permit fee structure, tolls, and/or the highway user tax structure. Even if these policy approaches are not pursued, changes in national size and weight limits and/or regulations could have significant impact on current permit systems and their effectiveness. Index Terms: Costs, Fees, Highway User Taxation, Motor Carriers, Oversize Loads, Permits, Policy, Pricing, Regulations, Research, Size, Tolls, Trucks, User Charges, Weight Candidate Terms: Overweight Available from:

Tag	Abstract
Comprehensive 95g	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 11 - ENVIRONMENT AND TRUCK SIZE AND WEIGHT REGULATIONS Language: English Publication Date: 02/00/1995 Pagination: 27p Report No: Features: TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: In general, very little work has been done relating the impact of changing truck size and weight (TS&W) regulations to impacts on the environment. Some work was done by the American Trucking Associations in the late 1970s and early 1980s. Other work by the Society of Automotive Engineers, the Environmental Protection Agency and several European sources has focused a great deal on characterizing the heavy duty engine. This includes emission requirements and standards, noise levels, performance standards, noise abatement, and fuel economy. While this is all useful information and a great deal of it was used for the development of this paper, most of the work related directly to truck size and weight issues has focused on the physical and structural impacts to bridges, pavements, etc. The majority of sources for this paper regarding environmental impacts focus on heavy duty engine emissions, noise levels, and other topical areas, not specifically the environmental impact associated with changes in truck size and weight regulations. Topics covered in the paper include: alternative fuel use; vehicle weight; vehicle configuration; intermodalism; truck usage; engine emissions; environmental modeling capabilities; vehicle related noise considerations; and truck induced vibrations. Index Terms: Alternate Fuels, Engines, Environmental Impacts, Fuel Consumption, Heavy Duty Vehicles, Intermodal Transportation, Noise Control, Regulations, Size, Trucks, Vehicle Weight, Vibration, Weight Candidate Terms: Air Quality Models, Emission Requirements, Emission Standards, Engine Emissions, Vehicle Configuration Available from:

Tag	Abstract
Crockford93	Title: WEIGHT TOLERANCE PERMITS. FINAL REPORT Author(s): Crockford, WW Language: English Publication Date: 11/00/1993 Pagination: 109p Period Covered: 9209-9308 Report No: Features: FIGS: 27 Fig. TABS: 15 Tab. REFS: Refs. APPS: 6 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Texas Department of Transportation Office of Research and Technology Transfer, P.O. Box 5051 78763 Texas Transportation Institute Texas A&M University TX 77843 USA Abstract: The Texas legislature has authorized the issuance of annual permits allowing commercial motor vehicle operators to operate nonagricultural vehicles exceeding the legislative mandated axle weight by 10% and the allowable gross vehicle weight by 5%, with heavier loads allowed for agriculture. The $75 permit (and $15, 000 bond) allows operation on state and county roads except the interstate system. The interpretation has been that this effectively allows 84, 000 lb vehicles on roads designed for 58, 420 lb vehicles. The movement of goods on Texas surface transportation infrastructure is an important factor in the economic health of the state; and truck shipping productivity is a key element in this movement. There is often a trade-off between vehicle weight management policies and pavement management policies in the maximization of productivity. AASHTO pavement design procedures indicate that the effect of the Texas legislation should be accompanied by a permit costing significantly more than $75. The study included a full scale truck loading experiment on two county roads and one state highway. General agreement with AASHTO damage models was found. Surveys of state and county agencies as well as the trucking industry were conducted. In general, the trucking industry showed substantial cost savings with the increase in load. Government agencies responsible for pavement and bridge management did not obtain receipts from the permit fee sufficient to offset maintenance and enforcement costs associated with this management activity. Index Terms: Cost Saving, Fees, Law Enforcement Costs, Local Governments, Maintenance Costs, Overweight Loads, Pavement Management, Permits, Policies, Size And Weight Laws, Texas, Trade Offs, Truck Load Limits, Truck Pavement Damage, Truck Weights, Trucking Industry, Weight Limits Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Danner81	Title: RESULTS OF AN ANALYSIS OF TRUCK ACCIDENTS AND POSSIBILITIES OF REDUCING THEIR CONSEQUENCES DISCUSSED ON THE BASIS OF CAR-TO-TRUCK CRASH TESTS Author(s): Danner, M: Langwieder, K Publication Date: 00/00/1981 Pagination: pp 903-950 Report No: Features: FIGS: 29 Fig. REFS: 10 Ref. Publisher/Corporate Author(s): Society of Automotive Engineers, Incorporated 400 Commonwealth Drive PA 15096 USA Abstract: Possibilities of improved truck safety regarding to frontal collisions with passenger cars are discussed. Characteristics of car/truck collisions are analysed in a study of 1, 559 real accidents. Almost 40% of the fatalities in car/truck collisions result from front-to-front collisions. It turned out that the inevitably high mass of the truck does not constitute the only dominant problem in the majority of real--life accidents. Another major factor is the form aggressivity of the truck front which may be reduced by technical measures. Based on these results a series of 10 car-to-truck crash tests was carried out analysing two collision types: truck running frontally into car front, 60 kph; and truck running frontally into car side, 39 kph. The tests were made both with an unchanged truck and with safety modifications, using a large impact plate and an energy absorbing front protection. The large "impact plate" did not produce any appreciable safety effect in the chosen test conditions. However, as a result of slightly reduced car intrusion an effect cannot be ruled out in the lower speed range. The frontal protection with energy-absorbing construction and mobile design did result in improvements especially by reducing the override of the car by the truck. Quantifying this effect must be reserved for the subsequent series of tests, which should reveal an order of priority on the basis of benefit/cost analyses. The study showed that safety measures of the truck front are extremely difficult - as they may influence the practical requirements such as bumper clearance angle, length, weight etc. - but solutions are necessary and possible. This study aimed to work out a proposal of principle safety measures. It is discussed in which terms safety measures on trucks may be described. The requirements of further research work are indicated. Index Terms: Accident, Aggressivity, Collision Injury Research, Conferences, Diagonal Brake System, Fatalities, Impact Attenuators, Injuries, Severity, Trucks, Velocity Available from: Society of Automotive Engineers, Incorporated 400 Commonwealth Drive Warrendale PA 15096 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Deacon90	Title: ALLOCATION OF HIGHWAY COSTS AND REVENUES. FINAL REPORT Author(s): Deacon, JA: Pigman, JG Publication Date: 01/00/1990 Pagination: 149p Report No: Features: FIGS: 12 Fig. TABS: 76 Tab. REFS: 12 Ref. APPS: 6 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 HP&R KYHPR-90-128 TRIS20 Kentucky Transportation Cabinet State Office Building, Clinton and High Streets 40622 Kentucky University Kentucky Transportation Center, College of Engineering KY 40506 USA Abstract: This highway cost and revenue allocation study is the fourth of a recent Kentucky series begun in 1982. Experience gained with each study has resulted in subsequent refinements that have enlarged the data base, enhanced the accuracy, and simplified the study process. One of the long-term aims is to develop an easy-to-use process for continuously monitoring effects of changes in traffic patterns, in finance and tax policy, and in highway expenditures. The primary objective of the current study was to determine the 1989 levels of revenue contribution and cost responsibility for each of several classes of Kentucky highway users. As was the case in the two most recent prior studies, incremental cost assignment has been replaced with various highway use measures including vehicle-miles of travel, axle-miles, passenger-car-equivalent-miles, and equivalent-single-axle-load-miles. The analysis indicates that cost responsibility is borne most heavily by passenger cars and motorcycles (45.7%). Heavy trucks, those with gross weights of 60, 000 pounds or more, were responsible for 23.2% of the cost. Pickups and other vehicles registered in the 6, 000-pound category were responsible for 20.2% of the cost. Cost responsibility of all other user groups totaled 10.9%. Revenue collected from passenger cars and motorcycles fell approximately 2% short of their cost responsibility; heavy trucks contributed approximately 12% more than their responsibility. Without a temporary surcharge of 1.15 cents per mile on heavy truck operations, the revenue and cost responsibility would have been very nearly balanced for cars and light trucks, pickups and heavy trucks would have contributed slightly more revenue that their cost responsibilities, and medium trucks would have failed to meet their responsibility. Index Terms: Automobile, Cost Allocation, Finance, Heavy Vehicle, Highway Costs, Highway User Costs, Light Trucks, Medium Trucks, Motorcycle, Pickups, Revenue, User Charges Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Deacon92	Title: REVIEW OF HIGHWAY COST ALLOCATION METHODOLOGIES. FINAL REPORT Author(s): Deacon, JA: Pigman, JG: Stamatiadis, N Language: English Publication Date: 06/00/1992 Pagination: 202p Report No: Features: FIGS: 14 Fig. TABS: 127 Tab. REFS: 20 Ref. APPS: 6 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Kentucky Transportation Cabinet State Office Building, Clinton and High Streets 40622 Kentucky University Kentucky Transportation Center, College of Engineering KY 40506 USA Abstract: The objectives of the current cost allocation study, the fifth in a series begun in 1982, include the following: 1) to evaluate current cost allocation methodologies and identify possible changes to Kentucky practices; and 2) to determine the 1991 fiscal year levels of cost responsibility and revenue contribution for each of several classes of highway users. Additional objectives include an evaluation of the equity of tax proposals advanced by the Kentucky Motor Transport Association, a preliminary determination of the revenue and cost implications of the Extended-Weight Coal Haul System, and an evaluation of the efficiency with which certain highway user taxes have been collected. As was the case in other recent cost-allocation studies, incremental cost assignment has been replaced with various highway use measures including vehicle-miles of travel, axle-miles, passenger-car-equivalent miles, and equivalent-single-axle-load miles. Results from the analysis indicate that cost responsibility was borne most heavily by passenger cars and motorcycles (44.2%). Other cost responsibilities were 24.6% for heavy trucks; 20.4% for pickups and vans; and 10.8% for all other groups. When compared to revenue for each vehicle class; cars, pickups and vans, and heavy trucks exceeded their cost responsibility, while medium trucks fell significantly short. From a limited examination of the Extended-Weight Coal Haul System, it was found that an estimated $2 million are lost annually from the Road Fund because fewer trucks are registered. Heavier weights of coal-decal trucks add approximately $9 million annually to pavement overlay costs. Related to tax collection, it was found that the weight-distance tax was collected at an efficiency of about 70% and other user-reported fuel taxes in the range of 75 to 77%. Index Terms: Automobiles, Cost Allocations, Efficiency, Equity, Extended-Weight Coal Haul System, Financial Responsibility, Heavy Vehicles, Highway User Costs, Highways, Kentucky, Maintenance Costs, Medium Trucks, Methodologies, Motorcycles, Pickups, Revenues, Tax Collection, Tax Proposals, Vans Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Deacon94	Title: ALLOCATION OF HIGHWAY COSTS AND REVENUES Author(s): Deacon, JA: Pigman, JG Language: English Publication Date: 01/00/1994 Pagination: 132p Report No: Publisher/Corporate Author(s): Kentucky Transportation Center KY 40506- USA Abstract: The highway cost allocation study is the 6th in a recent series begun in the early 1980s by the Transportation Cabinet and the Kentucky Transportation Center. Its primary objective is to determine the level of revenue contribution and cost responsibility for each class of highway user. Highway user classes, with which revenue and cost responsibility were associated, totaled 17 and included motorcycles, cars, buses, and 14 registered or declared weight classes of trucks. Primary sources of revenue allocated to the various classes of highway users include fuel taxes, registration or license fees, usage taxes, road tools, other motor carrier taxes, other Federal taxes, and miscellaneous taxes and fees. Primary expenditure categories include construction, maintenance and operation, administration and enforcement. Index Terms: Cost Allocations, Expenditures, Fees, Highway User Costs, Revenue Accounting, Road Pricing, Taxes, User Costs Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Dealba97	Title: MOST CONVENIENT NAFTA TRUCKS FOR OPERATING ON THE MEXICAN ROADS Author(s): De Alba, M: Mendoza, A Language: English Conference Title: XIIIth World meeting of the International Road Federation Sponsored by: International Road Federation Location: Toronto, Canada Date Held: 19970616-19970620 Publication Date: 00/00/1997 Pagination: n.p. Report No: Publisher/Corporate Author(s): International Road Federation 525 School Street, SW DC 20024 USA Abstract: This paper presents a detailed review of the physical and geometrical characteristics of the freight vehicles that are most commonly used in the USA, Canada and Mexico, as well as the weight and dimension limits established for them in the three countries. A series of vehicles are selected for analysis, including the most commonly used vehicles authorized by federal regulations, and other which are authorized only regionally but whose more extensive utilization could mean important productivity increases to the freight motor industry. The configurations considered are then evaluated in terms of vehicular efficiency (operating costs), road deterioration caused by them (road damage cost) and their physical possibilities of circulating safely on the part of the Mexican network that is most relevant for international commerce with the USA and Canada. A series of conclusions and recommendations are finally addressed regarding the most convenient vehicles for the trucking service, considering transportation costs, safety and the circulation possibilities the existing Mexican roads offer to them. Index Terms: Freight Transportation, Operating Costs, Road User Costs, Transportation Safety, Truck Transportation, Truck Weights, Vehicle Size Available from: International Road Federation 525 School Street, SW Washington DC 20024 USA

Tag	Abstract
Deen79	Title: TRUCK DESIGN AND USAGE AND HIGHWAY PAVEMENT PERFORMANCE Author(s): Deen, RC: Southgate, HF Publication Date: 11/00/1979 Pagination: 17 p. Report No: Features: FIGS: 8 Fig. Publisher/Corporate Author(s): Kentucky Department of Transportation Bureau of Highways, Div of Research, 533 South Limestone KY 40508 USA Abstract: Trucks, by virtue of their loads, profoundly affect pavement performance. Vehicle designers and manufacturers play an important role in this respect. Tires are a major factor in the loading of the pavement: the width of the tire, the number of tires, spacing between tires, tire pressure, and design of tire treads are all important. The number and spacing of axles are also important. This report reviews relevant principles of pavement design such as the concept of load distribution. The Kentucky DOT has developed a computer model based on elastic theory to obtain a first approximation of stresses and strains within a pavement system under various loading configurations. Fatigue concepts are discussed, and the importance of fatigue failure in pavement design is noted. Kentucky DOT work in this area is described. Figures are shown which illustrate how pavement damage increases with total loads on various axle groups, the increase of damage factors with increase of payload with increase of percentage damage. Other aspects briefly covered by the report include bridge loadings, operate damage. Other aspects briefly covered by the report include bridge loadings, operating costs, safety, economic considerations, and enforcement. Efforts must be made, by statute, to encourage the use of vehicles which are less damaging to highway pavements. Index Terms: Axle, Axle Load, Bridge, Damage, Failure, Law, Load Distribution, Loading, Mathematical Models, Operating Costs, Pavement Design, Pavement Performance, Payloads /Highway Construction/, Safety, Tires, Trucks, Vehicle Design Available from: Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Distribution83	Title: DISTRIBUTION STRATEGIES THAT MINIMIZE TRANSPORTATION AND INVENTORY COSTS Publication Date: 07/00/1983 Pagination: 31p Report No: Features: FIGS: 8 Fig. REFS: 14 Ref. APPS: 1 App. Publisher/Corporate Author(s): Abstract: This paper develops an analytic method for minimizing the cost of distributing freight by truck from one supplier to many customers. Formulas are derived for transportation and inventory costs, and the optimal cost trade-off is determined analytically and graphically. Two distribution strategies are analyzed and compared: direct shipping (i.e., shipping separate loads to each customer) and peddling (i.e., dispatching trucks that deliver items to more than one customer per load). The cost trade-off in each strategy depends on shipment size. Results indicate that, for direct shipping, the optimal shipment size is given by the economic order quantity (EOQ) model, while for peddling, the optimal shipment size is a full truck. The peddling cost trade-off also depends on the number of customers visited on a peddling route. The analytic approach taken here focuses on the spatial density of customers and the distribution of customer demand rather than the demands of specific customers in precise locations. This approach simplifies the analysis of distribution problems by eliminating the need to specify a detailed network and corresponding flows. It also results in formulas that allow cost trade-offs to be understood clearly. These formulas are useful for practical applications and only require estimates of a few easily measurable parameters. Mathematical programming techniques are not required. The formulas also facilitate sensitivity analyses that indicate how parameter value changes affect costs and operating strategies. (Author) Available from:

Tag	Abstract
Duke97	Title: A QUALITATIVE ASSESSMENT OF THE ROLE OF SHIPPERS AND OTHERS IN DRIVER COMPLIANCE WITH FEDERAL SAFETY REGULATIONS Author(s): Duke, ME: Morris, SW: Swinehart, J: Weppner, M Language: English Publication Date: 12/00/1997 Pagination: 200p Period Covered: 9604-9712 Report No: Features: FIGS: 1 Fig. REFS: Refs. APPS: 8 App. Publisher/Corporate Author(s): Federal Highway Administration Office of Motor Carriers, 400 7th Street, SW DC 20590 Global Exchange, Incorporated 7910 Woodmont Avenue, Suite 400 MD 20814-3015 USA Abstract: This research report assesses the results of a Congressionally-directed study of the extent to which shippers and others involved in interstate trucking commerce impose delivery demands on motor carriers that may result in commercial driver violations of Federal safety regulations, including the hours-of-service (HOS) rules. Drivers and commercial motor carriers have alleged that they are forced to violate HOS regulations by shippers who impose unrealistic delivery schedules. A series of focus group sessions was conducted with separate groups of shippers, carriers/brokers, independent and carrier-employed drivers, dispatchers and others. The key findings, based on perceptions of focus group participants, indicate that: 1) no one party is totally responsible for and can be held accountable for setting the schedule; and 2) a lack of communication and knowledge about the shipping process among the players contributes to the problem of driver violations. Participants noted other factors that may be contributing to the commercial operators' exceeding the Federal HOS rules: the sheer economic necessity of accepting loads with unreasonable schedules in a deregulated environment, increased reliance upon just-in-time delivery and zero-inventory, and unavoidable scheduling delays. Index Terms: Commercial Drivers, Federal Laws, Focus Groups, Hours Of Labor, Interstate Commerce, Just In Time Production, Motor Carriers, Safety Candidate Terms: Compliance, Delivery Schedules, Scheduling Delays, Shippers, Violations, Zero Inventory Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Duleep92	Title: COSTS AND BENEFITS OF AUTOMOTIVE FUEL ECONOMY IMPROVEMENT: A PARTIAL ANALYSIS Author(s): Duleep, KG: Greene, DL Language: English Publication Date: 03/00/1992 Pagination: 124p Report No: Publisher/Corporate Author(s): Contract DE-AC05-84OR21400 TRIS20 Oak Ridge National Laboratory P.O. Box 2008, 5500N MS 6207 TN 37831 USA Abstract: This paper describes an analysis that estimates the costs and benefits of technology-based fuel economy improvements for automobiles and light trucks. Benefits quantified include vehicle costs, fuel savings, consumers' surplus effects, the effect of reduced vehicle weight on safety, impacts on CO2 and criteria pollutant emissions, world oil market and energy security benefits, and the transfer of wealth from U.S. consumers to oil producers. Index Terms: Carbon Dioxide, Consumers, Fuel Economy, Oil Production, Pollutants, United States, Vehicle Safety, Vehicle Weight Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Duleep95	Title: EXPANDING METROPOLITAN HIGHWAYS: IMPLICATIONS FOR AIR QUALITY AND ENERGY USE. APPENDIX A: EMISSION AND ENERGY CHARACTERISTICS OF HEAVY-DUTY DIESEL-POWERED TRUCKS AND BUSES Author(s): Duleep, KG Language: English Journal Title: Transportation Research Board Special Report Issue: 245 Publication Date: 00/00/1995 Pagination: pp 237-294 Report No: ISBN: 0309061075 Features: FIGS: 8 Fig. TABS: 12 Tab. REFS: Refs. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Heavy-duty diesel-powered trucks are major contributors to oxides of nitrogen (NOx) emissions and combustion-derived particulate emissions in many urban areas. This appendix provides a brief review of the energy use and emissions characteristics of heavy-duty diesel vehicles (HDDVs) and reviews the effects of expansions of highway capacity on emissions. The structure of the HDDV fleet, which encompasses a wide range of vehicles [from 8, 500 lb gross vehicle weight (GVW) to more than 80, 000 lb GVW], is discussed. Data on sales, populations, and use of the HDDV fleet are presented. Historical and future emissions regulations for HDDVs are reviewed. Since California has been the leader in new emission standards and in-use controls, particular attention is given to the California standards and the proposed low-emission truck standards. Fuel standards and in-use requirements are also discussed in detail. The data that have been used to construct emission factors and speed correction factors for HDDVs are reviewed. In particular, U.S. Environmental Protection Agency (EPA) emission factors and speed correction factors are contrasted with the findings on these issues from other data or engineering analyses. HDDV fuel economy data are reviewed, with emphasis on average fuel economy derived from surveys. Data on the change of fuel economy with speed derived from simulation models or on-road tests are presented. These data and their relationship to the conversion factor used to convert emissions expressed in units of work to the more familiar units of grams per mile are explored. Finally, the findings are summarized in the context of the National Research Council's project goals of estimating the effects of expansions of highway capacity. Index Terms: Air Quality, Buses (Vehicles), California, Data Analysis, Diesel Trucks, Emission Control, Emission Standards, Emissions, Energy Consumption, Energy Utilization, Environmental Protection, Fleet Statistics, Fuel Economy, Heavy Duty Trucks, Highway Capacity Additions, Impacts, Nitrogen Oxides, Particulates, Regulations, Urban Areas Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Economic74	Title: ECONOMIC AND ENGINEERING ANALYSIS OF SEASONAL LOAD RESTRICTIONS ON NORTH DAKOTA HIGHWAYS Publication Date: 00/00/1974 Pagination: 125 pp Report No: Features: FIGS: 25 Fig. TABS: 35 Tab. REFS: 22 Ref. Publisher/Corporate Author(s): North Dakota State Highway Department Planning and Research Division ND 58501 USA Abstract: In an effort to review the present spring load restriction policies and reassess their economic feasibility, a study was performed to establish the economic potential lost by the trucking industry (ultimately the state) due to reduced loads required during the restriction season (of March, April and May) and weighed against the potential loss to the state if there were no restrictions. The study reviewed the historical development of highway and rail transportation, examined marketing practices and trends in the movement of commercial and agricultural products, and analysed the freignt rate and the volume and value of commerce conducted by trucking. Transportation costs were studied, as well as highway development costs, investment, and financial resources. Available data and past experience regarding use and nonuse of spring load restrictions and discussed. Information gathered in the study are set forth. This information which is specific to the North Dakota State Highway system, relates to the following: duration of load restriction, vehicle miles, agricultural commodity movement, commercial product movement, direction and distribution of travel, axle loadings, truck weights, economic loss, highway costs, highway investment, highway financing capabilities, and potential loss in highway investment. The consideration of certain factors (relating to legislation, the necessity of restrictions, stage construction, and the development of load-free system) led to the conclusion that measures intermediate between complete removal and continuation of present load restrictions will provide a realistic solution. Recommendations are made which reflect this conclusion. Index Terms: Agriculture, Analysis, Axle Load, Commerce, Freight Transportation, Goods Movement, Highways, Law, Load Restrictions, Marketing, Season, Stage Construction, Transportation Economics, Transportation Engineering, Truck Laws & Regulations, Truck Load Limits, Vehicle Miles Available from:

Tag	Abstract
Economic75	Title: THE ECONOMIC IMPACT OF TRUCK TRAFFIC ON TENNESSEE HIGHWAYS Publication Date: 04/00/1975 Pagination: 239 pp Report No: Publisher/Corporate Author(s): Abstract: The purpose of this study is to provide the Tennessee Department of Revenue with factual data relative to highway costs and revenue received from highway usage. In order to complete the analysis, five objectives were defined and completed during the study. These objectives are as follows: 1. Assessment of costs involved in providing highway designs for incremental weight class vehicles operating in the State of Tennessee. 2. Assessment of revenues associated with highway usage in the State of Tennessee. 3. Establishment of correlations between highway costs and revenues derived from incremental weight classes. 4. Assessment of economic impact relative to selected strategies for revenue collection in Tennessee. 5. Development of schemes for monitoring truck traffic in the State of Tennessee. /GMRL/ Available from:

Tag	Abstract
Economic87	Title: ECONOMIC FACTORS OF DEVELOPING FINE SCHEDULES FOR OVERWEIGHT VEHICLES IN TEXAS Journal Title: Transportation Research Record Issue: 1116 Publication Date: 00/00/1987 Pagination: pp 31-39 Report No: ISBN: 0-309-04467-7 Features: FIGS: 3 Fig. TABS: 12 Tab. REFS: 21 Ref. Publisher/Corporate Author(s): Abstract: A rapid deterioration of the state's highway network can have serious economic consequences for Texas. Many communities depend entirely on the trucking industry for the transport of goods to principal markets. In order to protect the structural integrity of the highway system, which represents a significant economic investment, statutes limit the gross weight and axle weights of vehicles. However, despite the illegality of an overloaded vehicle, a large number of trucks operating on Texas highways exceed their maximum allowable weights. These illegal operations deprive the state of nearly $48 million per year. The current schedule of fines and penalties is wholly inadequate. By its very structure it encourages rather than discourages overweight violations. Truck operators have merely accepted these penalties as a cost of doing business. An operator of a 120, 000-lb, 18-wheel vehicle, for example, has a $2, 621 incentive to operate above the 80, 000-lb legal gross weight limit. The low probability of being caught and the small fine fail to discourage a decision to overload a vehicle. Available from:

Tag	Abstract
Economics78	Title: ECONOMICS OF THE MAXIMUM LIMITS OF MOTOR VEHICLE DIMENSIONS AND WEIGHTS, VOLUME 2 Publication Date: 09/00/1978 Pagination: 397 pp Report No: Publisher/Corporate Author(s): Abstract: Determining the desirable maximum limits of dimensions and weights of motor vehicles is approached on the basis of highway cost and the operating cost so far as the factors of economy are concerned. Axle weight, gross vehicle weight, and vehicle length are analyzed on the basis of six highway systems consisting of the rural and urban systems within the interstate, primary and secondary highway systems. The analysis is based on data on track weight studies conducted in 46 States; operating costs data obtained from truck fleet operators; and experimental data on pavements and bridges obtained from the comprehensive AASHO road test. Numerous other studies also contributed to the findings of the report. The desirable limits of dimensions and weights for immediate use were found to be the following: Vehicle height of 13.5 feet; Vehicle width of 102 inches; Maximum lengths on all highways of 40 feet for single-unit trucks and trailers, 55 feet for tractors and semitrailers, and 65 feet for any other combination of vehicles; Axle weight limits of 22, 000 and 38, 000 pounds for single and tandem axles respectively, and; gross weight limit of at least 120, 000 pounds, or better yet, no gross weight limit at all with control of axle weight and spacing. /FHWA/ Available from: Acknowledgement of Document Source: Federal Highway Administration

Tag	Abstract
Effect81a	Title: EFFECT OF INCREASED TRUCK SIZE AND WEIGHT ON RURAL HIGHWAY GEOMETRIC DESIGN (AND REDESIGN) PRINCIPLES AND PRACTICES Journal Title: Transportation Research Record Issue: 806 Publication Date: 00/00/1981 Pagination: pp 13-21 Report No: Features: FIGS: 7 Fig. TABS: 3 Tab. REFS: 16 Ref. Publisher/Corporate Author(s): Abstract: A summary is presented of a study of the effects that an increase in legal truck limits would have on highway geometric design elements and of the cost implications should various segments of the Texas highway system require redesign and modification to facilitate their safe and efficient operation. The paper includes (a) a review of past and current research concerning the effects of a possible change in legal vehicle dimensions and weights on the geometric design elements of rural roads, (b) an identification of those geometric elements most affected by a change in truck dimension and weight, (c) an assessment of the effects a change in legal truck size and weight will have on these geometric design elements for a variety of operating conditions, and (d) an estimate of the cost required to redesign and modify the highway section. (Authors) Available from:

Tag	Abstract
Effect91	Title: THE EFFECT OF SIZE AND WEIGHT LIMITS ON TRUCK COSTS. WORKING PAPER. REVISED EDITION Language: English Publication Date: 10/00/1991 Pagination: 55p Report No: Features: TABS: 8 Tab. APPS: 2 App. Publisher/Corporate Author(s): Faucett (Jack) Associates 4550 Montgomery Avenue, Suite 300 North MD 20814- USA Federal Highway Administration 400 7th Street, SW DC 20590 Abstract: This Working Paper has been prepared as part of a study of the potential effects of possible changes in Federal truck size and weight limits. This revised edition incorporates several modifications to the cost estimates presented in the original Working Paper (June 1990). The paper is organized in the following sections: (1) Introduction; (2) Influences on Cost; (3) Configurations of Interest; (4) Published Estimates of Cost per Vehicle-Mile; (5) Cost per Vehicle-Mile as a Function of Configuration and Weight (Driver Costs; Vehicle Costs, Depreciation and Interest; Fuel Costs; Tires; Repair and Servicing; Indirect and Overhead Costs); (6) Cost per Payload Ton-Mile; and (7) Non-Linehaul Costs of Increasing the Number of Trailers. There are two appendices: (A) Estimated Cost per Vehicle-Mile by Cost Category; and (B) Estimated Cost per Vehicle-Mile and per Payload Ton-Mile. Index Terms: Costs, Impact Studies, Payload Ton-Miles, Size And Weight Laws, Trucking Industry, Vehicle Configurations, Vehicle Miles Available from: Federal Highway Administration 400 7th Street, SW Washington DC 20590 USA

Tag	Abstract
Effects94	Title: EFFECTS OF LOWER TIRE PRESSURE ON FROST WEAKENED ROADS Language: English Publication Date: 00/00/1994 Pagination: 294p Report No: Publisher/Corporate Author(s): Washington University, Seattle 4507 University Way, NE, Corbet Bldg, Suite 204 WA 98105 USA Abstract: Every year, thousands of miles of roads are closed or severely restricted to heavy traffic due to structural weakness during spring thaw. Spring thaw varies in length, depending on the severity of the winter. As thawing occurs, pavements become weak due to the high moisture content in the underlying base course and subgrade. In extreme cases, the base course and subgrade can become completely saturated and so weak that less than a hundred passes of an 18, 000 lb axle will cause the pavement to fail. Most pavements with high traffic volumes in areas where roads are subject to freezing are designed to resist the effects of spring thaw. This type of construction can be expensive when it is considered that the depth of freeze can be over five (5) feet. Other methods used to resist the weakening caused by spring thaw usually increase construction costs. In this paper the results of a theoretical investigation of lower tire pressure on roads in a severely weakened condition such as is found in spring thaw are demonstrated. With the recent technological development of Central Tire Inflation (CTI) in the trucking industry, trucks may be able to operate on roads subject to load restrictions. CTI would allow trucks to operate at lower tire pressures on load restricted roads. The second chapter reviews the results of previous studies about the effects of tire pressure, axle loads, and tire type on pavement structure. In Chapter 3 the failure criterion used in this study is discussed. A computer software program designed to calculate strain in multi-layer systems called ELYbM6 was used to determine strains at the bottom of the asphalt layer and top of subgrade. The strains were used to calculate load repetitions to failure for fatigue using formulas developed by the Asphalt Institute. Index Terms: Axle Load, Frost Damage, Pavement Condition, Structural Fatigue, Thaw, Tire Inflation Pressure, Truck Load Limits, Winter Maintenance Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
ElGindy98	Title: EFFECTS OF WHEEL-LOAD SPATIAL REPEATABILITY ON ROAD DAMAGE: A LITERATURE REVIEW Author(s): El-Gindy, M: Kenis, W: Mrad, N Language: English Publication Date: 09/00/1998 Pagination: 50p Period Covered: 9610-9710 Report No: Features: FIGS: 47 Fig. TABS: 5 Tab. REFS: Refs. Publisher/Corporate Author(s): Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike USA National Research Council of Canada Centre for Surface Transportation Technology, U-89 Alert Road, Uplands VA 22101 Canada Abstract: Concerns about growing governmental budgetary deficits and the awareness of the economic advantages associated with a safe and well-maintained road infrastructure are two of the main reasons for devoting attention to better understanding the problem of pavement wear caused by heavy road vehicles. The objective of this report is to conduct a review of the present and previously developed work devoted to the study of vehicle/road interaction. In particular, two of the most pressing questions that are to be answered in the area of heavy vehicle-generated road damage deal with the spatial repeatability of dynamic wheel loads produced by heavy road vehicles due to different types of suspension systems and the use of wide-base and dual tires. The outcome of this review, which is a part of the Federal Highway Administration Truck Pavement Interaction research program on truck size and weight, plays a determining role in assessing heavy truck suspension systems, tire configurations, and their contribution to pavement damage. Index Terms: Heavy Vehicles, Literature Surveys, Pavement Wear, Spatial Repeatability, Tires, Truck Pavement Damage, Vehicle Suspension Systems, Wheel Load Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 Canada

Tag	Abstract
Empirical78	Title: EMPIRICAL CRASH INJURY MODELING AND VEHICLE-SIZE MIX Publication Date: 05/15/1978 Pagination: 33 pp Report No: Publisher/Corporate Author(s): Abstract: Crash injury prediction models were developed using data from the CPIR file for crashes which occurred since January 1, 1970, involving 1969 or newer cars, vans, and pickup trucks. Hostile and protective effects of vehicle size were separated in addition to injury severity increases with age, front seating position, and lack of restraints. Differences by crash configuration were also isolated. Elasticity of injury with respect to average vehicle weight change was computed using these models. Fuel cost decreases were compared with injury cost increases as vehicle weight decreases. Fuel cost savings exceed injury cost increases as vehicle weight is reduced. The conclusion assumes no change in the relationship between vehicle volume and vehicle weight. Injury reduction from larger and lighter vehicles and from improved vehicle design could increase the difference even more. Available from: Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Enforcement90	Title: ENFORCEMENT OF HIGHWAY WEIGHT REGULATIONS: A GAME THEORETIC MODEL Journal Title: Journal of the Transportation Research Forum Volume: 30 Issue: 2 Publication Date: 00/00/1990 Pagination: pp 442-452 Report No: Features: FIGS: 2 Fig. REFS: 10 Ref. Publisher/Corporate Author(s): Abstract: Although there is extensive literature on the subject of weight regulation enforcement, an economic framework is generally lacking. It is generally accepted that the costs associated with complete compliance are excessive. At the same time, the nature of public highways is such that some level of enforcement is necessary. The theoretical model presented in this paper provides a strategic framework for analyzing the economic outcome of different levels of fines and enforcement efforts. The economic tools of "game theory" are used to model the conflict between truckers and the highway enforcement officials. The truckers have two choices: to comply with the law, or to overload their truck. The regulation enforcers also have two choices: they may have the scale open and weigh passing trucks, or they may close the scale. Assuming a randomized operation of scales and random overloading by truckers, the game theory model establishes the equilibrium level of weight regulation compliance, given a set of enforcement parameters. The paper begins with an overview of weight regulation enforcement and a review of the relevant literature. Subsequently, the game theory model is developed to estimate the equilibrium levels of enforcement and compliance. The paper concludes with a discussion of the model results and its implications for highway transport policy. Available from:

Tag	Abstract
Ervin94	Title: EFFICIENT, SAFE, AND ACCEPTABLE TRUCK DESIGNS AND CONFIGURATIONS, PAPER: LINKING TRUCK DESIGN TO PUBLIC AND PRIVATE LIFE-CYCLE COSTS Author(s): Ervin, RD Language: English Journal Title: CONFERENCE PROCEEDINGS 3 Conference Title: International Symposium on Motor Carrier Transportation Sponsored by: Transportation Research Board; American Automobile Manufacturers Association; Federal Highway Administration; and National Highway Traffic Safety Administration. Location: Williamsburg, Virginia Date Held: 19930531-19930604 Publication Date: 00/00/1994 Pagination: pp 78-92 Report No: ISBN: 0309055172 Features: FIGS: 3 Fig. TABS: 1 Tab. REFS: 25 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: This paper rationalizes the need for innovative methods that can ensure adoption of truck designs and configuations that suitably manage both public and private life-cycle costs within a politically realizable framework. The paper begins with a brief discussion of the truck-user industry. The scope of the industry is established and the process by which new trucks are specified and purchased is introduced. These considerations show that because the industry as a whole is highly diverse, the designs of heavy trucks are prescribed to a remarkable degree of detail by each individual purchaser, reflecting only the purchaser's economics unless some other constraint holds sway. Once specified and built, the typical heavy truck lasts such a long time and accrues so many miles that the accumulated public cost attributable to each individual vehicle can be great. Four categories of public cost are addressed in light of the public's exposure to each truck, however designed, over its service life. These are: air pollution from exhaust emissions; roadway deterioration due to truck loading; energy consumption by trucks with its corresponding impact on national energy security and the production of carbon dioxide and other greenhouse gases; and truck-involved crash damage and injury to other road users. Index Terms: Air Pollution, Energy Consumption, Life-Cycle Costing, Motor Carriers, Symposia, Truck Accidents, Truck Design, Truck Pavement Damage, Trucking Industry, Vehicle Configurations Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Estimating81	Title: ESTIMATING VEHICLE WEIGHT DISTRIBUTION SHIFTS RESULTING FROM CHANGES IN SIZE AND WEIGHT LAWS (ABRIDGMENT) Journal Title: Transportation Research Record Issue: 828 Publication Date: 00/00/1981 Pagination: pp 16-18 Report No: Features: FIGS: 4 Fig. REFS: 4 Ref. Publisher/Corporate Author(s): Abstract: Vehicle-weight-shifting methodology is an important element in the economic analysis model for changes in vehicle size and weight limits. The existing models were analyzed based on data for truck weights gathered in Texas since 1954. Results of the analysis show that the pattern of vehicle weight redistribution varies with vehicle class, which suggests that each vehicle class be considered separately. The historical and current use patterns of each vehicle type, practical maximum gross vehicle weight, and equipment-replacement policies should all be considered in a forecast. The phenomena described by the demand and volume-constraint concepts were observed in three vehicle types. Steering-axle weight distribution was not affected by the 1975 change in the Texas weight law, which allowed gross vehicle weight to increase from 72, 000 to 80, 000 lb. tandem-axle weight from 32, 000 to 34, 000 lb, and single-axle weight from 18, 000 to 20, 000 lb. The assumption that the distribution in axle weights for each type of axle has the same ratio to gross weight was found to be basically sound. The analyses of distribution of multiplying factors reveal large discrepancies and the need for further investigation. The findings suggest that further study's warranted to produce a more-accurate methodology for forecasting vehicle weight distribution under any proposed size and weight limits. (Author) Available from:

Tag	**Abstract**
Estimating88	Title: ESTIMATING THE FULL ECONOMIC COSTS OF TRUCK INCIDENTS ON URBAN FREEWAYS. FINAL REPORT Publication Date: 11/00/1988 Pagination: 51p Report No: Features: FIGS: 5 Fig. TABS: 13 Tab. REFS: 3 Ref. Publisher/Corporate Author(s): Abstract: This study addresses one aspect of the impact of truck-related freeway incidents, namely the economic costs of such incidents. Such costs consist of accident-related costs (vehicle repairs, medical expenses, economic losses associated with fatalities), increased vehicle operating costs due to the additional congestion, clean-up costs for such events as spilled loads or fires, and the economic costs of delay to motorists. Travelers' time has economic value, and congestion caused by truck-related incidents imposes economic costs on the community. The losses to society of this additional delay to individuals and commercial enterprises must be added to accident costs, increased vehicle operating costs, and clean-up costs to determine the full economic costs of truck-related incidents on urban freeways. This is the purpose of this study. Los Angeles County is used as the setting. Available from:

Tag	Abstract
Expected86	Title: EXPECTED PERFORMANCE OF LONGER COMBINATION VEHICLES ON HIGHWAY GRADES Journal Title: Transportation Research Record Issue: 1052 Publication Date: 00/00/1986 Pagination: pp 63-77 Report No: ISBN: 0-309-03968-1 Features: FIGS: Figs. TABS: Tabs. REFS: 8 Ref. Publisher/Corporate Author(s): Abstract: Sections 138 and 415 of the Surface Transportation Assistance Act (STAA) of 1982 require the FHWA to report to Congress on the benefits and costs of a national intercity truck route network for the safe and efficient operation of longer combination vehicles (LCVs) such as the double 48-ft and the triple 28-ft combinations. The current (1984) AASHTO criteria for determining critical lengths of grades and climbing lane design for the safe and efficient operation of existing heavy (3-S2) five-axle trucks assume a gross vehicle weight-to-net horsepower (GVW/NHP) ratio of 300 lb/hp to be "representative." The objective of this paper was to investigate the expected performance of LCVs on highway grades and possible impacts on the current AASHTO design criteria. The analysis involved the application of a modified simulation model (used by earlier studies for regular five-axle trucks) under alternative hypotheses about GVW/NHP ratios, rolling resistances, and aerodynamic drag for LCVs operating on different percentage upgrades (1-9 percent grade). The research also included a limited collection of data on GVW and NHP values of actual LCVs. It was found that for LCVs, a GVW/NHP ratio between 300 and 400 would be considered normal, and a ratio above 400 could, occasionally, be observed. It was also found that critical lengths of grades up to 6 percent could be significantly less than AASHTO-recommended values depending on the percentage grade and the LCV's characteristics such as GVW/NHP ratio, rolling resistance, and aerodynamic drag. The expected difference in critical lengths could be as large as 1, 060 ft on a 2 percent grade; that is, 44 percent less than the AASHTO-recommended value of 2, 400 ft. In order to make specific recommendations with respect to changes in current AASHTO design criteria, actual field data for the operation of LCVs on grades have to be collected and analyzed. Available from:

Tag	Abstract
Fan95	Title: TRANSPORTATION ENERGY INTENSITY TRENDS: 1972-1992 Author(s): Fan, Y: Greene, DL Language: English Journal Title: Transportation Research Record Issue: 1475 Publication Date: 00/00/1995 Pagination: pp 10-19 Report No: ISBN: 030906113X Features: FIGS: 9 Fig. TABS: 1 Tab. REFS: 13 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Trends in energy use and energy intensity in transportation are analyzed by growth in transportation activity, changes in energy intensity, and changes in modal structure. Trends in the fuel economy of light-duty vehicles are also analyzed. Reductions in the energy intensity of transport have held back the growth of energy use but with widely varied success across modes. Analysis of trends in the fuel economy of new passenger cars and light trucks from 1975 to 1993 shows that changes in the vehicle sales mix have had a relatively minor impact and that decreased vehicle weight has boosted fuel economy by 0.85 km/L (2 mpg). Increased performance has erased almost all of that gain, though, so the increase for new vehicles is due almost entirely to improved fuel economy technology. Index Terms: Air Transportation, Bus Transportation, Energy Intensiveness, Energy Utilization, Fuel Economy, Fuel Economy Technology, Highway Transportation, Light Trucks, Light Vehicles, Passenger Cars, Rail Transportation, Transportation Energy, Trends, Vehicle Weight Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Feasibility85	Title: THE FEASIBILITY OF A NATIONWIDE NETWORK FOR LONGER COMBINATION VEHICLES Publication Date: 06/00/1985 Pagination: v.p. Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 3 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW DC 20590 USA Abstract: This is the final report of a study, mandated by Section 138 and 415 of the Surface Transportation Assistance Act (STAA) of 1982, on the potential benefits and costs that could be anticipated from the establishment of a nationwide network for longer combination vehicles (LCVs). Impacts on shippers, rail and truck carriers by LCVs, the fuel savings, transportation cost savings and productivity, safety, pavement and bridge impacts, needed highway geometry improvments, and rail freight diversion are evaluated in the determination of network feasiblity. Vehicles considered in the study are Turnpike Doubles (a tractor-semitrailer-trailer coombinatin vehicle with 40- to 48-foot trailers), Rocky Mountain Doubles (a vehicle with one 40- to 48-foot and one 26- to 28-foot trailers), and Triples (a vehicle with three 26- to 28-foot trailers). Vehicle weights are not limited to 80, 000 pounds, but range up to the maximum for each configuration based on bridge overstress criteria roughly equivalent to the current statutory "Bridge Formula B" for lighter vehicles. Highways considered for inclusion in the study network include the Interstate System and a few other highways that are similar design as well as significant length. Several approaches to local access have been considered, including establishing staging areas, using access zones, or limiting off-network travel to selected roads that can safely accomodate LCVs. (Author) Index Terms: Benefit Cost Analysis, Economic Benefits, Feasibility Studies, Heavy Vehicle, Longer Combination Vehicles, Trade Offs, Truck Pavement Damage Available from: Federal Highway Administration 400 7th Street, SW Washington DC 20590 USA

Tag	Abstract
Federal83	Title: FEDERAL TRUCK SIZE AND WEIGHT STUDY Journal Title: Transportation Research Record Issue: 920 Publication Date: 00/00/1983 Pagination: pp 1-12 Report No: Features: FIGS: 12 Fig. TABS: 2 Tab. REFS: 3 Ref. Publisher/Corporate Author(s): Abstract: The report to Congress that has recently been prepared in response to a directive by the Congress to examine the need for, and desirability of, uniformity in maximum truck length and weight limits throughout the United States is summarized. Several alternative changes to federal limits on truck length and weight are investigated, and the impacts that these changes would have on truck productivity, modal diversion, freight costs, pavement and bridge costs, safety, energy, air quality, and noise are estimated. Also estimated was the present value of forecast cumulative changes in transportation and highway system costs. It was found that increases in truck length and weight limits within a substantial range provide sufficient transportation cost savings to pay for damage done to the highway system under changes in the limites. However, if limits are increased without a corresponding increase in highway system expenditures, then the condition of pavements and bridges in the United States would deteriorate, which would, in turn, affect the motor vehicle operating costs, travel speeds, and circuity experienced by highway users. (Author) Available from:

Tag	Abstract
Federal88	Title: FEDERAL HEAVY VEHICLE COST RESPONSIBILITY AND WEIGHT DISTANCE TAX STUDIES. HIGHWAY SUBCOMMITTEE ON HIGHWAY TRANSPORT OF THE STANDING COMMITTEE ON HIGHWAYS Journal Title: American Assn of State Hwy & Transp Official Proc Publication Date: 00/00/1988 Pagination: pp 53-62 Report No: Features: FIGS: 5 Fig. TABS: 1 Tab. Publisher/Corporate Author(s): Abstract: Methodologies and findings from the Federal Heavy Vehicle Cost Responsibility and Weight Distance Tax Studies are presented. The two studies were required following Federal Highway use tax changes in the Deficit Reduction Act (DRA) of 1984. The Heavy Vehicle Cost Responsibility was to provide information on highway cost responsibility of vehicles over 80, 000 pounds gross weight and assess whether they pay their fair share. It was found that heavy vehicle cost responsibility increases at an accelerating rate with axle load and that revenue to cost responsibility rates decrease with increasing truck weight with those over 80, 000 pounds paying less than their fair share depending upon configuration. The Weight Distance Tax findings were that administrative and compliance costs could vary widely for different carriers, evasion could be higher than the truck taxes, equity among users would be improved and that such a tax is indeed feasible. Available from:

Tag	Abstract
Federal97	Title: 1997 FEDERAL HIGHWAY COST ALLOCATION STUDY Language: English Publication Date: 08/00/1997 Pagination: 177p Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/Corporate Author(s): Department of Transportation 400 7th Street, SW DC 20590 USA Abstract: This is the first Federal Highway Cost Allocation Study (HCAS) since 1982. There are two key reasons for conducting this study. The first is to determine how changes in the Federal highway program and user fees which support that program have affected the equity of Federal highway user fees. The second is to coordinate this effort with the concurrent U.S. Department of Transportation Comprehensive Truck Size and Weight (1997 U.S. DOT TS&W) Study. The 1997 U.S. DOT TS&W Study uses analytical tools developed for this HCAS in estimating impacts of TS&W scenarios on infrastructure, environmental, and other costs and in estimating changes in user fees on various vehicle classes that would reflect changes in highway program costs associated with those scenarios. The base period for this study is 1993 to 1995, which covers the most up-to-date information available on Federal highway expenditure patterns since the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was enacted. The analysis year is 2000. A 3-year average of highway costs and revenues is used to represent the base period to reduce the effects of annual variations in costs and revenues. The report is organized as follows: Executive Summary; (I) Study Background, Objectives, Scope, and Approach; (II) Trends and Forecasts of Highway Use; (III) Trends and Forecasts of Highway Costs; (IV) Trends and Forecasts of Highway User Revenues; (V) Highway Cost Responsibility; (VI) Equity and Efficiency of Highway User Fees; and (VII) Study Conclusions. Index Terms: Cost Allocations, Economic Efficiency, Equity, Forecasts, Highway Costs, Highway Users, Trends, User Charges Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Fekpe97	Title: VEHICLE SIZE AND WEIGHT REGULATIONS AND HIGHWAY INFRASTRUCTURE MANAGEMENT Author(s): Fekpe, ESK Language: English Journal Title: Journal of Infrastructure Systems Volume: 3 Issue: 1 Publication Date: 03/00/1997 Pagination: pp 10-14 Report No: Features: FIGS: 1 Fig. TABS: 2 Tab. REFS: 12 Ref. APPS: 2 App. Publisher/Corporate Author(s): American Society of Civil Engineers 345 East 47th Street NY 10017-2398 USA Abstract: The author explains the relevance and important implications of regulations governing the sizes and weights of heavy vehicles in highway infrastructure management. A method is presented for evaluating infrastructure impacts, trucking productivity, and highway cost-allocation implications of alternative truck weight limits and enforcement options. A weight-prediction technique is used to resolve some major uncertainties from the regulatory standpoint with respect to input variables needed to provide the technical basis to support regulatory policy and infrastructure management decisions. The regulations form the core of transport policies related to trucking productivity, infrastructure provision, and management. Any revisions in the size and weight limits are reflected in truck fleet, operating weights, and volumes, which in turn affect the infrastructure geometric requirements, loadings, maintenance, and rehabilitation intervention levels. The proposed evaluation method permits regulatory and weight-control policies to be developed that are compatible with existing infrastructure capabilities. Index Terms: Alternatives Analysis, Compatibility, Evaluation, Highway Management, Infrastructure, Policy Making, Regulations, Size And Weight, Vehicles, Weight Control Available from: American Society of Civil Engineers 345 East 47th Street New York NY 10017-2398 USA

Tag	Abstract
Firey62	Title: PREDICTING FUEL CONSUMPTION AND TRAVEL TIME OF MOTOR TRANSPORT VEHICLES Author(s): Firey, JC: Sawhill, RB Journal Title: Highway Research Board Bulletin Publication Date: 01/00/1962 Report No: Publisher/Corporate Author(s): Abstract: extensive data on fuel consumption and travel time of heavier trucks have been collected by research engineers at the university of washington during the past two years under research contracts with the bureau of public roads. Additional field measurements were supplied and the total information used to assist in identifying the factors to be considered in developing a formula for predicting fuel consumption or travel time. In the development of these equations the first approach was to investigate a theoretical work and energy method for making the prediction. By making a comparison of the theoretical values of fuel consumption and travel time with the actual measured values, it was possible to understand the factors involved and then to make an empirical mathematical fit of the data to an equation. The prediction of fuel consumption depends on the vehicle characteristics of gross vehicle weight and brake horsepower at wide-open throttle as well as the road characteristics of the distance traversed, the length of downhill distance, and the amount of rise in the highway profile. The prediction of travel time likewise depends on these vehicle and road characteristics in the case of relatively rolling or mountainous terrain. However, in relatively flat topography and free moving traffic, the travel time is a function of the properly posted speed limit. The formulas presented in this paper will be beneficial for future highway programming and planning purposes in evaluating benefits to be derived from various alternate highway locations. In addition, this information can be used for determining the economics of hauling commodities in large trucks on one route vs another, for commercial operation or construction purposes. /author/ Index Terms: Economic, Empirical Methods, Freight Transportation, Fuel Consumption, Gross Weight, Highway Location, Highway Planning, Highway Programming, Mathematical Analysis, Prediction, Route Selection, Speed Limit, Travel Time, Trucks, Vehicle Characteristics Available from:

Tag	Abstract
Foreign81	Title: FOREIGN TRUCK SIZE AND WEIGHT LIMITS. ISSUES IN TRUCK SIZES AND WEIGHT Author(s): Staley, RA Publication Date: 00/00/1981 Pagination: 31p Report No: Features: TABS: 7 Tab. Publisher/Corporate Author(s): American Trucking Associations Research, Statistical and Economics Division, 1616 P St, NW DC 20036 USA Abstract: A survey of single and tandem axle weights, gross weights and combination length limits worldwide reveals extremely wide variations among nations. When compared with current maximum United States limits, as embodied in Federal statutes and in the laws of most of the individual states, a majority of the rest of the world permits the operation of vehicles which are heavier--in both (single and tandem) axle and gross weight--and shorter than equipment used in this country. Other nations of the world apparently have a different concept of how they wish to apply their investment in highway facilities. Economic need, more than concern over possible highway wear, seems to be a controlling factor. While some may believe that vehicle size and weight limits in the United States are among the most liberal of all Nations, this paper reveals that such is not the case. In fact, there often appears to be little actual relationship between the level of national development, the highway systems in place and the size and weight limits permitted for trucks. The requirements of international container transport appear to have had a strong influence on gross vehicle weights in Europe. Container operations are of growing importance to the United States. Failure to provide for maximum gross weights in the 95, 000 to 115, 000 pound range, to accommodate fully loaded 20 and 40-foot standard containers rated at up to 67, 200 lbs. gross weights could seriously hamper American foreign trade in the future--as well as cause unnecessary domestic inefficiencies in container operations. It is somewhat ironic that, while the concept of intermodal containers originated in the United States, the present international maximum weight standards for containers are based on European highway weight limits. (Author) Index Terms: Economic Impact, Foreign Countries, Size And Weight Laws, United States Government, Variance Available from: American Trucking Associations 1616 P Street, NW Washington DC 20036 USA

Tag	Abstract
Fu90	Title: A RELIABILITY ANALYSIS OF PERMIT LOADS ON BRIDGES. FINAL REPORT Author(s): Fu, GK: Liu, YW: Moses, F Publication Date: 09/01/1990 Pagination: 120p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 16 Ref. APPS: 1 App. Publisher/Corporate Author(s): Case Western Reserve University Department of Civil Engineering OH 44106 USA Federal Highway Administration 400 7th Street, SW 20590 Ohio Department of Transportation 25 South Front Street, P.O. Box 899 43216-0899 Abstract: Most states, including Ohio, have recently seen increasing numbers of overweight permit trucks and requests for even heavier and more frequent overloads. A major concern is the effect of such loads on the safety and remaining life of highway bridges. The study used a statistical data base for bridge loadings and simulated the effects of permit overloads. The simulation included distributions of truck weights, volumes, multiple lane occupancy and vehicle spacings. The output was a distribution (mean and coefficient of variation) of maximum load effect for a specified time duration ranging from a single vehicle crossing to a two-year inspection interval. A reliability model of bridge safety consistent with recent AASHTO code developments was broadened to cover permit loadings. Three categories of permit trucks were considered including a) routine frequent permits, b) special-single passage permits and c) escorted vehicles. For each permit category, load factors were derived to produce target reliability levels. Examples are included. The recommendations for reviewing permit loads were implemented in a specification format. These provisions are being incorporated in the proposed new AASHTO Maintenance Inspection Manual now under review. In addition, to facilitate permit issuance "bridge formulas" were derived which relate the permit vehicles subgroup weight and wheel base to the bridge rating factor preset as a percentage of the Ohio legal load. Also, formulas were derived to convert all bridges to an equivalent HS level. To assist in developing a permit fee structure, the study reviewed fatigue damage models. Several results are given based on a cost per bridge or a cost per route mile to assess different weight permits. Index Terms: Bridge Inspection, Damage, Fatigue (Materials), Fees, Highway Bridges, Overweight Loads, Permits, Recommendations, Safety, Specification, Statistical Analysis, Truck Effects (Bridges), Truck Load Limits Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Fuel76	Title: FUEL ECONOMY OF HEAVY DUTY VEHICLES Publication Date: 09/00/1976 Pagination: 31 pp Report No: Publisher/Corporate Author(s): Abstract: This report summarizes the fuel economy data analysis performed on data from the report, A Study of Emissions from Heavy Duty Vehicles. The contract involved emission testing of 30 trucks. The truck stratification included two axle single unit trucks, 3 axle single unit trucks, and tractor trailer trucks. Eighteen gasoline and twelve diesel engine powered trucks constituted the 30 tested. All measurements were taken on a chassis dynamometer. From the emission measurements, fuel consumption was calculated using the carbon balance technique. Although both transient and steady state data were gathered, only the steady state fuel consumption was analyzed in this effort. Conclusions: diesel powered trucks peak fuel economy was attained at 30 mph; gasoline powered trucks peak fuel economy occurred at 40 mph for light load test conditions, 30 mph at heavier. Available from: Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Gates75	Title: OPTIMUM SIZE OF HAULING UNITS Author(s): Gates, M: Scarpa, A Journal Title: ASCE Journal of the Construction Division Volume: 101 Issue: C04 Publication Date: 12/00/1975 Pagination: pp 853-860 Report No: Features: FIGS: 3 Fig. APPS: 2 App. Publisher/Corporate Author(s): American Society of Civil Engineers, 345 East 47th Street, NY 10017, USA Abstract: Construction planners are frequently required to analyze operations that consist of a service or loading facility and a number of hauling units. This is typified in truck and shovel operations. The optimum size hauling unit is shown to be directly proportional to the product of the operators' wages, the cycle time of the hauling unit, and the productivity of the loading facility. It is inversely proportional to the ownership and operating costs of the hauling unit. There also exists an optimum combination of time that the hauling units should spend being loaded and transporting the material. After the optimum size hauling unit is determined then the analysis should proceed with finding the number of hauling units required. The paper develops the necessary equations to make this entire analysis. /ASCE/ Index Terms: Analysis, equation, equipment, hauling, loading, materials handling, operating costs, operator, ownership, production rate, salaries, shovels, time, trucks Available from:

Tag	Abstract
Gutierrez97	Title: MEXICAN FIELD STUDY TO OBTAIN BASIC INFORMATION ON TRUCK TRANSPORT Author(s): Gutierrez, JL: Mayoral, E: Mendoza, A: Rico, A Language: English Journal Title: Transportation Research Record Issue: 1602 Publication Date: 00/00/1997 Pagination: pp 45-48 Report No: ISBN: 0309062047 Features: TABS: 6 Tab. REFS: 10 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: A field study begun in Mexico in 1991 is described. This study has become an annual task without a deadline. The field work seeks knowledge about truck traffic on Mexican roads, type of vehicles used, vehicle size and weight, tonnage transported, routes followed, type of freight moved in each case, origin and destination of movements, the packaging system for the transported freight, and whether the movement is related to domestic or to international trade. From these data, which are the core of the information gathered, other data can be obtained, such as each vehicle's degree of compliance with current size and weight regulations, the economic value of the freight transported, age of the fleet examined, empty vehicles detected, occupancy rate of each truck (cargo tonnage/maximum payload), and fuel type used. This study is described, and some examples of the information it provides based on the collected data are provided. Also, some of the most important applications for the acquired information are enumerated. Index Terms: Compliance, Domestic Trade, Economics, Empty Vehicles, Field Studies, Freight, Fuels, International Trade, Mexico, Origin And Destination, Packaging, Payloads, Routes, Size And Weight, Size And Weight Laws, Tonnage, Truck Transportation Statistics, Vehicle Age Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Hajek98	Title: ALLOCATION OF PAVEMENT DAMAGE DUE TO TRUCKS USING A MARGINAL COST METHOD Author(s): Hajek, JJ: Hutchinson, BG: Tighe, SL Language: English Journal Title: Transportation Research Record Issue: 1613 Publication Date: 00/00/1998 Pagination: pp 50-56 Report No: ISBN: 0309064589 Features: FIGS: 5 Fig. TABS: 2 Tab. REFS: 9 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: A procedure was developed for quantifying the pavement cost of proposed changes in regulations governing truck weights and dimensions, particularly the marginal cost method used for pavement cost allocation. The procedure was part of a comprehensive study undertaken by the Ontario Ministry of Transportation in response to government and industry initiatives to harmonize Ontario's truck regulations with those in surrounding jurisdictions. The marginal pavement cost of truck damage was defined as a unit cost of providing pavement structure for one additional passage of a unit truckload (expressed as equivalent single axle load). The results indicate that the highway type (or truck volumes associated with the highway type) has a major influence on marginal costs. For example, the annualized pavement life-cycle cost of the passage of one additional typical truck on 1 km of a highway in southern Ontario can range from about \$0.004 for a freeway to \$0.46 for a local road (Canadian dollars). The marginal cost method can be used to quantify pavement damage due to any axle load combination for both new and existing, in-service pavements. The knowledge of marginal costs would enable highway agencies to quantify the impact of specific regulatory changes of truck axle weights on pavement costs; for example, to quantify the pavement costs associated with increasing allowable truck weights of logging trucks on a specific segment of the highway network. Index Terms: Cost Allocations, Highway Classification, Impacts, Life Cycle Costs, Marginal Costs, Ontario (Canada), Quantifying, Regulatory Policy, Size And Weight Laws, Truck Pavement Damage Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Halim83	Title: ECONOMIC ANALYSIS OF AXLE-LOAD LIMITS IN LESS-DEVELOPED COUNTRIES Author(s): Halim, AOA: Saccomanno, FF Journal Title: Transportation Research Record Issue: 898 Publication Date: 00/00/1983 Pagination: pp 357-364 Report No: Features: FIGS: 6 Fig. TABS: 6 Tab. REFS: 12 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Overloaded vehicles contribute significantly to the deterioration of road surfaces. Most jurisdictions provide protection against severe pavement deterioration by enacting legislation that limits permissible axle loads. In most cases, axle-load limits are determined without reference to economic viability. Axle-load limits in less developed countries are obtained from experience in developed countries, where axle-load distributions, truck fleet composition, and adherence to regulations may differ significantly. An analysis is presented in which economically viable axle-load limits are established when the additional costs from pavement deterioration due to higher axle-load limits are offset by the benefits from reduced vehicle operating costs. With reference to this criterion, axle-load-distribution data from Abu Dhabi are used to establish economically viable axle-load limits. The dominance of vehicle operating cost savings due to higher limits submerges any additional costs due to pavement deterioration in the analysis. This suggests that economically viable axle-load limits in Abu Dhabi should be set to maximum feasible levels where bridge loading restrictions come into effect. This conclusion is amplified for less developed countries in general by considering sources of additional revenues. These additional revenues would be necessary to restore road serviceability after accelerated pavement deterioration from the application of higher axle loads. (Author) Index Terms: Axle Load, Benefit Cost Analysis, Developing Countries, Economic Analysis, Limits, Trade Offs, Truck Pavement Damage, Vehicle Operating Cost Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Hallenbeck94	Title: TRUCK FLOWS AND LOADS FOR PAVEMENT MANAGEMENT. FINAL REPORT Author(s): Hallenbeck, ME: O'Brien, AJ Language: English Publication Date: 01/00/1994 Pagination: 49p Report No: Features: FIGS: 3 Fig. TABS: 5 Tab. REFS: 4 Ref. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Washington State Department of Transportation Transportation Building, MS 7370 98504-7370 Washington State Transportation Center Washington University, 1107 NE 45th Street, Suite 535 WA 98105- USA Abstract: This report describes procedures state departments of transportation can use to determine the location and frequency of their truck monitoring activities. The objective of the recommended procedures is to help a state design a program that cost-effectively meets its needs for truck data within its overall pavement management structure. If the data are collected and used properly, they should provide a much more effective pavement design and management process than is currently available, thereby increasing the reliability of pavement designs; decreasing overall pavement construction, maintenance, and rehabilitation costs; and improving a state's ability to manage its pavement infrastructure. This summary report discusses: the procedures required to determine the number and distribution of permanent, automatic vehicle classification (AVC) and weigh-in-motion (WIM) devices within a state; a system for using the data gathered with these devices to adjust data from short duration vehicle classification and WIM counts to better estimate average annual conditions; the appropriate length of short duration AVC and WIM counts required to develop annual average estimates of travel within specified levels of precision; and research performed in Florida and Washington that illustrates the variability of vehicle classification and truck weight data that states can expect to find on their roads. Index Terms: Automatic Vehicle Classification, Data Collection, Monitoring, Pavement Management Systems, State Departments Of Transportation, Traffic Counts, Truck Weights, Trucks, Vehicle Classification, Weigh-In-Motion Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Hallenbeck94a	Title: TRUCK FLOWS AND LOADS FOR PAVEMENT MANAGEMENT Author(s): Hallenbeck, ME: O'Brien, AJ Language: English Publication Date: 01/00/1994 Pagination: 49p Report No: Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW DC 20590 Washington State Transportation Center 15700 Dayton Avenue WA 98133- USA Abstract: This report describes procedures state departments of transportation can use to determine the location and frequency of their truck monitoring activities. The objective of the recommended procedures is to help a state design a program that cost-effectively meets its needs for traffic data within its overall pavement management structure. If the data are collected and used properly, they should provide a much more effective pavement design and management process than is currently available, thereby increasing the reliability of pavement designs; decreasing overall pavement construction, maintenance, and rehabilitation costs; and improving a state's ability to manage its pavement infrastructure. This summary report discusses: the procedures required to determine the number and distribution of continuous, automatic vehicle classification (AVC) and weigh-in-motion (WIM) devices within a state; a system for using the data gathered with these devices to adjust data from short duration vehicle classification and WIM counts to better estimate average annual conditions; the appropriate length of short duration AVC and WIM counts required to develop annual average estimates of travel within specified levels of precision; and research performed in Florida and Washington that illustrates the variability of vehicle classification and truck weight data that states can expect to find on their roads. Index Terms: Automatic Vehicle Classification, Pavement Management Systems, Traffic Flow, Truck Effect On Highway Capacity, Vehicle Classification, Vehicle Monitoring, Weigh-In-Motion Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Harmonization97	Title: HARMONIZATION OF VEHICLE WEIGHT AND DIMENSION REGULATIONS WITHIN THE NAFTA PARTNERSHIP Language: English Publication Date: 10/00/1997 Pagination: 58p Report No: Features: FIGS: Figs. TABS: Tabs. APPS: 1 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW DC 20590 USA Abstract: This is a report to the Land Transportation Standards Subcommittee (LTSS) that is a result of continuing discussions on vehicle weights and dimensions under the North American Free Trade Agreement (NAFTA). The NAFTA was signed by Canada, Mexico and the United States to establish an economic partnership within which trade can grow among the member countries and in the global marketplace. The LTSS, which was mandated under NAFTA, would implement a work program for making compatible relevant standards-related measures for bus and truck operations and rail operations. Various working groups were established to develop this work program. Working Group 2 - Vehicle Weights and Dimensions focused on the standards and regulations for weight and dimension limits which apply to trucks operating on the highway system. The results of discussions among the partners have produced this report which presents a side-by-side comparison of truck size and weight limits of the three countries; composition of the truck fleet; and operational, safety and compatibility issues. Index Terms: Canada, Comparative Analysis, Compatibility, Fleets, Mexico, North American Free Trade Agreement, Operational Analysis, Safety, Size And Weight Laws, Standards, Truck Laws & Regulations, Truck Weights, United States, Vehicle Size Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Harris99	Title: FUEL ECONOMY EFFECTS AND INCREMENTAL COST, WEIGHT, AND LEADTIME IMPACTS OF EMPLOYING A CONTINUOUSLY VARIABLE TRANSMISSION (CVT) IN MID-SIZE PASSENGER CARS OR COMPACT LIGHT TRUCKS Author(s): Harris, RL: Patterson, DJ: Stockton, TR Language: English Publication Date: 06/00/1999 Pagination: 98p Period Covered: 9712-9812 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 34 Ref. APPS: 1 App. Publisher/Corporate Author(s): National Highway Traffic Safety Administration 400 7th Street, SW DC 20590 Volpe National Transportation Systems Center Kendall Square MA 02142 USA Abstract: This report is a paper study of the fuel economy benefits on the Environmental Protection Agency (EPA) City and Highway Cycles of using a continuously variable transmission (CVT) in a 3625 lb (1644 kg) car and compact light truck. The baseline vehicles are viewed as being equipped with contemporary four-speed automatic transmissions with lock-up torque converters (4SAT). The engines are each three liters in displacement, four valves per cylinder for the car and two valves for the truck, each with sequential port fuel injection and electronic throttle control. The CVT selected for the study was a modified Van Doorne push belt type, termed the Dual Mode. Calculations were made for a range of CVT efficiencies: same, +3% and +6% relative to the 4SAT. This range was thought to cover practical designs for larger vehicles. For the car only, the camshaft was modified to provide increased torque at low speeds, the HITORC engine. For the car, Combined Cycle economy gains ranged from 6.6% with equal to 11.0% with an assumed 6% transmission efficiency gain. Gains for the light truck were very similar; 6.0% to 10.8%. Index Terms: Continuously Variable Transmissions, Light Trucks, Midsize Automobiles, Torque Candidate Terms: Fuel Economy Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Harrison91	Title: IMPACT OF TURNPIKE DOUBLES AND TRIPLE 28S ON THE RURAL INTERSTATE BRIDGE NETWORK Author(s): Harrison, R: Weissman, J Journal Title: Transportation Research Record Issue: 1319 Publication Date: 00/00/1991 Pagination: pp 32-42 Report No: ISBN: 0-309-05157-6 Features: FIGS: 3 Fig. TABS: 6 Tab. REFS: 21 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Much truck research undertaken during the 1980s has been directed toward measuring the impact of longer and heavier vehicles on the highway infrastructure. However, bridge costs have been neglected, principally because of the technical difficulties involved in measuring realistic impacts from the available data bases. Recent Transportation Research Board (TRB) studies on truck weight limits and Turner vehicles attempt to resolve the issue of bridge costs by including estimates of bridge damage attendant on the operation of various large-truck configurations. At present, these TRB studies constitute the most important sources of information currently available to researchers and policymakers. Yet the assumptions concerning mechanisms for determining bridge deficiencies seem worthy of further investigation, particularly because the TRB findings suggest that productivity benefits substantially overwhelm infrastructure costs. Impact on the rural Interstate bridge system of two long-combination vehicle (LCV) configurations that, although attractive to truckers, were not included in the terms of reference for the TRB studies, is examined. These are double 48-ft trailers (turnpike doubles) and triple 28-ft trailers, both of which use the considerable investment made by the trucking industry in these trailer types. It is estimated that LCV operations on the rural Interstate system result in greater bridge damage than predicted when using the TRB methodology, and that user costs--not reported by the TRB authors--are likely to be extremely high on key rural structures, resulting in cost predictions that could exceed direct agency costs. Index Terms: Costs, Highway Bridges, Impact, Longer Combination Vehicles, Rural Interstate Highways, Triple Trailer Trucks, Truck Effects (Bridges), Turnpike Doubles Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Harrison98	Title: IMPACT OF 44 000-KG (97, 000-LB) SIX-AXLE SEMITRAILER TRUCKS ON BRIDGES ON RURAL AND URBAN U.S. INTERSTATE SYSTEM Author(s): Harrison, R: Weissmann, J Language: English Journal Title: Transportation Research Record Issue: 1624 Publication Date: 00/00/1998 Pagination: pp 180-183 Report No: ISBN: 0309064694 Features: FIGS: 3 Fig. TABS: 4 Tab. REFS: 17 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The impact of a 44, 000-kg (97, 000-lb) tridem semitrailer truck on bridges on the urban and rural U.S. Interstate system is examined. The impacts are determined using a suite of models developed for Federal Highway Administration (FHWA) policy use, and both agency and user costs are estimated. Bridges on the Interstate system that are already deficient at current loads are excluded from this analysis, which utilizes the National Bridge Inventory database and reports results for the rural and urban Interstate systems. Index Terms: Bridges, Costs, Impacts, Interstate Highway System, Longer Combination Vehicles, Rural Areas, Truck Effects (Bridges), Urban Areas Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Harrison98b	Title: INCREASING U.S. TRUCK SIZE AND WEIGHT REGULATIONS UNDER NAFTA: THE BRIDGE DIMENSION Author(s): Harrison, R: Weissman, J Language: English Journal Title: Journal of the Transportation Research Forum Volume: 37 Issue: 1 Publication Date: 00/00/1998 Pagination: pp 1-14 Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/Corporate Author(s): Transportation Research Forum 11250-8 Roger Bacon Drive, Suite 8 VA 20190- USA Abstract: In the North American Free Trade Agreement (NAFTA) nations, Canadian and Mexican truck size and weight limits are substantially higher than those permitted on the Federal aid system of the United States. Currently, a NAFTA Land Transportation Standards subcommittee is considering a variety of truck related issues, including size and weight harmonization. If this process selects a typical Canadian or Mexican heavy truck as the NAFTA configuration, productivity gains will need to be balanced against the marginal increase in infrastructure costs. This paper evaluates the impacts of adopting two of the most widely used truck types -- one Mexican, one Canadian -- on the bridge system of the U.S. Interstate highway network. It uses a model specifically designed to calculate bridge impacts at the network level, and reports both replacement costs for the deficient structures and the user delay costs incurred when the structures are being reconstructed. Index Terms: Bridge Reconstruction, Bridge Stresses, Canada, Heavy Vehicles, Interstate Highway System, Mexico, North America, Trade Policies, Traffic Delay Costs, Truck Weights Available from: Transportation Research Forum 11250-8 Roger Bacon Drive, Suite 8 Reston VA 20190- USA

Tag	Abstract
Harvey71	Title: ECONOMIC IMPACT OF ENFORCING WEIGHT RESTRICTIONS ON EASTERN KENTUCKY ROADS Author(s): Harvey, CE Publication Date: 00/00/1971 Report No: Publisher/Corporate Author(s): Kentucky University /College of Business & Economics USA Abstract: it was found that the use of large numbers of overweight coal trucks in eastern kentucky contributes to road destruction and thereby imposes costs on society at large. The public sector, in its role as a transfer agent for equating private and social costs with benefits, has the responsibility of enforcing maximum weight restrictions on eastern kentucky roads. It was concluded that the maximum weight limitations can be enforced without inflicting hardships upon the economy of the region and with a net increase in citizens' welfare. The phasing out of overweight coal trucks implies the sale and use of many more smaller trucks with a proportionate rise in the number of truck drivers needed. Enforcing weight limitations would shift forward, in the form of higher prices to coal buyers, social costs now borne by kentuckians. A general increase in real income would result in the state, because resources now devoted to the repair and maintenance of damaged roads would be freed for other more useful purposes. /author/ Index Terms: Economic Impact, Enforcement, Trucks, Weight Limits Available from:

Tag	Abstract
Hawthorne65	Title: THE SIX-WHEEL HIGH CAPACITY TRUCK Author(s): Hawthorne, JW Journal Title: Engineering Interchange for Railroad Advancement Publication Date: 09/23/1965 Pagination: pp 22-26 Report No: Publisher/Corporate Author(s): Symington Wayne Corporation 2 Main Street NY USA Abstract: In very recent years the operating advantages of high capacity cars and traffic advantage of incentive rates have sparked the drive for cars handling very high payloads. This trend toward equipment capable of transporting cargo in large volume, and of great weight, has for the most part been on such a competitive basis that there has been little or no coordination between the designer of the equipment and the responsible railroad officers who must operate it in trains over their road. Advantages and disadvantages of four-wheel trucks for high capacity cars are suggested. Economic trade offs are mentioned. Index Terms: Costs, Economic, Freight Cars, Jumbo Freight Cars, Railroad Cars, Tonnage, Train Load, Truck Design, U.S. Technology

Tag	Abstract
Heavy85	Title: HEAVY TRUCK DIMENSIONS AND CHARATERISTICS UNDER STUDY IN AUSTRALIA AND CANADA Journal Title: World Highways Volume: 36 Issue: 3 Publication Date: 03/00/1985 Pagination: p2 Report No: Features: PHOT: 2 Phot. Publisher/Corporate Author(s): International Road Federation 525 School Street, SW DC 20024 USA Abstract: The safety and economic aspects of heavy trucks and their relationships to pavement wear and damage continue to be one of the foremost areas of concern to transportation administrators. In their booklet "Roads and Vehicle Limits", the National Association of Australian State Roads Authorities (NAASRA) reviews the problems of truck overloading in Australia. They note that while allowable loads may be increased if more axles or tires are added to better distribute the load on the pavement, doublings the number of tire or axles does note necessarily mean that the load can be doubled. A truck loaded to the legal limit of 8.5 tons would caused the same damage as 5000 large cars. If it is overloaded to 10 tons, the pavement damage is doubled. Meanwhile, the first interim report hs been publish as part of a joint project being carried out by the Roads and Transportation Association of Canada (RTAC) and the Canadian Conserence of Motor Transport Administrators. It contains the results of a survey on the characteristics, of Canadian truck fleet equipment. Acqueintion of the data was needed since the study of trucks and trailers in service in canada involves computerized simulation of configurations. Index Terms: Axle Load, Fleets, Size And Weight Laws, Surveys (Data Collection), Tires, Truck Pavement Damage, Truck Weights Available from: International Road Federation 525 School Street, SW Washington DC 20024 USA

Tag	Abstract
Heavy88	Title: HEAVY VEHICLE COST RESPONSIBILITY STUDY. REPORT OF THE SECRETARY OF TRANSPORTATION TO THE UNITED STATES CONGRESS PURSUANT TO SECTION 931 OF THE DEFICIT REDUCTION ACT OF 1984 Publication Date: 11/00/1988 Pagination: v.p. Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/Corporate Author(s): Abstract: Section 931 of the Deficit Reduction Act of 1984 (Pub. L. 96-369, 98 Stat. 494) required the Secretary of Transportation to "conduct a study of whether highway motor vehicles with taxable gross weights of 80, 000 pounds or more bear their fair share of the cost of the highway system." This Heavy Vehicle Cost Responsibility (HVCR) study confirmed findings reported in the 1982 Highway Cost Allocation Study, the 1985 study of "The Feasibility of a Nationwide Network of Longer Combination Vehicles, " and other studies that pavement damage increases substantially with axle load. The highway cost responsibility of heavy trucks varies widely depending on their operating weight and the number and configuration of axles. While combination vehicles generally have higher cost responsibilities than single unit vehicles, single units with high axle loads can cause greater pavement damage. Combination vehicles with seven or more axles operating at 80, 000 pounds cause less pavement damage than many single unit trucks operating at weights considerably below 80, 000 pounds. The study concluded that, as a group, trucks with taxable weights over 80, 000 pounds do not pay a fair share of highway costs compared to other vehicles. Other conclusions include: (1) for any configuration, the greater the weight, the lower the share of highway costs that are covered by user revenues; (2) in any weight category, the greater the number of axles, the higher the ratio of revenues to costs; (3) six-axle tractor-semitrailers and multi-unit combination vehicles with seven or more axles may pay a fair share of highway costs at weights somewhat above 80, 000 pounds; and (4) twin trailer combinations with nine or more axles may bear a fair share of highway costs at gross weights up to about 120, 000 pounds, depending on their axle loads. Available from:

Tag	Abstract
Heavy88a	Title: HEAVY TRUCKS, CLIMATE AND PAVEMENT DAMAGE Publication Date: 00/00/1988 Pagination: 176p Report No: ISBN: 92-64-13150-7 Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 5 App. Publisher/Corporate Author(s): Abstract: The objective of this study was to prepare a report which describes the effect of recent technical developments of heavy vehicle configurations on road pavement performance and to assess the separate and combined effects of loading and climate as causes of pavement distress. The Report's Introduction presents the various heavy freight vehicle factors and climatic parameters to be taken into account, defines the major pavement categories -- flexible, semi-rigid and rigid -- and reviews the predominant types of surface and structural distress which may occur under the action of both traffic and climate. Chapter II describes recent empirical research on the effects of loads on pavement fatigue life and results of theoretical and experimental studies on the mechanical properties of road materials and on needed pavement thicknesses. A short subsection deals with dynamic loads. Chapter III discusses the climatic factors influencing pavement behaviour and their role in pavement deterioration -- frost/thaw damage, rutting, thermal cracking, etc. Chapter IV presents the economic and policy issues associated with heavy loads and gives three typical technico-economic assessments illustrating this problem under extreme climatic conditions. Chapter V discusses research philosophy, key areas of research and proposes directions for future research to limit the economic consequences of the combined action of heavy vehicle traffic and climate on road pavements. Five annexes provide technical information on truck characteristics, surface distress types, the load equivalence law, models for predicting temperature distributions in pavements and pavement distress models. As a whole this report constitutes an up-to-date compendium of recent research and practical expertise on loading and climatic effects providing a reference basis for future national and/or international highway and freight transport policies. Available from:

Tag	Abstract
Hennes58	Title: WASHINGTON STATE HIGHWAY COST ALLOCATION STUDY Author(s): Hennes, RG: Mylroie, WW Journal Title: Highway Research Board Bulletin Publication Date: 00/00/1958 Report No: Publisher/Corporate Author(s): Abstract: A discussion is presented of the objectives, procedures, methodology and some of the findings of a three-year study of highway cost allocation conducted by the washington state council for highway research through the agency of the university of washington and the state college of washington for the washington state legislative joint fact-finding committee on highways, streets and bridges for the biennia 1953-55 and 1955-57. Answers to the following questions were the objectives of this study. Who should contribute toward paying the cost of public roads and streets in the state of washington? What is an equitable division of road cost responsibility among the three principal direct beneficiaries: the highway users, the owners of affected property, and the general public? How can the users' share of these costs be divided equitably among the various types of automobiles, trucks, and buses? Major reliance was placed on collateral research by the washington state highway department and the united states bureau of public roads. Where data were lacking original fact-finding was done. The collection and analysis of these data are discussed as well as the manner in which responsibility for washington's highway costs might be divided between users and others. This is done for each road system (county, city and state--a reasonably functional as well as administrative classification) and for the combined systems on the bases of relative use, earnings credit and relative benefit. The results are also compared with the actual 1953 needs and with the 1954 receipts from users and others for highways. These comparisons show that the current rate of user contribution is sufficient to support the users' share of the cost of a modern-day system of public roads and city streets. The users' share of the highway costs is then divided among classes of users on three different bases: the amount of highway use (ton-mile or weight mile), operating costs, and incremental costs. Alternative procedures for converting user group responsibility into individual fees and the cost of borrowing for highway construction are also discussed. /author/ Index Terms: Cost Allocation, Data Acquisition, Data Analysis, Highway Construction, Highway Costs, Highway User Taxation, Public Highway Available from:

Tag	Abstract
Hewitt99	Title: IMPACT OF CHANGES IN TRUCK WEIGHT REGULATIONS ON MONTANA'S ECONOMY Author(s): Hewitt, J: Menuez, N: Smith, K: Stephens, J Language: English Publication Date: 02/00/1999 Pagination: 208p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 4 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Montana Department of Transportation 2701 Prospect Avenue 59620- Montana State University, Bozeman Department of Civil Engineering MT 59717 USA Abstract: This study investigated the impacts on Montana's economy of changes in the allowable gross weights of the vehicles that operate on the state's highway system. Four scenarios were considered with different maximum allowable gross vehicle weights (GVWs). Three scenarios, with maximum GVWs of 36, 300; 39, 900; and 47, 900 kg (80, 000; 88, 000; and 105, 500 lb), represented reductions in GVWs in Montana. The fourth scenario consisted of an increase in allowable GVW to 58, 100 kg (128, 000 lb). Work on the study began with the estimation of the vehicle fleets that would evolve under each scenario, as users and providers of transportation services adjusted to the new GVW limits. Based on these estimated changes in the vehicle fleet and traffic streams, attendant changes in the demands on, and the performance of, the highway infrastructure were determined. Attention was focused on pavements and bridges, as these elements of the infrastructure were believed to be most sensitive to load related changes in vehicle demands. Consideration was also given to possible effects that changes in allowable GVW would have on other aspects of system performance, including geometric and capacity requirements and fatalities and injuries. The investigation subsequently focused on the economic impacts that would be experienced above and beyond changes in direct infrastructure costs. These impacts were first investigated by studying specific industries in the state. A statewide economic model was used to obtain a broader indication than available from the case studies of both the direct and indirect economic impacts that would result from changes in maximum allowable GVW. It was found in the results from both the case studies and the statewide economic model that in many instances the total economic impacts of changes in GVW limits exceeded the associated changes in infrastructure costs by an order of magnitude. This result reinforced the need to consider more than just infrastructure impacts in evaluating truck size and weight issues. Index Terms: Bridges, Case Studies, Economic Impacts, Economic Models, Fatalities, Geometric Design, Gross Vehicle Weight, Highway Capacity, Industries, Infrastructure, Injuries, Pavements, Regulations, Trucks, Vehicle Size, Vehicle Weight Geographic Terms: Montana Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Hewitt99a	Title: INFRASTRUCTURE AND ECONOMIC IMPACTS OF CHANGES IN TRUCK WEIGHT REGULATIONS IN MONTANA Author(s): Hewitt, J: Menuez, N: Smith, K: Stephens, J Language: English Journal Title: Transportation Research Record Issue: 1653 Publication Date: 00/00/1999 Pagination: pp 42-51 Report No: ISBN: 0309070503 Features: FIGS: 2 Fig. TABS: 4 Tab. REFS: 21 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The overall impacts of changes in truck weight limits on the economy in Montana were determined. Four scenarios were considered with different maximum allowable gross vehicle weights (GVWs). Three scenarios, with maximum GVWs of 36, 300 kg (80, 000 lb), 39, 300 kg (88, 000 lb), and 47, 900 kg (105, 500 lb), represented reductions in GVWs. The fourth scenario represented an increase in allowable GVW to 58, 100 kg (128, 000 lb). Predictions were made of the vehicle fleets under each scenario and of the changes in demands and performance of the highway infrastructure. Only nominal changes in infrastructure demands were observed across all scenarios (maximum of $1.5 million). Case studies of the impacts expected on selected industries within the state were conducted. Changes in transportation costs of 4 to 54 percent were predicted under the 36, 300 kg (80, 000 lb) scenario, which were estimated to be 0.2 to 4.1 percent of the value of the goods produced. Changes in transportation costs typically were at least an order of magnitude larger than changes in infrastructure costs. Statewide economic impacts in terms of forgone gross state product amounted to -0.4 percent and, in the first year alone, were 2 to 20 times the infrastructure impacts, depending on the scenario. Index Terms: Case Studies, Economic Impacts, Gross Vehicle Weight, Infrastructure, Regulations, Strategic Planning, Trucks Candidate Terms: Size And Weight Regulations Geographic Terms: Montana Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Highway80	Title: HIGHWAY ECONOMIC EFFECTS OF INCREASED TRUCK SIZE AND WEIGHT Publication Date: 00/00/1980 Pagination: pp 149-157 Report No: Features: REFS: 19 Ref. Publisher/Corporate Author(s): Abstract: This paper presents the findings of the current effort of assessing increased truck size and weights on Texas highways. Four alternative scenarios characterized by forecasted truck ton-miles over twenty years, highway classifications, commodity flow, and truck configurations were studied to determine the effects each would have on highway and bridge costs, truck operating costs, and fuel consumption over the same twenty-year planning horizon. Available from: Acknowledgement of Document Source: Engineering Index
Highway88	Title: HIGHWAY ROAD DAMAGE: CAN BIG WHEELS KEEP ON ROLLING? Journal Title: Traffic Safety Volume: 88 Issue: 3 Publication Date: 05/00/1988 Pagination: pp 6-9 Report No: Publisher/Corporate Author(s): Abstract: This article, which considers the question, can our pavements handle heavy truck loadings? reviews the history of pavement design, and answers "yes" to the question. It is noted that an increase in the average weight of trucks by 20 percent can cut the expected life of a concrete pavement in half. However, it is pointed out (according to the AASHTO Design Guide), that an increase of 1 additional inch of concrete pavement thickness will double the load carrying capacity of the pavement. The cost of providing this additional inch of concrete at the initial construction stage is much lower than the cost of future rehabilitation of the roadway under traffic conditions. There is a need to think of the total life cycle of the highway rather than seek the lowest possible initial cost. It is also suggested that truck lanes separate from the rest of Interstate traffic lanes but running parallel to them may be in the best overall public interest. Available from:

Tag	Abstract
Highway94	Title: HIGHWAY USER FEES: UPDATED DATA NEEDED TO DETERMINE WHETHER ALL USERS PAY THEIR FAIR SHARE Language: English Publication Date: 06/00/1994 Pagination: 27p Report No: Features: FIGS: 2 Fig. TABS: 2 Tab. APPS: 3 App. Publisher/Corporate Author(s): General Accounting Office 441 G Street, NW DC 20548 USA Abstract: There is concern that fuel taxes, combined with other federal user fees, may not be the most equitable and efficient way to allocate highway costs because such taxes do not sufficiently correlate the charges that users pay with the damage that they cause. The General Accounting Office (GAO) was asked to (1) summarize the rationale for and arguments against assessing fees explicitly according to the wear a user causes to highways, (2) evaluate the recent experiences of the states that assess or have rescinded wear-based fees, and (3) identify potential approaches that might be used to overcome the obstacles to implementing such fees. Briefly, GAO found the following: Proponents contend that the current fees do not capture the key elements that cause highway wear: a vehicle's weight per axle and the miles traveled. They argue that a user fee based on the weight and distance traveled would more accurately charge heavy trucks for the wear they cause and, in the long run, provide truck operators with an incentive to use loading configurations and choose truck designs that reduce pavement wear. Opponents argue that such wear-based fees are (1) unnecessary because heavy trucks are currently paying their fair share, (2) costly to administer and enforce, and (3) easy to evade. It is difficult to determine whether the current federal user fee system undercharges heavy trucks because the last comprehensive FHWA study of this issue, done in 1982, is out of date. The states' recent experiences with charging heavy trucks on the basis of weight and distance have varied. In 1989, 11 states employed such fees; today, only 6 continue to do so. Two states that had attempted to charge on a per-trip basis abandoned their fees because the administrative costs consumed about 20% of the revenues collected. Another state rescinded its fee because of widespread evasion. Finally, two states rescinded their fees following legal challenges that their systems favored intrastate truck operators over interstate operators. Officials from those two states, as well as the six states that currently impose weight-distance user fees, emphasized that they efficiently implemented such fees, spending only between 2 and 5% of the revenues collected on administrative costs. The obstacles that prevented some states from efficiently administering and enforcing weight-distance user fees--high administrative costs and evasion rates--can be minimized. Intelligent Vehicle Highway Systems technologies now emerging are beginning to allow states to more efficiently collect data on vehicle weight and miles traveled. FHWA officials emphasized that the efficient implementation of a national weight-distance user fee is currently feasible. They noted that new technologies could facilitate the enforcement of such a fee and allow greater precision in charging trucks on a weight-per-axle basis. Index Terms: Administration, Axles, Cost Allocations, Costs, Data Needs, Enforcement, Evasion, Heavy Duty Trucks, Highway Damage, Highway User Fees, Intelligent Vehicle Highway Systems, Legal Aspects, Mileage, Technological Innovations, Vehicle Weight, Wear Available from: General Accounting Office P.O. Box 6015 Gaithersburg MD 20877 USA

Tag	Abstract
HILDEBRAND88	Title: AN ECONOMIC APPROACH TO TRUCK WEIGHT REGULATION ENFORCEMENT Author(s): Hildebrand, MD: Prentice, BE Language: ENGLISH Journal Title: RESEARCH BULLETIN UNIVERSITY OF MANITOBA Issue: 4 Publication Date: 08/00/1988 Pagination: 46 PP Report No: Publisher/Corporate Author(s): Supplemental Information: Barry E. Prentice and Marvin D. Hildebrand other phys. Description: x august 1988 bibliography: p. 45-46 addl corp. Author info: university of manitoba. Transport institute research bulletin university of manitoba transport institute no 4 -untraced series Index Terms: Canada, Law And Legislation, Trucking, Trucks, Weight Available from: Acknowledgement of Document Source: UC, BERKELEY, INSTITUTE FOR TRANSPORTATION STUDIES 19281125

Tag	Abstract
Hirsch72	Title: TRUCK TESTS ON TEXAS CONCRETE MEDIAN BARRIER Author(s): Hirsch, TJ: Post, ER Publication Date: 12/00/1972 Pagination: 43 pp Report No: Features: FIGS: 17 Fig TABS: 1 Tab REFS: 14 Ref Publisher/Corporate Author(s): Federal Highway Administration /US/ Texas State Department of Highways & Public Transp Texas Transportation Institute USA Abstract: The rigid Texas concrete median barrier (cmb-70), with inclined surfaces, remained intact in restraining and redirecting a large 48, 800 lb. Tractor-trailer truck with load under the full-scale impact test conditions of 35 mph/19 deg; 34 mph/16 deg; and 45 mph/15 deg. The truck was remotely controlled from a chase pickup vehicle. The longitudinally reinforced cmb had a height of 32 in. And weighed 507 plf. The barrier test section, with a length of 150 ft., Was not anchored to the ground. A 1-in. Layer of hot mix asphalt was placed at the base of the barrier to help resist lateral displacements. Subsequent to the tests, no rotational and lateral permanent set displacements of the barrier was visible. The relatively minor damage to the truck consisted of sheet metal damage to the front fender and running board of the tractor. Estimated rapair cost would be less than 200 dollars. Maintenance of the barrier would require at most a light sand-blasting job to remove the unsightly tire scrub markings. The small amount of concrete spalling that occurred in the immediate area of impact would require no maintenance. The fence and luminaire pole on top of the barrier were not damaged. /AUTHOR/ Index Terms: Damage, Displacement, Impact Test, Median Barriers, Spalling Available from:

Tag	Abstract
Hirsch73	Title: TRUCK TESTS ON TEXAS CONCRETE MEDIAN BARRIER Author(s): Hirsch, TJ: Nixon, JF: Post, ER Journal Title: Highway Research Record Issue: 460 Publication Date: 00/00/1973 Pagination: pp 73-81 Report No: Features: FIGS: 12 Fig REFS: 5 Ref Publisher/Corporate Author(s): Abstract: The Texas concrete median barrier, with inclined surfaces, satisfactorily restrained and redirected a large 48, 800-lb tractor-trailer trailer truck with load under the full-scale impact test conditions of 35 mph at a 19-deg angle, 34 mph at a 16-deg angle, and 45 mph at a 15-deg angle. The truck was remotely controlled from a chase pickup vehicle. There was damage to the sheet metal of the front fender and running board of the tractor. Estimated repair cost was less than $200. Maintenance of the barrier would require, at most, a light sandblasting job to remove the unsightly tire scrub markings. The small amount of concrete spalling that occurred in the immediate area of impact would require no maintenance. The fence and light pole on top of the barrier were not damaged. /AUTHOR/ Index Terms: Abrasive Blasting, Concrete Structures, Impact Test, Maintenance, Median Barriers, Spalling, Tractor Trailers, Trucks Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418

Tag	Abstract
Hoel97	Title: EXCLUSIVE LANES FOR TRUCKS AND PASSENGER VEHICLES ON INTERSTATE HIGHWAYS IN VIRGINIA: AN ECONOMIC EVALUATION Author(s): Hoel, LA: Vidunas, JE Language: English Publication Date: 06/00/1997 Pagination: 102p Report No: Features: FIGS: 18 Fig. TABS: 10 Tab. REFS: 23 Ref. APPS: 7 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Virginia Department of Transportation 1401 East Broad Street 23219 Virginia Transportation Research Council P.O. Box 3817, University Station VA 22903 USA Abstract: Increases in heavy truck traffic on Virginia's highways in recent years have raised concerns about both safety and capacity, particularly on the interstate system. Transportation agencies have developed a number of strategies for dealing with the impacts on safety and capacity of a truck population that has been increasing in volume and in the percentage of large tractor-trailers. One strategy that has been suggested is separate lanes for trucks and passenger vehicles. A reliable methodology to determine when separate lanes for trucks and passenger vehicles are economically feasible would enable transportation officials to make informed decisions concerning when this approach should be considered and used. This study evaluated a computer program, Exclusive Vehicle Facilities (EVFS), developed by the Federal Highway Administration for determining the economic feasibility of separating trucks and other vehicles on freeway segments. A 50.7-km (31.5-mi) segment of I-81 in Virginia was selected to demonstrate the application of the program. A number of factors contribute to the feasibility of exclusive lanes. Although no single factor predominates, traffic volume, vehicle mix percentage, accident rates, and maintenance and construction costs are given more weight than other factors in the program. Among the program's strengths are its ability to analyze a number of alternatives for a variety of different conditions, its ease of use, and the fact that it can be inexpensively applied. Its weaknesses include its inability to differentiate between the lane(s) (i.e., inside, middle, outside) to which restrictions are applied and its unsuitability for analyzing exclusive lane alternatives in which a barrier is used to separate vehicle types. With respect to I-81, several exclusive lane strategies produced a benefit-cost ratio greater than 1.0 and a net present worth in the millions of dollars. Should I-81 or another high-volume interstate corridor with a large truck percentage be considered for improvement, the Virginia Department of Transportation should apply EVFS to assist in evaluating the feasibility of exclusive lane alternatives. Since EVFS is designed to perform economic analyses, operational and geometric implications of any exclusive lane strategy should also be considered. Index Terms: Barriers, Benefit Cost Analysis, Computer Programs, Economic Evaluations, Exclusive Vehicle Facilities, Feasibility Studies, Heavy Vehicles, Traffic Segregation, Truck Lanes, Trucks, Virginia Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Hohorst65	Title: MARKET PLANNING AND HIGH CAPACITY TRUCKS Author(s): Hohorst, HG Journal Title: Engineering Interchange for Railroad Advancement Publication Date: 09/23/1965 Pagination: pp 4-16 Report No: Features: FIGS: 16 Fig Publisher/Corporate Author(s): Symington Wayne Corporation 2 Main Street NY USA Abstract: Poorly designed cars, i.e. cars with poor payload to tare weight ratios result in unfavorable competitive positions. Also, low volume favors trucking, high volume favors railroads. However, railroads generally can operate faster on long distances and consequently, hold a competitive edge in this situation. The discussion covers towing costs, profitability of the FLEXI-FLO cement delivery system, profit comparisons for three types of high capacity cars, cost analyses for jumbo tank cars, and other related subjects. It is pointed out that the 125-ton car has the best payload to tare weight ratio. Analysis indicated that the 125-ton four-wheel truck as of today's technology is the next logical lower cost advance for heavier capacity trucks after the 100-ton truck. Index Terms: Cargo, Costs, Economic, Freight Cars, Jumbo Freight Cars, Railroad Cars Available from:

Tag	Abstract
How75	Title: HOW LONG WILL AN ASPHALT PAVEMENT LAST? Journal Title: Maryland Asphalt Paver Publication Date: 05/00/1975 Pagination: pp 4-5 Report No: Features: PHOT: 4 Phot. Publisher/Corporate Author(s): Maryland Asphalt Association, Incorporated Baltimore Life Building, 901 North Howard Street MD 21201 USA Abstract: It depends on many things, namely: type of subgrade, rainfall, frost penetration, temperature differences, terrain, type and quantity of traffic, pavement design, materials, specifications, and construction. In fact these are the items that should be considered when designing new pavements and overlays of existing pavements. Current technology indicates that properly designed, specified and constructed hot mix asphalt pavements will give 20 years of service prior to the need for an asphalt overlay. Such pavements would be capable of handling the heaviest legal loads with the highest average daily traffic for this period. When overlaid the old pavement becomes an integral part of the new structure which includes the new asphalt surface of varying thickness. Again it is reasonable to expect 20 years service life of this pavement providing the criteria noted in the preceding paragraph is adhered to. Technology from national road tests, simulated laboratory testing, private industry and State research efforts, and studies of in place pavements have been utilized to establish the 20 years life expectancy. The Asphalt Institute, National Asphalt Pavement Association, and The Maryland Asphalt Association advocate the use of Full Depth Asphalt Pavement to attain the long life and the most economical performance from asphalt pavements. These pavements have one big advantage over other flexible pavements which is subgrades remain strong even in the critical thaw part of the year. In fact indications are that subgrades beneath full depth asphalt pavements get stronger in service. At least one of the Associations noted is currently studying in service pavements to determine if 25 years life is feasible design criteria. So, to get full life from your pavement, design your pavement carefully considering subgrade properties, amount and type of traffic, and the materials available. Utilize the lates State Highway Administration Specifications for Materials, Highway, Bridges, and Incidental Structures. Grade, drain, and compact the subgrade carefully so that it will support trucks and construction equipment. Proceed with placing the proper hot mix asphalt courses being sure that specification density and smoothness is incorporated in the construction. One of the main things is to be sure to have a good contractor who has the equipment, personnel, materials, experience, financial responsibility, and expertise to do the job that you want done. The pavements shown in this articles are a few installations from around the State that are giving satisfactory performance. None of them have been resurfaced to date. Index Terms: Asphalt Pavement, Asphalt Pavement Specifications, Economic Considerations, Hot Mix Paving Mixtures, Pavement Design, Pavement Durability, Pavement Performance, Service Life, Subgrade, Traffic Loads Available from:

Tag	Abstract
How84	Title: HOW VEHICLE LOADS AFFECT PAVEMENT PERFORMANCE Language: English Journal Title: Wisconsin Transportation Bulletin Publication Date: 00/00/1984 Pagination: 4p Report No: Features: FIGS: 5 Fig. Publisher/Corporate Author(s): Abstract: Why keep roads in good condition? The economy of any area depends on shipping and receiving products and materials; trucks are the most common form of transport. The condition of area roads directly affects the speed, efficiency, and ultimately the costs of transportation. Considering the huge cost of maintaining and rebuilding roads, local governments have great incentive to protect pavements. Three elements work to cause road deterioration: traffic loads, the environment, and aging. While we have little or no control over the environment and aging, we can control traffic loads. This bulletin describes pavement fatigue and discusses how wheel loads, number of truck axles, number of truck tires, quality of subgrade, pavement thickness and changing seasons contribute to pavement fatigue. Available from:

Tag	Abstract
Humphrey97	Title: OVERSIZE/OVERWEIGHT TRANSPORTATION STUDY Author(s): Humphrey, TF Language: English Publication Date: 00/00/1997 Pagination: v.p. Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: Apps. Publisher/Corporate Author(s): Massachusetts Institute of Technology Center for Transportation Studies, 77 Massachusetts Avenue MA 02139 USA Abstract: Throughout the United States, oversize/overweight trucking is a strong viable industry. In Fiscal Year 1994 alone, 1, 927, 010 permits were issued for overweight vehicles, an 8% increase from FY93. It is important to gain an understanding of the oversize/overweight trucking industry and the vital role it plays in keeping the nation's economy moving ahead. That task was accomplished in a large part by a comprehensive report conducted by the Center for Transportation Studies at the Massachusetts Institute of Technology (MIT). The Specialized Carriers & Rigging Association (SC&RA) requested the SC&R Foundation to undertake the research. The report includes a state by state breakdown of oversize/overweight permits for FY93 and FY94, provided by the Federal Highway Administration (FHWA). This information is further broken down into overweight categories: nondivisible single trip, nondivisible multiple trip, divisible single trip, and divisible multiple trip. The report also includes all 13 working papers commissioned by FHWA for its ongoing Comprehensive Truck Size and Weight Study (TS&W). This study's ultimate objective was to estimate the effects of various elements of regulatory policy on a transport system as it evolves to serve a modern global economy. It examines how changing logistics costs, production strategies and shipping patterns must be balanced with the needs and concerns of carriers, managers of infrastructure, shippers, consumers and the traveling public. TS&W policy touches upon safety, infrastructure design and wear, States' rights and national uniformity, environment, energy use, intermodal competition and cost recovery. Index Terms: Cost Recovery, Costs, Energy Consumption, Environmental Aspects, Infrastructure, Intermodal Competition, Logistics, Motor Carriers, Oversized Vehicles, Overweight Loads, Permits, Production, Regulatory Policy, Safety, Shipping Trends, States United States, Trip, Trucking Industry, Trucks, User Needs Available from: Specialized Carriers & Rigging Foundation 2750 Prosperity Avenue, Suite 620 Fairfax VA 22031-4312 USA

Tag	Abstract
Hutton74	Title: WHY NOT TRIPLES? Author(s): Hutton, TD Publication Date: 08/00/1974 Pagination: 15 pp Report No: Features: FIGS: Figs. TABS: Tabs. PHOT: Phots. REFS: 23 Ref. Publisher/Corporate Author(s): Society of Automotive Engineers 2 Pennsylvania Plaza NY 10001 USA Abstract: The size and weight of commerical motor vehicles have been effectively frozen since the adoption of the Federal Aid Highway Act of 1956. The removal of political barriers for the liberalization of these restrictions will help stem the tide of inflation, while at the same time making potential fuel savings of as much as 21% for intercity freight trucks a reality. With transportation a recurrent cost in every phase of production, distribution, and service, fuel becoming more expensive, and the security of supply more tenuous, the significant increase in transportation efficiency provided by the triple trailer combination must not be withheld from the nation's economy. Millions of operational miles have clearly demonstrated that our nation's highways have been built to the point where they can safety handle this equipment, with triples having established the best safety record of any vehicle ever used on our highways. Triples also make it possible to move freight with fewer vehicles, thereby reducing highway congestion, conserving energy, and consequently reducing pollution. /HSRI/ Index Terms: Air Pollution, Commercial Vehicles, Energy, Freight Transportation, Fuel Consumption, Highway Safety, Size, Triple Trailer Trucks, Trucks, Weight Available from: Society of Automotive Engineers, Incorporated 400 Commonwealth Drive Warrendale PA 15096 USA Acknowledgement of Document Source: Highway Safety Research Institute

Tag	Abstract
Impact84	Title: IMPACT ANALYSIS OF A COST-BASED APPROACH TO HIGHWAY FINANCING IN IOWA Language: English Publication Date: 03/00/1984 Pagination: 88p Report No: Features: FIGS: 3 Fig. TABS: 20 Tab. REFS: Refs. Publisher/Corporate Author(s): Abstract: This research deals with the potential impacts of increased highway funding in Iowa ($100 million yearly). The added funding would permit improvement of the highway infrastructure and would be raised through revised user fees applied to heavier motor vehicles. The mechanism used, "third structure" weight-distance taxes, would apply with the greatest impact to the heaviest, most used vehicles. At the same time, the author suggests a reduction in vehicle registration fees, especially for the heavier trucks. The impacts studied in this report are the net effects of higher fees compared with the gains to be achieved from better highways. The author posits several scenarios based upon different assumptions pertaining to excess capacity, cost shifting, and incidence in the motor carrier industry and in other industries. He employs economic models to quantify employment and tax revenue impacts affecting various sectors of the Iowa economy, which result from highway finance changes. Available from:
Impact93	Title: IMPACT ASSESSMENT OF THE REGULATION OF HEAVY TRUCK OPERATIONS Language: English Publication Date: 09/00/1993 Pagination: v.p. Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 3 App. Publisher/Corporate Author(s): Abstract: The main objective of this project was to evaluate the impact of the New York State divisible-load permit system for heavy trucks in terms of costs to society, resulting mostly from increased pavement damage, benefits to the trucking industry (primary economic benefits), and also benefits to New York State's economy (secondary economic benefits). Research objectives include investigation of seasonal variations in truck usage and estimates of costs and benefits for several lower weight limit scenarios, in order to assess the appropriateness of the present weight regime. Available from:

Tag	Abstract
Improvements80	Title: IMPROVEMENTS NEEDED IN THE DEPARTMENT OF TRANSPORTATION'S TRUCK SIZE AND WEIGHT STUDY (CED-80-41) Publication Date: 01/14/1980 Pagination: 9p Report No: Publisher/Corporate Author(s): Comptroller General of the United States DC 20548 USA Abstract: A review of the Department of Transportation draft study plan for its truck size and weight study revealed several areas needing improvement to provide a more objective research effort. The draft plan did not: discuss how the actual effect of specific changes in truck weight limits would be calculated; consider the effect of permit and expemption policies, level of weight enforcement, or severity of fines; consider earlier GAO recommendations for legislative changes to Federal weight limitations; include an assumption for evaluating the maximmum truck weights that would be allowable now in virtually al States; state whether additional highway funds would be available under any of the assumptions; state intentions to determine who will assume costs or receive benefits under various weight limits; include a representative sample of all Federal-aid highways and bridge; include obtaining data on overlay design; include plans to consider the impact of pavement condition on fuel efficiency; provide any indication of the relationship between weight and the cause of accidents; or consider the impact of weather. These issues need to be addressed to adequately consider important aspects of truck weight. Index Terms: Exemption, Fuel, Fund Allocations, Impact Studies, Policy, Size And Weight Laws, Traffic Accident Causes, Traffic Law Enforcement, Truck Effects (Bridges), Truck Laws & Regulations, Truck Pavement Damage, Truck Weights, Weather Available from:

Tag	Abstract
Investigation80	Title: AN INVESTIGATION OF TRUCK SIZE AND WEIGHT LIMITS: TECHNICAL SUPPLEMENT VOLUME 2. TRUCK AND RAIL COST EFFECTS OF TRUCK SIZE AND WEIGHT LIMITS Publication Date: 12/00/1980 Pagination: 255p Report No: Publisher/Corporate Author(s): Abstract: This volume presents reported truck and rail operating data and analytical methods developed to estimate changes in transportation prices attributable to specific sets of truck size and weight limits. A system of cost based "rates" (or average shipment charges) is developed for differentiating among specific truck and rail transport services by allocating full economic cost to appropriate vehicle payloads. The affects of various truck size and weight limits are examined in terms of changes in the competitive relationships among various highway and rail carrier services. Available from: Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Invstigation81	Title: AN INVESTIGATION OF TRUCK SIZE AND WEIGHT LIMITS Publication Date: 08/00/1981 Pagination: v.p. Report No: Features: APPS: 9 App. Publisher/Corporate Author(s): Office of the Secretary of Transportation 400 7th Street, SW DC 20590 USA Abstract: This study applied a systematic investigation of the range of benefits and costs to the U.S. economy and society as a whole, as well as to individual interest groups, resulting from a set of alternative changes to current Federal limits on truck size and weight. The ten alternatives, or "scenarios, " that were examined consist of a Base Case and five categories of changes in current Federal truck size and weight limits. A broad range of increases and decreases in limits are covered. The results of this analysis show that transport cost savings (from improved truck productivity) could overwhelm the associated costs of increased highway and bridge wear and tear and truck accident costs. The analysis also shows relatively little diversion of traffic from rail to truck. Index Terms: Alternatives, Benefit Cost Analysis, Change, Size And Weight Laws, Truck Laws & Regulations Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Irwin89	Title: THE ECONOMICS OF TRUCK SIZES AND WEIGHTS IN CANADA Author(s): Irwin, NA: Long, R: Sims, LS Language: ENGLISH Journal Title: INTERNATIONAL SYMPOSIUM ON HEAVY WEIGHTS Publication Date: 00/00/1989 Pagination: 19 PP Report No: Publisher/Corporate Author(s): Supplemental Information: Neal A. Irwin, Lee S. Sims, Ross Long illustrated note: source is monographic, not a series international symposium on heavy weights and dimensions 2nd : 1989 : kelowna, bc proceedings Index Terms: Canada, Costs, Economic Aspects, Size, Trucking, Trucks, Weight Available from: Acknowledgement of Document Source: UC, BERKELEY, INSTITUTE FOR TRANSPORTATION STUDIES 20677681

Tag	Abstract
Isotalo95	Title: SEASONAL TRUCK LOAD RESTRICTIONS: MITIGATING EFFECTS OF SEASONAL ROAD STRENGTH VARIATIONS Author(s): Isotalo, J Language: English Journal Title: CONFERENCE PROCEEDINGS 6 Volume: 1 Conference Title: Sixth International Conference on Low-Volume Roads Sponsored by: Forest Service and Agricultural Marketing Service, U.S. Department of Agriculture; Federal Highway Administration, U.S. Department of Transportation; Bureau of Indian Affairs, U.S. Department of the Interior; and Kuwait Fund for Arab Economic Development. Location: Minneapolis, Minnesota Date Held: 19950625-19950629 Publication Date: 00/00/1995 Pagination: pp 137-141 Report No: ISBN: 0309060745 Features: TABS: 1 Tab. REFS: 5 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Roads in cold climates are exposed to seasonal strength variations. A paved road with a thin overlay on top of frost-susceptible soil may lose more than 50% of its summer strength. A gravel road built without sufficient base course may lose 70% of its strength in spring. In Scandinavia it is estimated that the annual costs of road repair would be $35 million (U.S.) per country without load restrictions. A recent World Bank study in some central and eastern European countries estimated the costs of road strength variations between 1.8 to 14.8% of the gross national product. The rehabilitation of some of the most important frost-susceptible transport routes in a particular province of Finland would give a benefit-cost ratio of 1.5. Unfortunately, the scarcity of financial resources seldom allows improvement of all needed roads. Therefore, many countries apply various types of weight restrictions. However, these restrictions are seldom based on accurate measurements and uniform policies. There is a need for more accurate technical and economic methods of deciding truck load restrictions. The complexity of the thaw phenomenon requires more accurate methods of frost measurement and measurement of moisture and other soil properties related to thaw prediction and fast and cheap methods to measure bearing capacity. The World Bank is currently updating its project planning model, HDM III, by including a cold climate submodel. Index Terms: Bearing Capacity, Cold Regions, Conferences, Economic Considerations, Finland, Frost, Gravel Roads, Load Restrictions, Low Volume Roads, Measurements, Mitigation, Pavements, Predictions, Scandinavia, Seasonal Variations, Soil Moisture, Soil Properties, Strength, Thaw, Truck Pavement Damage Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Isotalo98	Title: SPRING LOAD RESTRICTIONS IN FINLAND: CURRENT POLICY AND RESEARCH IMPLICATIONS Author(s): Isotalo, J Language: English Journal Title: Transportation Research Record Issue: 1615 Publication Date: 00/00/1998 Pagination: pp 29-31 Report No: ISBN: 0309064600 Features: REFS: 6 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Roads in Finland are exposed to seasonal strength variation. Because of industrial policy, the maximum weight of heavy trucks is 60 metric tons all year. The policies applied by the Finnish National Road Administration (Finnra) to mitigate the effects of seasonal road strength variations on public roads, and the current research on the topic in Finland, are investigated. It has been estimated that the annual cost of road repairs because of spring damages is about $10 million under the present load restriction policy. The costs for road repairs would be $35 million without restrictions. The annual additional cost for all heavy transport is estimated at $15 million. An internal Finnra survey revealed that $80 million to $100 million is needed to repair all known frost-susceptible road sections. Finnra load restrictions are intended to prevent damage to roads by heavy vehicles during spring thaw. The restrictions will reduce and possibly eliminate increases in annual road maintenance costs. On the other hand, the restrictions will allow a minimum standard for vital transport. Finnra's Road Structures Research Programme (TPPT) studies improvements in the durability, strength, and economy of road structures. A key part of the TPPT project concerns problems associated with frost, especially durability against frost action. The most important factors of frost action on roads are the freezing index, duration of frost and thaw seasons, surface temperature, and ground water level. Methods for testing and calculating frost effects are discussed, as are the questions that must be answered before more precise models can be published. Index Terms: Duration, Finland, Freezing Index, Freezing Thawing Effects, Frost Action, Frost Damage, Government Policy, Groundwater Level, Heavy Vehicles, Load Restrictions, Maintenance Costs, Pavement Damage, Repair Costs, Seasonal Variations, Spring Breakup, Surface Temperature, Thaw Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Issues81	Title: ISSUES IN TRUCK SIZES AND WEIGHTS--FOREIGN TRUCK SIZE AND WEIGHT LIMITS Publication Date: 00/00/1981 Pagination: 31p Report No: Features: TABS: 7 Tab. Publisher/Corporate Author(s): Abstract: This examination of five vehicle size and weight limits in the nations of the world, covers maximum single and tandem axle weights, maximum gross weight, and the length permitted for tractor semitrailer and other combination vehicles. When compared with the current maximum U.S. limits, a majority of the rest of the world permits the operation of vehicles which are heavier in both (single and Landem) axle and gross weight, and shorter than equipment used in this country. This suggests the existence of more generous bridge formulae than those of the American Association of State Highway and Transportation Officials. However, few such formulae were found to exist. In other nations, economic need, more than concern over possible highway wear seems to be controlling the factor. The requirements of international container transport have influenced gross vehicle weights in Europe. Failure to provide for maximum gross weights in the 95, 000 to 115, 000 pound range to accommodate fully loaded 20- and 40-foot standard containers rated up to 67, 200 lbs. gross weight, could seriously hamper American foreign trade and cause domestic inefficiencies in container operations. This report examines truck size and weight limits in Canada, Western Europe, Africa, Asia, Middle East and Oceanic, and South and Central America. High limits and other foreign limitations are noted. The relationship of road stress to vehicle weight limits is examined. Available from:

Tag	Abstract
Jasek98	Title: AN OVERVIEW OF DEVELOPMENT OF A STRATEGIC PLAN FOR COMMERCIAL VEHICLE OPERATIONS IN TEXAS Author(s): Jasek, D: Middleton, D: Montufar, J Language: English Publication Date: 09/00/1998 Pagination: 34p Period Covered: 9709-9808 Report No: Features: TABS: 3 Tab. REFS: 2 Ref. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Texas Department of Transportation Office of Research and Technology Transfer, P.O. Box 5080 78763- Texas Transportation Institute Texas A&M University TX 77843 USA Abstract: The Texas Transportation Institute (TTI) conducted a one-year study for the Texas Department of Transportation (TxDOT) to develop a statewide strategic plan for commercial vehicle operations (CVO). This report presents the strategic plan for commercial vehicle operations in Texas. To develop this plan, it was necessary for the research team to understand trucking activity; commodity movements; truck size, weight, and safety regulations; and administrative processes in the state. It was also important to investigate current advances in information and transportation technology and their potential applications in Texas. Several tasks were involved with the development of this plan, including a comprehensive literature review; an extensive analysis of commodity movements and trucking activity in the state; a CVO stakeholder survey; development of goals, objectives, and projects for the CVO plan; and a cursory evaluation of the safety and economic implications of the proposed ways to streamline motor carrier activities and administrative procedures in Texas. Index Terms: Administrative Procedures, Commercial Vehicle Operations, Commodity Flow, Intelligent Transportation Systems, Law Enforcement, Regulations, Strategic Planning, Trucking Safety, Vehicle Size, Vehicle Weight Candidate Terms: Literature Survey Geographic Terms: Texas Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Jennrich79	Title: THE GREAT TRUCK WEIGHT DEBATE Author(s): Jennrich, JH Journal Title: Nation's Business Volume: 67 Issue: 10 Publication Date: 10/00/1979 Pagination: pp 58-60 Report No: Features: PHOT: 2 Phot. Publisher/Corporate Author(s): U.S. Chamber of Commerce 1615 H Street, NW DC 20062 USA Abstract: The complexity of the controversy regarding truck weights is discussed and some of the tradeoffs are noted. The GAO issued the findings of a study in a report: Excessive Truck Weight: An Expensive Burden We Can No Longer Support. This report is briefly discussed as well the permit system (designed for heavy loads that cannot be divided and other exigencies), the state barriers which prevent uniformity of weight limits and the minimum limit. The GAO says the states will need $18 billion (excluding routine maintenance) to offset deterioration of interstate highways and $67 billion to repair and replace interstate roads. The GAO report recommends that federal weight limits be applied to all federal-aid highways, not just the interstate system. The GAO also recommends the elimination of the overweight exemptions and permits. Uniformity would be achievable if the industry will accept the weights for which the interstate was designed. A recent Transportation Research Board (TRB) report says that nonuniformity in size and weight laws cost the American public from 1.6 billion to 2.8 billion as well as the use of 400 to 875 million gallons of fuel. The TRB report recommends the use of 105-foot trucks in all states including both double and triple combinations which are as safe as the shorter lighter trucks. The effect of more efficient trucks on the nations railroads is discussed. Index Terms: Combinations, Exemption, Federal Aid Highways, Highway Maintenance, Impact, Maintenance Costs, Overweight Loads, Rail Transportation, Size And Weight Laws, Truck Weights Available from: Nation's Business U.S. Chamber of Commerce, 1615 H Street, NW Washington DC 20062 USA

Tag	Abstract
John97	Title: SIZE-WEIGHT REBELLION Author(s): JOHN BENDEL. Language: ENGLISH Journal Title: HEAVY DUTY TRUCKING, Publication Date: 05/00/1997 Report No: Publisher/Corporate Author(s): Abstract: Opposition Of Mississippi Trucking Association To Ata's Attempts To Increase Weight Limits, Because Of Cost Of Purchasing Larger, Heavier Trucks. Supplemental Information: Heavy Duty Trucking, V. 76, NO. 5 (MAY 1997), P. 74-76: ILL. Index Terms: regulation., Trucks Available from: Acknowledgement of Document Source: NORTHWESTERN UNIVERSITY TRANSPORTATION LIBRARY

Tag	Abstract
Johnson75	Title: IMPROVING MOTOR TRUCK SOCIAL{ ENVIRONMENTAL{ AND ECONOMIC UTILIZATION A LITERATURE REVIEW Author(s): Johnson, M Publication Date: 06/00/1975 Pagination: 113 pp Report No: Features: REFS: Refs. Publisher/Corporate Author(s): Motor Vehicle Manufacturers Association 320 New Center Building MI 48202 USA Abstract: This business literature review (covering the years 1973, 1974 and the first 6 months or 1975) presents statements of the major and subsidiary proposals (together with the arguments for a against), and identifies the organizations and individuals supporting each position. The major topics covered in the literature are economic regulation, equipment utilization, logistics, highways and roads, environment impact, financing, and driver safety. The arguments for and the major issues discussed in this area are the freedom of entry and exit, market-regulated pricing, and trucking as an instrument of social policy. The quantification of the effects of deregulation is discussed. The controversy about improving motor truck utilization has certered on the reduction of the "empty backhauls" of line[haul operations, and consolidating urban goods movements. Five areas of logistics in which improvements could lead to better transportation economics and energy conservation are termainal automation, containerization, freight forwarding, intermodal operations, and piggyback. In the area of highways and roads the major issues have been the financing of transportation systems? arguments relate to the highway trust fund and local options. Areas of concern in the field of environment have been the search for alternative powerplants, noise control, and size and weight legislation. Securities regulation and debt financing are discussed in relation to financing. Driver health and safety programs and vehicle safety standards are also covered. Index Terms: Drivers (Vehicle), Energy, Environmental Impact, Equipment, Financing, Freight Transportation, Highways, Linehaul, Logistics, Piggyback, Regulation, Reviews, Socioeconomic Aspects, Substitutes, Transportation Economics, Truck Drivers, Trucks, Urban Areas, Utilization, Vehicular Safety Available from:

Tag	Abstract
Jones98	Title: 1998 HIGHWAY COST ALLOCATION UPDATE: TECHNICAL REPORT Author(s): Jones, SS: Pigman, JG Language: English Publication Date: 01/00/1998 Pagination: n.p. Report No: Publisher/Corporate Author(s): Kentucky Transportation Cabinet State Office Building, Clinton and High Streets 40622 Kentucky University, Lexington Kentucky Transportation Center, College of Engineering KY 40506-0281 USA Abstract: This update of the highway cost allocation study is the eighth in a recent series begun in the early 1980s by the Kentucky Transportation Cabinet and the Kentucky Transportation Center. The primary objectives were to determine the level of revenue contribution and cost responsibility for each class of highway user. The base year of the study is FY 97, the most recent time period for which revenue and cost data were available. Highway user or travel activity for calendar year 1996 was the most recent available. A basic premise of the study was that only state maintained highways were of interest in recouping the costs expended to construct and maintain the system. In 1996, this system comprised 27, 350 miles (44, 006 km) of the 73, 170 miles (117, 731 km) of roads and streets in Kentucky, while accommodating 84% of all travel. There were 17 highway user classes with which revenue contribution and cost responsibility were associated. Primary sources of revenue included fuel taxes, registration fees, usage taxes, tolls, and other motor carrier and federal taxes and fees. Primary expenditure categories included construction (subdivided into 6 categories), maintenance and traffic, administration, and enforcement. Construction was subdivided into planning and design; right of way; utility relocation; grade, drain and surfacing; resurfacing; bridges; and miscellaneous. Results from the analysis indicate that cost responsibility is borne most heavily by cars and motorcycles with 45.74%; followed by heavy trucks with gross weights of 60, 000 lb (27, 216 kg) or more at 26.22%. Pickups and other vehicles registered in the 6, 000 lb (2, 722 kg) category were responsible for 20.72% of the cost. The ratio of percentage revenue attributed to percentage cost allocated was also determined in the study. A ratio of one indicates that the revenue and cost percentages are in balance for a particular vehicle type. Cars (0.94), buses (0.78) and heavy trucks (0.91) contribute less revenue than their cost responsibility dictates. Index Terms: Automobiles, Buses (Vehicles), Cost Allocations, Expenditures, Heavy Duty Trucks, Highway Costs, Kentucky, Revenues, State Highways, Taxes Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: Kentucky Transportation Center, Kentucky University

Tag	Abstract
Kenis79	Title: FACTORIAL STUDY OF RELATIONS BETWEEN PAVEMENT COST AND LEGAL AXLE LOADS Author(s): Kenis, WJ: Rauhut, JB Journal Title: Transportation Research Record Issue: 725 Publication Date: 00/00/1979 Pagination: pp 22-30 Report No: Features: FIGS: 6 Fig. TABS: 10 Tab. REFS: 9 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Results are presented of a study conducted to estimate lifetime costs for flexible pavements as a function of legal axle-load limits by using an improved version of the VESY IIM computer program. VESYS IIM was modified to include capabilities for (a) seasonal characterizations of pavement materials, (b) a discretized representation of axle-load distribution, and (c) predictions of low-temperature cracking. A literature survey and a laboratory testing program were combined to produce definitions of the variations in permanent deformation parameters as important material characteristics vary seasonally with the environment. These data and other information and experience were applied to produce input data that would yield realistic performance predictions. A factorial of 64 solutions was obtained by using the input data and the improved version of VESYS IIM to study the effects of truck traffic for four levels of legal axle-load limits, two levels of traffic, two levels of pavement-section thickness, and four environmental zones. When failures were predicted, an overlay was applied and a new solution obtained until a pavement life of at least 20 years was attained. Initial and overlay costs were estimated, and these costs, for 20 years of pavement service, were related to legal axle-load limits. Estimated costs for 20 years of pavement service were considerably increased by increasing legal axle loads, and estimated cost increases were more severe for the northern than for the southern environmental zones of the United States. Index Terms: Axle Load, Computer Programs, Computer Simulation, Construction Costs, Environment, Flexible Pavement, Flexible Pavement Construction, Load Distribution, Maintenance Costs, Pavement Performance, Pavement Thickness, Seasonal Variations, Truck Load Limits Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Kenis98	Title: OECD DIVINE ELEMENT 1: ACCELERATED DYNAMIC PAVEMENT TESTING Author(s): Kenis, WJ: Wang, W Language: English Publication Date: 09/00/1998 Pagination: 110p Period Covered: 9410-9709 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 18 Ref. APPS: 3 App. Publisher/Corporate Author(s): Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: The loads that trucks impose on pavements and bridges have an important effect on the life of the infrastructure and, therefore, on total national road costs. The Organisation for Economic Co-operation and Development (OECD) Road Transport Research Programme has found that dynamic pavement loading is increasing in OECD countries, resulting in an increased rate of road wear. Although the importance of the relationship between the magnitude of dynamic loading and road wear is being recognized, many questions remain regarding the nature and influence of dynamic loading, and the interaction between the vehicle and pavements and bridges. In an attempt to address some of these issues, the OECD Road Transport Research Programme launched a major 2-year study into the relationship between heavy vehicle dynamic loading and pavement and bridge wear, known as the Dynamic Interaction of the Vehicle and INfrastructure Experiment (DIVINE) project. The project consisted of the following six interrelated research projects: Element 1: Accelerated Pavement Dynamic Testing; Element 2: Pavement Primary Response Testing; Element 3: Road Simulator Testing; Element 4: Computer Simulation of Heavy Vehicles; Element 5: Spatial Repeatability of Dynamic Loads; and Element 6: Bridge Dynamic Loads. Element 1 of the DIVINE project is an accelerated pavement testing project undertaken at the Canterbury (New Zealand) Accelerated Pavement Testing Indoor Facility (CAPTIF) to determine the effect of the quality of two different suspensions -- airbag with shock absorber and multi-leaf steel spring suspensions, based on measurements of primary pavement response and the rates of damage progession in a flexible pavement subjected to accelerated loadings. This report describes Element 1 of the program, which consists of the design of the experiment, testing method, method of data collection, results of the data analysis, and major findings and recommendations. Index Terms: Accelerated Testing, Data Analysis, Data Collection, Dynamic Loading, Dynamic Tests, Flexible Pavements, Heavy Vehicles, Pavement Tests, Pavement Wear, Recommendations, Test Methods, Test Results, Truck Pavement Damage, Vehicle Suspension Systems Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Kent60	Title: FUEL AND TIME CONSUMPTION RATES FOR TRUCKS IN FREIGHT SERVICE Author(s): Kent, MF Journal Title: Highway Research Board Bulletin Publication Date: 00/00/1960 Report No: Publisher/Corporate Author(s): Abstract: The number of times a truck must change its speed in a mile of travel increases with the density of traffic, according to an analysis of data derived from studies conducted in 1957 and 1958 of rural and urban travel in five states--data necessary in the analysis of highway-user benefits. Using a congestion index, which indicates that speed changes per mile increase uniformly with average daily traffic for different types of highway, together with the rates of fuel and travel time consumed during a change in vehicle speed, the added cost of operating at nonuniform speed could be assessed. This article also shows that, for the gross vehicle weights observed, smaller and less powerful engines give better fuel economy, but their use carries a penalty of increased time-consumption (lower road speeds) at the higher gross vehicle weights. Trucks with diesel engines were found to travel about 50 percent more miles on a gallon of fuel than trucks with gasoline engines of approximately equivalent power and gross weight characteristics. Index Terms: Average Daily Traffic, Diesel Engine, Freight Transportation, Fuel Consumption, Gasoline Engines, Time Effects, Traffic Congestion Indexes, Traffic Density, Traffic Speed, Travel Time Available from:

Tag	Abstract
Khazanovich98	Title: MECHANISTIC-BASED MODEL FOR PREDICTING REFLECTIVE CRACKING IN ASPHALT CONCRETE-OVERLAID PAVEMENTS Author(s): Khazanovich, L: Owusu-Antwi, EB: Titus-Glover, L Language: English Journal Title: Transportation Research Record Issue: 1629 Publication Date: 00/00/1998 Pagination: pp 234-241 Report No: ISBN: 0309064740 Features: FIGS: 10 Fig. TABS: 1 Tab. REFS: 17 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: One of the most common types of pavement on the national highway system is composite asphalt concrete (AC) over portland cement concrete (PCC). With a large percentage of PCC pavements either approaching or at the end of their design lives, AC overlay of PCC pavements has become one of the most common methods of rehabilitation. This has resulted in several thousand kilometers of composite AC/PCC pavements. As the level of heavy truck traffic loading continues to increase on a majority of pavements, it is likely that the total length of composite pavements in the nation will continue to increase considerably in the coming years. A common type of distress that occurs on these composite pavements is reflective cracking. This occurs when the joints of cracks in the underlying PCC pavement reflect through the AC overlay. A performance model that can be used to predict accurately the amount of reflective cracks in composite AC/PCC pavements has enormous potential uses. The development of a mechanistic-based performance model for predicting the amount of reflective cracks in composite AC/PCC pavements is described. Data from the Long-Term Pavement Performance database were used to develop the model. Using the principles of fracture mechanics, it is illustrated that a mechanistic-based model can be developed that closely models the real-life behavior of composite pavements and predicts the amount of reflective cracks. Because of the mechanistic nature of the model, it is particularly effective for performance prediction for design checks and pavement management. Also, since the model can take into account the relative damaging effect of the actual axle loads in any traffic distribution, it has great potential for application in cost allocation. Index Terms: Composite Pavements, Computer Models, Cost Allocations, Field Data, Fracture Mechanics, Long Term Pavement Performance, Mechanistic Analysis, Pavement Management, Performance Prediction, Reflection Cracking Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Kolins82	Title: THE RELATIONSHIP BETWEEN GROSS VEHICLE WEIGHT AND LINE-HAUL TRUCKING COSTS IN 1981 Author(s): Kolins, RW: Selva, RT Journal Title: Transportation Research Forum Proceedings Volume: 23 Issue: 1 Publication Date: 00/00/1982 Pagination: pp 631-641 Report No: Features: FIGS: 1 Fig. TABS: 8 Tab. Publisher/Corporate Author(s): Cross (Richard B) Company, Incorporated P.O. Box 405 47971 USA Abstract: The estimated relative fully-allocated line-haul costs at various gross vehicle weights are not particularly sensitive to the absolute cost level at those weights, however, the estimated change of costs with increasing gross vehicle weight should be reliable. The estimation of this cost relationship was the major thrust of this research. The absolute cost levels reported should be regarded to represent a hypothetical trucking company characterized by average cost and average operating conditions, e.g., 440 to 450 miles length of haul. Again these cost estimates should not be taken to represent any specific trucking company. (Author) Index Terms: Change, Costs, Gross Vehicle Weight, Line Haul Transport, Trucking Industry Available from: Cross (Richard B) Company, Incorporated P.O. Box 405 Oxford, Indiana 47971 USA

Tag	Abstract
Lave99	Title: FUEL ECONOMY AND AUTO SAFETY REGULATION: IS THE CURE WORSE THAN THE DISEASE? Author(s): Lave, C: Lave, L Editor(s): Gomez-Ibanez, J: Tye, WB: Winston, C Language: English Journal Title: Essays in Transportation Economics and Policy. A Handbook in Hono Publication Date: 00/00/1999 Pagination: pp 257-289 Report No: ISBN: 0815731825 Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Brookings Institution 1775 Massachusetts Avenue, NW DC 20036 USA Abstract: Federal legislation and regulation of automobiles focus on the immediate concern, whether it is tailpipe emissions, safety, or fuel economy. The regulation, however, tends to take a myopic view of the issue, ignoring the possibility of system effects or behavioral changes. Congress, for example, did not intend vehicles to be less safe because it mandated a fuel efficiency standard of 27.5 mpg; it did not take into account that lighter, smaller vehicles are less safe, other factors being constant. The result has been the growth of solution-caused problems. Moreover, regulatory intervention will almost always produce unanticipated consequences. Drivers and passengers are not passive actors who simply do what they are told. Instead, they weight personal considerations when deciding whether to adhere to a speed limit, buckle their seat belts, or drive faster because a car has been made safer; and they find ways around regulations, such as buying light trucks instead of cars to get the size and engine power that they desire. For regulations to achieve their goals, they must be supported with other actions, such as public education on the benefits of buckling up, and higher gasoline prices to increase the desire for fuel-economic vehicles. Index Terms: Behavior, Fuel Conservation, Light Vehicles, Safety Programs, Vehicle Safety P Terms: NHTSA, UNITED STATES CONGRESS Available from: Brookings Institution 1775 Massachusetts Avenue, NW Washington DC 20036 USA

Tag	Abstract
Lee75	Title: TRUCK WEIGHT SURVEYS BY IN-MOTION WEIGHING Author(s): Lee, CE: Machemehl, RB: Walton, CM Publication Date: 09/00/1975 Pagination: 126 pp Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 47 Ref. APPS: 4 App. Publisher/Corporate Author(s): Texas University, Austin Center for Highway Research TX 78712 USA Abstract: The need for vehicle weight data in planning and designing highway facilities has historically been satisfied by stopping selected vehicles at specially prepared roadside sites and weighing each wheel or each axle of the vehicle on either portable scales or on platform scales. This survey technique has been an expense as well as a safety hazard to both the surveying agency and the road user. A recently developed system for weighing highway vehicles in motion eliminates all user costs and reduces many of the traffic hazards and personnel expenses which have previously been inherent in weight surveys. Field tests of the in-motion weighing system indicate that accuracy comparable to that of conventional portable wheel weighing devices is feasible. A recommended weight survey program for the State of Texas that incorporates in-motion weighing and dimensioning is described in this report. An evaluation of the required number of survey sites, the number of trucks to be weighed, and sampling techniques for detecting timewise variations in vehicle weight is presented. The potential economic advantages of using in-motion weighing in lieu of conventional static weighing for statewide surveys are also analyzed. /Author/ Index Terms: Benefit Cost Analysis, Field Tests, Highway Design, Highway Safety, Motion, Roadside, Sites, Surveys (Data Collection), Truck Weights, Vehicle, Weighing Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Lestina98	Title: ALLOCATING THE COSTS OF MOTOR VEHICLE CRASHES BETWEEN VEHICLE TYPES Author(s): Lestina, DC: Levy, DT: Miller, T: Spicer, RS Language: English Journal Title: Transportation Research Record Issue: 1635 Publication Date: 00/00/1998 Pagination: pp 81-87 Report No: ISBN: 0309065070 Features: TABS: 5 Tab. REFS: 33 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: When a truck and an automobile are involved in a crash, the harm to occupants tends to vary with the weight of the vehicles involved. In determining the appropriate level of government expenditures for traffic safety, costs in multivehicle crashes involving different vehicle types must be allocated between occupants and nonoccupants of a particular vehicle type. Four methods for allocating costs among different vehicle types are considered, corresponding to different perspectives, including that of occupants of a vehicle and that of society under different property right assignments. Costs based on the four allocation methods for the United States as a whole and per vehicle mile are also estimated. The allocation method was found to have large effects on the relative magnitude of costs. Index Terms: ACCIDENT COSTS, COST ALLOCATIONS, MOTOR VEHICLE ACCIDENTS, MULTIPLE VEHICLE ACCIDENTS, VEHICLE TYPE Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Levinson82	Title: WEIGHING OVERLAND CARGO CARRIERS--THE ECONOMIC CONSEQUENCES OF THE CONFUSION Author(s): Levinson, SH Journal Title: Transportation Research Forum Proceedings Volume: 23 Issue: 1 Publication Date: 00/00/1982 Pagination: pp 653-658 Report No: Features: FIGS: 1 Fig. Publisher/Corporate Author(s): Cross (Richard B) Company, Incorporated P.O. Box 405 47971 USA Abstract: This paper proposes guidelines for revising U.S. rail and truck cargo weight regulations to make them consistent, and to promote frequent, convenient and economical weighment of trucks and rail cars likely to impose uneconomic wear. One is that the accuracy of weighment is that which is actually produced by the whole system (machines and operators involved in weighing). Tests and qualifications must be evolved to encourage use of systems which produce the most equitable results in every day use, as distinguished from satisfying periodic testing requirements. Also, the units of product to be weighed for commercial purpose shall be the units shipped from a single consignor to a single consignee, or such portions of such shipments as can be most economically and conveniently weighed. Index Terms: Compliance, Enforcement, Freight Transportation, Regulation, Size And Weight Laws, Standards, Uniformity, Weighing Equipment, Weight Stations Available from: Cross (Richard B) Company, Incorporated P.O. Box 405 Oxford, Indiana 47971 USA

Tag	Abstract
Lill00	Title: FUTURE TRUCK DESIGNS Author(s): Lill, RA Publication Date: 00/00/0000 Pagination: 3 pp Report No: Publisher/Corporate Author(s): American Trucking Associations 1616 P Street, NW DC 20036 USA Abstract: The view is expressed that there is no way of evaluating future truck designs because they are determined by governmental laws and regulations, and in a most direct manner by the maximum vehicle size and weight limitations that are in effect. The 1980 goals study recommends a new level of vehicle size and weights which would achieve greater fuel efficiency. The goals study also recommends other significant policy positions affecting the trucking industry ranging from the hours of service to emission and noise standards, and Federally mandated reciprocity and proration. The view is expressed that the dialogue opened by the 1980 goals study must be continued. The technical services division's comments regarding the study and further observations relating to the future commerical motor vehicle fleet, fuel economy, gaseous emissions, commercial vehicle noise, safety, and operating constraints are included. Index Terms: Commercial Vehicles, Fuel Consumption, Safety, Truck Exhaust, Truck Noise, Trucks, Vehicle Design Available from:

Tag	Abstract
Manniche65	Title: VEHICLE LOADINGS AND BRIDGE DESIGN Author(s): Manniche, K: Wright, DT Journal Title: Canadian Good Roads Association Proc Publication Date: 09/27/1965 Report No: Publisher/Corporate Author(s): Abstract: this paper provides a critical review of the present state of the art of highway bridge design with particular reference to vehicle loads and bases for design. The authors point of view is that of the design of a transportation system. It is argued that bridge design loadings and licensing regulations should reflect an optimum solution of the joint problem of economics and technical design. It is recognized that ordinary truck combinations are tending to become longer and heavier. Heavy loads, now covered only under special permit, should become part of the design regime. The problem of bases for design is considered with a requirement for substantial increases in nominal load carrying capacity. Bridges should be designed on two bases' that of plastic ultimate strength for very heavy vehicles operating under controlled conditions, and that of repeated loading - fatigue strength for lesser loads. Bridges should be made to behave more as three dimensional structures. Considering this aspect, the combination of greatly increased design loads with more rational design bases would probably not lead to very great increases in costs. /cgra/ Index Terms: Bridge Design, Bridge Dynamics, Bridge Engineering, Cost, Dead Loads, Deflections, Design Load, Design Specifications, Fatigue, Highway Bridges, Impact, Overweight Loads, Plastic Design, Repeated Loading, Residual Stress, Safety, State Of The Art Studies, Stress, Three Dimensional, Transportation Systems, Ultimate Strength, Vibration, Weight Limits Available from:

Tag	Abstract
Manzo92	Title: TURNER TRUCK IMPACT ON WASHINGTON STATE BRIDGES. FINAL REPORT Author(s): Manzo-Robledo, F: Sorensen, HC Language: English Publication Date: 12/00/1992 Pagination: 48p Period Covered: 9102-9212 Report No: Features: FIGS: 10 Fig. TABS: 2 Tab. REFS: 6 Ref. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Washington State Department of Transportation Transportation Building, MS 7370 Washington State University, Pullman Civil and Environmental Engineering, Sloan Hall, Room 101 WA 99164-1210 USA Abstract: Values of various impacts associated with the concrete bridges in the State of Washington as related to the operation of trucks with configurations as proposed by Francis C. Turner have been determined. These cost estimates are presented in matrix form and are based on permutations involving four basic Turner prototype trucks, a range of values for the bridge design life and a range of values for bridge live load overload. The various cost estimates were compiled for a population of 2024 concrete bridges and were based on the assumption that each bridge in the population had a controlling maximum length simple span which was used in a failure criterion. The largest value of the cost estimate for the replacement of all deficient bridges in the population is 2.643 billion dollars, which resulted from the calculations involving the most severe Turner prototype truck loading (11AD), a 75 year design life, and a 0% live load overload. Several courses of action are postulated, and recommendations for further studies are given. Index Terms: CONCRETE BRIDGES, COST ESTIMATES, DEFICIENT BRIDGES, IMPACT STUDIES, REPLACEMENTS, TRUCKS, TURNER PROPOSAL, WASHINGTON STATE Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Maze94	Title: POLICY ISSUES OF AN IOWA LONGER COMBINATION VEHICLE NETWORK Author(s): Maze, T: Smadi, A: Walter, CK Language: English Publication Date: 11/00/1994 Pagination: 133p Report No: Features: FIGS: Figs. TABS: Tabs. APPS: 1 App. Publisher/Corporate Author(s): Midwest Transportation Center Iowa State University, 2521 Elwood Drive, Suite 125 IA 50010- USA Abstract: This report explores policy issues related to Longer Combination Vehicles (LCVs) and the potential expansion of the LCV network to include Iowa. Specifically, the transportation service impacts and public policy issues are examined. The report is organized as follows: Chapter 1: Introduction and Longer Combination Vehicle Background - weight and length limits, LCV traffic markets, trucking productivity gains, future state level LCV policy issues; Chapter 2: Survey of LCV Permit Holders - questionnaire, conclusions; Chapter 3: Commodity Transport and Economic Factors - economic base data, freight traffic patterns, truck traffic analysis, conclusions; Chapter 4: Conclusions and Recommendations - issues promoting size and weight reform, traffic volumes, policy issues, conclusions; Appendix A: Survey for Longer Combination Vehicle Permit Holders (the questionnaire). Index Terms: Commodities, Economic Factors, Freight Traffic, Impact Studies, Iowa, Longer Combination Vehicles, Patterns, Public Policy, Questionnaires, Rail Transportation, Size And Weight Laws, Surveys (Data Collection), Traffic Analysis (Freight), Traffic Volume, Trends, Trucking Available from: Midwest Transportation Center Iowa State University, 2521 Elwood Drive, Suite 12 Ames IA 50010- USA

Tag	Abstract
Maze96	Title: STATEWIDE TRUCK TRANSPORTATION PLANNING: METHODOLOGY AND CASE STUDY (WITH DISCUSSION) Author(s): Maze, TH: Smadi, A Discussors(s): Shafran, I Language: English Journal Title: Transportation Research Record Issue: 1522 Publication Date: 00/00/1996 Pagination: pp 55-63 Report No: ISBN: 0309062195 Features: FIGS: 5 Fig. TABS: 2 Tab. REFS: 11 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: An alternate approach for truck transportation planning at the state level is presented using a case study application in the State of Iowa. The method was based on some freight modeling concepts and available freight data sets. However, the model takes advantage of two concepts: unconstrained highway capacities and the decomposition of commodities, resulting in manageable data and modeling requirements. Identification of significant economic sectors, selection of appropriate productivity measures, estimation of truck freight volumes for each sector individually, and estimation of routing of truck traffic on major highway routes are major elements of the planning method. The case study used two industrial sectors--food and kindred products, and machinery products--which accounted for the largest portion of state employment in nonservice sectors and the largest truck traffic generated in the state. A simplistic transportation network was used to demonstrate the modeling procedure. The analysis uses county-level employment and population to estimate zonal freight tonnage. The truck share of generated freight was estimated as the total freight generated less the freight tonnage shipped by rail. A gravity model was used to distribute the truck tonnage among origin-destination pairs, using travel time as the impedance on highway links. Estimated truck flows were converted to vehicle trips on least time highway routes using typical vehicle equivalent weights. Index Terms: Case Studies, Demand Models, Freight Transport Demand Analysis, Gravity Model, Iowa, Methodologies, Origin-Destination, Travel Time, Truck Transportation Planning Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
McCarthy60	Title: ECONOMIC COST OF TRAFFIC ACCIDENTS IN RELATION TO THE VEHICLE Author(s): Mccarthy, JF Journal Title: Highway Research Board Bulletin Publication Date: 00/00/1960 Report No: Publisher/Corporate Author(s): Abstract: This paper discusses accidents in massachusetts in which massachusetts registered vehicles were involved and the resulting economic costs. The data were developed by the massachusetts department of public works and the registry of motor vehicles in cooperation with the u.s. Bureau of public roads. It covers the involvements of passenger cars in traffic accidents during 1953 and the involvements of trucks in traffic accidents during 1955. The purpose is to present the cost of accidents in relation to the vehicle in a way that will be helpful both to those interested in pinpointing where prevention efforts should be centered and to those engaged in the economic analysis of highway improvements. It is not the purpose to fix the responsibility for accidents by type of vehicle but rather to show what kinds of vehicles were involved and the extent of the involvement in terms of cost. Involvement and cost data are analyzed separately for passenger cars and trucks by age of vehicle and severity of accident. Further analyses are made of trucks involved in accidents and their direct costs in relation to the registered gross weight and type of truck. Comparisons are made throughout the report on the basis of the involvements per 100 million vehicle-miles and the accident cost per vehicle-mile. An involvement is one vehicle in one accident. For example, in the passenger car study if a passenger car hit a pedestrian there was 1 involvement in 1 accident. If 2 passenger cars collided with other there were 2 involvements in 1 accident. Also, in the passenger car study if a passenger car collided with a truck this was 1 passenger car involvement in 1 accident. The truck involvement was not included in the passenger car study. /author/ Index Terms: Accident Prevention, Accident Rate, Automobile, Motor Vehicle, Traffic Accident Economic Effects, Trucks Available from:

Tag	Abstract
Measurement79	Title: MEASUREMENT OF FUEL CONSUMPTION BY DRIVER IN COMMERCIAL TRUCKING OPERATIONS Publication Date: 00/00/1979 Pagination: 27p Report No: Publisher/Corporate Author(s): Chilton Company, Incorporated Datalog Division PA 19089 USA Abstract: Appropriate fueling practices and record-keeping procedures can be adopted to develop a driver-related history of miles driven and fuel consumed in order to evaluate commercial truck driver mpg performance. This basic driver mpg calculation will be a sufficient management tool in cases where vehicle, route, and load weight variables are not significant. If one or more of the variables are significant, their influence can be removed by specific mathematical factoring methods. Calculations can be easily and inexpensively made using computerized record-keeping systems. An equitable driver fuel economy measurement system is a prerequisite for the trucking industry to realize a potential 10% to 15% fuel savings from improved driver performance. For maximum success, the performance results should be systematically fed back to the fleet drivers as a motivational influence. Attached are instructions for assembling a Reminder Poster and for arranging accompanying slides. Adjustment calculations are appended for route assignment and load weight assignment variables. Index Terms: Fuel Consumption, Recording, Truck Drivers, Trucks, Vehicle Performance, Vehicle Weight Available from: Chilton Company, Incorporated Datalog Division Radnor PA 19089 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Mehring85	Title: TRANSPORT MANAGEMENT : STRATEGIES FOR A NEW ENVIRONMENT Author(s): Mehring, JS: Roberts, PO Language: ENGLISH Journal Title: PROCEEDINGS -- TRANSPORTATION RESEARCH FORUM -- Volume: 26 Publication Date: 00/00/1985 Pagination: PP 545-553 Report No: Publisher/Corporate Author(s): Abstract: Market share, costs of competing carrier types (tofc, double-stack container, truck load. Etc.), Advantages of multi-modal companies Supplemental Information: By Paul O. Roberts (Roberts Associates, Inc.) And Joyce S. Mehring (ICF Incorporated) Index Terms: Costs, Freight, Management, Transportation Available from: Acknowledgement of Document Source: Northwestern University Transportation Library Dah0725

Tag	Abstract
Mendoza97	Title: COMPARATIVE EFFICIENCY OF DIFFERENT REPRESENTATIVE MEXICAN TRUCKS Author(s): Mendoza, A: Rico, A Language: English Conference Title: XIIIth World Meeting of the International Road Federation Sponsored by: International Road Federation Location: Toronto, Canada Date Held: 19970616-19970620 Publication Date: 00/00/1997 Pagination: n.p. Report No: Publisher/Corporate Author(s): International Road Federation 525 School Street, SW DC 20024 USA Abstract: This study is based on truck weight information collected in a series of survey stations installed yearly, during a one week time period, approximately, in some of the most important Mexican roads. In these stations, trucks are weighed, and their dimensions, origin and destination and other additional information are obtained. This paper presents the most relevant results obtained from the annual surveys, including the identification of the most representative Mexican freight vehicles, their brand and model, and their tare and gross weight registered. This information is then used as a basis for analyzing various operating costs; and based on the above data, the advantages and disadvantages of each representative vehicle for transporting the national freight are listed, while considering the limits established by existing regulations. Index Terms: Cost Analysis, Cost Comparisons, Freight Transportation, Regulatory Constraints, Truck Transportation Statistics, Truck Weights, Vehicle Weight Available from: International Road Federation 525 School Street, SW Washington DC 20024 USA

Tag	Abstract
Methodology83	Title: METHODOLOGY FOR EVALUATING INCREASE IN PAVEMENT MAINTENANCE COSTS THAT RESULT FROM INCREASED TRUCK WEIGHTS ON STATEWIDE BASIS Journal Title: Transportation Research Record Issue: 900 Publication Date: 00/00/1983 Pagination: pp 10-18 Report No: Features: FIGS: 8 Fig. TABS: 6 Tab. REFS: 15 Ref. Publisher/Corporate Author(s): Abstract: When this study was made, Indiana's weight limits for trucks were 18, 000 lb on a single axle, 32, 000 lb on a tandem axle, and 73, 280 lb gross vehicle weight (GVW). The federal limits for the Interstate system and other primary roads were 20, 000 lb on a single axle, 34, 000 lb on a tandem axle, and 80, 000 lb GVW. The objective of this study was to evaluate what the effects would be on pavement maintenance costs if Indiana's weight limits were increased to those of the federal limits. The methodology that was developed to evaluate the increase in load limits from 73, 280 to 80, 000 GVW is described. The road-life records of the Indiana Department of Highways were searched and pavement sections were evaluated by using these data coupled with truck weight information from the weight stations and soil and performance data available from previous studies. A total of 301 pavement sections were selected for evaluation. The types of pavements evaluated included continuously reinforced concrete, jointed reinforced concrete, asphalt, and concrete pavements overlaid with asphalt. The pavement sections were evaluated according to functional classification. The pavements were further divided on a regional basis so that climatic effects would be evaluated as well. Cost estimates were presented in dollars per lane mile per year and dollars per year for Interstates, primary roads (U.S. and state routes carrying more than 4, 000 vehicles/day), and secondary roads (U.S. and state routes carrying less than 4, 000 vehicles/day). (Author) Available from:

Tag	Abstract
Methodology89	Title: METHODOLOGY FOR EVALUATION OF TRUCK WEIGHT REGULATION ENFORCEMENT PROGRAMS Journal Title: Transportation Research Record Issue: 1249 Publication Date: 00/00/1989 Pagination: pp 16-17 Report No: ISBN: 0-309-04971-7 Features: REFS: 3 Ref. Publisher/Corporate Author(s): Abstract: Highway agencies all over the world recognize that overweight trucks are a major cause of premature pavement deterioration. Compliance with truck weight regulations in each jurisdiction varies because of differences in enforcement levels, tolerances, fine schedules for violations, and other punitive actions. The object of this research was to develop a methodology for assessing the effectiveness of a truck weight enforcement program. Truck weight regulations and trucking activity in the Province of New Brunswick, Canada, were used as a case study. The methodology essentially compares incremental revenues that can be earned by overloading a particular truck configuration with the expected cost of getting caught, taking into account the fine regime and the level of enforcement. The results of the research demonstrated that fines are not structured in New Brunswick to be an effective deterrent for would-be violators. Alternative enforcement programs were postulated and the deterrent effect was evaluated. Available from:

Tag	**Abstract**
Meyburg91	Title: IMPACT ASSESSMENT OF THE REGULATION OF HEAVY TRUCK OPERATIONS Author(s): Meyburg, AH: Schuler, RE Language: English Publication Date: 01/00/1991 Pagination: n.p. Report No: Features: TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): University Transportation Research Center, Region II City College, Building Y, Room 220 NY 10031- USA Abstract: This report provides the results of a literature review of heavy vehicle impacts, it describes the design of a truck usage survey for the New York State (NYS) divisible-load permit vehicle fleet, it discusses the questionnaire design for the truck usage survey, it provides the results of the first survey, and it provides a preliminary analysis of the primary economic impact analysis of the permit vehicle operations. Also, a brief discussion of the methodology for the secondary economic impact analysis is provided, as is a preliminary pavement damage assessment methodology and the results of its application. Finally, the scope of work for the second year of this project is presented. Index Terms: Analysis, Assessments, Economic Impacts, Economics, Heavy Vehicles, Impact, Infrastructure, Load Restrictions, Methodologies, Operations, Pavement Damage, Permits, Private, Public, Regulations, Regulatory Policy, Surveys (Data Collection), Trucks Available from: University Transportation Research Center, Region II City College, Building Y, Room 220 New York NY 10031- USA

Tag	Abstract
Meyburg96	Title: COLLECTING USAGE DATA FOR ANALYZING A HEAVY-VEHICLE, DIVISIBLE-LOAD PERMIT SYSTEM Author(s): Meyburg, AH: Saphores, J-DM: Schuler, RE Language: English Journal Title: Transportation Research Record Issue: 1522 Publication Date: 00/00/1996 Pagination: pp 9-17 Report No: ISBN: 0309062195 Features: FIGS: 2 Fig. TABS: 4 Tab. REFS: 4 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The collection of truck usage data for performing a benefit-cost analysis of the New York State Divisible-Load Permit System is described. To motivate the data collection requirements, the procedures used for estimating both infrastructure costs and economic benefits are briefly described. The survey procedure is summarized, as are data gathered on permitted vehicles, operator characteristics, and truck usage. Advantages and shortcomings of the methodology for collecting data are reviewed from the perspective of analyzing devisible-load permit systems for heavy vehicles. The overall study is one of the first attempts to assess the economic impact of permit systems based on actual usage data provided voluntarily by truck operators through seasonal mail surveys. As illustrated by the authors in a 1994 report, the economic benefits of a permit system for trucks hauling heavy divisible loads can be substantial. The collected survey data were adequate for providing order-of-magnitude estimates of benefits and costs although bridge damage and accident costs could not be evaluated because of a lack of data. Results should therefore be of interest to transportation officials throughout the country for use in evaluating the merits of allowing extra-heavy vehicles on the roads. Index Terms: Benefit Cost Analysis, Costs, Divisible-Load Permit Systems, Economic Benefits, Economic Impacts, Estimating, Heavy Vehicles, Infrastructure, New York State, Overloads, Surveys (Data Collection), Truck Pavement Damage Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Meyburg98	Title: THE ECONOMIC IMPACTS OF A DIVISIBLE-LOAD PERMIT SYSTEM FOR HEAVY VEHICLES Author(s): Meyburg, AH: Saphores, J-D: Schuler, RE Language: English Journal Title: Transportation Research. Part A: Policy and Practice Volume: 32 Issue: 2 Publication Date: 02/00/1998 Pagination: pp 115-127 Report No: Features: FIGS: Figs. REFS: Refs. Publisher/Corporate Author(s): Elsevier Science, Limited The Boulevard, Langford Lane England Abstract: A methodology is demonstrated for analyzing the economic impacts of various weight limits for heavy vehicles through an application to New York State. Truck usage data were gathered from truck operators in 1990-1991 through three seasonal mail surveys, which allowed the collection of sensitive truck usage data while guaranteeing anonymity to the respondents. The benefits of this permit system are primarily lower business costs for those operators who hold permits; in the long-run, part of the savings realized by the truck operators flow to most sectors of the state's economy. On the cost side, increased infrastructure damage is assumed to result primarily from increased pavement damage. An important finding of this study is the surprising level of non-compliance with permitted weight limits that was reported voluntarily. Index Terms: Cost-Benefit Analysis, Heavy Vehicles, Load Limits, Load Restrictions, Permits, Surveys (Data Collection), Truck Load Limits Available from: Elsevier Science, Limited 660 White Plains Road Tarrytown NY 10591-5153 England

Tag	Abstract
Millar81	Title: POSSIBILITY FOR ENERGY CONSERVATION IN TRANSPORTING FREIGHT BY TRUCK Author(s): Millar, M Publication Date: 09/00/1981 Pagination: 20p Report No: Publisher/Corporate Author(s): Argonne National Laboratories 9700 South Cass Avenue IL 60439 USA Department of Energy 1000 Independence Avenue, SW DC 20585 Abstract: Increasing energy efficiency in transporting freight by truck in interurban areas is discussed. Technical parameters using various devices described to improve fuel economy are: efficiency of the engine and drive train; rolling resistance; gross weight of the vehicle; accessory load; and aerodynamic resistance. Operating procedures to improve fuel economy are also discussed. Savings obtained up to the present in the USA due to the use of these various devices are summarized. (ERA citation 07: 004516) Index Terms: Efficiency, Energy Conservation, Freight Transportation, Gross Vehicle Weight, Resistance, Rolling, Truck Engines, Truck Transportation Economics Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Modeling88	Title: MODELING OPERATING WEIGHT AND AXLE WEIGHT DISTRIBUTIONS FOR HIGHWAY VEHICLES Publication Date: 07/00/1988 Pagination: 151p Report No: Publisher/Corporate Author(s): Abstract: The estimation of highway cost responsibility requires detailed information on vehicle operating weights and axle weights by type of vehicle. Typically, 10--20 vehicle types must be cross classified by 10--20 registered weight classes and again by 20 or more operating weight categories, resulting in 100--400 relative frequencies to be determined for each vehicle type. For each of these, gross operating weight must be distributed to each axle or axle unit. Given the rarity of many of the heaviest vehicle types, direct estimation of these frequencies and axle wieghts from traffic classification count statistics and truck weight data may exceed the reliability of even the largest (e.g., 250, 000 record) data sources. An alternative is to estimate statistical models of operating weight distributions as functions of registered weight, and models of axle weight shares as functions of operating weight. This paper describes the estimation of such functions using multinomial logit model (a log-linear model) and the implementation of the modeling framework as a PC-based FORTRAN program. Areas for further research include the addition of highway class and region as explanatory variables in operating weight distribution models, and the development of theory for including registration costs and costs of operating overweight in the modeling framework. Available from: Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Moses92	Title: TRUCK WEIGHT EFFECTS ON BRIDGE COSTS. FINAL REPORT Author(s): Moses, F Language: English Publication Date: 07/00/1992 Pagination: 163p Report No: Features: FIGS: 14 Fig. TABS: 17 Tab. REFS: 11 Ref. Publisher/Corporate Author(s): Case Western Reserve University Department of Civil Engineering OH 44106 USA Contract State Job No. 14485(0) TRIS20 Federal Highway Administration 400 7th Street, SW 20590 Ohio Department of Transportation 25 South Front Street, P.O. Box 899 43216-0899 Abstract: States are facing strong pressure to allow heavier truck weights. Such increases in weight place a heavy burden on the bridge system which already suffers many structural deficiencies. Ohio is considering increases in weight through a permit system which would allow the collection of funds to maintain the safety and service life of the existing bridge system. This study has examined the statistics of both the Ohio State and non-State owned bridges under a very large variety of possible changes in truck weight regulations. Bridge cost models have been derived to cover new bridge construction, rehabilitation of capacities of existing bridges and reduced service life due to fatigue. For each portion of the bridge cost, the entire population of Ohio's bridges have been surveyed. Current legal ratings have been analyzed and expected changes due to weight law scenarios have been computed using simple span and continuous span bridge behavior analyses for bending moments. For each weight scenario, the overall required AASHTO HS design level required was assessed along with added construction cost. Further, the number of bridges that will need to be strengthened along with these costs was determined. Finally, a fatigue cost was estimated to be assessed for each crossing of a bridge by either a truck using a new weight regulation or falling into the superload class. Total bridge costs are computed for several hundreds of permit weight types and combined for both State and non-State bridges. The report also discusses the effects of heavier trucks on bridge design practices, permit fees, truck weight enforcement needs and implementation. Index Terms: Bending Moments, Bridge Capacity, Bridge Construction, Bridges, Cost Models, Costs, Fatigue Life, Law Enforcement, Ohio, Permits, Rehabilitation, Service Life, Strengthening, Truck Effects (Bridges), Truck Laws & Regulations, Truck Weights Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Motor81	Title: 1980 MOTOR VEHICLE COST RESPONSIBILITY STUDY. SUMMARY REPORT Publication Date: 02/00/1981 Pagination: 22p Report No: Features: FIGS: 2 Fig. TABS: 5 Tab. Publisher/Corporate Author(s): Oregon Department of Transportation 140 Transportation Building, Policy and Planning OR 97310 USA Abstract: This report presents the findings and recommendations of a study which examined the two groups of users of the Oregon state highway system to determine what their proportion of road user taxes should be to maintain equity between the two groups. The two groups are: Basic vehicles--autos and smaller load-carrying vehicles weighing 8, 000 pounds or less; and Heavy vehicles--trucks and buses weighing over 8, 000 pounds. Among the major findings were that basic vehicles should contribute 55 percent of road user revenue and heavy vehicles 45 percent, by 1983 at current tax rates basic vehicles will contribute 55.7 percent and heavy vehicles 44.3 percent, and increases in expenditures for highway deterioration prevention will result in a higher cost responsibility share for heavy vehicles. Index Terms: Automobile, Buses (Vehicles), Cost Sharing, Equity, Heavy Vehicle, Highway User Taxation, Road User Costs, State Highways, Tax Rates, Trucks Available from: Oregon Department of Transportation Highway Planning Section, Economic Services Unit Salem OR 97310 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	**Abstract**
Murphy80	Title: IMPROVEMENT IN FUEL ECONOMY AND PRODUCTIVITY THROUGH USE OF LIGHTWEIGHT COMPONENTS IN HEAVY DUTY HIGHWAY TRUCKS Author(s): Murphy, RW Publication Date: 00/00/1980 Pagination: 8p Report No: Features: REFS: 11 Ref. Publisher/Corporate Author(s): Freightliner Corporation P.O. Box 3591 OR 97208 USA Abstract: Using the relationship between gross vehicle weight and fuel consumption, a simplified method of estimating cost savings resulting from weight reduction is described. Two methods of calculating the economic advantage of reduced tare weight are presented: the increase revenue method for private carriers, and the cost avoidance method, applicable to for-hire carriers. Examples are provided to demonstrate the economic benefits, using data from actual fleet operations. Three practical methods of reducing tare weight are discussed: using aluminum in place of iron and steel, using composite rather than solid parts, and alternate light-weight systems (e.g. wedge brakes, tubeless tires, single vs. dual drive, frontal air, air starter, smaller fuel tank, and special engine). Weight savings for each method are cited. Cost savings per truck for a 2000 lb. tare weight reduction can be as high as $4000 over a five-year period for a private carrier of bulk petroleum products. Increased annual revenue for a for-hire carrier can be as high as $4800. It is shown that the use of aluminum in place of steel is fuel efficient even though more energy is required to produce aluminum. Index Terms: Aluminum, Composite Materials, Cost Effectiveness, Economic Benefits, Fleets, Fuel Consumption, Gross Vehicle Weight, Lightweight Materials, Productivity, Savings, Trucks, Vehicle Operating Cost, Weight Reduction Available from: National Highway Traffic Safety Administration 400 7th Street, SW Washington DC 20590 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
New90	Title: NEW TRUCKS FOR GREATER PRODUCTIVITY AND LESS ROAD WEAR. AN EVALUATION OF THE TURNER PROPOSAL Journal Title: Transportation Research Board Special Report Issue: 227 Publication Date: 00/00/1990 Pagination: 242p Report No: ISBN: 0-309-04963-6 Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 3 App. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: This report, prepared by the Transportation Research Board Committee for the Study of Relationships Between Vehicle Configurations and Highway Design, evaluates the approach to regulation of the size and weight of trucks using U.S. roads known as the Turner Proposal. This approach had its origin in a proposal put forth in a 1984 address to AASHTO by former Federal Highway Administrator Francis C. Turner. The approach evaluated by the committee differs in an important respect from Turner's original concept: in the committee's approach, use of the new trucks would be voluntary; that is, truck operators would be offered the choice of continuing with existing equipment and weight rules or adopting the new trucks with the new weight regulations. The committee designed a package of changes in size and weight limits, safety restrictions, and procedures regarding bridge deficiencies, routing, and enforcement that would be a practical regulatory scheme for implementing the Turner concept. The committee recommends that every state, with careful assessment of the risks and uncertainties, consider this proposal as a supplement to current size and weight regulations. If Turner trucks were adopted in all states according to the recommended rules, they would reduce the cost of shipping freight and would not degrade safety. The total cost of maintaining the road system would be reduced, although pavement wear savings would be partially offset by higher bridge costs. Index Terms: Costs, Freight Transportation, Highway Bridges, Highway Safety, Pavement, Policy, Productivity, Size, Traffic Safety, Truck Weights, Trucking Industry, Trucks, Turner Proposal, Vehicle Configurations, Wear Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Ng82	Title: TRUCK SIZES AND WEIGHTS: A COMPARISON OF STATE STUDIES Author(s): Ng, P: Tobias, S: Walton, CM: Yu, C-P Journal Title: Transportation Research Forum Proceedings Volume: 23 Issue: 1 Publication Date: 00/00/1982 Pagination: pp 391-404 Report No: Features: TABS: 8 Tab. REFS: 25 Ref. Publisher/Corporate Author(s): Cross (Richard B) Company, Incorporated P.O. Box 405 47971 USA Abstract: With the prevailing and persistent economic conditions, many states have recently conducted studies on a variety of transportation management and financial matters. This is particularly the case with respect to highway transportation and the use of highways by motor carriers. As with the congressional mandate to the federal Department of Transportation to study truck sizes and weights and highway cost allocation, many state legislatures and transportation agencies felt compelled to initiate similar studies. As a result of these studies and actions taken, this paper was prepared to provide an overview of the information contained in each study as to the objective; scope; methodology, including data acquisitions and analysis; findings; and conclusions. A summary of the collective findings is provided. (Author) Index Terms: Cost Allocation, Highway Costs, Reviews, Size And Weight Laws, State Government, Studies, Truck Weights Available from: Cross (Richard B) Company, Incorporated P.O. Box 405 Oxford, Indiana 47971 USA

Tag	Abstract
Ogden91	Title: TRUCK MOVEMENT AND ACCESS IN URBAN AREAS Author(s): Ogden, KW Journal Title: Journal of Transportation Engineering Volume: 117 Issue: 1 Publication Date: 01/00/1991 Pagination: pp 71-90 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 1 App. Publisher/Corporate Author(s): American Society of Civil Engineers 345 East 47th Street NY 10017-2398 USA Abstract: The paper discusses some ways in which traffic can contribute to a better urban freight system, including ways in which some of its adverse effects can be reduced. Traffic management objectives for urban trucking is discussed in the wider context of overall community objectives for urban freight, inlcuding efficiency, contribution to the regional and national economy, environmental protection, safety and urban form. Problems in urban trucking include congestion, road networks, parking and loading. Traffic management solution strategies of 4 general types are discussed: measures at a network level; measures at a site level; measures directed at parking and loading; and the removal of physical impediments to movement. Truck traffic generation rates likely to be associated with development in the future is also a necessary area of consideration. Index Terms: Access, Economic Development, Loading, Parking, Road Network, Traffic Congestion, Traffic Generation, Traffic Management, Trucks, Urban Areas Available from: American Society of Civil Engineers 345 East 47th Street New York NY 10017-2398 USA

Tag	Abstract
Optimum68	Title: OPTIMUM ENFORCEMENT LEVEL FOR TRAFFIC WEIGHT OPERATIONS Publication Date: 10/31/1968 Report No: Publisher/Corporate Author(s): Abstract: enforcement of vehicle size and weight regulations is assigned to the traffic weight operations department of the iowa state highway commission. In addition to observing the weight and size of trucks and buses, traffic weight officers inspect vehicle registrations to ascertain that the vehicles are registered for the weight that they are carrying and are properly registered for travel in iowa. The enforcement of traffic weight and size regulations involves both benefits and costs to iowa. Determination was made of the optimum level and method of traffic weight and size regulation enforcement. A literature search was made involving several state governments, federal agencies, manufacturers of weighing equipment, etc. The study was conducted in the following three steps: (1) find the benefits and costs of traffic weight operations (two), (2) calculate the benefits and costs from various levels and methods of two, and (3) pick the level and method of two that maximized the difference of benefits and costs. The analysis is essentially a cost-benefit comparison which incorporates provisions for assessing the effects of various modes and degrees of enforcement. The costs included in the analysis are the costs of maintaining any given number of traffic weight officers in the field, and the cost of the administration needed to support and direct the field operations. The benefits included in the analysis are: (1) fines for overweight vehicles, (2) proper registration fees otherwise not paid, and (3) prevention of uncompensated pavement wear. Computer models were developed to permit calculation of benefits and costs for a wide variety of inspection methods and levels of effort. The models were based on factors such as apprehension probability, fraction of the truck population complying with the law, and the average cost to iowa from uncompensated road wear caused by overweight trucks. The computer models were applied to a set of proposed enforcement methods and levels of effort. The study revealed that the iowa state highway commision has progressively improved traffic weight operations by the addition of resources of enforcement personnel and conventional weighting equipment to the point where 89% of the trucks now complied with state weight and registration laws. If increased compliance with the law is paramount, an increase of staff level would reduce net revenue to the same level at present attainable, but compliance would be increased to 95%. Increased benefits from two can also be realized for the near term by the application of newly developed management tools for the allocation of enforcement resources. Technological improvements in weighting and surveillance equipment now under development offer promise of further improvements for the long term. Available from:

Tag	Abstract
Pagan92	Title: EVALUATING TRUCK DAMAGE TO HIGHWAYS Author(s): Pagan, AR Language: English Journal Title: Better Roads Volume: 62 Issue: 12 Publication Date: 12/00/1992 Pagination: p 38 Report No: Publisher/Corporate Author(s): Abstract: This article examines public costs, which are directly related to traffic numbers and loading, and especially to loads and overloads due to trucks. It has been discovered that the pavement damage due to the number and weights of axle loads can be expressed as a function of the number of axles which use a road (k) times the axle load to the 4.5 power: Damage = k X (axle load) (super 4.5). Index Terms: Axle Loads, Highway Costs, Overloads, Pavement Damage, Pavement Loading, Pavement Wear, Traffic Volume, Truck Weights Available from: Better Roads P.O. Box 558 Park Ridge IL 60068 USA

Tag	Abstract
Pant73	Title: COMPUTER ALGORITHM FOR ROUTING OVERSIZE TRUCKS Author(s): Pant, SK: Wegmann, FJ Journal Title: ASCE Journal of Transportation Engineering Volume: 99 Issue: TE1 Publication Date: 02/00/1973 Pagination: pp 151-66 Report No: Publisher/Corporate Author(s): Abstract: A computer algorithm for routing oversized trucks through a network was developed. The basic input to the algorithm consists of the usual network description in terms of speed and distance on constituent links, and in addition, the height and weight limits on each link, and the height and weight of the truck to be routed between specified origins and destinations. The algorithm computes the minimum time path on the basic network or on the residual network subsequent to removal of all links having an allowable height and weight less than the corresponding parameters for the truck to be routed. The output also includes the distance along the minimum time path and the corresponding overweight fee computed on the basis of a certain rate per excess ton-mile traveled. These outputs can then be compared to determine the increase in user costs resulting from routing a truck over a minimum time path that avoids restricted links. /asce/ Index Terms: Algorithms, Computer Applications, Height, Overweight Loads, Routing, Trucks, Weight Limits Available from:

Tag	Abstract
Patton74	Title: INCREASE TRUCK WEIGHTS, PRESIDENT FORD URGES Author(s): Patton, O Journal Title: Transport Topics Publication Date: 11/25/1974 Pagination: 2 pp Report No: Publisher/Corporate Author(s): Transport Topics Incorporated 1616 P Street, NW DC 20036 USA Abstract: In the interest of economic efficiency and fuel conservation, a series of legislative proposals have been sent to Congress (by the chief executive) which request positive action on an increase in truck sizes and weights, endorse the pending Surface Transportation Act, and call for action on a proposal to establish a one-year National Regulatory Reform Commission. The National Transportation Assistance Act of 1974 also received endorsement. In an effort to offset economic disadvantages to trucks resulting from lower permissible speed and fuel costs, legislation was submitted which would provide for increases in sizes and weights. With modifications to insure greater reliance on competitive market forces, the Surface Transportation Act would contribute to the vitality of the railroad system. Proposals for reform by the National Regulatory Reform Commission are expected to be soon ready for consideration. The Mass Transportation Assistance Act will provide the nation's cities with Federal financial assistance to help meet priority urban mass transportation needs. Index Terms: Costs, Energy, Federal Aid, Fuel Consumption, Law, Mass Transit, Rail Transportation, Regulation, Size And Weight Laws, Surface Rail Transit, Transportation Economics, Trucks, Urban Transportation, Vehicle

Tag	Abstract
Pavement81	Title: PAVEMENT REHABILITATION ANALYSIS: A MODEL FOR TEXAS Journal Title: Texas Transportation Researcher Volume: 17 Issue: 1 Publication Date: 01/00/1981 Pagination: pp 8-10 Report No: Publisher/Corporate Author(s): Abstract: A research project to investigate the effects of changes in truck size, weight, and axle configuration on pavement performance, and to relate these effects to pavement maintenance and rehabilitation costs is outlined. This article presents the initial results of a study in progress to analyze the computer programs REHAB and NULOAD and prepare a synthesized program. Available from: Acknowledgement of Document Source: Engineering Index

Tag	Abstract
Pavement89	Title: PAVEMENT DAMAGE ATTRIBUTABLE TO FOUR AXLE SINGLE UNIT TRUCKS. FINAL REPORT Publication Date: 01/00/1989 Pagination: v.p. Period Covered: 8707-8810 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 18 Ref. APPS: 4 App. Publisher/Corporate Author(s): Abstract: The objective of the study was to investigate and define the types of pavement damage which may be attributed to four axle single unit trucks and identify and define applicable terms and uses of the truck. Assesment of pavement damage was accomplished by determining average equivalent axle loads (EALs) associated with each class of truck. Also, truck traffic patterns on Arkansas highways and percent of (EALs) generated by each class of truck on rural arterials were determined. A test plate was developed which measured the resultant tire forces produced by the four axle single unit truck during tight turns. A national survey of state highway departments, weight and permit divisions and enforcement divisions was conducted. The survey asked for information concerning the usage and restrictions associated with four axle single unit trucks. Truck and lift axle manufacturers were surveyed for information on the manufacture and sale of lift axles. Recommendations were made concerning four axle single unit trucks which could reduce the EALs associated with these trucks by a factor of two to three. These recommendations would impose a minimal economic hardship on the truck owners and operators. Available from:

Tag	Abstract
Pavement90	Title: PAVEMENT AND BRIDGE IMPACTS OF LONGER COMBINATION VEHICLES. FINAL REPORT Publication Date: 06/30/1990 Pagination: 14p Report No: Features: FIGS: 3 Fig. TABS: 4 Tab. Publisher/Corporate Author(s): American Trucking Associations, Incorporated Trucking Research Institute, 2200 Mill Road VA 22314 Urban Institute 2100 M Street, NW DC 20037 USA Abstract: This report presents estimates of pavement and bridge cost impacts of four longer combination vehicle (LCV) scenarios described in "Productivity and Consumer Benefits of Longer Combination Vehicles" (Sydec, Incorporated, May 14, 1990). Both the pavement and bridge impacts were developed using data and methods presented in "Truck Weight Limits: Issues and Options" (Transportation Research Board Special Report No. 225, 1990). Each of the four scenarios results in lower pavement costs and higher bridge costs, with a net increase in pavement and bridge costs of about $375 million per year. The increase is due to the elimination of the 80, 000 pound GVW cap. Relative to a scenario in which this cap is eliminated with no change in length limits, each of the four LCV scenarios would result in a slight decrease in total pavement and bridge costs. Index Terms: Bridge, Cost Estimates, Economic Impact, Gross Vehicle Weight, Longer Combination Vehicles, Pavement, Scenarios Available from: American Trucking Associations, Incorporated Trucking Research Institute, 2200 Mill Road Alexandria VA 22314 USA

Tag	**Abstract**
Paxson82	Title: VALUE OF OVERWEIGHTING TO INTERCITY TRUCKERS Author(s): Paxson, DS Journal Title: Transportation Research Record Issue: 889 Publication Date: 00/00/1982 Pagination: pp 33-37 Report No: Features: TABS: 5 Tab. REFS: 2 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: An analysis of the problem of truck overweighting is presented. Legal and illegal overweighting and current enforcement procedures are discussed. The benefits to truckers of overweighting are shown by means of an incremental approach (decrease in transport cost per unit with increase in cargo weight) and by using specific cargo movements to calculate the incentives to overweight. The fine and penalty structures of various states are examined and are combined with the probability of being weighed to calculate the expected value of being weighed to the trucker. The net benefit of overweighting to the trucker is then shown by comparing the costs with the incentives. Finally, actual permit costs are examined in relation to the cost of additional pavement damage caused by overweight trucks. It is concluded that (a) economic incentives often exceed the expected costs of overweighting to the trucker, (b) current enforcement programs in some states are not effective, (c) fine structures should take account of both the amount of truck overweight and the number of miles traveled, and (d) the cost of overweight permits does not reflect the additional pavement damage caused by overweighting. (Author) Index Terms: Costs, Freight Transportation, Intercity Transportation, Licenses, Motor Carriers, Overweight Loads, Truck Pavement Damage, Truck Transportation Economics Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Pearson97	Title: ASSESSING THE IMPACT OF RESEARCH - THE CANADIAN EXPERIENCE WITH HEAVY VEHICLE WEIGHTS AND DIMENSIONS Author(s): Pearson, JR Language: English Conference Title: Development and Evaluation of Road Transport Research Programmes Sponsored by: Institut National de Recherche sur lkes transports et leur Securite Location: Lyon-Annecy, France Date Held: 19961021-19961025 Publication Date: 01/00/1997 Pagination: pp 192-197 Report No: ISBN: 2857824750 Features: FIGS: 2 Fig. TABS: 1 Tab. REFS: 2 Ref. Publisher/Corporate Author(s): Institut National Recherche sur Transp et Securite 2, Avenue du General Malleret-Joinville, BP 34 France Abstract: The differences which existed in size and weight regulations within Canada reflected different engineering judgments of the structural capacity of highway infrastructure, the compatibility of large and heavy truck configurations with highway geometrics, and safety concerns for truck performance as weights and/or dimensions change. Research was needed to provide a common technical basis for discussion of harmonization of regulations. The research approached the issues of vehicle weights and dimensions from a "first principles" perspective, focusing in identifying the type and magnitude of impacts that change in truck size and weight parameters would have. Initial studies conducted on bridge capacity concluded that higher capacity existed than previously thought and that variations in the load carrying capacity of different pavement structures used across Canada were likely to be a greater constraining factor. To explore the remaining range of concerns, the largest cooperative highway research program ever undertaken in Canada was developed and launched. Jointly sponsored by thirteen governments and four organizations representing the truck manufacturing and operating industries, a special corporation was established (Canroad Transportation Research Corporation) to assemble the required funding ($3 million), and to organize and steer the research. Pavement strain and deflection data was collected at thirteen sites on the primary highway system across Canada under a common test program comprising a wide range of axle loads and configurations. The test results were analyzed and presented in terms of Equivalent Single Axle Loads (ESAL's for single, tandem and tridem axle groups for loading levels within and beyond the range of typical regulated limits. In support of the discussion of regulatory harmonization, companion studies were also undertaken of the impact of vehicle length, on passing on two-lane highways, and on the economic implications of changes in size and weight scenarios. Index Terms: Configurations, Dimensions, Heavy Vehicles, Highway Capacity, Regulations, Research Programs, Safety, Truck Performance, Vehicle Weight, Weight Available from: Institut National Recherche sur Transp et Securite 2, Avenue du General Malleret-Joinville, BP 34 94114 Arcueil Cedex France

Tag	Abstract
Peterson77	Title: TRUCK CHARACTERISTICS AND PAVEMENT EFFECTS Author(s): Peterson, DE: Shepherd, LW Publication Date: 04/00/1977 Pagination: 30 pp Report No: Features: FIGS: 21 Fig. Publisher/Corporate Author(s): Utah Department of Transportation 757 West Second South UT 84104 USA Abstract: A project is reported which was intended to develop engineering knowledge which could be used in the design and construction of new highway pavements and bridges, and in the preservation and improvement of existing pavements. It was also intended that the findings be used, in conjunction with data from other research, toward the ultimate goal of determining an optimum economic balance between vehicle operating costs and the costs of highways. The relationship between axle loads for both single and tandem axles and the number of equivalent single axles for flexible pavements is discussed, and an analysis procedure to provide a means of easily comparing the effect of different truck combinations at different weight levels is described. Other aspects covered here include a Present Serviceability Index, the effect of pavement thickness, the effect of various pavement design strategies, and the relationship between payload and the ton mile. Index Terms: Axle Load, Bridge Design, Flexible Pavement, Highway Improvements, Pavement Construction, Pavement Maintenance, Pavement Thickness, Payloads /Highway Construction/, Serviceability Index, Trucks, Vehicle Characteristics, Vehicle Operating Cost Available from:

Tag	Abstract
Phang69	Title: VEHICLE WEIGHT REGULATION AND THE EFFECTS OF INCREASED LOADING ON PAVEMENTS Author(s): Phang, WA Publication Date: 11/00/1969 Report No: Publisher/Corporate Author(s): Ontario Dept Hwys, Downsview /Canada/ Abstract: heavily loaded vehicles are particularly damaging to highway pavements and protective weight limitations safeguard the highway investment. Over the past four decades, the changing needs of transportation have required upward revisions in these weight limitations, and further upward revision is again under consideration. The reaction to loading of flexible and rigid pavements, the effects of different wheel loads on pavement life, their equivalence in terms of pavement damage, and the influence of adjacent axles, are described. Increased maintenance and strengthening overlays are needed for increased wheel loads. A 1967 vehicle survey showed the 85 percentaile single-axle load to be about 22 kips, so that raising the weight limitation from 18 kips to 20 kips would only result in regularization of those trucks with 20 kip single-axles now regarded as overloaded. Stricter enforcement must ensure that there is no upward shift in the loading specturm when the weight limitations are raised. Some aspects of economic limitations are presented and a license fee structure based on load equivalency factors is suggested. /hsri/ Index Terms: Change, Economic, Highway Pavements, Loading, Pavement Distress, Pavement Life, Pavement Maintenance, Vehicle, Weight Limits, Wheel Load Available from: Acknowledgement of Document Source: Highway Safety Research Institute

Tag	Abstract
Prasad94	Title: COMPUTERIZED OVERLOAD PERMITTING PROCEDURE FOR INDIANA Author(s): Prasad, NBR: Ramirez, JA: White, DW: White, TD: Zaghloul, SM Language: English Journal Title: Transportation Research Record Issue: 1448 Publication Date: 00/00/1994 Pagination: pp 40-52 Report No: ISBN: 0309060575 Features: FIGS: 11 Fig. TABS: 3 Tab. REFS: 18 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Truck weight regulations are used to control the rate of damage accumulation for pavements and bridges. Permitting heavier loads can increase the rate at which pavement damage and bridge deterioration accumulate and the costs of maintenance. Truck weight limits have always been controversial. Each state has legal truck weight limits. In many cases, trucks carrying weights higher than legal limits need to use the highway system and a special overload permit is required. A study conducted at Purdue University and funded by the Indiana Department of Transportation and FHWA developed an enhanced procedure for permitting overloaded trucks in Indiana. The procedure evaluates damage effects of overloaded trucks for pavements and bridges. Both pavement and bridge analyses use statistical models developed especially for this study. The pavement statistical models are based on a three-dimensional, nonlinear dynamic finite-element analysis of rigid, flexible, and composite pavements. Repeated axle loads moving at different speeds are considered, and realistic material models, such as viscoelastic and elastic-plastic models, are used for pavement materials and subgrades. The bridge statistical models are based on analysis using the AASHTO Bridge Analysis and Rating System and selected samples of bridges and overloaded trucks. User-friendly computer software was developed to implement this enhanced procedure, which allows the user to run damage analysis for overloaded trucks at the network level (e.g., route-independent analysis) as well as at the project level for specific pavement or bridge structures. Three options are available at both project levels: to check for pavements only, to check for bridges only, or to check for both, the default option. At the project level, the user is permitted to enter all cross-section and load parameters. Typical default values are provided for material properties. Index Terms: Bridges, Damage Analysis, Finite Element Analysis, Indiana, Overloads, Pavements, Permits, Software, Statistical Models, Truck Effects (Bridges), Truck Pavement Damage Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Procedures83	Title: PROCEDURE FOR ASSESSING TRUCK WEIGHT SHIFTS THAT RESULT FROM CHANGES IN LEGAL LIMITS Journal Title: Transportation Research Record Issue: 920 Publication Date: 00/00/1983 Pagination: pp 19-26 Report No: Features: FIGS: 6 Fig. TABS: 5 Tab. REFS: 6 Ref. Publisher/Corporate Author(s): Abstract: In recent years, maximum legal truck size and weight limits have become major issues in the United States. The assessment of impacts due to changes in maximum limits is an ongoing, dynamic problem faced by many highway departments and state legislatures. It has been difficult to predict future truck weight distribution patterns as affected by the alternative legislation that governs truck weight. Consequently, it has become implausible to try to forecast precisely the benefits and costs associated with changes in size and weight limits. In the past, various methodologies for projecting truck weight distribution patterns have been developed. Each methodology has made a contribution in the capability of a framework for assessing changes in truck size and weight patterns; however, improvement is needed to enhance the overall precision of these estimates. In June 1977 the Texas State Department of Highways and Public Transportation contracted the Center for Transportation Research to conduct a study on selected aspects of the truck size and weight issue. As a part of this study, a shifting methodology has been developed for the projection of future truck weight distribution patterns. This methodology can be applied either manually or by using a series of computer programs, and it can be used to predict both gross vehicle weight and axle weight distributions. A brief review of available methodologies and a detailed discussion of the Texas Shift are presented. Illustrative applications of predicting gross vehicle weight and axle weight distributions as a result of changes in weight limits are presented. Comparison of the prediction results generated by all the available shifting methodologies is also included. (Author) Available from:

Tag	Abstract
Proceedings88	Title: PROCEEDINGS, INTERNATIONAL SYMPOSIUM ON HEAVY VEHICLE WEIGHTS AND DIMENSIONS, JUNE 8-13, 1986, KELOWNA, BRITISH COLUMBIA Publication Date: 00/00/1988 Pagination: 474p Report No: ISBN: 0-919098-99-1 Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Abstract: Contents are as follows: Important United States Issues on Truck Weight and Dimensions, JP Eicher; Heavy Vehicles--Some European Observations, I Schacke and E Barenholdt; N.Z. Perspective on the Emerging Critical Issues and Research Needs in Vehicle Size and Weights, NT Peterken; Heavy Vehicle Axle Dynamics--Rig Development, Instrumentation, Analysis Techniques, JHF Woodrooffe and PA LeBlanc; Road Damaging Effects of Dynamic Axle Loads, D Cebon; Dynamic Loading of Road Pavements, RR Addis, AR Halliday and CGB Mitchell; Dynamic Suspension Characteristics: Is There Research Beyond the Fourth Power Law?, PF Sweatman; Axioms Relating Truck Size and Weight to Vehicle Controllability, RD Ervin and Y Guy; Heavy Truck Testing for the Canadian Vehicle Weights and Dimensions Study, JR Billing; Stability Analysis of Liquid Tank Vehicle, S Sankar, S Rakheja and RN Sabounghi; Pavement Response to Heavy Truck Axle Loadings: The Canadian Vehicle Weights and Dimensions Study, JT Christison; Tire Pressure and Pavement Response, AC Sharp; The Effects of Different Trucks on Road Pavements, M Huhtala; A High Performance WIM System by Piezo-Electric Cables and Its Applications, B Jacob and M Sieffert; On-the-Scene Study of Commercial Vehicle Accidents, M Wolkowicz; Overview of the University of Michigan Transportation Research Institute Large-Truck Survey Program, O Carsten and KL Campbell; Effect of Nationwide Introduction of Twin Trailer Trucks in the U.S., JR Morris and RE Skinner; The Effect of Ontario's Weight Regulations on Commercial Vehicle Design, AC Agarwal and JR Billing; The United States Bridge Formula, CS Napier, Jr and JP Eicher; Investigation of a Comprehensive Truck Weight Data Collection Plan Using Low Cost Permanent and Portable Weigh-in-Motion Equipment, ME Hallenbeck and C Carlson; Road and Structure Protection Through Weight Control - Economic and Engineering Issues, SCJ Radbone, WA Phang and RA Dorton; California and Their HELP Project, J Van Berkel, Jr; Design Guidelines for Developing Truck Inspection Stations, AT Bergan and BD Pidwerbesky; ...continued on TRIS ACCESSION Number 482479. Available from:

Tag	Abstract
Proceedings88a	Title: PROCEEDINGS, INTERNATIONAL SYMPOSIUM ON HEAVY VEHICLE WEIGHTS AND DIMENSIONS, JUNE 8-13, 1986, KELOWNA, BRITISH COLUMBIA (CONTINUED FROM TRIS ACCESSION NUMBER 482478) Publication Date: 00/00/1988 Pagination: 474p Report No: ISBN: 0-919098-99-1 Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Abstract: Continued from TRIS ACCESSION Number 482478... Investigating Articulated Vehicle Roll Stability Using a Tilt Table Device, G Delisle; Development of a Mobile Tire Test Dynamometer and Tests of Three Truck Tires, W Mercer and W Stephenson; Innovative Dollies: Improving the Dynamic Performance of Multi-Trailer Vehicles, CB Winkler; Comparison of Simulation and Test Results for Various Truck Combination Configurations, CP Lam; An Overview of the Strategic Highway Research Program, RA McComb; Pavement Loading/Design Relationships in Iowa, JK Cable; Analyses of Moving Dynamic Loads on Highway Pavements: Part I-- Vehicle Response, S O'Connell, E Abbo and K Hedrick; Analyses of Moving Dynamic Loads on Highway Pavements: Part II -- Pavement Response, BD Bradmeyer, NJ Delatte and MJ Markow; Longer Combination Vehicle Studies in the United States, GE Maring; The Australian Experience in Assessing the Economics of Road Vehicle Limits, RA Pearson; Estimating the Benefits of Increased Gross Vehicle Weights, G Halls; Assessing the Impact of Weight and Dimension Regulations: Methodological Considerations, FP Nix and AM Clayton; and Motor Carrier Vehicle Weights and Dimensions and Their Impact Upon the Competitive Balance Between the Rail and Road Modes in Western Canada, GA Sparks. Available from:

Tag	Abstract
Proposed70	Title: PROPOSED NEW NATIONAL HIGHWAY TRUCK LAWS Journal Title: New Mexico Highway Engineering Conference Proc Publication Date: 01/00/1970 Report No: Publisher/Corporate Author(s): Abstract: size and weight standards for trucks reflect the state of road and bridge design as of 1946. In the meantime, construction practices have improved and the relation of gross weight to axle distribution and truck dimensions has been clarified. Since the economies of many states are probably tied more closely to truck transportation than to any other form of transportation, it is necessary to bring national and state standards in line with existing conditions. Recommendations of the federal highway administration in this regard are described and supported. Available from:
Proposed86	Title: PROPOSED NEW TRUCK WEIGHT LIMIT FORMULA Journal Title: Journal of Structural Engineering Volume: 112 Issue: 7 Publication Date: 07/00/1986 Pagination: 16p Report No: Features: FIGS: 15 Fig. TABS: 4 Tab. REFS: 8 Ref. APPS: 2 App. Publisher/Corporate Author(s): Abstract: A formula for limiting truck and combination vehicle weights is proposed. The proposed formula gives the maximum allowable gross vehicle weight as a function of extreme axle spacing, and is intended to replace the existing formula which depends on the number of axles in the string as well as the extreme axle spacing. The advantages of the proposed formula over the existing formula are several. The existing formula does not prevent certain critical vehicles from operating on H15 bridges except by means of a footnote addendum. The proposed formula does protect H15 bridges aganist such vehicles. The existing formula does not provide adequately for economic operation of proposed long combinations of multiple trailers. An existing 80, 000 lb gross vehicle weight limit presently prevents extension of the existing formula to the proposed longer vehicles. Should the existing 80, 000 lb limit be increased or removed, the existing formula would not adequately protect HS20 bridges. The proposed formula will protect the bridges in the absence of such a limit. Available from:

Tag	Abstract
Raney89	Title: RELATIONSHIP BETWEEN COSTS AND RATES IN THE LESS-THAN-TRUCKLOAD MARKET Author(s): Raney, B Journal Title: Journal of the Transportation Research Forum Volume: 30 Issue: 1 Publication Date: 00/00/1989 Pagination: pp 160-169 Report No: Features: FIGS: 9 Fig. TABS: 2 Tab. APPS: 3 App. Publisher/Corporate Author(s): Transportation Research Forum 1600 Wilson Boulevard, Suite 905 VA 22209 USA Abstract: The purpose of this paper is to analyze the costs and rates in the Ontario less-than-truckload (LTL) segment of the for-hire trucking industry, in order to determine whether LTL rates are based on cost factors, market forces or other factors. To complete this analysis, LTL rates are compared to carrier costs for various weights, for various distances, and for various origins and destinations. The paper is organized into four main sections: 1) LTL Carrier Costing; 2) Implications of Costing Model; 3) LTL Rate Structure; and 4) LTL Cost/Rate Comparison. Index Terms: Comparison, Costs, Less Than Truckload, Mathematical Models, Ontario (Canada), Rate Structure, Rates (Costs), Trucking Industry Available from: Transportation Research Forum 1600 Wilson Boulevard, Suite 905 Arlington VA 22209 USA

Tag	Abstract
Rappaport77	Title: TRANSPORTATION ENERGY CONSERVATION: RESEARCH NEEDS AND POSSIBILITIES Author(s): Rappaport, CS Journal Title: Transportation Research Circular Issue: 187 Publication Date: 12/00/1977 Pagination: pp 22-29 Report No: Features: REFS: 46 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The obstacles to energy conservation in the U.S. are noted, the advantages of energy conservation are pointed out, and the ways in which the transportation sector can make a significant contribution to energy conservation are listed: technical fuel efficiency of vehicles; in-use improvements in routing, scheduling, load factors and operating characteristics; and diversion of demand to more fuel-efficient modes or substitutes. Existing transportation energy conservation programs (automobile fuel economy standards, state energy conservation grants, and energy conservation in regulated industries) are outlined, and proposed programs and goals for the future are discussed. Actions proposed by the President include the following: Excise taxes and rebates on new automobiles; standby gasoline taxes and rebates; light truck standards, taxes, rebates; removal of 10 percent excise tax on intercity buses; increased fuel tax on aviation and motor boats; increase federal auto fleet efficiency; federal employee vanpooling demonstration. Comments are also made on policy-oriented research needs in transportation energy conservation. Index Terms: Conservation, Energy, Fuel Consumption, Fuel Taxation, Taxation, Transportation Research, Vanpools Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Rauhut78	Title: EFFECTS ON FLEXIBLE HIGHWAYS OF INCREASED LEGAL VEHICLE WEIGHTS USING VESYS IIM Author(s): Rauhut, JB Publication Date: 01/00/1978 Pagination: 215 p. Report No: Publisher/Corporate Author(s): Austin Research Engineers Incorporated 2600 Dellana Lane TX 78746 USA Abstract: This report provides results of a detailed study to estimate lifetime costs for flexible pavements as a function of legal axle limits using an improved version of FHWA Computer Program VESYS IIM. VESYS IIM was modified to include capabilities for: (1) seasonal characterizations of pavement materials, (2) a discretized representation of axle load distribution, and (3) low-temperature cracking predictions. A combined survey of the literature and laboratory testing program was conducted to define the variations in material permanent deformation parametes as important material characteristics vary seasonally with the environment. The resulting data and other information and experience were applied to arrive at input data that would yield realistic performance predictions. A factorial of 64 solutions was obtained using the improved version of VESYS IIM and the input data developed to study the effects of truck traffic consistent with four levels of legal axle limits (18, 20, 22 and 24 kips), two levels of traffic, two levels of pavement section thickness and four environmental zones (Wet-Freeze, Dry-Freeze, Wet-No Freeze and Dry-No Freeze). Where failures were predicted, and ovelay was applied and a new solution obtained until a pavement life of at least 20 years was attained. The initial and overlay costs were estimated and these costs for 20 years of pavement service were related to the legal axle limits. /FHWA/ Index Terms: Axle Load, Deformation, Flexible Pavement, Increase, Law, Seasonal Variations, Service Life Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: Federal Highway Administration

Tag	Abstract
Ross56	Title: INCREMENTAL METHOD OF ALLOCATING HIGHWAY COSTS Author(s): Ross, WD Journal Title: Highway Research Board Bulletin Publication Date: 00/00/1956 Report No: Publisher/Corporate Author(s): Abstract: A Louisiana highway finance study was conducted in conjunction with a comprehensive engineering study of highway needs within the state. Incremental analysis was used. The foundation of the incremental method is the fact that vehicles of different dimensions and weights differ in their requirements for highway facilities. The approach involves an attempt to differentiate the cost attributable to vehicle weight and size and to assign these costs to vehicles in graduated weight-and-size-increment groups. The apportionment used in the Louisiana incremental analysis involves a feature originated by Melton. The objective is to separate those highway costs chargeable to the highway user from those which should not be charges to the highway user. Louisiana registers trucks and trailers by load-carrying axle weight. The Louisiana study distributes weight-related costs between vehicles falling into the various weight increments on an axle-mile basis. Nonweight costs are distributed on an axle-mile basis. The problem of selecting the most valid inventory figures was extremely difficult. The next problem was of distributing total traffic by road- surface type and by vehicle-use type and weight group. The distribution of total traffic by proposed surface type was accomplished by IBM tabulation of traffic count data for each section or portion of the road system. Average annual mileage data available for commercial vehicles in Louisiana served as a guide to adjustments where incongruities appeared in results obtained from the statistical approach. Index Terms: Axle Load, Commercial Vehicles, Cost Allocation, Highway Costs, Highway Needs, Highway Users, Incremental Costs, Road Surfaces, Size, Traffic Counting, Vehicle, Vehicle Miles, Weight Available from:

Tag	**Abstract**
Runaway82	Title: RUNAWAY TRUCK ARRESTING SCHEMES. FINAL REPORT Publication Date: 06/00/1982 Pagination: 126p Period Covered: 7810-8106 Report No: Publisher/Corporate Author(s): Abstract: The objective of the initial phase of the project was to identify, develop, analyze, and evaluate potential methods for stopping heavy vehicles on long, steep downgrades. Four categories of methods were examined: (1) devices for arresting aircraft in emergency landing or take-off situations, (2) crash cushions of barriers, (3) retarders which are part of the vehicle, and (4) escape ramps utilizing an arresting material and/or an ascending grade. Using criteria of arresting capability, safety, reliability, down time, cost effectiveness, and adaptability to truck use, vehicle retarders and arrester beds were found to be the most feasible methods of arresting runaway heavy vehicles. The extension phase has as its objective to examine the energy dissipation properties of a variety of materials covering a variation of particle size, particle shape, vehicle velocity, and wheel load. Available from: Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Russell95	Title: HIGHWAY USE TAX ALTERNATIVES FOR HEAVY TRUCKS IN OREGON Author(s): Russell, RE Language: English Journal Title: Transportation Research Record Issue: 1498 Publication Date: 00/00/1995 Pagination: pp 1-4 Report No: ISBN: 0309061628 Features: REFS: 9 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: This paper presents a policy analysis of highway use tax alternatives for heavy trucks. It compares registration fees, fuel taxes and weight-distance taxes in terms of equity, compliance costs, administrative costs, and evasion potential. Three different tax scenarios are evaluated for the state of Oregon. The conclusion is that continued reliance on the weight-distance tax is the best option for Oregon. Index Terms: Administrative Costs, Compliance Costs, Equity, Fuel Taxation, Heavy Vehicles, Highway User Taxation, Oregon, Policy Analysis, Registration Fee, Tax Evasion, Trucking Industry, Weight-Distance Taxes Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Rutland94	Title: INCREMENTAL COST, WEIGHT, AND LEADTIME IMPACTS OF REQUIRING HEAVY TRUCK TRACTOR/TRAILER ABS. FINAL REPORT Author(s): Rutland, KW: Spinney, BC Language: English Publication Date: 06/00/1994 Pagination: 294p Report No: Features: FIGS: Figs. TABS: Tabs. PHOT: Phots. APPS: 4 App. Publisher/Corporate Author(s): National Highway Traffic Safety Administration Engineering Systems Staff, 400 7th Street, SW DC 20590 USA Abstract: This report documents the findings of an incremental cost, weight, and leadtime analysis developed from process cost and weight teardown of heavy truck antilock braking system (ABS) hardware from three manufacturers - Rockwell/WABCO, Midland-Grau and Bendix. Both truck tractor and trailer ABS configurations were studied including failure warning systems and several types of ABS tractor/trailer connectors. The scope of this study was confined to Class 7 and 8 trucks and tractor/trailers, which represent 72.4% of the total vehicles under consideration. A baseline tractor/trailer combination, an "18-wheeler" Navistar tractor pulling a Great Dane trailer, was used to determine cost and weight estimates of the three different ABS manufacturers' hardware and ABS configurations when fully installed on the vehicle. A supplementary analysis of Class 7 single unit trucks using Rockwell/WABCO hardware provided estimates for incremental cost and weight impacts for this class of vehicle. The significant findings of this study are: 1) Tractor/trailer ABS configurations examined in this study should result in price and weight increases no greater than $1700 and 100 pounds per vehicle combination; 2) Single unit heavy truck ABS should result in price increases of $900 or less per vehicle; and 3) The proposed effective dates for ABS installation for each vehicle type should permit adequate leadtime for implementation of heavy truck ABSs as standard equipment. Index Terms: Anti-Lock Brakes, Heavy Vehicles, Incremental Costs, Lead Time, Prices, Tractor Trailers, Weight Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Tag	Abstract
Sanderson96	Title: TRUCK IMPACTS ON TRAFFIC OPERATION AND GEOMETRIC DESIGN FOR TWO-LANE TWO-WAY ROADS Author(s): Sanderson, RW Language: English Conference Title: Truck Safety: Perceptions and Reality Sponsored by: Institute for Risk Research; Transportation Development Center, Ontario Ministry of Transportation Location: Toronto, Canada Date Held: 19950911-19950913 Publication Date: 00/00/1996 Pagination: pp 341-376 Report No: ISBN: 0969674775 Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Institute for Risk Research Waterloo University, Canada Canada Abstract: This paper discusses the findings of the study "the Effect of Vehicle Length on Traffic on Canadian Two-Lane, Two-Way Roads", (Good et al., 1991), carried out for the Transportation Association of Canada (TAC), along with other research completed since the time of the report, identifying the critical issues relating to truck dimensions and performance effects on traffic operation and geometric design. Although the Memorandum of Understanding signed by all Ministers of Transportation in 1991 establishes limits of weights, dimensions and performance for long trucks, current geometric design and traffic operation guidelines are primarily based on passenger cars from the 1940s and 1950s. Both Canadian Manuals need to be updated to reflect current vehicle dimensions and performance characteristics, including trucks, and cost-effective guidelines developed for when trucks should be used as design vehicles. Index Terms: Canada, Geometric Design, Manual (Book), Traffic Operations, Truck Design, Truck Effect On Highway Capacity Available from: Institute for Risk Research Publications, Waterloo University, Canada Waterloo Ontario N2L 3GI Canada

Tag	Abstract
Saricks85	Title: ARE STRINGENT EMISSION STANDARDS FOR HEAVY-DUTY TRUCKS WORTH THE COST? Author(s): Saricks, CL: Singh, MK Journal Title: Transportation Research Record Issue: 1033 Publication Date: 00/00/1985 Pagination: pp 71-78 Report No: ISBN: 4-X Features: TABS: 12 Tab. REFS: 26 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: A study sponsored at Argonne National Laboratory (ANL) by the U.S. Department of Energy's Office of Environmental Analysis investigated the costs, benefits, and cost-effectiveness of requiring heavy-duty trucks to meet gaseous and particulate emission standards suggested or proposed by the U.S. Environmental Protection Agency (EPA) in 1981. The EPA and engine and truck manufacturers disagree over the feasibility of achieving these standards and the expenditure required. Moreover, EPA apparently did not include explicit computation of fuel economy losses in its draft regulatory analyses. The resulting incremental costs, presumably passed on to truck buyers both at time of sale and during the vehicle's lifetime, could be considerable. The greatest variation in cost estimates is related to trap oxidizer technology for heavy-duty diesel particulate control. Although the ANL study arrived at a quantitative estimate of cost-effectiveness in $/ton of pollutant removed, the values are distributed over a wide range that reflects the continuing unresolved disagreements in control costs. The study also focused more specifically on the likely air quality benefits of the suggested standards in a case-study urban area with a history of nonattainment. While the proposed NOx standard would result in a 45 percent reduction in total NOx loading from the current standard, the corresponding reduction of short-term NOx exposure in prototypical urban corridors of high heavy-truck vehicle-miles traveled would not exceed 35 percent. The resulting health benefits are unknown. Index Terms: Air Pollution, Benefit Cost Analysis, Exhaust Emission, Fuel Consumption, Health, Heavy Vehicle, Nitrogen Oxide, Standards, Trade Offs, Urban Areas Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Sawhill60	Title: MOTOR TRANSPORT FUEL CONSUMPTION RATES AND TRAVEL TIME Author(s): Sawhill, RB Journal Title: Highway Research Board Bulletin Publication Date: 00/00/1960 Report No: Publisher/Corporate Author(s): Abstract: fuel consumption and travel time measurements are a prime consideration in the economical design of highways and contribute a substantial monetary value in benefit-cost analysis. Only limited up-to-date on-the-road data are available, not only for passenger cars but also mainly for various sizes of commercial vehicles. The purpose of this report is to record the procedure and findings of an extensive survey during the summer months of 1959 in which fuel consumption and travel time were measured on nearly every possible classification of truck and trailer combinations, as well as on urban and intercity buses. Both gasoline- and diesel-powered vehicles were tested under varying conditions of grade, surface speed, weight, stopping and slowing. One of the primary uses of the data will be to provide a comprehension of the differential fuel and travel time benefits associated with each classification of the heavier vehicles operating in greater numbers each year on the highways. Combining the results of this study with a similar investigation of single-unit trucks and passenger cars will complete the range of vehicle types. The data presented in the report should be highly beneficial to the economical planning and design of highways as well as to assignment of cost responsibility. Comparisons and analyses are possible for fuel and time savings by improvement of roadway surfacing, removal or reduction of stops, elimination of congestion and slowdowns, reduction of grade, shortening of grades, or control of operating speed. Preliminary analysis of the pretesting data obtained on each vehicle and correlated with the actual data recorded during the road testing indicates a potential method of predicting the operating characteristics under any conditions. Verification of this method would eliminate the need for such a detailed study as this in the future, assuming no radical changes in the means of motor transportation. /author/ Index Terms: Automobile, Benefit Cost Analysis, Buses (Vehicles), Diesel Engine, Fuel Consumption, Gasoline Engines, Highway Planning, Highway Programming, Traffic Congestion, Trailer, Travel Time, Trucks Available from:

Tag	Abstract
Schneider94	Title: SAFE AND EFFICIENT MOTOR CARRIER OPERATIONS, KEYNOTE ADDRESS Author(s): Schneider, DJ Language: English Journal Title: CONFERENCE PROCEEDINGS 3 Conference Title: International Symposium on Motor Carrier Transportation Sponsored by: Transportation Research Board; American Automobile Manufacturers Association; Federal Highway Administration; and National Highway Traffic Safety Administration. Location: Williamsburg, Virginia Date Held: 19930531-19930604 Publication Date: 00/00/1994 Pagination: pp 109-110 Report No: ISBN: 0309055172 Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: In this keynote address on safe and efficient motor carrier operations, it is pointed out that over the past 10 years, business has driven inventory out in order to get an adequate return on investment, and as inventories fall, a higher level of service is demanded from carriers. Logistics costs have decreased while vehicle size has increased, both factors contributing to the overall increased productivity of motor carriers. Several points flow from the economic realities of companies lowering their inventories and demanding higher performance from carriers. These are: safety and efficiency are not in conflict; technology has improved both efficiency and safety; regulation can be detrimental to safe operations; truck and rail technologies are unique and the marketplace will demand the appropriate mode for the appropriate load; longer combination vehicles are safe and efficient technologies when managed properly; truck weight increased by more axles improves safety and efficiency; harmonization of size and weight in North America improves efficiency and safety; and the marketplace is the best source for direction on safety and efficiency. Index Terms: Efficiency, Level Of Service, Longer Combination Vehicles, Motor Carriers, Operations, Productivity, Safety, Size And Weight Laws, Symposia, Truck Weights, Uniformity Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Sebaaly94	Title: PAVEMENT STRAINS INDUCED BY SPENT-FUEL TRANSPORTATION TRUCKS Author(s): Sebaaly, PE: Siddharthan, R: Zafir, Z Language: English Journal Title: Transportation Research Record Issue: 1448 Publication Date: 00/00/1994 Pagination: pp 8-15 Report No: ISBN: 0309060575 Features: FIGS: 12 Fig. TABS: 1 Tab. REFS: 22 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Four types of vehicles are being considered for the transportation of spent-fuel casks to the high-level nuclear waste repository that is to be located in Yucca Mountain, Nevada. The use of a finite-layer moving-load model to compute the pavement strains is described. Pavement strains are required to compare the relative pavement damage caused by each of the spent-fuel trucks and to estimate the increased cost associated with the increase in maintenance and rehabilitation on pavements caused by the spent-fuel trucks. The strain response induced by the spent-fuel trucks for a site near Reno, Nevada, is reported. The asphalt concrete layer and the unbound materials are assumed viscoelastic and elastic, respectively. Pavement material properties were deduced from falling-weight deflectometer testing. The study reveals that the strain response is affected strongly by the axle configuration and by the speed of the vehicle. Increased vehicle speed reduces the pavement strains substantially; longitudinal strains in the asphalt concrete layer decrease by as much as 33% when the speed of the vehicle increases from 30 to 60 km/hr. A substantial compressive strain component is also present when tandem and tridem axle loading are considered. The difference in contribution to pavement distress between the two legal-weight trucks and between the two overweight trucks is minimal. Laboratory fatigue and cyclic triaxial tests are being evaluated to compare the effects of legal-weight and overweight axle loading. Index Terms: Asphalt Pavements, Axle Configuration, Fatigue Tests, Highway Transportation, Maintenance Costs, Nuclear Wastes, Overweight Loads, Pavement Distress, Spent Fuel Casks, Strains, Triaxial Tests, Truck Pavement Damage, Vehicle Speed Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Sintef93	Title: TRUCKING COST REDUCTIONS RESULTING FROM THE RELAXATION OF WEIGHT RESTRICTIONS IN NORWAY.. Author(s): Sintef Samferdselsteknik. Language: NOR Publication Date: 00/00/1993 Report No: Publisher/Corporate Author(s): Supplemental Information: 1 V. (VARIOUS PAGINGS): ILL.; INCLUDES BIBLIOGRAPHICAL REFERENCES (P. 71) VEGLABORATORIET. SELSKAPET FOR INDUSTRIELL OG TEKNISK FORSKNING VED NORGES TEKNISKE HGSKOLE. PUBLICATION, NO. 70 "NOVEMBER 1993." Index Terms: economic aspects, law and legislation, live loads., Norway, norway., Pavements, trucking, trucks Available from: Acknowledgement of Document Source: UC, BERKELEY, INSTITUTE FOR TRANSPORTATION STUDIES TOP PREV
Solomon00	Title: ECONOMICAL AXLE LOAD PART I. TRUCK OPERATING COSTS IN RELATION TO VEHICLE SIZE Author(s): Solomon, KT Publication Date: 00/00/0000 Pagination: 29 pp Report No: Features: FIGS: 9 Fig TABS: Tabs Publisher/Corporate Author(s): Australian Road Research Board Abstract: The truck operating costs of 9 companies are presented. The records cover 300 vehicles, with number of axles ranging from 2 to 5, and hauling pay loads of from 2 to 21 tons. /TRRL/ Index Terms: Axle, Loads, Operating Costs, Trucks Available from: Acknowledgement of Document Source: Transport & Road Research Lab /UK/

Tag	Abstract
Southgate91	Title: SENSITIVITY STUDY OF 1986 AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES. FINAL REPORT Author(s): Southgate, HF Language: English Publication Date: 11/00/1991 Pagination: 150p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 15 Ref. APPS: 5 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 HP&R KYHPR-88-125 TRIS20 Kentucky Transportation Cabinet State Office Building, Clinton and High Streets 40622 Kentucky University Kentucky Transportation Center, College of Engineering KY 40506 USA Abstract: A sensitivity study of 14 items added to the 1986 AASHTO Guide for Design of Pavement Structures indicated: (1) Variations in percent reliability were most influential on the design EAL for the same pavement structure while (2) variations in standard deviations had minimal effects. (3) Resilient moduli for base and subbase materials are very dependent upon stress state (or bulk stress). (4) A method was developed to quantify the effect of drainage capabilities for various soils and its effect upon reduction in structural coefficients for base and subbase materials. (5) Literature review revealed 13 relationships to define soil stiffness. The 1986 Guide has two equations for subgrade resilient modulus that yield results differing by factors of 2 to 10. Caution in their use cannot be over emphasized. (6) A method to account for environmental changes in subgrade materials is included in the 1986 Guide. (7) Temperature effects upon asphaltic concrete stiffness are not included. Sensitivity studies showed that temperature effects on pavement stiffness and variations in Structural Number far overshadow variations in subgrade stiffness. (8) The amount of material pumped from under rigid pavements appears to be a function of the number of axles passing over the spot rather than the number of groups of axles. (9) Kentucky and AASHTO load equivalencies were compared for the same stream of truck traffic. Fatigue data from the AASHO Road Test were used to compare the Kentucky and AASHTO thickness designs for the same soil stiffness. (10) The inclusion of mechanistic principles in pavement design was evaluated and discussed. (11) A value of 3.1 is recommended for the load transfer coefficient, J, because trucks travel with their tires located at the pavement-shoulder joint. (12) Kentucky employs most of the recommended rehabilitation procedures, or has more sophisticated procedures for those not being used. In some cases, economics has ruled out one, or more, of these procedures. (13) Kentucky thickness design methods include low volume roads. (14) Life cycle costs and pavement management were not included in this study because they are subjects of individual studies currently in progress. Index Terms: AASHTO, Base Courses, Coefficients, Comparisons, Drainage, Environmental Effects, Equations, Guide (Recommendation), Kentucky, Literature Surveys, Load Transfer, Mechanistic Design, Modulus Of Resilience, Pavement Design, Rehabilitation, Reliability, Soil Stiffness, Standard Deviation, Stiffness, Subbase, Subgrades, Temperature Effects, Thickness Design, Truck Pavement Damage, Variations Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Special76	Title: A SPECIAL REPORT ON THE HIGHWAY WEIGHT LIMIT Publication Date: 11/00/1976 Pagination: 75p Report No: Features: FIGS: 11 Fig. TABS: Tabs. REFS: 32 Ref. Publisher/Corporate Author(s): Mississippi State Highway Commission P.O. Box 1850 MI 39205 USA Abstract: The intent of this report is to be fair to all parties concerned in developing recommendations for laws whose effects will permit the fullest economic development for Mississippi while simultaneously protecting the state's investment in highways and protecting the safety of the motoring public. The report will examine, in a logical progression: the positive effects of increasing the allowable truck weight including the state's overall economy and movement of goods; the negative effects of increasing the maximum allowable truck weight including pertinent factors of highway pavement and bridge design, stress and damage caused by increased loading, and the safety of the motoring public; an analysis of the positive and negative factors involved, a review of the state highway system, impacts of weight limits on the state highway system, and additional reconstruction and maintenance funds that will be required immediately if the proposed truck weight increase is enacted into law. Last but not least will be a chapter discussing the weight limit enforcement including the present enforcement laws and further enforcement recommendations. (Author) Index Terms: Economic Benefits, Economic Impact, Goods Movement, Highway Maintenance, Increase, Traffic Loads, Traffic Safety, Truck Effects (Bridges), Truck Highway Damage, Truck Load Limits, Truck Pavement Damage, Truck Weights Available from:

Tag	Abstract
Spreading94	Title: SPREADING OUT THE WEIGHT Language: English Journal Title: Heavy Duty Trucking Volume: 64 Issue: 9 Publication Date: 09/00/1994 Pagination: p 100 Report No: Features: FIGS: 4 Fig. PHOT: 2 Phot. Publisher/Corporate Author(s): Newport Publications Box W CA 93658 USA Abstract: As the federal influence on weight laws spreads, so does the use of lift axles. Lift axles are becoming more popular as a means of complying with Federal Formula B. Formula B is an algebraic equation that governs the amount of weight that can be put on each of a truck's axles and how far apart the axles must be to legally carry a given weight. This article explains why lift axles are controversial, describes various types of lift axles, reports on the actual capacity of these extra axles, and presents technical information on suspension and steering as well as distance between axles. Lift axles add cost, weight, and complexity to a truck; however, they spread the weight of truck loads and preserve the roads that are federally funded by taxpayers. Index Terms: Axle Design, Axle Load, Equations, Federal Laws, Formulas, Lift Axles, Pavement Life, Trucks, Weight Distribution, Weight Limits Available from: Newport Publications Box W Newport Beach CA 93658 USA

Tag	Abstract
Staley81	Title: FOREIGN TRUCK SIZE AND WEIGHT LIMITS. ISSUES IN TRUCK SIZES AND WEIGHT Author(s): Staley, RA Publication Date: 00/00/1981 Pagination: 31p Report No: Features: TABS: 7 Tab. Publisher/Corporate Author(s): American Trucking Associations Research, Statistical and Economics Division, 1616 P St, NW DC 20036 USA Abstract: A survey of single and tandem axle weights, gross weights and combination length limits worldwide reveals extremely wide variations among nations. When compared with current maximum United States limits, as embodied in Federal statutes and in the laws of most of the individual states, a majority of the rest of the world permits the operation of vehicles which are heavier--in both (single and tandem) axle and gross weight--and shorter than equipment used in this country. Other nations of the world apparently have a different concept of how they wish to apply their investment in highway facilities. Economic need, more than concern over possible highway wear, seems to be a controlling factor. While some may believe that vehicle size and weight limits in the United States are among the most liberal of all Nations, this paper reveals that such is not the case. In fact, there often appears to be little actual relationship between the level of national development, the highway systems in place and the size and weight limits permitted for trucks. The requirements of international container transport appear to have had a strong influence on gross vehicle weights in Europe. Container operations are of growing importance to the United States. Failure to provide for maximum gross weights in the 95, 000 to 115, 000 pound range, to accommodate fully loaded 20 and 40-foot standard containers rated at up to 67, 200 lbs. gross weights could seriously hamper American foreign trade in the future--as well as cause unnecessary domestic inefficiencies in container operations. It is somewhat ironic that, while the concept of intermodal containers originated in the United States, the present international maximum weight standards for containers are based on European highway weight limits. (Author) Index Terms: Economic Impact, Foreign Countries, Size And Weight Laws, United States Government, Variance Available from: American Trucking Associations 1616 P Street, NW Washington DC 20036 USA

Tag	Abstract
State79	Title: STATE LAWS AND REGULATIONS ON TRUCK SIZE AND WEIGHT Journal Title: NCHRP Report Issue: 198 Publication Date: 02/00/1979 Pagination: 116 p. Report No: Features: TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: This study describes the interstate trucking industry and the impacts on the industry resulting from non-uniformity among state laws and regulations governing truck sizes and weights. Based on numerous existing data sources including the Truck Weight Studies and the Census of Transportation, a commodity flow network was generated from which estimated changes in interstate truck mileage and equivalent axle loads were made for various options of new levels of truck size and weight uniformity. Operating cost nomographs for various truck types and pavement condition curves were developed for the analysis. /Author/ Index Terms: Commodity Flow, Interstate Commerce, Operating Costs, Regulation, Size, Size And Weight Laws, States, Truck Weights, Uniformity Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
State83	Title: STATE HIGHWAY USER TAXES: COMPARATIVE TAX STRUCTURES AND CURRENT TRENDS Journal Title: Transportation Research Record Issue: 900 Publication Date: 00/00/1983 Pagination: pp 47-57 Report No: Features: FIGS: 2 Fig. TABS: 9 Tab. REFS: 10 Ref. Publisher/Corporate Author(s): Abstract: An attempt is made to interrelate and analyze the important state highway user taxes within historical context. First are the registration fees for automobiles and light trucks. These are sometimes referred to as first-structure taxes. Second are the motor fuel, or second-structure, taxes. Third are the heavy-truck registration, weight, and mileage taxes, or third-structure taxes. Eighteen states increased and five states decreased their automobile registration fees in 1981. Some states have changed from flat fees to fees based on weight or horsepower to encourage the energy-saving potential of lighter vehicles. Five states base their fees on weight and age or value. This is one method of trading off the conficting values of energy conservation and not unduly penalizing low-income households that own older, heavier vehicles. A motor fuel tax is relatively inexpensive to administer and is most closely related to use, so the taxes to cover costs of providing highway service can be related to the benefits received. As a result, 26 states increased their motor fuel taxes in 1981. In order to keep up with inflation, eight states have completely converted their motor fuel tax from a cents-per-gallon to an ad valorem tax (percentage of price). Ten states have changed to a combined cents-per-gallon and ad valorem tax. User taxes for heavy trucks include graduated registration fees and weight, mileage, and gross-receipts taxes. Generally, states attempt to relate taxes to benefits obtained from highway service and the costs occasioned to the system and seek to minimize administrative costs of collecting the taxes. (Author) Available from:

Tag	**Abstract**
Statter84	Title: A CRITIQUE OF THE FEDERAL HIGHWAY COST ALLOCATION STUDY'S TRAFFIC ANALYSIS Author(s): Statter, BD Journal Title: Transportation Quarterly Volume: 38 Issue: 3 Publication Date: 07/00/1984 Pagination: pp 345-360 Report No: Features: FIGS: 4 Fig. TABS: 7 Tab. Publisher/Corporate Author(s): Eno Foundation for Transportation, Incorporated P.O. Box 55, Saugatuck Station CT 06880 USA Abstract: This article examines problems with the HCAS's traffic analysis; in particular the development of 1977 base vehicle counts and miles traveled for trucks, and the traffic forecasts to 1985. The methodology and assumptions used in the HCAS has serious flaws that overestimated the number of miles traveled for combination vehicles with weights greater than 75, 000 pounds and underestimated the 70-75, 000 and 50-70, 000 pound weight groups. Specifically, this article provides an analysis of how the 1977 base vehicle counts and mileage traveled were developed. It discusses reasons why HCAS vehicle miles and counts are not realistic and are biased against heavy trucks. Finally, it looks at the manner in which the inflated vehicle miles and counts compounded by DOT's new consumption methodology, based on misuse of the 1960 AASHO Road Test, substantially overstated cost responsibility of heavy trucks. Index Terms: Federal Highway Cost Allocation Study, Gross Vehicle Weight, Heavy Vehicle, Highway User Taxation, Traffic Analysis, Traffic Forecasting, Trucks, User Charges, Vehicle Miles Available from: Eno Foundation for Transportation, Incorporated P.O. Box 55, Saugatuck Station Westport CT 06880 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Stevens60	Title: LINE-HAUL TRUCKING COSTS IN RELATION TO VEHICLE GROSS WEIGHTS Author(s): Stevens, H Journal Title: Highway Research Board Bulletin Publication Date: 00/00/1960 Report No: Publisher/Corporate Author(s): Abstract: a representative schedule is presented of vehicular operating costs. The differences between which are caused only by changes in vehiclular gross weight, and/or changes in types of trailer combinations. Such representative vehicular cost data later can be related to representative costs for highway facilities with different load-carrying capabilities. The report describes how the different cost factors were adjusted for differences in prices paid for fuel, wages, fringe benefits, depreciation and interest charges, and new vehicles. The data are presented in an extensive series of charts showing the variations in vehicle-mile costs by loaded gross weight for all the 23, 384 trailer combinations, all the gasoline engine powered trailer combinations and all the diesel powered combinations using either gasoline or diesel engines. Other charts and tables show how unit costs are affected by body type, type of terrain, average daily travel mileage, average load speed, and other operating variables. Index Terms: Diesel Trucks, Gasoline Engines, Graphical Analysis, Gross Vehicle Weight, Highway Costs, Mileage, Operating Costs, Trailer, Truck Transportation Economics, Trucks, Vehicle Miles, Weights Available from:

Tag	**Abstract**
Stevens66	Title: LINE-HAUL TRUCKING COSTS UPGRADED, 1964 Author(s): Stevens, H Journal Title: Highway Research Record, Hwy Res Board Publication Date: 00/00/1966 Report No: Publisher/Corporate Author(s): Abstract: The line-haul trucking costs in relation to vehicle gross weights, reported in highway research board bulletin 301, were developed from 1955 and 1956 cost data obtained by interviews with line-haul highway freight carriers. In the present paper, these costs are upgraded to 1964 by three types of indexes, the methods of developing this information are described, and the resulting upgraded unit mileage cost data are given in a series of charts. /author/ Index Terms: Costs, Data, Freight Transportation, Gross Vehicle Weight, Interviews, Mileage, Motor Carriers, Truck Transportation Economics, Trucks, Upgrading Available from:

Tag	**Abstract**
Structure71	Title: STRUCTURE AND ECONOMICS OF INTRAURBAN GOODS MOVEMENT Journal Title: Highway Research Board Special Reports Publication Date: 00/00/1971 Report No: Publisher/Corporate Author(s): Abstract: The tri-state transportation commission has made an analysis of 1961--63 goods movement within the new york city tri-state region to characterize and quantify goods movement by truck, rail, barge, and oil pipelines. Data sources and limitations are discussed. The fundamental breakdown was into consumer-oriented and business-oriented commodities. In the gross, trucks were found to account for 73% of all tons handled internally in the region and for 97% of the cost; waterborne freight made up 25% of the tonnage but only 2% of local distribution costs. The total tonnage and cost data for trucks are presented in two tables by industry and commodity type; a third table shows the cost per ton of goods by commodity and industry. The major truck trip patterns studied in the survey were large single-shipment loads, single origin with multiple destination (the most common pattern by far), multiple origin with single destination (e.g., Garbage trucks), and simultaneous pickup and delivery (e.g., Beverage trucks). Analysis of system efficiency showed that the distribution and redistribution patterns are becoming more efficient except with respect to local truck freight, i.e., The most expensive segment of the modes studied. Two tables are presented that break down the inbound and outbound truck traffic of the region. An exemplary statistic is that 4200 trucks are required to handle daily internal traffic against 28 trucks for over-the-road operations; the average internal consignment weights 160 lb., That over-the-road, 12, 400 lb. An attempt is made to describe in a gross way the process of filtering from within and outside the region; as expected, the process is irrational and inefficient. It is noted in conclusion that a tunnel or subway employed to link 10% of the trading points would link only 1% of the interchanges, leaving trucks to handle the difference. Unless this disparity can be resolved, the present patter of worsening intraregional truck distribution will continue. Available from:

Tag	Abstract
Taylor81	Title: REVIEW AND EVALUATION OF AUTOMOTIVE FUEL CONSERVATION TECHNOLOGIES. VOLUME 1 SUMMARY Author(s): Taylor, T, Jr Publication Date: 12/00/1981 Pagination: v.p. Period Covered: 790300-8109 Report No: Features: FIGS: Figs. TABS: Tabs. APPS: Apps. Publisher/Corporate Author(s): Corporate-Tech Planning, Incorporated 275 Wyman Street MA 02154 USA National Highway Traffic Safety Administration 400 7th Street, SW DC 20590 Abstract: A series of research tasks were instituted to assess the impact of automotive technologies and the manufacturer's overall product plans on existing and future fuel economy requirements. Supported by NHTSA's Technology Assessment Division, this program provided analytical capabilities in the areas of automotive technology, manufacturing costs, and industry assessments. Specific subject areas of investigation include: potential fuel economy improvements from variable valve timing of internal combustion engines; effects of tire under inflation on fuel economy; reductions in engine friction; automotive applications of metal/plastic laminates as a substitute material; cost, weight and material analyses of a Ford F-150 light truck; design, cost and weight analyses of truck-trailer rear underride guards; the impact of FMVSS (seat belts) comfort and convenience on vehicle manufacturing; design modifications and manufacturing costs of child seat tether anchorages; and identification of auto manufacturer's technical progress in weight reduction through material substitution and component redesign. Volume I summarizes the results of the individual research efforts, the methodologies employed, and impact on automotive fuel economy requirements. The Appendices of Volumes I and II contain reports on those subject areas not previously submitted under NTIS. These subjects are: effects of automobile tire pressure changes on fuel economy; weight reduction through material substitution and component redesign; and an alternate design for truck rear underride guard protection. Index Terms: Automobile, Automobile Engines, Child Restraints, Costs, Fuel, Light Trucks, Manufacturing, Material, Safety Belt, Technology Assessment, Tire Inflation, Underride Guards, Vehicle Design Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Taylor81a	Title: REVIEW AND EVALUATION OF AUTOMOTIVE FUEL CONSERVATION TECHNOLOGIES. VOLUME II APPENDIX C Author(s): Taylor, T, Jr Publication Date: 12/00/1981 Pagination: v.p. Period Covered: 790300-8109 Report No: Features: FIGS: Figs. TABS: Tabs. APPS: Apps. Publisher/Corporate Author(s): Corporate-Tech Planning, Incorporated 275 Wyman Street MA 02154 USA National Highway Traffic Safety Administration 400 7th Street, SW DC 20590 Abstract: A series of research tasks were instituted to assess the impact of automotive technologies and the manufacturer's overall product plans on existing and future fuel economy requirements. Supported by NHTSA's Technology Assessment Division, this program provided analytical capabilities in the areas of automotive technology, manufacturing costs, and industry assessments. Specific subject areas of investigation include: potential fuel economy improvements from variable valve timing of internal combustion engines; effects of tire under inflation on fuel economy; reductions in engine friction; automotive applications of metal/plastic laminates as a substitute material; cost, weight and material analyses of a Ford F-150 light truck; design, cost and weight analyses of truck-trailer rear underride guards; the impact of FMVSS (seat belts) comfort and convenience on vehicle manufacturing; design modifications and manufacturing costs of child seat tether anchorages; and identification of auto manufacturer's technical progress in weight reduction through material substitution and component redesign. Volume I summarizes the results of the individual research efforts, the methodologies employed, and impact on automotive fuel economy requirements. The Appendices of Volumes I and II contain reports on those subject areas not previously submitted under NTIS. These subjects are: effects of automobile tire pressure changes on fuel economy; weight reduction through material substitution and component redesign; and an alternate design for truck rear underride guard protection. Index Terms: Automobile, Automobile Engines, Child Restraints, Costs, Fuel Consumption, Light Trucks, Manufacturing, Material, Safety Belt, Technology Assessment, Tire Inflation, Underride Guards, Vehicle Design Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Thacker73	Title: ESTIMATION OF 18-KIP EQUIVALENT ON PRIMARY AND INTERSTATE ROAD SYSTEMS IN VIRGINIA Author(s): Thacker, DE: Vaswani, NK Journal Title: Highway Research Record, Hwy Res Board Issue: 466 Publication Date: 00/00/1973 Pagination: pp 82-95 Report No: Features: FIGS: 9 Fig TABS: 1 Tab REFS: 5 Ref Publisher/Corporate Author(s): Abstract: For flexible pavement design purposes, the virginia department of highways uses the aasho method of determining the 18-kip equivalent singleaxle load, . The evaluation of the eal-18 is based on on-location truck axle weight studies . These studies are expensive and time-consuming and hence are not used for pavement reevaluation and rehabilitation. For this reason, a method by which the eal-18 could be economically and quickly estimated from the routinely available records seemed desirable. These records are the yearly traffic count on each section of the primary, interstate, and arterial systems and the yearly record of the weights of vehicles using these systems. In this investigation, several methods were tried to determine the best one for estimating the eal-18 from routine available records. A method involving three equations was considered the best for the following reasons: it provides a very good correlation with the aasho method, data for estimating the eal-18 are readily available from the yearly reports published by the virginia department of highways (and those of most other states), and the method accounts for the weight and count of two-axle, six-tire single units, three-axle single units, and tandem trailer trucks separately, thus providing greater accuracy in the evaluation. It is shown that, even if the estimated eal-18 deviates greatly from the aasho value, the effect on the ultimate pavement design is very little. The approach could be used to develop traffic projections in cases where load meter studies are not feasible, for example, on roads with heavy traffic where vehicles can be counted but not weighed. Index Terms: Aasho Road Test, Axle Load, Equation, Flexible Pavement Design, Pavement Evaluation, Traffic Counting, Vehicle, Weight Available from:

Tag	Abstract
Trends83	Title: TRENDS IN HEAVY-TRUCK ENERGY USE AND EFFICIENCY Publication Date: 10/00/1983 Pagination: 73p Report No: Publisher/Corporate Author(s): Abstract: An analysis of recent historical and projected future trends in heavy-truck (over 26, 000 lbs Gross Vehicle Weight (GVW) fuel economy and fuel consumption is presented. In-depth consideration is given to the various technological improvements which account for ongoing fuel-economy improvements in the heavy-truck fleet. Literature estimates are used to arrive at fuel-economy-improvement figures for the various technologies. Market penetrations are projected using a technological forecasting model based on the Weibull distribution. Fuel-economy improvements possible with the application of new advanced technologies are contrasted to those possible with currently available technologies only. It is estimated that these advanced technologies could account for a 20% savings, or 4.1 billion gallons of fuel per year by the year 2000. It is suggested that long-term technologies could double this savings to 8 billion or more gallons per year. (ERA citation 08: 055908) Available from:

Tag	Abstract
Truck74	Title: TRUCK SPEED LIMITS: CRISIS FOR AMERICA Journal Title: Fleet Owner Volume: 69 Issue: 1 Publication Date: 01/00/1974 Pagination: pp 53-84 Report No: Features: PHOT: Phots Publisher/Corporate Author(s): Abstract: this comprehensive report covers vital aspects of federal high speed regulations for trucking. It includes technical and operational analysis as well as a discussion of the immediate and long-range outlook for trucking's fuel problems. The question of equal speed limits for trucks and passenger cars, is considered. The plea is made for trucks to move at speeds higher than 50 mph when road conditions permit. The estimate that 50 mph limit on line-haul diesel powered trucks would save 5 percent of highway used diesel fuel, is questioned. Speed limits operative at specific times of the day are proposed. The consequences of low-speed trucking are reviewed and details are given of mechanical and equipment approaches. It is concluded from computer studies that most trucks, including those built after the 60s can save approximately 15 percent on fuel at 55 mph. Fuel economies resulting from cutting speeds from 70 to 50-55 are not much affected by heavier loads. Tests were conducted with a typical international line haul tractor. Transmission specifications are discussed. A final alternative to meeting a reduced speed limit with a vehicle geared for high cruising speeds is a change in the rear axle gears. This, however, can be costly and such gears are in short supply. The best means of achieving significant saving in the use of highway fuel is in increasing the allowable sizes and weights of trucks and combinations. Action in this area by the several states may lead to permanent legislation. The special case of turnpike doubles is discussed, and the question of more equipment and drivers, and changes in schedules are considered. The elimination of deadhead miles and indirect routes are seen as two key areas of economies. The effects of speed reductions and the fuel crisis on trucking service are outlined, and the role of piggyback as an alternative mode of transportation is reviewed. Index Terms: Axle, Diesel Trucks, Economic Considerations, Equipment, Line Haul Transport, Mechanics, Operation, Piggyback, Speed Limit, Toll Road, Transmission, Truck Drivers, Truck Laws & Regulations, Truck Load Limits, Truck Transportation Economics, Trucks Available from:

Tag	Abstract
Truck80	Title: TRUCK SIZE AND WEIGHT ISSUES Journal Title: Engineering Bulletin of Purdue University Publication Date: 00/00/1980 Pagination: pp 91-109 Report No: Features: FIGS: 11 Fig. TABS: 6 Tab. REFS: 12 Ref. Publisher/Corporate Author(s): Abstract: This paper emphasizes the information obtained from the 1977 truck weight study concerning overweight trucks presently traveling on Indiana highways, specifically the 3-S2 and 3-S3 trucks, and presents the results of a study conducted at Purdue concerning the effect of increasing truck weights limits from 73, 280 to 80, 000 lbs. gross on pavement maintenance costs. Based on this study, the following conclusions can be made: (1) It is very difficult for the state of Indiana to enforce the weight limits adopted from the Federal Aid Highway Act of 1956 since three out of the four states that surround Indiana have adopted those weight limits established by the Federal Aid Highway Act of 1974; in addition, one state is protected under the "grandfather clause" which permits loads in excess of those specified by the Act; (2) Overweight trucks cause an increase in highway deterioration (decrease in the life of the pavement) as well as an increase in routine maintenance costs; and (3) Increase in truck weight limits from 73, 280 lbs. to 80, 000 lbs. gross will cause an increase in maintenance costs for the total state mileage between 10.43 and 12.15 million dollars annually in 1978 dollars. This increase depends largely on the effect of the present energy shortage mainly of petroleum which greatly influences the cost of asphalt concrete. Available from:

Tag	Abstract
Truck80a	Title: TRUCK DESIGN -- A LOOK TO THE FUTURE Journal Title: Automotive Engineering Volume: 88 Issue: 11 Publication Date: 11/00/1980 Pagination: pp 39-46 Report No: Publisher/Corporate Author(s): Abstract: To predict vehicle designs and configurations of the future, it is necessary to look at the driving forces and constraints which surround the truck industry, and where the emphasis for change will come from. The first will continue to be a reduction in operating cost, i.e. fuel, tires and maintenance. Second is configuration, i.e., maximizing vehicle size and weight or other commodity considerations. Third is driver comfort and safety. Engineers tend to look at things from a technical aspect first when, in fact, economic factors are the motivators for technical achievements and innovation. Available from: Acknowledgement of Document Source: Engineering Index

Tag	Abstract
Truck82a	Title: TRUCK REGULATION AND ENFORCEMENT IN CONNECTICUT: A PROGRAM REVIEW Publication Date: 06/00/1982 Pagination: 133p Report No: Features: FIGS: Figs. TABS: Tabs. APPS: Apps. Publisher/Corporate Author(s): Connecticut General Assembly Legislative Office Bldg, 18 Trinity Street CT 06115 USA Abstract: In March 1981, at the request of the Senate cochairman of the Connecticut legislature's Transportation Committee, the Legislative Program Review and Investigations Committee (LPR&IC) voted to review the administration and enforcement of the state's major non-economic regulatory programs affecting trucks and their use of Connecticut highways. The number of agencies involved in truck regulation, the wide variety of regulatory activites and the complexity of issues encompassed by each truck-related program forced LPR&IC to concentrate on two main areas--ways to better coordinate the many agencies and programs, and ways to improve the enforcement of all truck-related laws. The findings and recommendations contained in this report address issues that the committee felt were critical to more efficient and effective administration and enforcement of state weight and size restrictions, vehicle registration requirements and truck-related highway use taxes and fees. Overall, the LPR&IC found that better coordination among the state agencies administering truck-related programs was vitally needed to ease the burden that multiple and diverse requirements and agencies place on trucking operations. Furthermore, the committee study revealed that agency cross-referral mechanisms and internal procedures for follow-up on detected truck violations were inadequate. Committee members proposed a number of methods for improving administrative procedures and strengthening coordination among the five agencies responsible for operating and enforcing major truck regulatory programs. The effectiveness of the state's truck weight enforcement program was found to be seriously impeded by staff shortages and equipment problems. Increases in truck squad personnel levels and funding for additional weighing facilities were recommended by the LPR&IC. The committee also found that technical and substantive changes in the state's complex weight law were required to facilitate enforcement efforts and to improve the courts' ability to adjudicate truck weight cases. (Author) Index Terms: Coordination, Enforcement, Registration, Reviews, Size And Weight Laws, State Government, Truck Laws & Regulations, User Charges Available from:

Tag	Abstract
Truck83	Title: TRUCK WEIGHT SHIFTING METHODOLOGY FOR PREDICTING HIGHWAY LOADS Publication Date: 04/00/1983 Pagination: 208p Report No: Features: FIGS: 34 Fig. TABS: 24 Tab. REFS: 17 Ref. APPS: 8 App. Publisher/Corporate Author(s): Abstract: In recent years, maximum legal truck size and weight limits have become major issues in the United States. The assessment of impacts due to changes in maximum limits is an ongoing dynamic problem faced by many highway departments and State legislatures. It has been difficult to predict future truck weight distribution patterns as affected by an alternative legislation governing truck weight. Consequently, it has become implausible to try to forecast precisely the benefits and costs associated with changes in weight limits. In the past, various methodologies for projecting truck weight distribution patterns have been developed. Each methodology makes some contributions to the assessment of changes in truck weight patterns. However, the precision of projection and the application of each methodology can yet be improved. In June 1977, the Texas SDHPT contracted the Center for Transportation Research to conduct a study into the truck size and weight issue. As a part of the truck study, a shifting methodology has been developed for the projection of future truck weight distribution patterns. This methodology can be applied either manually or by using a series of computer programs. It can be used to predict both gross vehicle weight and axle weight distributions. In this report, a brief review of available methodologies and a detailed discussion of the new methodology are presented. Illustrative application of predicting gross vehicle weight and axle weight distributions as a result of changes in weight limits are presented in the text. Comparison of prediction results generated by all the available shifting methodologies is also included. Available from: Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Truck83a	Title: TRUCK WEIGHT STUDY SAMPLING PLAN IN WISCONSIN Journal Title: Transportation Research Record Issue: 920 Publication Date: 00/00/1983 Pagination: pp 12-18 Report No: Features: FIGS: 1 Fig. TABS: 5 Tab. REFS: 10 Ref. Publisher/Corporate Author(s): Abstract: The procedures used by the Wisconsin Department of Transportation for determining the number and locations of sampling stations for its truck weight study are described. The purpose of the program is to collect representative trucking characteristic data for use in pavement design, highway cost allocation, motor carrier enforcement, and other planning and research activities. Previous weight studies have produced data of limited value due to inadequate road type and geographic coverage. In addition, stations are selected without statistical guidelines for sampling. The use of new weighting-in-motion technologies and the emphasis on the collection of basic weight data permit a more random selection of weigh stations and a more comprehensive sample of truck traffic. The sampling plan developed relies heavily on user needs and statistical criteria to help ensure a valid and meaningful sample. By using data from the 1980-1981 highway performance monitoring system Wisconsin truck weight case study, the number of required stations is calculated on the basis of the average variability of truck weights in the state. These stations are distributed across recommended road types in proportion to the size of the total population (truck vehicle miles of travel) on each road type. Stations by road type are assigned to counties by using a weighted random numbers procedure. Criteria are presented for selecting corridors and sites where stations should be established. This type of sampling approach can generate more representative and comprehensive data that better describe the truck population. (Author) Available from:

Tag	Abstract
Truck83b	Title: TRUCK SIZE AND WEIGHT ENFORCEMENT: A CASE STUDY Journal Title: Transportation Research Record Issue: 920 Publication Date: 00/00/1983 Pagination: pp 26-33 Report No: Features: FIGS: 3 Fig. TABS: 3 Tab. REFS: 7 Ref. Publisher/Corporate Author(s): Abstract: In this paper the current state regulations affecting motor vehicle sizes and weights, the agencies involved directly or indirectly in the enforcement of these regulations, the characteristics of oversize and overweight vehicle movements within the state (both legal and illegal), and the cost of these vehicle movements to the state are discussed. The characterization of oversize and overweight movements in Texas is emphasized. To study the economic effects to the state, a 100 percent compliance case was set up to compare with the actual case. The case study of Texas showed that, although the current oversize and overweight movements may save the trucking industry up to $1.4 billion over the next 20 years at current conditions, these movements are estimated to cost the state an additional $261 million over the same 20-year period. Similarly, enforcement of the state laws is estimated to result in only $84 million if the current fine and permit fee structure is maintained. It was recommended that the current fine and fee structure be revised to discourage violation. (Author) Available from:

Tag	Abstract
Truck83b	Title: TRUCK SIZE AND WEIGHT ENFORCEMENT: A CASE STUDY Journal Title: Transportation Research Record Issue: 920 Publication Date: 00/00/1983 Pagination: pp 26-33 Report No: Features: FIGS: 3 Fig. TABS: 3 Tab. REFS: 7 Ref. Publisher/Corporate Author(s): Abstract: In this paper the current state regulations affecting motor vehicle sizes and weights, the agencies involved directly or indirectly in the enforcement of these regulations, the characteristics of oversize and overweight vehicle movements within the state (both legal and illegal), and the cost of these vehicle movements to the state are discussed. The characterization of oversize and overweight movements in Texas is emphasized. To study the economic effects to the state, a 100 percent compliance case was set up to compare with the actual case. The case study of Texas showed that, although the current oversize and overweight movements may save the trucking industry up to $1.4 billion over the next 20 years at current conditions, these movements are estimated to cost the state an additional $261 million over the same 20-year period. Similarly, enforcement of the state laws is estimated to result in only $84 million if the current fine and permit fee structure is maintained. It was recommended that the current fine and fee structure be revised to discourage violation. (Author) Available from:

Tag	Abstract
Truck86	Title: TRUCK WEIGHT ENFORCEMENT ON A WIM Journal Title: Civil Engineering Volume: 56 Issue: 11 Publication Date: 11/00/1986 Pagination: pp 60-63 Report No: Features: FIGS: Figs. Publisher/Corporate Author(s): Abstract: The article shows how heavy trucks cause much or most of the premature damage to pavements. It is believed that the solution is to improve truck weight enforcement, build stronger pavements in some places, and make sure trucks pay their fair share of highway costs. The truck weigh-in-motion (WIM) systems are described, and Georgia's experience in this field is noted. Maryland DOT is using the improved truck weight data from its WIM installations to modify its pavement designs. Five classes of WIM systems or sensors are described. The cost of the WIM systems are discussed, and the need is noted for developing a consensus as to WIM quality and performance. Available from:

Tag	Abstract
Truck88	Title: TRUCK SAFETY REPORT Journal Title: Transpo 88 Volume: 11 Issue: 4 Publication Date: 00/00/1988 Pagination: pp 19-21 Report No: Publisher/Corporate Author(s): Abstract: The results are presented and discussed of a recent 2-phase Saskatchewan study. In the study, provincial records of accidents were combined with estimates of distance travelled to develop accident rates. It showed that large trucks have a safety record about as good as other vehicles on the road. The study, however, did not deal with the disparity in size and weight between heavy trucks and cars. The study found that the new C-train may not be as safe as was hoped. The study also examined the cause of accidents. It was found that only 35% of truck accidents could be related to the type of configuration. This study was the first in Canada to make estimates on the basis of over-the-road data of the safety performance of truck-semitrailer combinations, A-trains, B-trains, and C-trains. Criticism is expressed against research that has influenced recent policy changes in Canada. It is noted that future research should be aimed at driver training which is the most cost-effective and productive target for truck safety. Available from:

Tag	Abstract
Truck90	Title: TRUCK WEIGHT LIMITS: ISSUES AND OPTIONS Journal Title: Transportation Research Board Special Report Issue: 225 Publication Date: 00/00/1990 Pagination: 319p Report No: ISBN: 0-309-04955-5 Features: FIGS: Figs. TABS: Tabs. PHOT: Phots. REFS: Refs. APPS: 7 App. Publisher/Corporate Author(s): Abstract: To help assess proposals for further changes in federal truck weight limits, Congress requested this study through Section 158 of the Surface Transportation and Uniform Relocation Assistance Act of 1987. To conduct the study, the National Research Council convened a special Transportation Research Board committee with experts in pavements, bridges, highway safety, freight transportation economics, motor vehicle design, highway administration, motor carrier operations, and enforcement of motor vehicle regulations. The study focused on four issues identified in the study request that involve potential changes to federal weight limits for Interstate highways: (1) Elimination of existing grandfather provisions; (2) Alternative methods for determining gross vehicle weight and axle loadings; (3) Adequacy of the current federal bridge formula; and (4) Treatment of specialized hauling vehicles--garbage trucks, dump trucks, and other trucks with short wheel bases that have difficulty complying with the current federal bridge formula. For each of these issues, the study committee estimated the nationwide effects of changes in federal limits proposed by the trucking industry, highway agencies, and other groups. Projections of heavy-truck miles by type of truck, region of the country, highway functional class, and operating weight were developed for a base case and alternative truck weight regulatory scenarios. These projections were then used to estimate impacts on truck costs, pavements, bridges, and safety. Available from:

Tag	**Abstract**
Truck95a	Title: TRUCK SIZE AND WEIGHT MODELING WORKSHOP. U.S. DEPARTMENT OF TRANSPORTATION COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY REPORT NO. 3, ACTIVITY II: TASK C REFINE FREIGHT DIVERSION MODELS FOR ALL MODES Language: English Publication Date: 09/00/1995 Pagination: 24p Report No: Publisher/Corporate Author(s): Battelle Company 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: The Federal Highway Administration (FHWA) sponsored an informal workshop on February 10, 1995, as part of a comprehensive truck size and weight (TS&W) study. The objectives of the workshop were to discuss past work in modeling issues and identify new tools for TS&W analysis. Several experts gave presentations of their models and prior TS&W work which demonstrated different analytical approaches to the TS&W issue. Following the presentations, there was group discussion of future research needs to support TS&W analysis. Overall, there was wide agreement among the workshop that there is not one tool or combination of tools that is capable of modeling the complexity of all the possible TS&W options that may be considered. One major weakness that applied to all tools discussed was the lack of accurate data bases for model inputs and case studies. A final overall observation from the workshop was that FHWA should consider case studies of industry practices. Studies presented include the Freight Network Policy Model, cost diversion effects, a survey of freight shippers, and a statistically disaggregate model called the Truck-Rail/Rail-Truck (Rail-Truck) Diversion Model. Index Terms: Case Studies, Costs, Databases, Freight Transportation, Mathematical Models, Size, Trucks, Weight, Workshops Candidate Terms: Freight Diversion Models, Shippers Available from:

Tag	Abstract
Truck99	Title: TRUCK SAFETY: EFFECTIVENESS OF MOTOR CARRIERS OFFICE HAMPERED BY DATA PROBLEMS AND SLOW PROGRESS ON IMPLEMENTING SAFETY INITIATIVES. TESTIMONY Language: English Publication Date: 03/17/1999 Pagination: 11p Report No: Features: FIGS: 3 Fig. TABS: 1 Tab. Publisher/Corporate Author(s): General Accounting Office 441 G Street, NW DC 20548 USA Abstract: This is the statement of Phyllis F. Scheinberg, Associate Director, Transportation Issues, Resources, Community, and Economic Development Division, General Accounting Office, before the Subcommittee on Ground Transportation, Committee on Transportation and Infrastructure, House of Representatives, on the safety of large commercial trucks on our nation's highways. The testimony presents preliminary information based on ongoing work to assess the effectiveness of the Federal Highway Administration's Office of Motor Carrier and Highway Safety (OMCHS) in improving the safety of large trucks [those trucks with a gross vehicle weight of 10, 000 lb (4536 kg) or more]. Specifically discussed are (1) recent increases in the number of crashes involving large trucks, (2) OMCHS' need to better understand the factors that contribute to such crashes, and (3) OMCHS' need for better data and quicker action on implementing improvements to truck safety in order to be more effective. Index Terms: Accident Causes, Heavy Duty Trucks, Implementation, Improvements, Testimony, Truck Accidents, Trucking Safety Candidate Terms: Contributing Factors, Data Needs P Terms: Office Of Motor Carrier And Highway Safety, Fhwa Available from: General Accounting Office P.O. Box 6015 Gaithersburg MD 20877 USA

Tag	Abstract
Trucks90	Title: TRUCKS WEIGHTS AS A FUNCTION OF REGULATORY LIMITS Journal Title: Canadian Journal of Civil Engineering Volume: 17 Issue: 1 Publication Date: 02/00/1990 Pagination: pp 45-54 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): Abstract: Models are developed for the gross vehicle weight and axle weight distributions of laden trucks as a function of governing weight limits. The models are based on truck weight surveys conducted in Manitoba between 1972 and 1986, a period of changing weight limits. They are developed for 2-axle truck, 3-axle trucks, 5-axle (3-S2) tractor-semitrailers, 7-axle (3-S2-2) A-trains, and 7-axle (3-S2-S2) B trains. The models can provide important input to the analysis of pavement loadings (and costs), given particular weight limits or changes in weight limits. They can also provide useful input estimates of the relative benefits of alternative weight limit regimes. Available from:

Tag	Abstract
Twin83	Title: TWIN CITIES METROPOLITAN AREA HEAVY TRUCK STUDY Journal Title: Transportation Research Record Issue: 920 Publication Date: 00/00/1983 Pagination: pp 39-45 Report No: Features: TABS: 7 Tab. REFS: 1 Ref. Publisher/Corporate Author(s): Abstract: Due to the growing significance of goods movement by heavy trucks in recent years, the Minnesota Twin Cities metropolitan area heavy truck study was conducted to update the Minnesota Department of Transportation data on heavy trucks. These data are needed for pavement design, heavy truck routing, and policy formulation. Similar data were obtained from a 1970 travel behavior inventory (TBI). The 1970 study surveyed 2 percent of all truck trips, but less than 1 percent of the trips were by heavy trucks. The results were of limited use in forecasting because of the small sample. This resulted in a poor distribution of trips when the sample was expanded. From the outset, the current study was constrained due to limited funding. Although the budget was enough for a survey of heavy commercial truck movements, innovative methods were needed to obtain data on the movement of heavy tax-exempt trucks and grain trucks. These data were produced through a combination of limited surveying and simulation. In addition to financial problems, two other constraints had to be overcome: (a) Minnesota's vehicle registration of tax-exempt trucks does not list vehicle weight; therefore, it was necessary to inventory heavy trucks; and (b) because of financial, personnel, and administrative problems, there was no external cordon-line survey conducted in conjunction with the heavy truck study; therefore, the data needed on external and through trips had to be developed by other means; i.e., they were simulated by applying growth factors to the 1970 data and then using 1980 truck counts at the external cordon lines as control totals. A comparison of the results of this study with the 1970 TBI reveals a substantial increase in external and through trips by heavy trucks and a substantial decrease in internal trips. The decrease in internal trips is probably due to the depressed economy, whereas the increase in external and through trips can be attributed to 1, 560 miles of railroad track abandoned in Minnesota between 1971 and 1981. Final results of the study reveal that in 1981 there were 116, 800 heavy truck trips per day in the metropolitan area, and in the year 2000 there are expected to be 265, 300 trips/day. (Author) Available from:

Tag	Abstract
Uncrowding75	Title: UNCROWDING CROWDED STREET Journal Title: Chicago Public Works Volume: 5 Issue: 3 Publication Date: 00/00/1975 Pagination: pp 10-13 Report No: Features: FIGS: Figs. Publisher/Corporate Author(s): Chicago Department of Public Works 121 North LaSalle Street IL 60602 USA Abstract: In order to relieve the congestion that characterizes State Street, Chicago's busiest street, a transit mall is scheduled to be created in 1977. An interagency task force came up with a plan calling for the restriction of vehicular traffic, allowing only pedestrians and buses and emergency vehicles. Three basic objectives are behind the mall scheme: the improvement of State Street's pedestrian environment, the improvement of public transportation services in downtown Chicago, and the provision of an economic stimulus to the State Street business community. Several useful, as well as esthetic, improvements will be made such as shelters, escalators leading to subways, trees, etc. The bus system will be systematized, and provision for taxi stands will be made on the cross streets, which will still be open to traffic. Side street loading for delivery trucks will be designated, and traffic control measures are planned for the traffic that must be rerouted from State Street. The area computerized traffic signal system, a parking ban on streets in the Loop area, and exclusive reverse flow bus lanes are all measures that will increase traffic flow speed and vehicle capacity on the streets. The idea of a "mall" is descended from the Middle Ages, where its purpose was to promote interaction and communication. Today's transit malls have begun to do that again, as well as promote transportation and economic improvements. After grant applications are filed and the final design stage completed, construction on the Chicago Transit Mall will get under way. Index Terms: Bus Lanes, Buses (Vehicles), Delivery Service, Emergency Vehicle, Parking Regulations, Pedestrian Malls, Taxicabs, Traffic Congestion, Traffic Control Systems, Traffic Restraint Available from:

Tag	Abstract
Vehicle80	Title: VEHICLE/WEIGHT COST OPTIMIZATION Publication Date: 07/00/1980 Pagination: 88p Period Covered: 8002-8006 Report No: Publisher/Corporate Author(s): Abstract: The purpose of the study was the development of a computerized mathematical optimization tool to be used in the determination of weight and cost tradeoffs through materials substitution in the design of passenger cars and light trucks. The model determines the minimum cost materials mix for specified weight constraints as well as the relative proportion of each material use in the vehicle as a function of desired percentage weight reduction. Available from: Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Whitford82	Title: LIMITED TRUCKTRAIN: A CONCEPT FOR ENERGY CONSERVATION AND TRUCK PRODUCTIVITY Author(s): Whitford, RK Journal Title: Transportation Research Record Issue: 870 Publication Date: 00/00/1982 Pagination: pp 37-41 Report No: Features: FIGS: 2 Fig. TABS: 4 Tab. REFS: 16 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The widespread use of turnpike double and western triple trucks constrained to operate only on the Interstate system offers the potential not only for a reduction in U.S. diesel fuel consumption but also for a major increase in trucking productivity. This option is based on two 40- or 45-ft trailers (doubles) or two 27- to 30-ft trailers (triples) with axle weights maintained at the present 20000-lb single/34000-lb tandem level. Under this approach, the Interstate would be modified to provide for adequate access to truck stops and to provide parking areas or "corrals" where doubles and triples would be made up for intercity movement and disassembled for city delivery. Two scenarios are evaluated for their potential in fuel savings. Fuel improvements are estimated to be about 22 percent. A turnpike double offers nearly the same energy intensity as conventional trailer-on-flatcar unit trains traveling at similar speeds. Potential productivity improvements in trucking are so substantial that the industry may have to consider changes in its mode of operation. Under this scheme, about 500 trucks can do the job of 900, resulting in a reduction of drivers and capital equipment. The road stress as expressed in terms of equivalent axle load is slightly below that for single trucks moving the same freight. For the investment in road alterations and tractor upgrading, fuel savings equivalent to $15000 to $40000/bbl/day are realized (oil shale plants require an investment of about $35000/bbl/day). Considering the reduced number of drivers and tractors, dollar savings much greater than the fuel cost are achieved. The overall benefit/cost ratio exceeds 10 for a nominal road rehabilitation cost factor, which makes trucktrain a very attractive option. Negative factors concern highway safety and the potentially severe impact on the railroads. (Author) Index Terms: Benefit Cost Analysis, Energy Conservation, Highway Improvements, Highway Safety, Interstate Highway System, Productivity, Savings, Size And Weight Laws, Trailer, Truck Transportation Economics Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Winfrey68	Title: ECONOMICS OF THE MAXIMUM LIMITS OF MOTOR VEHICLE DIMENSIONS AND WEIGHTS (VOL. 1) Author(s): Winfrey, R Publication Date: 09/00/1968 Pagination: 279 pp Report No: Publisher/Corporate Author(s): Federal Highway Administration Environmental Design and Control Division DC 20590 USA Abstract: Determining the desirable maximum limits of dimensions and weights of motor vehicles is approached on the basis of highway cost and the operating cost so far as the factors of economy are concerned. Axle weight, gross vehicle weight, and vehicle length are analyzed on the basis of six highway systems consisting of the rural and urban systems within the Interstate, primary and secondary highway systems. The analysis is based on data on truck weight studies conducted in 46 States; operating cost data obtained from truck fleet operators; and experimental data on pavements and bridges obtained from the comprehensive AASHO road test. Numerous other studies also contributed to the findings of the report. The desirable limits of dimensions and weights for use were found to be the following: 1) Vehicle height of 13.5 feet 2) Vehicle width of 102 inches 3) Maximum lengths on all highways of 40 feet for single-unit trucks and trailers, 55 feet for tractors and semitrailers, and 65 feet for any other combination of vehicles. 4) Axle weight limits of 22, 000 and 38, 000 pounds for single and tandem axles respectively. 5) Gross weight limit of at least 120, 000 pounds, or better yet, no gross weight limit at all with control of axle weight and spacing. /FHWA/ Index Terms: Benefit Cost Analysis, Economic, Limits, Motor Vehicle, Size, Truck Transportation Economics, Weight, Weight Limits Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22151 USA Acknowledgement of Document Source: Federal Highway Administration

Abstracts on Divisible Loads, Permit Loads

Tag	Year	Citation
Agardy99	99	00/00/1999 PERMIT VEHICLE ROUTING SYSTEM IN HUNGARY - BRIDGE PREVENTION FROM HIGHLY LOADED VEHICLES Conference: Eighth Transportation Research Board Conference on Bridge Management AUTHOR(S): Agardy, G Gaspar, L Kolozsi, G Szilassy, A
Chou99	99	08/00/1999 INNOVATIVE METHOD FOR EVALUATING OVERWEIGHT VEHICLE PERMITS Journal: Journal of Bridge Engineering Vol: 4 No: 3 AUTHOR(S): Chou, KC Deatherage, JH Khayat, AJ Leatherwood, TD
Hovey99	99	00/00/1999 LOAD RATING AND PERMIT VEHICLE ROUTING Conference: Eighth Transportation Research Board Conference on Bridge Management AUTHOR(S): Hovey, G Nord, M
Minervino99	99	00/00/1999 LOAD RATING AND PERMIT REVIEW USING LOAD AND RESISTANCE FACTOR PHILOSOPHY Conference: Eighth Transportation Research Board Conference on Bridge Management AUTHOR(S): Minervino, CM Sivakumar, B
Ashur98	98	10/00/1998 AUTOMATED ROUTE EVALUATION OF OVERWEIGHT/OVERSIZE VEHICLES AUTHOR(S): Ashur, S Carrasco, CJ Garcia-Diaz, A Melchor-Lucero, O Osegueda, RA
Commander 98	98	03/00/1998 DETERMINING BRIDGE RESPONSES TO OVERWEIGHT LOADS AUTHOR(S): Commander, BC Goble, GG Schultz, JL
Elgindy98a	98	09/00/1998 INFLUENCE OF A TRAILER'S AXLE ARRANGEMENT AND LOADS ON THE STABILITY AND CONTROL OF A TRACTOR/SEMITRAILER AUTHOR(S): El-Gindy, M Kenis, W
Faghri98	98	01/00/1998 GIS APPLICATION FOR THE REVIEW OF OVERSIZE VEHICLE PERMITS. FINAL REPORT AUTHOR(S): Faghri, A Glaubitz, M
Meyburg98	98	02/00/1998 THE ECONOMIC IMPACTS OF A DIVISIBLE-LOAD PERMIT SYSTEM FOR HEAVY VEHICLES Journal: Transportation Research. Part A: Policy and Practice Vol: 32 No: 2 AUTHOR(S): Meyburg, AH Saphores, J-D Schuler, RE
Fernando97	97	10/00/1997 GUIDELINES FOR EVALUATING SUPERHEAVY LOAD ROUTES AUTHOR(S): Fernando, EG
Fu97	97	04/00/1997 SAFETY-BASED BRIDGE-OVERSTRESS CRITERIA FOR NONDIVISIBLE LOADS AUTHOR(S): Fu, G Hag-Elsafi, O
Humphrey97	97	00/00/1997 OVERSIZE/OVERWEIGHT TRANSPORTATION STUDY AUTHOR(S): Humphrey, TF

Tag	Year	Citation
Chen96	96	00/00/1996 APPLICATION OF FALLING WEIGHT DEFLECTOMETER DATA FOR ANALYSIS OF SUPERHEAVY LOADS Journal: Transportation Research Record No: 1540 AUTHOR(S): Chen, D-H Fernando, E Murphy, M
Fu96	96	00/00/1996 NEW SAFETY-BASED CHECKING PROCEDURE FOR OVERLOADS ON HIGHWAY BRIDGES JOURNAL: TRANSPORTATION RESEARCH RECORD NO: 1541 AUTHOR(S): Fu, G Hag-Elsafi, O
Meyburg96	96	00/00/1996 COLLECTING USAGE DATA FOR ANALYZING A HEAVY-VEHICLE, DIVISIBLE-LOAD PERMIT SYSTEM Journal: Transportation Research Record No: 1522 AUTHOR(S): Meyburg, AH Saphores, J-DM Schuler, RE
Chou95	95	01/00/1995 EVALUATION AND TESTING OF THE SOFTWARE PROGRAM FOR THE ANALYSIS OF OVERWEIGHT VEHICLES ON TENNESSEE HIGHWAY BRIDGES. VOLUME 1 - FINAL REPORT AUTHOR(S): Chou, KC Deatherage, JH
Fernando95	95	11/00/1995 DEVELOPMENT OF A PROCEDURE FOR THE STRUCTURAL EVALUATION OF SUPERHEAVY LOAD ROUTES AUTHOR(S): Fernando, EG Jooste, FJ
List95	95	00/00/1995 ELECTRONIC ISSUANCE OF SPECIAL HAULING PERMITS Conference: Intelligent Transportation: Serving the User Through Deployment. Proceedings of the 1995 Annual Meeting of ITS America. AUTHOR(S): List, GF Nozick, LK Turnquist, MA
Abdulshafi94	94	11/05/1994 RELIABILITY OF AASHTO DESIGN EQUATION FOR PREDICTING PERFORMANCE OF FLEXIBLE AND RIGID PAVEMENTS IN OHIO. FINAL REPORT AUTHOR(S): Abdulshafi, O Kedzierski, B Mukhtar, H
Barron94	94	07/00/1994 A CASE STUDY OF MOTOR VEHICLES VIOLATING SPECIAL WEIGHT PERMITS IN THE STATE OF WASHINGTON. PHASE I. FINAL TECHNICAL REPORT AUTHOR(S): Barron, CJ Casavant, KL Jessup, EL
Barron94a	94	07/00/1994 CASE STUDY OF MOTOR VEHICLES VIOLATING SPECIAL WEIGHT PERMITS IN THE STATE OF WASHINGTON AUTHOR(S): Barron, CJ Casavant, KL Jessup, EL
Fernando94	94	10/00/1994 VICTORIA SUPERHEAVY LOAD MOVE: REPORT ON ROUTE ASSESSMENT AND PAVEMENT MODELING. INTERIM REPORT AUTHOR(S): Fernando, EG Jooste, FJ
Fernando94a	94	00/00/1994 INVESTIGATION OF THE EFFECTS OF SUPERHEAVY LOADS ON PAVEMENTS Conference: 4th International Conference, Bearing Capacity of Roads and Airfields AUTHOR(S): Fernando, EG Jooste, FJ

Tag	Year	Citation
Hein94	94	00/00/1994 EVALUATION OF OVERLOADS ON PAVEMENTS FOR OVERSIZE/OVERWEIGHT PERMIT GUIDELINES Conference: 4th International Conference, Bearing Capacity of Roads and Airfields AUTHOR(S): Hein, DK Jung, FW
List94	94	12/00/1994 IMPROVED CUSTOMER SERVICE AND AUTOMATED ROUTE VERIFICATION FOR THE ISSUANCE OF SPECIAL HAULING PERMITS BY THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION AUTHOR(S): List, GF Nozick, LK Turnquist, MA
Prasad94	94	00/00/1994 COMPUTERIZED OVERLOAD PERMITTING PROCEDURE FOR INDIANA Journal: Transportation Research Record No: 1448 AUTHOR(S): Prasad, NBR Ramirez, JA White, DW White, TD Zaghloul, SM
Crockford93	93	11/00/1993 WEIGHT TOLERANCE PERMITS. FINAL REPORT AUTHOR(S): Crockford, WW
Impact93	93	09/00/1993 IMPACT ASSESSMENT OF THE REGULATION OF HEAVY TRUCK OPERATIONS
Monismith93	93	00/00/1993 NONLINEAR ELASTIC VISCOUS WITH DAMAGE MODEL TO PREDICT PERMANENT DEFORMATION OF ASPHALT CONCRETE MIXES Journal: Transportation Research Record No: 1384 AUTHOR(S): Monismith, CL Sackman, JL Sousa, J Weissman, SL
Guide91	91	11/00/1991 Guide For Maximum Dimensions And Weights Of Motor Vehicles And For The Operation Of Nondivisible Load Oversize And Overweight Vehicles
Guide91rev	91	00/00/1991 Guide For Maximum Dimensions And Weights Of Motor Vehicles And For The Operation Of Nondivisible Load Oversize And Overweight Vehicles: (rev. Nov. 1991.)
Meyburg91	91	01/00/1991 IMPACT ASSESSMENT OF THE REGULATION OF HEAVY TRUCK OPERATIONS AUTHOR(S): Meyburg, AH Schuler, RE
McGhie90	90	00/00/1990 HEAVILY LOADED TRAILERS: AN APPROACH TO EVALUATE THEIR INTERACTION WITH ASPHALT CONCRETE PAVEMENTS Journal: Transportation Research Record No: 1286 AUTHOR(S): McGhie, J Shepard, B Sousa, JB
Southgate90	90	06/00/1990 ESTIMATION OF EQUIVALENT AXLELOADS USING DATA COLLECTED BY AUTOMATED VEHICLE CLASSIFICATION AND WEIGH-IN-MOTION EQUIPMENT AUTHOR(S): Southgate, HF
Uniformity88	88	12/00/1988 Uniformity Efforts In Oversize/Overweight Permits Journal: NCHRP Synthesis of Highway Practice No: 143
Noyszewski 75	75	10/00/1975 EFFECT OF HEAVY AXLE LOADS ON BRIDGES AUTHOR(S): Noyszewski, M

Tag	Year	Citation
Whitton41	41	00/00/1941 REPORT OF COMMITTEE ON PERMITS FOR OVERSIZE AND OVERWEIGHT VEHICLES Journal: Highway Research Board Proceedings AUTHOR(S):, Whitton, RM

Tag	Abstract

Tag	Abstract
Abdulshafi94	Title: RELIABILITY OF AASHTO DESIGN EQUATION FOR PREDICTING PERFORMANCE OF FLEXIBLE AND RIGID PAVEMENTS IN OHIO. FINAL REPORT Author(s): Abdulshafi, O: Kedzierski, B: Mukhtar, H Language: English Publication Date: 11/05/1994 Pagination: 181p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 3 App. Publisher/Corporate Author(s): CTL Engineering, Incorporated 2860 Fisher Road OH 43204- USA Federal Highway Administration 400 7th Street, SW 20590 Ohio Department of Transportation 25 South Front Street, P.O. Box 899 43216-0899 Abstract: The AASHTO pavement design procedures were developed as a result of the AASHO Road Test conducted in the late '50s and early '60s. The developed design methods are empirical and relate pavement performance measurements and the loss of serviceability directly to the traffic volume and loading characteristics, the modulus of subgrade reaction, layer coefficients, and environmental factors that were present at the road site. The resulting design equations have been generalized to make them applicable to broader sets of design variables. In the 1986 AASHTO design guide, the equations were enhanced to include design reliability, the resilient modulus of the subgrade soil, material variability and drainability, and construction quality. Further, the design guide permits the user to use overall standard deviations applicable to the local conditions. These values of standard deviation are used to determine the reliability design factors. Large values of standard deviation result in pavement designed at a higher level of reliability than supposed. Therefore, any uncertainty in standard deviation will result in uncertainty in the reliability level. Since the Ohio Department of Transportation (ODOT) has adopted the AASHTO design equations for new pavement design, it was considered needful to conduct a research study that would determine the deviations in traffic and performance prediction parameters and the overall standard deviations applicable to Ohio conditions. Pavement test sites were selected to represent the statewide distribution of pavement designs in Ohio, characterized by such factors as material type, functional classification, and different climatic and soil regions. Continuous traffic data collection was accomplished by the use of weigh-in-motion devices. Pavement serviceability index (PSI) was measured by Ohio noncontact profilometer. Core samples were obtained and several laboratory tests were conducted to determine the as-constructed material properties and variability of the design input parameters. Comparison of predicted and observed performances based on approximately four years of data indicated that AASHTO equation does not predict the performance of flexible pavements in Ohio. The predicted and the observed performance for rigid pavement sites were essentially the same that is no change in the observed and the predicted PSI, however, these observations were based on short term performance data. The overall variance estimates for flexible and rigid pavements were, however, not obtained due to lack in the change of performance data for most sections. Index Terms: AASHTO, Comparisons, Equations, Field Measurements, Flexible Pavement Design, Ohio, Pavement Performance, Predictions, Reliability, Rigid Pavement Design, Serviceability Index, Standard Deviation, Variability Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Agardy99	Title: PERMIT VEHICLE ROUTING SYSTEM IN HUNGARY - BRIDGE PREVENTION FROM HIGHLY LOADED VEHICLES Author(s): Agardy, G: Gaspar, L: Kolozsi, G: Szilassy, A Language: English Conference Title: Eighth Transportation Research Board Conference on Bridge Management Sponsored by: Transportation Research Board Committee on Bridge Maintenance and Management (A3C06); and Federal Highway Administration. Location: Denver, Colorado Date Held: 19990426-19990428 Publication Date: 00/00/1999 Pagination: 14p Report No: Features: FIGS: 4 Fig. PHOT: 2 Phot. REFS: 10 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Hungary, together with other Central-European young democracies, has been more and more integrated into the "family" of developed Western-European countries. The economic boom and the increasing transport needs cause high loading of roads and bridges. From 1910 on, written Hungarian Bridge Codes have been available which include the design loads. During the past 88 years, the intensity of loads has been increased by three, while the total number of road vehicles has grown from some hundreds to the present 300 vehicles/1000 inhabitants. The continuous development has, of course, needed the repeated updating of these specifications, the 8th version of which is presently valid. There are already special vehicle loads for old bridges which are similar to the realistic loads of the actual road vehicles. The traffic size is monitored continuously by built-in measuring stations (WIM-stations). For the permit vehicle routing system of overloaded vehicles, a computer programme used by the central highway administration has been available since 1987. Some 25, 000 permits are issued for vehicle routing every year; the ratio of overloaded vehicles is 40%. Special attention is given to the vehicles which have a total weight of 2000-2500 kN. In the computer selection of vehicle routing, the programme considers every route between the starting point and the destination, evaluating the possible obstacles (including bridges) of the routes available in the data base from the viewpoint of size and loadability. If the result of built-in routine checking is "sharp", the calculation should be checked by a specific method. The method needs an updated data base which is loaded by the managers of highway bridges and the data are updated every year or after major changes. A computer-assisted routing of hazardous materials developed in Hungary is also outlined. Index Terms: Bridge Management Systems, Heavy Vehicles, Permits, Routing Geographic Terms: Hungary Available from: Transportation Research Board Library 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Ashur98	Title: AUTOMATED ROUTE EVALUATION OF OVERWEIGHT/OVERSIZE VEHICLES Author(s): Ashur, S: Carrasco, CJ: Garcia-Diaz, A: Melchor-Lucero, O: Osegueda, RA Language: English Publication Date: 10/00/1998 Pagination: 653p Period Covered: 9609-9708 Report No: Features: FIGS: Figs. PHOT: Phots. REFS: 6 Ref. APPS: 7 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Texas Department of Transportation Office of Research and Technology Transfer, P.O. Box 5080 78763- Texas University, El Paso Center for Geotechnical and Highway Materials Research TX 79968-0516 USA Abstract: The Motor Carrier Division (MCD) of the Texas Department of Transportation (TxDOT) typically issues more than 45, 000 permits each month for oversize and/or overweight vehicles. The current procedure for attending permit requests for superheavy vehicles is entirely manual and requires hundreds of man-hours. This report documents the efforts to implement a procedure for the automated route evaluation for overweight/oversize vehicles. The procedure uses a network representation of the On-system roads according to TxDOT base maps to identify bridges on the vehicle's route. The bridges' adequacy, in terms of clearances and weight restrictions, are evaluated. The weight capacities of the bridges are determined according to Texas Administrative Code requirements and/or through Bridge Load Formulae. Description of the operation of the system for routing, as well as for bridge management applications are included. Index Terms: Automation, Geographic Information Systems, Permits, Routing Candidate Terms: Bridge Capacity, Clearances (Bridges), Oversize Vehicles, Overweight Vehicles, Weight Restrictions (Bridges) Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Barron94	Title: A CASE STUDY OF MOTOR VEHICLES VIOLATING SPECIAL WEIGHT PERMITS IN THE STATE OF WASHINGTON. PHASE I. FINAL TECHNICAL REPORT Author(s): Barron, CJ: Casavant, KL: Jessup, EL Language: English Publication Date: 07/00/1994 Pagination: 66p Report No: Features: FIGS: 3 Fig. TABS: 15 Tab. REFS: 7 Ref. APPS: 1 App. Publisher/Corporate Author(s): Washington State Department of Transportation Transportation Building, MS 7370 98504-7370 Washington State Transportation Center Washington State Univ, Civil & Environmental Eng, Sloan Hall 99164- Washington State University, Pullman Department of Agricultural Economics WA 99164-1210 USA Abstract: The objective of this paper was to address the problem of accelerated highway and bridge deterioration from overloaded trucks by developing a profile of trucks which exceed overweight permit authorization. The profile of trucks in violation of overweight permits include location, seasonal variation, commodity group, origin/destination, scale type and permit type. The profile was developed from a statewide telephone survey of permit violations between November 1, 1991 and October 31, 1992 and provides policy makers, transportation planners and law enforcement officials greater understanding of the nature of load-related damage created by overload permit violations. Index Terms: Case Studies, Overweight Loads, Permits, Surveys (Data Collection), Truck Effects (Bridges), Truck Highway Damage, Violations, Washington State Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Barron94a	Title: CASE STUDY OF MOTOR VEHICLES VIOLATING SPECIAL WEIGHT PERMITS IN THE STATE OF WASHINGTON Author(s): Barron, CJ: Casavant, KL: Jessup, EL Language: Dutch Publication Date: 07/00/1994 Pagination: 67p Report No: Publisher/Corporate Author(s): Washington State Transportation Center 15700 Dayton Avenue WA 98133- USA Abstract: The objective of this paper was to address the problem of accelerated highway and bridge deterioration from overloaded trucks by developing a profile of trucks which exceed overweight permit authorization. The profile of trucks in violation of overweight permits include location, seasonal variation, commodity groups, origin/destination, scale type and permit type. The profile was developed from a statewide phone survey of permit violations between November 1. 1991 and October 31, 1992 and provide policy makers, transportation planners and law enforcement officials greater understanding of the nature of load-related damage created by overload permit violators. Index Terms: Bridge Repairs, Enforcement (Law), Overweight Loads, Pavement Damage, Permits, Truck Weights Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Chen96	Title: APPLICATION OF FALLING WEIGHT DEFLECTOMETER DATA FOR ANALYSIS OF SUPERHEAVY LOADS Author(s): Chen, D-H: Fernando, E: Murphy, M Language: English Journal Title: Transportation Research Record Issue: 1540 Publication Date: 00/00/1996 Pagination: pp 83-90 Report No: ISBN: 0309059208 Features: FIGS: 7 Fig. TABS: 5 Tab. REFS: 11 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Permitting superheavy loads may increase the rate of pavement damage and the cost of maintenance. An analysis of a proposed superheavy load route (FM519) to evaluate the potential pavement damage caused by a planned superheavy load move is presented. Falling weight deflection (FWD) tests and back calculations of layer moduli were performed on the FM519. FWD tests and back calculations of layer moduli were performed on the pavement before and after the superheavy load was moved. ELSYM5 and BISAR were used to evaluate the pavement responses using the back calculated layer moduli from FWD data. The predictions of surface deflections from ELSYM5 and BISAR were close to (within 10% of) the measured deflections from FWD tests. The FWD data and analyses show that the existing pavement structure is adequate for the planned superheavy load move. Finally, the permit was issued with the condition that the transport vehicle should be kept within the travel lanes and away from the shoulder whenever possible. FWD tests were conducted after the superheavy load move and comparisons with before superheavy load move were made. T-tests were performed to check for significant difference at the 95% confidence level. T-tests showed that there is no significant difference between before and after superheavy load move. Also, no significant distresses due to this superheavy load were observed after the move, and the pavement condition is consistent with the analysis performed to issue the permit. Index Terms: Back calculation, Before And After Studies, Comparisons, Computer Programs, Falling Weight Deflectometers, Layer Moduli, Pavement Deflection, Pavement Distress, Permits, Predictions, Structural Adequacy, Superheavy Loads, T Test Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Chou95	Title: EVALUATION AND TESTING OF THE SOFTWARE PROGRAM FOR THE ANALYSIS OF OVERWEIGHT VEHICLES ON TENNESSEE HIGHWAY BRIDGES. VOLUME 1 - FINAL REPORT Author(s): Chou, KC: Deatherage, JH Language: English Publication Date: 01/00/1995 Pagination: 39p Period Covered: 9312-9501 Report No: Features: FIGS: 7 Fig. TABS: 4 Tab. REFS: 4 Ref. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Tennessee Department of Transportation James K. Polk State Office Building, 505 Deaderick Street 37243- Tennessee University, Knoxville Transportation Center TN 37996-0700 USA Abstract: Any vehicle whose gross weight exceeds 80, 000 lb (36, 288 kg) requires a permit to use the Tennessee highway system. The Department of Transportation receives in excess of 1000 permit applications per month. A method has been developed to efficiently extract any potentially hazardous overweight vehicles requesting a permit. The technique utilizes the combination of gross weight, axle loads, and axle spacings. Software has been developed for a PC-XT personal computer or higher. The analysis is intended to be conservative and yet reduce the number of structural analyses required under the present operational procedures. Research has been done to evaluate the technical merit of the method. Over 2460 overload truck-bridge configurations were analyzed using the software developed and the results were compared to structural analyses using BRASS to evaluate the effectiveness of the program. A statistical alpha test was performed which indicated that the probability that the software would yield a wrong conclusion (based on approving an application which would cause overstress on a bridge) is under 4.0 x 10 to the -14th power. The odds that the software would make a wrong recommendation are 1 in 2.6 x 10 to the 13th power. Based on these statistical data, the software evaluated is a powerful and effective tool to evaluate overweight vehicle permits. Index Terms: Axle Loads, Axle Spacings, Evaluation, Overweight Vehicles, Permits, Software, Tennessee Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Chou99	Title: INNOVATIVE METHOD FOR EVALUATING OVERWEIGHT VEHICLE PERMITS Author(s): Chou, KC: Deatherage, JH: Khayat, AJ: Leatherwood, TD Language: English Journal Title: Journal of Bridge Engineering Volume: 4 Issue: 3 Publication Date: 08/00/1999 Pagination: pp 221-227 Report No: Features: FIGS: Figs. REFS: Refs. Publisher/Corporate Author(s): American Society of Civil Engineers 1801 Alexander Bell Drive VA 20191-4400 USA Abstract: Any vehicle whose gross weight exceeds 356 kN (80, 000 lb) and/or does not conform to the restriction imposed by the Tennessee Department of Transportation (TDOT) requires a permit issued by TDOT in order to use the Tennessee roads. A method has been developed empirically to efficiently extract any suspicious overweight vehicle requesting a permit, regardless of gross weight, for further detailed analysis. The technique utilizes the combination of gross weight, axle loads, and axle spacings. The algorithm can be easily implemented to a computer program for users with limited technical training, since the only input information is the axle load and spacing configurations. The method is intended to be conservative. A study, based on actual permit applications and detailed bridge analyses, has shown that this approach would reduce the number of structural analyses required by approximately 50 percent when compared to the current policy. Index Terms: Algorithms, Axle Loads, Gross Vehicle Weight, Permits, Vehicle Weight Geographic Terms: Tennessee Available from: American Society of Civil Engineers 1801 Alexander Bell Drive Reston VA 20191-4400 USA

Tag	Abstract
Commander 98	Title: DETERMINING BRIDGE RESPONSES TO OVERWEIGHT LOADS Author(s): Commander, BC: Goble, GG: Schultz, JL Language: English Publication Date: 03/00/1998 Pagination: 103p Report No: Publisher/Corporate Author(s): Bridge Diagnostics, Incorporated 5398 Manhattan Circle #100 CO 80303-4239 USA Federal Highway Administration 400 7th Street, SW DC 20590 Wyoming Department of Transportation P.O. Box 1708 WY 82003-1708 Abstract: The Wyoming Department of Transportation (WYDOT) Office of Overweight Loads issues overload permits to motor carriers based on the results of conventional structural analysis of bridges along the anticipated permit route. This study was initiated to determine if current analytical methods accurately represent the actual live-load response of common bridge types, or if the results are over- or under-conservative in predicting maximum stresses. Field test procedures consisted of performing diagnostic load tests on each structure type as it was subjected to both a standard vehicle load and then an overload/permit vehicle. Finite element models were developed and an analysis performed with the same loads as those applied in the field. Comparisons between the measured strains and the analytical strains were made, and each model systematically modified until comparisons were in good agreement. The three bridge types used in the study are: Reinforced Concrete (R/C) Slab Bridge; R/C T-Beam Bridge; and Slab/Steel Girder Bridge. The results demonstrated that the concrete slab bridge rated significantly higher than conventional analysis dictated. The actual load capacity of the steel bridge was also greater than conventional analysis predicted. While the capacity of the concrete t-beam was not as high as anticipated, in no instance were the actual capacities determined to be lower than conventional analysis indicated. Index Terms: Bridge Capacity, Bridges, Field Tests, Finite Element Analysis, Girder Bridges, Live Loads, Load Tests, Overloads, Permits, Reinforced Concrete Bridges, Strains, Stresses, Structural Analysis, T Beams Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: Wyoming Department of Transportation

Tag	Abstract
Elgindy98a	Title: INFLUENCE OF A TRAILER'S AXLE ARRANGEMENT AND LOADS ON THE STABILITY AND CONTROL OF A TRACTOR/SEMITRAILER Author(s): El-Gindy, M: Kenis, W Language: English Publication Date: 09/00/1998 Pagination: 178p Period Covered: 9602-9712 Report No: Features: FIGS: 27 Fig. TABS: 8 Tab. REFS: Refs. APPS: 6 App. Publisher/Corporate Author(s): Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: The evaluation of a basic vehicle type relative to another, in terms of stability and control properties, can be done comprehensively only by examining its behavior over a wide range of loading conditions, component selection, and operation variables, such as tire tread wear level, pavement friction, etc. While the scope of this study did not permit an evaluation at such levels of detail, the results show the safety-related dynamic performance effects of varying a trailer's axle arrangement (tandem vs. tridem), suspension type (steel vs. air), tire type (dual vs. wide-base single), and axle loading level. Typical five- and six-axle tractor/semitrailers [483-cm (190-in.) tractor and 14.6-m (48-ft) van-semitrailer] were used in this study. Vehicle safety-related dynamic performance is examined using a recent version of the constant-speed yaw/roll model developed by the University of Michigan Transportation Research Institute (UMTRI). The five- and six-axle tractor/semitrailers are examined using three loading scenarios: (1) loading the trailer with control tractor axle loads at their maximum legal limits, i.e., 5443.2 kg and 15422.4 kg (12 kips and 34 kips) at the steering and tandem drive axles, respectively; (2) loading the trailer without controlling the tractor axle loads; and (3) keeping the payload constant (constant center of gravity height) and varying the trailer axle spacing. It should be noted that the second loading scenario represents the maximum possible gross vehicle weight gain for these vehicle configurations, provided that the load on the steering axle does not exceed the maximum limit of 5443.2 kg (12 kips). Furthermore, the results of this analysis may assist in understanding the performance trends for other tractor/semitrailer configurations that have different dimensions, suspensions, tires, fifth-wheel settings, tractor parameters, and other component characteristics. Index Terms: Axle Loads, Axle Spacing, Heavy Vehicles, Rollover, Tires, Tractor Semitrailers, Vehicle Control, Vehicle Stability, Vehicle Suspension Systems Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Faghri98	Title: GIS APPLICATION FOR THE REVIEW OF OVERSIZE VEHICLE PERMITS. FINAL REPORT Author(s): Faghri, A: Glaubitz, M Language: English Publication Date: 01/00/1998 Pagination: 182p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: Apps. Publisher/Corporate Author(s): Delaware University, Newark Department of Civil & Environmental Engineering DE 19716- USA Abstract: This publication develops a computer application capable of automating the task of oversize vehicle permit review. Realization of the application is made possible by recent developments in the emerging field of Geographic Information Systems (GIS). Commercial GIS software is used to support custom application programs that are written specifically for this application. The purpose of the application is to determine the ideal route for an oversize vehicle through a road network, while accounting for the fact that the passage of these large and heavy vehicles through certain parts of the network may be compromised due to the load ratings of bridges or critical clearance heights. The application functions by prompting the user to enter statistics regarding the physical extent of the vehicle as well as the origin and destination of the desired trip. Index Terms: Clearances, Computer Applications, Geographic Information Systems, Load Bearing Capacity, Oversized Vehicles, Permits, Route Selection Available from: Delaware University, Newark Department of Civil & Environmental Engineering Newark DE 19716- USA

Tag	Abstract
Fernando94	Title: VICTORIA SUPERHEAVY LOAD MOVE: REPORT ON ROUTE ASSESSMENT AND PAVEMENT MODELING. INTERIM REPORT Author(s): Fernando, EG: Jooste, FJ Language: English Publication Date: 10/00/1994 Pagination: 86p Period Covered: 9209-9308 Report No: Features: FIGS: 74 Fig. TABS: 5 Tab. PHOT: 1 Phot. REFS: 16 Ref. APPS: 1 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Texas Department of Transportation Office of Research and Technology Transfer, P.O. Box 5051 78763- Texas Transportation Institute Texas A&M University TX 77843 USA Abstract: The Texas Department of Transportation (TxDOT) has been issuing an increasing number of permits for movement of superheavy loads. The effect of superheavy loads on pavements is not well established at the present time. To address this problem, TxDOT has funded a research project with the Texas Transportation Institute (TTI) with the objective of developing a procedure to evaluate the potential for pavement damage on a proposed superheavy load route, as well as to determine whether temporary strengthening measures are needed. During the study a number of superheavy loads will be monitored. This report describes the data collection and analysis results for a superheavy load move which took place in Victoria during December, 1992. The move involved the transport of two superheavy loads. A Multi-Depth Deflectometer measured pavement deflection under the superheavy loads. This study used the deflection data to evaluate the applicability of linear elastic layered theory to predict pavement response under the loading. Predicted displacement from the theory compared favorably with corresponding measurements. To evaluate the effects of multiple wheel loads, an analysis was done to establish how predicted pavement response varies with distance from a given load and with different load configurations. The results indicate that stresses based on a single-axle model yield conservative estimates of the potential for pavement damage. This analysis showed that the road had adequate structural capacity to sustain the superheavy loads without developing visible distress. Index Terms: Comparisons, Data Analysis, Data Collection, Deflectometer, Displacement, Linear Elastic Layered Theory, Measurements, Multiple Wheel Loads, Overloads, Pavement Damage, Pavement Deflection, Permits, Predictions, Superheavy Loads Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Fernando94a	Title: INVESTIGATION OF THE EFFECTS OF SUPERHEAVY LOADS ON PAVEMENTS Author(s): Fernando, EG: Jooste, FJ Language: English Conference Title: 4th International Conference, Bearing Capacity of Roads and Airfields Sponsored by: FHWA, U of Minnesota, Army Corps of Engineers, NRC Canada, FAA Location: Minneapolis, MN Date Held: 19940817-19940821 Publication Date: 00/00/1994 Pagination: p1565-1581 Report No: Features: FIGS: 10 Fig. TABS: 2 Tab. REFS: 13 Ref. Publisher/Corporate Author(s): Minnesota Department of Transportation Transportation Building, 395 John Ireland Boulevard MN 55155 USA Abstract: The Texas Department of Transportation has been issuing permits for movement of superheavy loads on an ever-increasing basis. By definition, the Department classifies gross vehicle weights in excess of 250, 000 lbs. (113, 400 kg) as superheavy loads. Occasionally, superheavy loads have exceeded 1, 000, 000 lbs. (453, 600 kg), and in some instances, 2, 000, 000 lbs. (907, 200 kg). The effects of superheavy loads on pavements are not established at the present time. This paper illustrates a preliminary procedure for evaluating proposed superheavy load routes. The procedure developed may be used to identify weak sections along a route where temporary strengthening measures are needed to prevent overstressing of the pavement. Alternatively, recommendations can be made with respect to modifying the trailer configuration such that the predicted stresses under load are reduced to levels that will not exceed the strength of the subgrade. Index Terms: Effect, Gross Vehicle Weight, Heavy Load, Investigations, Pavements, Procedures, Strengthening (Pavement), Stresses, Subgrades Available from: Minnesota Department of Transportation Transportation Building, 395 John Ireland Boulevard St Paul MN 55155 USA

Tag	**Abstract**
Fernando95	Title: DEVELOPMENT OF A PROCEDURE FOR THE STRUCTURAL EVALUATION OF SUPERHEAVY LOAD ROUTES Author(s): Fernando, EG: Jooste, FJ Language: English Publication Date: 11/00/1995 Pagination: 282p Period Covered: 9301-9508 Report No: Features: FIGS: Figs. TABS: Tabs. PHOT: Phots. REFS: 96 Ref. APPS: 6 App. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Texas Department of Transportation Office of Research and Technology Transfer, P.O. Box 5080 78763- Texas Transportation Institute Texas A&M University TX 77843 USA Abstract: The Texas Department of Transportation (TxDOT) receives about 75 to 100 permit requests for superheavy load moves annually. Most of the moves take place in the southeast region of the state due to the proximity to the Gulf of Mexico and the presence of navigational inland waterways. Gross vehicle weights associated with these moves range from 1112 kN to over 8896 kN and include loads like dragline components, off-shore pipe-laying equipment, oil pressure vessels, and electric transformers. The number of superheavy load permit applications has increased over the years. Before a permit can be issued, TxDOT needs to determine whether the proposed route is structurally adequate to sustain the superheavy load. The analysis of damage potential under superheavy loads concerns the likelihood of a rapid, load-induced shear failure as opposed to the long-term accumulation of permanent deformation and fatigue due to repeated load applications. In this project, researchers developed a procedure for evaluating the potential for pavement damage prior to a superheavy load move based on the Mohr-Coulomb yield criterion. In developing this procedure, researchers investigated the sensitivity of the Mohr-Coulomb yield criterion to changes in the predicted stress state and material strength parameters; compared different models for evaluating pavement response under vehicle loading; and investigated the effect of different load configurations on the predicted pavement response and yield function value. Using the results from these investigations, researchers developed a two-stage procedure for the structural assessment of superheavy load routes which utilizes existing capabilities within TxDOT. Flexibility is provided to conduct structural evaluations with varying degrees of complexity depending on the quantity and quality of information available on the proposed superheavy load route. In the first stage, structural adequacy is evaluated by means of charts with minimal requirements for materials characterization. Relationships are provided for estimating resilient and strength parameters of base and subgrade materials from results of simple soil tests. Should the initial results indicate that the structure is inadequate to accommodate the expected superheavy load, then the second stage analysis should be conducted which requires a more detailed characterization of the proposed route. In this stage, the evaluation uses an incremental, non-linear layered elastic computer program. This report documents the development of the methodology for permitting superheavy load moves. Index Terms: Mathematical Models, Modulus Of Resilience, Mohr-Coulomb Criterion, Overloads, Pavement Damage, Permits, Poisson's Ratio, Predictions, Routes, Structural Adequacy, Superheavy Loads Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Fernando97	Title: GUIDELINES FOR EVALUATING SUPERHEAVY LOAD ROUTES Author(s): Fernando, EG Language: English Publication Date: 10/00/1997 Pagination: 68p Period Covered: 9609-9708 Report No: Features: FIGS: 20 Fig. TABS: 9 Tab. PHOT: 1 Phot. REFS: 13 Ref. Publisher/Corporate Author(s): Texas Department of Transportation Office of Research and Technology Transfer, P.O. Box 5080 78763- Texas Transportation Institute Texas A&M University TX 77843 USA Abstract: Superheavy loads are defined as loads that have gross vehicle weights in excess of 1112 kN. In the past, loads in excess of 8900 kN have been moved. Before a permit can be issued for a superheavy load move, the Texas Department of Transportation (TxDOT) needs to determine whether the proposed route is structurally adequate to sustain the superheavy load. The analysis of damage potential under superheavy loads concerns the likelihood of a rapid, load-induced shear failure as opposed to the long-term accumulation of permanent deformation and fatigue due to repeated load applications. A methodology for evaluating superheavy load routes was developed in Project 0-1335, "Movement of Superheavy Loads Over the State Highway System". This methodology is now implemented in TxDOT for permitting superheavy load moves. It is based on an incremental, nonlinear layered elastic pavement model for predicting the induced pavement response under surface wheel loads. Predicted stresses under a superheavy load are used with the Mohr-Coulomb yield criterion to evaluate the potential for pavement damage prior to the superheavy load move. Since the initial development, a follow-up study led to enhancements in the analysis procedure. Researchers developed routines to evaluate the edge load condition and to determine the failure wheel load for a given pavement structure. The former modification is used to evaluate the potential for edge shear failure on moves where the wheel loads will travel close to the edge of a given pavement with unpaved shoulders. The latter modification is used in identifying alternative trailer configurations to prevent pavement damage during superheavy load moves. This project summary report provides guidelines in the application of the methodology to evaluate superheavy load routes. Index Terms: Edges, Evaluation (Assessment), Guidelines, Mohr-Coulomb Criterion, Overloads, Pavement Damage, Permits, Predictions, Routes, Shear Failures, Structural Adequacy, Superheavy Loads, Unpaved Shoulders, Vehicle Configurations Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Fu96	Title: NEW SAFETY-BASED CHECKING PROCEDURE FOR OVERLOADS ON HIGHWAY BRIDGES Author(s): Fu, G: Hag-Elsafi, O Language: English Journal Title: Transportation Research Record Issue: 1541 Publication Date: 00/00/1996 Pagination: pp 22-28 Report No: ISBN: 0309059143 Features: FIGS: 9 Fig. TABS: 4 Tab. REFS: 13 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Overweight trucks exceeding legal weight limits are seen crossing highway bridges. Many states adopt the AASHTO rating concept with or without an overstress criterion to check overweight permits for bridge evaluation. However, the basis of these overstress criteria has not been well documented, and the AASHTO load-rating concept is not intended to be applicable to overweight truck traffic. The development of a new overload-permit checking procedure for bridge evaluation, in the format of load and resistance factors and based on relatively uniform bridge safety, is presented. Annual and trip overload permits for nondivisible loads are covered. This procedure may be included in bridge evaluation codes for overload checking. Index Terms: Highway Bridges, Load And Resistance Factors, Nondivisible Loads, Overload Checking, Overloads, Overweight Loads, Permits, Safety, Truck Laws & Regulations Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Fu97	Title: SAFETY-BASED BRIDGE-OVERSTRESS CRITERIA FOR NONDIVISIBLE LOADS Author(s): Fu, G: Hag-Elsafi, O Language: English Publication Date: 04/00/1997 Pagination: 46p Report No: Features: FIGS: 16 Fig. TABS: 10 Tab. REFS: 18 Ref. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW DC 20590 New York State Department of Transportation Transportation Research and Development Bureau, State Campus NY 12232-0869 USA Abstract: Most states face increasing pressure to issue more permits for heavier overweight trucks, and currently use the AASHTO rating concept (with or without an overstress criterion) in checking these loads. That bridge-rating procedure, however, is intended to cover only normal traffic, and the basis for these overstress criteria involved is not well documented. This report discusses current New York State practice for checking overweight permits. A new permit-issuance procedure for checking overloads is then proposed for both annual and trip permits for nondivisible loads, based on principles of uniform bridge safety. This procedure may be included in bridge-evaluation specifications. Index Terms: Bridges, New York State, Overweight Loads, Permits, Safety, Structural Behavior, Truck Weights Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Guide91	Title: Guide For Maximum Dimensions And Weights Of Motor Vehicles And For The Operation Of Nondivisible Load Oversize And Overweight Vehicles Publication Date: 11/00/1991 Pagination: 28p Report No: Features: FIGS: 11 Fig. TABS: 1 Tab. Publisher/Corporate Author(s): American Association of State Highway & Transp Off , 444 North Capitol Street, NW, Suite 225, DC 20001, USA Abstract: This guide replaces the 1974 policy and is the result of the AASHTO Executive Committee's directive that a guide be prepared in light of the significant truck size and weight law changes from the Surface Transportation Assistance Act of 1982. It is intended that this guide be updated from time to time. The guide is organized in four chapters. Chapter 1.00 contains definitions. The provisions of Chapter 2.00 governing width, height, length, permissible loads, and performance limits apply to vehicles serving in regular operation. Vehicles operated under the terms of special permits are covered in Chapter 3.00. Chapter 4.00 covers oversize/overweight shipments declared essential to the national defense. Index Terms: Aashto, Guides, Motor Vehicle, National Defense, Oversize Loads, Overweight Loads, Size And Weight Laws, Truck Laws & Regulations, Vehicle Size, Vehicle Weight Available from: American Association of State Highway & Transp Off, 444 North Capitol Street, NW, Suite 225, Washington DC 20001, USA
Guide91rev	Title: Guide For Maximum Dimensions And Weights Of Motor Vehicles And For The Operation Of Nondivisible Load Oversize And Overweight Vehicles :(REV. NOV. 1991.) Language: ENGLISH Publication Date: 00/00/1991 Pagination: 7 PP Report No: Publisher/Corporate Author(s): Supplemental Information: Prepared by the subcommittee on highway transport, the american association of state highway and transportation officials other phys. Description: ii illustrated american association of state highway and transportation officials Index Terms: Law And Legislation, Size, Trucks, United States, Weight Available from: Acknowledgement of Document Source: UC, Berkeley, Institute For Transportation Studies 25279004

Tag	Abstract
Hein94	Title: EVALUATION OF OVERLOADS ON PAVEMENTS FOR OVERSIZE/OVERWEIGHT PERMIT GUIDELINES Author(s): Hein, DK: Jung, FW Language: English Conference Title: 4th International Conference, Bearing Capacity of Roads and Airfields Sponsored by: FHWA, U of Minnesota, Army Corps of Engineers, NRC Canada, FAA Location: Minneapolis, MN Date Held: 19940817-19940821 Publication Date: 00/00/1994 Pagination: p1491-1515 Report No: Features: FIGS: 7 Fig. TABS: 6 Tab. REFS: 27 Ref. Publisher/Corporate Author(s): Minnesota Department of Transportation Transportation Building, 395 John Ireland Boulevard MN 55155 USA Abstract: A rational test and evaluation procedure was developed to assess the load-carrying capability of flexible pavements (asphalt concrete surface over granular base/subbase) subjected to heavy loads from Oversize/Overweight Permit transport vehicles. A step-by-step method is described to evaluate pavements on designated Oversize/Overweight Permit routes, including the use of non-destructive falling weight deflectometer (FWD) deflection testing. The deflection test results are analyzed using a modified version of the PROBE software program to predict the pavement response (critical deflection) under the Oversize/Overweight Permit transport vehicle so that excessive deflection and ensuing pavement damage can be avoided. In addition, procedures are outlined to safeguard against localized and overall ground fracture under a single, and a large cluster of wheel loads, respectively. Index Terms: Asphalt Concrete, Deflection Tests, Evaluation, Falling Weight Deflectometers, Flexible Pavements, Granular Base, Guidelines, Heavy Load, Overloads, Oversize Loads, Oversized Vehicles, Overweight Loads, Pavement Damage, Pavements, Permits, Procedures, Responses, Wheel Load Available from: Minnesota Department of Transportation Transportation Building, 395 John Ireland Boulevard St Paul MN 55155 USA

Tag	Abstract
Hovey99	Title: LOAD RATING AND PERMIT VEHICLE ROUTING Author(s): Hovey, G: Nord, M Language: English Conference Title: Eighth Transportation Research Board Conference on Bridge Management Sponsored by: Transportation Research Board Committee on Bridge Maintenance and Management (A3C06); and Federal Highway Administration. Location: Denver, Colorado Date Held: 19990426-19990428 Publication Date: 00/00/1999 Pagination: 11p Report No: Features: FIGS: 14 Fig. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The Colorado Department of Transportation (CDOT), through an agreement with In Motion, Inc., of Denver, Colorado, has developed an automated Windows-based PC system for issuing permits for most of the 100, 000+ extra-legal load requests Colorado receives each year. The automated system relies on geographic information system (GIS) information to track the current status of the State's highway network. The system documents pertinent ownership and load information about a truck, checks height, length, and weight restrictions [up to 200, 000 lb (90, 720 kg)], determines an appropriate route, identifies special needs such as pilot cars when necessary, and issues a permit to the trucking firm electronically. The system can select a route for the trucker automatically, check a route requested by the trucker, select a "common route" or a route can be selected by "point-and-click" on a map. The system is flexible and is used to issue single trip and annual permits. The system logs all requests and creates an electronic "rolodex" database of requestors, which saves time and eliminates errors for future requests from the same company. Based on predefined axle and axle group criteria, the system is used to permit loads up to 200, 000 lb (90, 720 kg). Permit requests for loads over 200, 000 lb (90, 720 kg) are sent to, and reviewed by, engineers in CDOT's Staff Bridge Branch Rating Unit. Over the years, CDOT has developed tools to help expedite analyses and provide faster turn-around to the trucking industry. Some of these tools have been incorporated into the automated system and future enhancements will include more of these tools to aid in evaluation of loads greater than 200, 000 lb (90, 720 kg). This paper describes the automated system, the enhancements to the system currently being worked on, the current method of reviewing overload requests, and the future automation for loads over 200, 000 lb (90, 720 kg). Index Terms: Bridge Management Systems, Geographic Information Systems, Heavy Vehicles, Permits, Routing Candidate Terms: Overweight Vehicles Geographic Terms: Colorado Available from: Transportation Research Board Library 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Humphrey97	Title: OVERSIZE/OVERWEIGHT TRANSPORTATION STUDY Author(s): Humphrey, TF Language: English Publication Date: 00/00/1997 Pagination: v.p. Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: Apps. Publisher/Corporate Author(s): Massachusetts Institute of Technology Center for Transportation Studies, 77 Massachusetts Avenue MA 02139 USA Abstract: Throughout the United States, oversize/overweight trucking is a strong viable industry. In Fiscal Year 1994 alone, 1, 927, 010 permits were issued for overweight vehicles, an 8% increase from FY93. It is important to gain an understanding of the oversize/overweight trucking industry and the vital role it plays in keeping the nation's economy moving ahead. That task was accomplished in a large part by a comprehensive report conducted by the Center for Transportation Studies at the Massachusetts Institute of Technology (MIT). The Specialized Carriers & Rigging Association (SC&RA) requested the SC&R Foundation to undertake the research. The report includes a state by state breakdown of oversize/overweight permits for FY93 and FY94, provided by the Federal Highway Administration (FHWA). This information is further broken down into overweight categories: nondivisible single trip, nondivisible multiple trip, divisible single trip, and divisible multiple trip. The report also includes all 13 working papers commissioned by FHWA for its ongoing Comprehensive Truck Size and Weight Study (TS&W). This study's ultimate objective was to estimate the effects of various elements of regulatory policy on a transport system as it evolves to serve a modern global economy. It examines how changing logistics costs, production strategies and shipping patterns must be balanced with the needs and concerns of carriers, managers of infrastructure, shippers, consumers and the traveling public. TS&W policy touches upon safety, infrastructure design and wear, States' rights and national uniformity, environment, energy use, intermodal competition and cost recovery. Index Terms: Cost Recovery, Costs, Energy Consumption, Environmental Aspects, Infrastructure, Intermodal Competition, Logistics, Motor Carriers, Oversized Vehicles, Overweight Loads, Permits, Production, Regulatory Policy, Safety, Shipping Trends, States United States, Trip, Trucking Industry, Trucks, User Needs Available from: Specialized Carriers & Rigging Foundation 2750 Prosperity Avenue, Suite 620 Fairfax VA 22031-4312 USA

Tag	**Abstract**
Impact93	Title: IMPACT ASSESSMENT OF THE REGULATION OF HEAVY TRUCK OPERATIONS Language: English Publication Date: 09/00/1993 Pagination: v.p. Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 3 App. Publisher/Corporate Author(s): Abstract: The main objective of this project was to evaluate the impact of the New York State divisible-load permit system for heavy trucks in terms of costs to society, resulting mostly from increased pavement damage, benefits to the trucking industry (primary economic benefits), and also benefits to New York State's economy (secondary economic benefits). Research objectives include investigation of seasonal variations in truck usage and estimates of costs and benefits for several lower weight limit scenarios, in order to assess the appropriateness of the present weight regime. Available from:

Tag	**Abstract**
List94	Title: IMPROVED CUSTOMER SERVICE AND AUTOMATED ROUTE VERIFICATION FOR THE ISSUANCE OF SPECIAL HAULING PERMITS BY THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION Author(s): List, GF: Nozick, LK: Turnquist, MA Language: English Publication Date: 12/00/1994 Pagination: 40p Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/Corporate Author(s): University Transportation Research Center, Region II City College, Building Y, Room 220 NY 10031- USA Abstract: This report presents a design for an electronic permit issuance system for overdimensional and/or overweight vehicles with nondivisible loads. The system has been designed in collaboration with, and for use by, the New York State Department of Transportation (NYSDOT), but the major elements of the design (if not the specific details) should be transferable to other states or agencies. The effort in this project has focused both on improving the efficiency of the special hauling permitting processes of the NYSDOT and on improving the level of service offered to NYSDOT's customers -- truckers, construction companies, and others applying for permits. The electronic system is designed to replace a largely manual system of data checking, route verification and permit issuance. By linking personal computers at transmission companies (third parties that prepare and submit permit applications for truckers) directly to computers at NYSDOT and equipping these computers with automated route verification capability using a geographical information system (GIS), improved service can be offered at a reduced cost to the state. Index Terms: Computer Systems, Computers, Construction, Costs, Customer Service, Customers, Data, Geographical Information Systems, Hauling, Improvement, Interfaces, New York State, Permits, Personal Computers, Route (Itinerary), Systems Design, Truck Drivers Available from: University Transportation Research Center, Region II City College, Building Y, Room 220 New York NY 10031- USA

Tag	**Abstract**
List95	Title: ELECTRONIC ISSUANCE OF SPECIAL HAULING PERMITS Author(s): List, GF: Nozick, LK: Turnquist, MA Language: English Conference Title: Intelligent Transportation: Serving the User Through Deployment. Proceedings of the 1995 Annual Meeting of ITS America. Sponsored by: ITS America Location: Washington, D.C. Date Held: 19950315-19950317 Publication Date: 00/00/1995 Pagination: pp 1071-79 Report No: Features: FIGS: 8 Figs. REFS: 4 Refs. Publisher/Corporate Author(s): ITS America 400 Virginia Avenue, SW, Suite 800 DC 20024-2730 USA Abstract: This paper presents a design for an electronic permit issuance system for overdimensional and/or overweight vehicles with nondivisible loads. The system has been designed for use by the New York State Department of Transportation (NYSDOT), but the major elements of the design (if not the specific details) should be transferable to other states or agencies. An electronic permitting system contributes to the two main goals established within the intelligent vehicle-highway system (IVHS) functional area of commercial vehicle operations (CVO): (1) Increasing the safety of commercial vehicles; (2) Increasing the efficiency of the activities and associated regulatory activities. Index Terms: Commercial Vehicles, Electronic Scanners, Intelligent Vehicle Highway Systems, Overweight Loads, Permits, Regulatory Policy Available from: ITS America 400 Virginia Avenue, SW, Suite 800 Washington DC 20024-2730 USA

Tag	Abstract
McGhie90	Title: HEAVILY LOADED TRAILERS: AN APPROACH TO EVALUATE THEIR INTERACTION WITH ASPHALT CONCRETE PAVEMENTS Author(s): McGhie, J: Shepard, B: Sousa, JB Journal Title: Transportation Research Record Issue: 1286 Publication Date: 00/00/1990 Pagination: pp 95-111 Report No: ISBN: 0-309-05070-7 Features: FIGS: 19 Fig. TABS: 4 Tab. REFS: 9 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The Permits Department of the California Department of Transportation is often asked to issue permits for the movement of unusual vehicle configurations. It then becomes necessary to evaluate the damage these configurations cause. The shaking table of the Earthquake Engineering Research Center at the Richmond Field Station was used to investigate and compare some aspects of the dynamic behavior of a new super-heavy haul vehicle trailer (JXS), equipped with an hydraulic cylinder-nitrogen suspension, with those of four other, currently used, semitrailer types. Based on the data obtained during the tests conducted on the shaking table improvements on the JXS suspension were made, and it can be concluded that levels of the dynamic component of the loads, induced by the JXS at normal highway operations, are within the same range of magnitude as those produced by the other trailers studied. The results also suggest that the difference in performance between trailers equipped with leaf-spring suspensions and trailers equipped with air bag suspensions is greater than the difference between tridem trailers and tandem trailers equipped with air bags. From a dynamic point of view, the effect of suspension type appears to be more significant than the number of axles. Index Terms: Air Bags, Asphaltic Concrete, Dynamic Response, Heavy Vehicle, Improvement, Leaf Springs, Overweight Loads, Semitrailers, Shaking Table Test, Test Results, Truck Pavement Damage, Vehicle Pavement Interaction, Vehicle Suspension Systems Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Meyburg91	Title: IMPACT ASSESSMENT OF THE REGULATION OF HEAVY TRUCK OPERATIONS Author(s): Meyburg, AH: Schuler, RE Language: English Publication Date: 01/00/1991 Pagination: n.p. Report No: Features: TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): University Transportation Research Center, Region II City College, Building Y, Room 220 NY 10031- USA Abstract: This report provides the results of a literature review of heavy vehicle impacts, it describes the design of a truck usage survey for the New York State (NYS) divisible-load permit vehicle fleet, it discusses the questionnaire design for the truck usage survey, it provides the results of the first survey, and it provides a preliminary analysis of the primary economic impact analysis of the permit vehicle operations. Also, a brief discussion of the methodology for the secondary economic impact analysis is provided, as is a preliminary pavement damage assessment methodology and the results of its application. Finally, the scope of work for the second year of this project is presented. Index Terms: Analysis, Assessments, Economic Impacts, Economics, Heavy Vehicles, Impact, Infrastructure, Load Restrictions, Methodologies, Operations, Pavement Damage, Permits, Private, Public, Regulations, Regulatory Policy, Surveys (Data Collection), Trucks Available from: University Transportation Research Center, Region II City College, Building Y, Room 220 New York NY 10031- USA

Tag	**Abstract**
Meyburg96	Title: COLLECTING USAGE DATA FOR ANALYZING A HEAVY-VEHICLE, DIVISIBLE-LOAD PERMIT SYSTEM Author(s): Meyburg, AH: Saphores, J-DM: Schuler, RE Language: English Journal Title: Transportation Research Record Issue: 1522 Publication Date: 00/00/1996 Pagination: pp 9-17 Report No: ISBN: 0309062195 Features: FIGS: 2 Fig. TABS: 4 Tab. REFS: 4 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The collection of truck usage data for performing a benefit-cost analysis of the New York State Divisible-Load Permit System is described. To motivate the data collection requirements, the procedures used for estimating both infrastructure costs and economic benefits are briefly described. The survey procedure is summarized, as are data gathered on permitted vehicles, operator characteristics, and truck usage. Advantages and shortcomings of the methodology for collecting data are reviewed from the perspective of analyzing divisible-load permit systems for heavy vehicles. The overall study is one of the first attempts to assess the economic impact of permit systems based on actual usage data provided voluntarily by truck operators through seasonal mail surveys. As illustrated by the authors in a 1994 report, the economic benefits of a permit system for trucks hauling heavy divisible loads can be substantial. The collected survey data were adequate for providing order-of-magnitude estimates of benefits and costs although bridge damage and accident costs could not be evaluated because of a lack of data. Results should therefore be of interest to transportation officials throughout the country for use in evaluating the merits of allowing extra-heavy vehicles on the roads. Index Terms: Benefit Cost Analysis, Costs, Divisible-Load Permit Systems, Economic Benefits, Economic Impacts, Estimating, Heavy Vehicles, Infrastructure, New York State, Overloads, Surveys (Data Collection), Truck Pavement Damage Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	**Abstract**
Meyburg98	Title: THE ECONOMIC IMPACTS OF A DIVISIBLE-LOAD PERMIT SYSTEM FOR HEAVY VEHICLES Author(s): Meyburg, AH: Saphores, J-D: Schuler, RE Language: English Journal Title: Transportation Research. Part A: Policy and Practice Volume: 32 Issue: 2 Publication Date: 02/00/1998 Pagination: pp 115-127 Report No: Features: FIGS: Figs. REFS: Refs. Publisher/Corporate Author(s): Elsevier Science, Limited The Boulevard, Langford Lane England Abstract: A methodology is demonstrated for analyzing the economic impacts of various weight limits for heavy vehicles through an application to New York State. Truck usage data were gathered from truck operators in 1990-1991 through three seasonal mail surveys, which allowed the collection of sensitive truck usage data while guaranteeing anonymity to the respondents. The benefits of this permit system are primarily lower business costs for those operators who hold permits; in the long-run, part of the savings realized by the truck operators flow to most sectors of the state's economy. On the cost side, increased infrastructure damage is assumed to result primarily from increased pavement damage. An important finding of this study is the surprising level of non-compliance with permitted weight limits that was reported voluntarily. Index Terms: Cost-Benefit Analysis, Heavy Vehicles, Load Limits, Load Restrictions, Permits, Surveys (Data Collection), Truck Load Limits Available from: Elsevier Science, Limited 660 White Plains Road Tarrytown NY 10591-5153 England

Tag	Abstract
Minervino99	Title: LOAD RATING AND PERMIT REVIEW USING LOAD AND RESISTANCE FACTOR PHILOSOPHY Author(s): Minervino, CM: Sivakumar, B Language: English Conference Title: Eighth Transportation Research Board Conference on Bridge Management Sponsored by: Transportation Research Board Committee on Bridge Maintenance and Management (A3C06); and Federal Highway Administration. Location: Denver, Colorado Date Held: 19990426-19990428 Publication Date: 00/00/1999 Pagination: 8p Report No: Features: TABS: 2 Tab. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The new American Association of State Highway and Transportation Officials (AASHTO) Manual for condition Evaluation and Load and Resistance Factor Rating of Bridges being developed under National Cooperative Highway Research Program (NCHRP) Project 12-46 will be consistent with the AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications in using a reliability based limit states philosophy. The primary goal of this project is to produce a practical evaluation manual that is easy to understand and use, which will receive broad support for adoption and distribution by the AASHTO Subcommittee on Bridges and Structures. The reliability aspects will remain invisible to the evaluation engineer through the use of calibrated load and resistance factors, as was done in the LRFD Specifications. A pre-final Draft Manual was submitted for review and testing in March 1999 and the final Draft Manual is scheduled for completion by the end of 1999. The new Manual provides procedures and calibrated load and resistance factors for load rating and for overweight permit review. Index Terms: Bridges, Heavy Vehicles, Manuals, Permits, Routing Candidate Terms: Load And Resistance Factors, Load Ratings, Overweight Vehicles P Terms: AASHTO Available from: Transportation Research Board Library 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	**Abstract**
Monismith93	Title: NONLINEAR ELASTIC VISCOUS WITH DAMAGE MODEL TO PREDICT PERMANENT DEFORMATION OF ASPHALT CONCRETE MIXES Author(s): Monismith, CL: Sackman, JL: Sousa, J: Weissman, SL Language: English Journal Title: Transportation Research Record Issue: 1384 Publication Date: 00/00/1993 Pagination: pp 80-93 Report No: ISBN: 0309054540 Features: FIGS: 20 Fig. TABS: 3 Tab. REFS: 11 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The development and use of a nonlinear elastic, viscous with damage model are discussed. The model is proposed as a constitutive relation for asphalt concrete mixes to permit prediction of permanent deformation. The model is intended to capture the macrobehavior of mixes, including (a) the dilatancy observed when the mix is subjected to shear strains, (b) the increase of effective shear modulus under increased hydrostatic pressure, (c) the significant variation of behavior with changes in temperature and rates of loading, and (d) the residual accumulation of permanent deformation under repetitive loading. This model has been developed as part of the Strategic Highway Research Program A-003A efforts to characterize the permanent deformation characteristics of asphalt-aggregate mixes. A new series of tests proposed for the determination of the material properties is presented; modeled and observed responses from a simple validation test are compared; and the use of the model to predict permanent deformation response in an asphalt concrete pavement section is illustrated. Index Terms: Asphaltic Concrete, Deformation, Dilatancy, Loading Rate, Macrobehavior, Models, Pavement Performance, Predictions, Repetitive Loading, Shear Modulus, Strategic Highway Research Program, Temperature Effects Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	**Abstract**
Noyszewski 75	Title: EFFECT OF HEAVY AXLE LOADS ON BRIDGES Author(s): Noyszewski, M Publication Date: 10/00/1975 Pagination: pp 133-138 Report No: Features: FIGS: 9 Fig. Publisher/Corporate Author(s): Federal Railroad Administration 400 7th Street, SW DC 20590 USA Abstract: It is estimated there are 3500 miles of bridges on American railroads; replacement cost is estimated at $10 billion. The problem is not the spectacular, long-span steel bridges, but the many structures built many years ago for much lighter loading. As reconstruction is deferred, more speed and weight restrictions will have to be imposed; modern equipment may have to be prohibited from many lines. With scarce capital it will be many years before the frail steel spans of 1880-1900 are replaced. The Cooper E-60 rating permitted by the AAR Mechanical Division does not produce cars capable of unrestricted operation over the rail network. Timber trestles are particularly vulnerable to closely spaced axles. Index Terms: Axle Loadings, Bridge Design, Bridge Reconstruction, Cooper Ratings, Decision Making, Freight Car Design, Speed Limit, Timber Bridges Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Southgate90	Title: ESTIMATION OF EQUIVALENT AXLELOADS USING DATA COLLECTED BY AUTOMATED VEHICLE CLASSIFICATION AND WEIGH-IN-MOTION EQUIPMENT Author(s): Southgate, HF Language: English Publication Date: 06/00/1990 Pagination: 85p Report No: Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW 20590 Kentucky Transportation Cabinet State Office Building, Clinton and High Streets 40622 Kentucky University Kentucky Transportation Center, College of Engineering KY 40506-0043 USA Abstract: The primary objective of this research study was to modify the existing Equivalent Axle Load (EAL) estimation system to include data obtained using the Golden River Weigh-In-Motion (WIM) system and automated vehicle classification equipment. Data are to be collected over a three-year cycle in accordance with the Federal Highway Administration (FHWA) Traffic Monitoring Guide. Having the capability of moving the portable WIM scales to locations other than interstate sites permits the collection and analysis of specific data at sites on other highway functional classifications. Such data permits estimating both accumulated and future EAL requirements for that site. Such data permits estimating EAL requirements for sites on the same highway functional classification for which the annual average daily traffic (AADT) is the only available data. An algorithm was developed to identify heavy/coal trucks weighed by WIM. The algorithm involves a minimum weight for straight-frame trucks, and for semi-trailer coal trucks has the additional parameter of gross weight divided by the spacing between the last axle on the tractor and the first axle on the trailer. The algorithm works because the coal semi-trailer is shorter than a normal semi-trailer. Historical data files have been sorted by highway functional classification to permit calculating EAL requirements on a three-year cycle corresponding to the requirements of the FHWA Traffic Monitoring Guide. The revised computer programs use the same data format contained in historical files. The basic equation for estimating EALs contains the following seven parameters as independent variables: 1) AADT volume, 2) average fraction of trucks in the traffic stream, 3) average fraction of coal trucks in the total truck population, 4) average number of axles per coal truck, 5) average number of axles per non-coal truck, 6) average number of EALs per coal-truck axle, and 7) average number of EALs per non-coal-truck axle. Index Terms: Algorithms, Annual Average Daily Traffic, Axles, Coal Trucks, Equations, Equivalent Single Axle Loads, Estimating, Heavy Duty Trucks, Highway Classification, Vehicle Classification, Weigh-In-Motion Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: KENTUCKY TRANSPORTATION CENTER, KENTUCKY UNIVERSITY

Tag	Abstract
Uniformity88	Title: Uniformity Efforts In Oversize/Overweight Permits Journal Title: NCHRP Synthesis of Highway Practice Issue: 143 Publication Date: 12/00/1988 Pagination: 85p Report No: ISBN: 0-309-04553-3 Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 3 App. Publisher/Corporate Author(s): Abstract: The purpose of this synthesis is to summarize efforts directed at achieving national uniformity in the basic elements of oversize and overweight permit functions for nondivisible loads. Key results of research efforts on this topic over the past 20 years are summarized. Also described are six state-level efforts, three national-level efforts, and one industry-level effort aimed at developing common, multistate agreements. One state-level effort in particular appears to provide a positive experience in developing a common set of permit procedures: five New England states signed an agreement on April 28, 1987, and expect to have a common set of permit procedures fully operational by early 1989. Available from:

Tag	Abstract
Whitton41	Title: REPORT OF COMMITTEE ON PERMITS FOR OVERSIZE AND OVERWEIGHT VEHICLES Author(s): Whitton, RM Journal Title: Highway Research Board Proceedings Publication Date: 00/00/1941 Report No: Publisher/Corporate Author(s): Abstract: various phases of each state's policy in the matter of issuing permits for oversize and overweight movements were determined by questionnaires in September, 1940. The committee thought that it would be desirable if states would standardize on the following items: (1) no permit should be granted for the movement of a vehicle and/or load which is readily reducible to the legal limitations. (2) no permit should be granted for a proposed interstate or a long intra- state movement of a vehicle which has a gross wheel load of over 9, 000 lb. Or a gross axle load of over 18, 000 lb. (3) overweight and oversize permits should be handled through the maintenance bureau or division of the state highway department. Index Terms: Axle Load, Gross Load, Licenses, Oversize Loads, Overweight Loads, Questionnaire, Vehicle, Wheel Load Available from:

Abstracts on Truck Weight and Relation to Rating

Tag	Year	Citation
Barker97	97	05/00/1997 RELIABILITY OF INELASTIC LOAD CAPACITY RATING LIMITS FOR STEEL BRIDGES Journal: Journal of Composites for Construction Vol: 2 No: 2 AUTHOR(S): Barker, MG Zacher, JA
Fu97	97	04/00/1997 SAFETY-BASED BRIDGE-OVERSTRESS CRITERIA FOR NONDIVISIBLE LOADS AUTHOR(S): Fu, G Hag-Elsafi, O
Commander 96	96	00/00/1996 AN EFFICIENT METHOD FOR EVALUATING THE LOAD RESPONSE BEHAVIOUR OF STEEL AND PRESTRESS CONCRETE BRIDGES Conference: Structural Materials Technology. An NDT Conference. AUTHOR(S): Commander, B Johnson, L Patterson, S Schulz, J Stephens, J
Fu96	96	00/00/1996 NEW SAFETY-BASED CHECKING PROCEDURE FOR OVERLOADS ON HIGHWAY BRIDGES Journal: Transportation Research Record No: 1541 AUTHOR(S): Fu, G Hag-Elsafi, O
Barker95	95	00/00/1995 GUIDE SPECIFICATION STRENGTH CAPACITY RATING OF EXISTING GIRDER BRIDGES Journal: Transportation Research Record No: 1476 AUTHOR(S): Barker, MG
Ghosn95	95	05/00/1995 BRIDGE OVERSTRESS CRITERIA. FINAL REPORT AUTHOR(S): Ghosn, M Moses, F Runco, G Schilling, CG
Prasad94	94	00/00/1994 COMPUTERIZED OVERLOAD PERMITTING PROCEDURE FOR INDIANA Journal: Transportation Research Record No: 1448 AUTHOR(S): Prasad, NBR Ramirez, JA White, DW White, TD Zaghloul, SM
Ghosn91	91	00/00/1991 RELIABILITY AND LOAD MODELING FOR BRIDGE MANAGEMENT Journal: Transportation Research Record No: 1290 AUTHOR(S): Ghosn, M Moses, F
Huang91	91	12/00/1991 A COMPUTER SYSTEM FOR BRIDGE RATING AND FATIGUE LIFE ANALYSIS. FINAL REPORT AUTHOR(S): Huang, J Wang, T-L
Fu90	90	09/01/1990 A RELIABILITY ANALYSIS OF PERMIT LOADS ON BRIDGES. FINAL REPORT AUTHOR(S): Fu, GK Liu, YW Moses, F
Lieber90	90	11/00/1990 AUTOMATED PROCEDURE FOR THE REGULATION OF OVERWEIGHT VEHICLES ON WYOMING'S HIGHWAYS AUTHOR(S): Lieber, SR Puckett, JA
Load87	87	12/00/1987 LOAD CAPACITY EVALUATION OF EXISTING BRIDGES Journal: NCHRP Report No: 301

Tag	Year	Citation
Ghosn86	86	00/00/1986 EVALUATION OF STEEL BRIDGES USING IN-SERVICE TESTING Journal: Transportation Research Record No: 1072 AUTHOR(S): Ghosn, M Gobieski, J Moses, F
Ghosn84	84	00/00/1984 APPLICATION OF LOAD SPECTRA TO BRIDGE RATING Journal: Transportation Research Record Vol: 1 No: 950 AUTHOR(S): Ghosn, M Moses, F Snyder, RE
Moses82	82	00/00/1982 LOAD SPECTRA FOR BRIDGE EVALUATION Journal: IABSE Reports Vol: 38 AUTHOR(S): Moses, F
Truck82	82	06/00/1982 TRUCK WEIGHT DISTRIBUTION. SAFE, PROPER LOAD BALANCING SAVES WEAR AND REDUCES LOSS Journal: Glass Dealer Vol: 32 No: 6
High79	79	03/00/1979 HIGH-CAPACITY CLARKS Journal: Container News Vol: 14 No: 3
Evaluation78	78	00/00/1978 EVALUATION AND POSTING OF BRIDGES IN ONTARIO Journal: Transportation Research Record No: 664
Mackie78	78	10/00/1978 EFFECTS OF HOURS OF SERVICE REGULARITY OF SCHEDULES, AND CARGO LOADING ON TRUCK AND BUS DRIVER FATIGUE AUTHOR(S): Mackie, RR Miller, JC
Moses76	76	08/00/1976 PROBABILITY THEORY FOR HIGHWAY BRIDGE FATIGUE STRESSES PHASE II AUTHOR(S): Moses, F Pavia, AP

Tag	**Abstract**
Barker95	Title: GUIDE SPECIFICATION STRENGTH CAPACITY RATING OF EXISTING GIRDER BRIDGES Author(s): Barker, MG Language: English Journal Title: Transportation Research Record Issue: 1476 Publication Date: 00/00/1995 Pagination: pp 98-105 Report No: ISBN: 0309061148 Features: FIGS: 5 Fig. TABS: 2 Tab. REFS: 11 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The impact of the AASHTO Guide Specifications for Strength Evaluation of Steel and Concrete Bridges (STRENGTH method) on 40 steel and 33 concrete bridges in Missouri was investigated. The STRENGTH method is a reliability-based load and resistance factor rating procedure. The variable factors depend on levels of redundancy, deterioration, inspection, maintenance, truck volume, and weight enforcement, and selection of these factors is subjective, requiring considerable engineering judgment. The STRENGTH method considers site-specific loading and capacity characteristics to obtain consistent levels of safety over the bridge inventory. For bridges with good load and resistance characteristics, the STRENGTH method can significantly increase load ratings over current AASHTO load factor rating operating levels. However, deterioration and adverse traffic conditions can cause STRENGTH ratings to fall below load factor rating inventory levels. A method to evaluate the load capacity of concrete bridges that do not have detailed bridge plans is also investigated. Index Terms: AASHTO, Concrete Bridges, Girder Bridges, Load Carrying Capacity, Specifications, Steel Bridges, Strength Analysis Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Barker97	Title: RELIABILITY OF INELASTIC LOAD CAPACITY RATING LIMITS FOR STEEL BRIDGES Author(s): Barker, MG: Zacher, JA Language: English Journal Title: Journal of Composites for Construction Volume: 2 Issue: 2 Publication Date: 05/00/1997 Pagination: pp 45-52 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/Corporate Author(s): American Society of Civil Engineers 345 East 47th Street NY 10017-2398 USA Abstract: This paper examines load capacity ratings and reliabilities for two bridges comprising compact sections: a single-span composite bridge and a three-span composite bridge. The limit states examined are the first-hinge limit, the shakedown limit using lateral distribution factors and a single-girder analysis, and the shakedown limit of the system using a side-by-side truck loading. The load capacity ratings and safety indices of the three capacity limits are compared and discussed for the two bridges. Index Terms: Bridge Capacity, Capacity, Composite Beam Bridge Decks, Shakedown, Steel Bridges Available from: American Society of Civil Engineers 345 East 47th Street New York NY 10017-2398 USA

Tag	Abstract
Commander 96	Title: AN EFFICIENT METHOD FOR EVALUATING THE LOAD RESPONSE BEHAVIOUR OF STEEL AND PRESTRESS CONCRETE BRIDGES Author(s): Commander, B: Johnson, L: Patterson, S: Schulz, J: Stephens, J Language: English Conference Title: Structural Materials Technology. An NDT Conference. Sponsored by: The California Department of Transportation, FHWA, California Transportation Foundation Location: San Diego, CA Date Held: 19960220-19960223 Publication Date: 00/00/1996 Pagination: pp 128-133 Report No: Features: FIGS: 4 Fig. TABS: 1 Tab. REFS: 2 Ref. Publisher/Corporate Author(s): Technomic Publishing Company, Incorporated 851 New Holland Avenue, Box 3535 PA 17604- USA Abstract: Four bridges on the interstate system in Montana were field tested under vehicle loads as part of a study on the effects of heavy Canadian style trucks on the highway infrastructure. Three prestress concrete and one steel bridge were tested in four days under various moving loads. The data were used to study bridge behavior and calculate bridge load ratings. Index Terms: Bridge Tests, Bridges, Canada, Data, Efficiency, Evaluation, Highway, Infrastructure, Load Tests, Methods, Moving Loads, Prestressed Concrete Bridges, Ratings, Responses, Steel Bridges, Tests, Trucks Available from: Technomic Publishing Company, Incorporated Order Department, 851 New Holland Avenue, Box 3535 Lancaster PA 17604- USA

Tag	**Abstract**
Evaluation78	Title: EVALUATION AND POSTING OF BRIDGES IN ONTARIO Journal Title: Transportation Research Record Issue: 664 Publication Date: 00/00/1978 Pagination: pp 221-229 Report No: Features: FIGS: 15 Fig. TABS: 1 Tab. REFS: 9 Ref. Publisher/Corporate Author(s): Abstract: The present system of posting substandard bridges in Ontario with a single load limit serves only as a vague warning to a driver that the bridge is somewhat deficient. Truck drivers generally disregard the posting sign, because they know they can carry heavier loads across without causing any apparent damage to the bridge. The quantitative definition of the posted value is based upon a design load reflecting vehicles in common use three decades ago, and herein lies the problem. Diverse modern traffic cannot be effectively represented by any single value posting which is generally too restrictive on short span bridges, especially for the long vehicles. Specified loads for the purpose of bridge design can be determined through statistically based load surveys to a significant degree of reliability. The procedure employs the concept of the "Equivalent Base Length" to transform actual vehicles into uniformly distributed loads for mathematic manipulations leading to a single truck model which efficiently represents the wide variation in vehicle types. This report describes the development of live loads and a new triple posting system. Both have been adopted as the basis of capacity rating of existing bridges in the new Ontario Highway Bridge Design Code. The system employs the philosophy of ultimate limit states in evaluation of three levels of posting using an appropriate loading model for each level. Adjustments to the calculated load-carrying capacity are made to account for the operational overloads beyond legal limits, inherent to human nature, and the unusual distribution of loads on various axles in a partially loaded vehicle. Available from:

Tag	Abstract
Fu90	Title: A RELIABILITY ANALYSIS OF PERMIT LOADS ON BRIDGES. FINAL REPORT Author(s): Fu, GK: Liu, YW: Moses, F Publication Date: 09/01/1990 Pagination: 120p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 16 Ref. APPS: 1 App. Publisher/Corporate Author(s): Case Western Reserve University Department of Civil Engineering OH 44106 USA Federal Highway Administration 400 7th Street, SW 20590 Ohio Department of Transportation 25 South Front Street, P.O. Box 899 43216-0899 Abstract: Most states, including Ohio, have recently seen increasing numbers of overweight permit trucks and requests for even heavier and more frequent overloads. A major concern is the effect of such loads on the safety and remaining life of highway bridges. The study used a statistical data base for bridge loadings and simulated the effects of permit overloads. The simulation included distributions of truck weights, volumes, multiple lane occupancy and vehicle spacings. The output was a distribution (mean and coefficient of variation) of maximum load effect for a specified time duration ranging from a single vehicle crossing to a two-year inspection interval. A reliability model of bridge safety consistent with recent AASHTO code developments was broadened to cover permit loadings. Three categories of permit trucks were considered including a) routine frequent permits, b) special-single passage permits and c) escorted vehicles. For each permit category, load factors were derived to produce target reliability levels. Examples are included. The recommendations for reviewing permit loads were implemented in a specification format. These provisions are being incorporated in the proposed new AASHTO Maintenance Inspection Manual now under review. In addition, to facilitate permit issuance "bridge formulas" were derived which relate the permit vehicles subgroup weight and wheel base to the bridge rating factor preset as a percentage of the Ohio legal load. Also, formulas were derived to convert all bridges to an equivalent HS level. To assist in developing a permit fee structure, the study reviewed fatigue damage models. Several results are given based on a cost per bridge or a cost per route mile to assess different weight permits. Index Terms: Bridge Inspection, Damage, Fatigue (Materials), Fees, Highway Bridges, Overweight Loads, Permits, Recommendations, Safety, Specification, Statistical Analysis, Truck Effects (Bridges), Truck Load Limits Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Fu96	Title: NEW SAFETY-BASED CHECKING PROCEDURE FOR OVERLOADS ON HIGHWAY BRIDGES Author(s): Fu, G: Hag-Elsafi, O Language: English Journal Title: Transportation Research Record Issue: 1541 Publication Date: 00/00/1996 Pagination: pp 22-28 Report No: ISBN: 0309059143 Features: FIGS: 9 Fig. TABS: 4 Tab. REFS: 13 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Overweight trucks exceeding legal weight limits are seen crossing highway bridges. Many states adopt the AASHTO rating concept with or without an overstress criterion to check overweight permits for bridge evaluation. However, the basis of these overstress criteria has not been well documented, and the AASHTO load-rating concept is not intended to be applicable to overweight truck traffic. The development of a new overload-permit checking procedure for bridge evaluation, in the format of load and resistance factors and based on relatively uniform bridge safety, is presented. Annual and trip overload permits for nondivisible loads are covered. This procedure may be included in bridge evaluation codes for overload checking. Index Terms: Highway Bridges, Load And Resistance Factors, Nondivisible Loads, Overload Checking, Overloads, Overweight Loads, Permits, Safety, Truck Laws & Regulations Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	**Abstract**
Fu97	Title: SAFETY-BASED BRIDGE-OVERSTRESS CRITERIA FOR NONDIVISIBLE LOADS Author(s): Fu, G: Hag-Elsafi, O Language: English Publication Date: 04/00/1997 Pagination: 46p Report No: Features: FIGS: 16 Fig. TABS: 10 Tab. REFS: 18 Ref. Publisher/Corporate Author(s): Federal Highway Administration 400 7th Street, SW DC 20590 New York State Department of Transportation Transportation Research and Development Bureau, State Campus NY 12232-0869 USA Abstract: Most states face increasing pressure to issue more permits for heavier overweight trucks, and currently use the AASHTO rating concept (with or without an overstress criterion) in checking these loads. That bridge-rating procedure, however, is intended to cover only normal traffic, and the basis for these overstress criteria involved is not well documented. This report discusses current New York State practice for checking overweight permits. A new permit-issuance procedure for checking overloads is then proposed for both annual and trip permits for nondivisible loads, based on principles of uniform bridge safety. This procedure may be included in bridge-evaluation specifications. Index Terms: Bridges, New York State, Overweight Loads, Permits, Safety, Structural Behavior, Truck Weights Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Ghosn84	Title: APPLICATION OF LOAD SPECTRA TO BRIDGE RATING Author(s): Ghosn, M: Moses, F: Snyder, RE Journal Title: Transportation Research Record Volume: 1 Issue: 950 Publication Date: 00/00/1984 Pagination: pp 45-53 Report No: Features: FIGS: 14 Fig. TABS: 6 Tab. REFS: 14 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Important safety decisions are made each time a bridge is evaluated. Field inspections have concentrated on estimating deterioration and dimensions of load-carrying members. How to measure and use a load spectrum at the site is described. Information on truck loads, dynamic impact, and girder distribution can provide additional data for rating bridges. Five sites in Ohio are reported. In addition, almost 100 other instrumented bridges have been studied by a similar weigh-in-motion operation, which uses existing bridges to provide equivalent static weights of passing vehicles. Weight data are unbiased because the field operation is undetected by drivers. The measured bridge load spectra can replace conservative AASHTO rating recommendations for impact and girder distribution factors. In order to enhance this application a reliability or probabilistic approach incorporates the measured site load spectra in evaluating the bridge safety. Loading is modeled by random variables including truck weight, traffic volume (affecting multiple presence), axle spacings and loads, impact, girder distribution, and measured stresses. A load simulation forecasts the maximum response for periods corresponding to inspection intervals. The calculation incorporates uncertainties and provides a reliability measure for comparing bridge safety. Examples include ultimate strength and fatigue-limit states. Strategies are described for using the load spectra and the reliability model to develop load factors for rating, schedules for inspection intervals, posting control, and redundancy evaluation. Index Terms: Bridge, Fatigue Limit, Inspection, Load Factor, Loads, Measuring Instruments, Postings, Probabilistic Analysis, Rating, Redundancy, Reliability, Safety, Structural Behavior, Ultimate Strength, Uncertainty, Weigh-In-Motion Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	**Abstract**
Ghosn86	Title: EVALUATION OF STEEL BRIDGES USING IN-SERVICE TESTING Author(s): Ghosn, M: Gobieski, J: Moses, F Journal Title: Transportation Research Record Issue: 1072 Publication Date: 00/00/1986 Pagination: pp 71-78 Report No: ISBN: 0-309-04066-3 Features: FIGS: 4 Fig. TABS: 5 Tab. REFS: 9 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Highway bridges often exhibit higher strengths than indicated by AASHTO rating procedures. This is because the code is inherently conservative and is intended to be applied to general situations. A more appropriate approach is to incorporate field observations in the rating process. A field measurements (weigh-in-motion) system is capable of providing all pertinent data on the loading and response of highway bridges. The data collected include measured stresses and girder distribution factors in addition to truck weights and volumes. The data are then incorporated in a working stress design rating or in a reliability-based safety evaluation of bridge members. Results from an example site indicate high safety levels despite the large numbers of permit vehicles allowed. Index Terms: Evaluation, Field Observation, Loading, Safety, Steel Bridges, Stresses, Weigh-In-Motion Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Ghosn91	Title: RELIABILITY AND LOAD MODELING FOR BRIDGE MANAGEMENT Author(s): Ghosn, M: Moses, F Journal Title: Transportation Research Record Issue: 1290 Publication Date: 00/00/1991 Pagination: pp 176-184 Report No: ISBN: 0-309-05067-7 Features: FIGS: 4 Fig. TABS: 4 Tab. REFS: 19 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Managing the nation's bridge infrastructure requires major decisions on design and construction of new bridges, replacement, strengthening or posting of deficient bridges, issuing permits for truck overloads, and the implementation of truck weight regulations. These decisions have to be made after a careful review of the safety of the affected bridges. This paper illustrates how structural reliability theory can be used to provide tools for bridge management decisions. Using a reliability index as safety criteria, this paper describes reliability-based methods for the development of: a) Criteria for selection of load and resistance factors for a new LRFD bridge design code; b) Flexible load capacity evaluation or rating techniques for existing bridges; c) Fatigue evaluation procedures for steel bridges; and d) New bridge formulas for establishing truck weight regulations. Index Terms: Bridge Capacity, Bridge Design, Bridge Management Systems, Decision Making, Design Criteria, Fatigue (Materials), Formulas, Highway Bridges, Loads, Mathematical Models, Safety, Steel Bridges, Structural Reliability, Weight Limits Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Ghosn95	Title: BRIDGE OVERSTRESS CRITERIA. FINAL REPORT Author(s): Ghosn, M: Moses, F: Runco, G: Schilling, CG Language: English Publication Date: 05/00/1995 Pagination: 213p Period Covered: 8810-9209 Report No: Features: FIGS: 18 Fig. TABS: 70 Tab. REFS: 88 Ref. Publisher/Corporate Author(s): City College of the City University of New York Department of Civil Engineering NY 10031- USA Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 Abstract: This report presents a reliability-based procedure to determine the optimal allowable loads on highway bridges considering both static and dynamic effects. A truck weight (bridge) formula was developed to provide acceptable levels of safety for bridges designed according to the 15th edition of the AASHTO specifications. Using the safety index as a measure of safety, the truck weight formula was developed to produce a safety index value of 2.5. Twelve bridges of different material types, span lengths and configurations were analyzed for truck loads corresponding to the proposed truck weight formula. The results of the rating evaluation of these bridges showed large variations between the rating values for LFD and WSD procedures and inventory or operating stresses. Application of the higher truck weight limits to a large sample of bridges from the National Bridge Inventory indicated an increase in the number of deficient bridges if the inventory rating stress is used in the evaluation procedure. However, very few of the existing bridges would be considered deficient if the operating ratings are used. A fatigue analysis determined the relative fatigue damage caused by various new truck types and traffic scenarios that might result from changes in truck regulations. The fatigue calculations for actual bridges suggest that many existing bridges would not be affected by the possible truck regulation changes. Even for bridges with fatigue stresses above the fatigue limit, the reduced fatigue lives with the new regulations may still be sufficient for practical requirements. Index Terms: Fatigue Analysis, Fatigue Life, Fatigue Limit, Fatigue Stress, Highway Bridges, Loads, Ratings, Size And Weight Laws, Truck Effects (Bridges), Truck Laws & Regulations, Truck Weight Formula Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
High79	Title: HIGH-CAPACITY CLARKS Journal Title: Container News Volume: 14 Issue: 3 Publication Date: 03/00/1979 Pagination: n.p. Report No: Publisher/Corporate Author(s): Communication Channels, Incorporated 6285 Barfield Road GA 30328 USA Abstract: To meet the increased demand for lift trucks to handle 20 to 40 tons, Clark Equipment Company's Industrial Truck Division has introduced a new line of trucks consisting of six models with capacity ratings from 40, 000 to 80, 000 pounds. The trucks, largest of Clark's C500 Y Line, have pneumatic tires and are diesel powered. They feature full-reversing powershift transmission, hydrostatic power steering and planetary axles. Clark has also introduced a high-mounted expandable container spreader, with a rate capacity of 70, 000 pounds and a 48-inch load center. It has been designed to handle 20- and 40-foot containers and features automatic lock stops. With a 266-inch upright, the unit allows 9' 6" containers to be stacked three-high. Index Terms: Cargo Handling Gear (Terminals), Container Handling Equipment, Container Spreaders, Fork Lift Trucks, Lifting Equipment, Materials Handling Available from: Reader Service Computer Center Container News, P.O. Box 13809 Philadelphia PA 19101 USA Acknowledgement of Document Source: Communication Channels, Incorporated

Tag	**Abstract**
Huang91	Title: A COMPUTER SYSTEM FOR BRIDGE RATING AND FATIGUE LIFE ANALYSIS. FINAL REPORT Author(s): Huang, J: Wang, T-L Language: English Publication Date: 12/00/1991 Pagination: 140p Period Covered: 9001-9109 Report No: Features: FIGS: 37 Fig. TABS: 4 Tab. REFS: 14 Ref. APPS: 2 App. Publisher/Corporate Author(s): Contract|HP&R C-3376|Proj No. 0510523 TRIS20 Federal Highway Administration 400 7th Street, SW 20590 Florida Department of Transportation Haydon Burns Building, 605 Suwannee Street 32301 Florida International University Department of Civil and Environmental Engineering, University Park FL 33199- USA Abstract: In order to insure bridge safety for the traveling public and to protect the initial investment, the bridge capacity rating and the prediction of remaining service life of highways were studied in this project. The objectives of this project were (1) the development of a computer package for highway bridge rating based on new AASHTO specifications and (2) the prediction of fatigue life for highway steel bridges by using the stress range and average daily truck traffic. Eight different truck loads and the equivalent lane loading were introduced as vehicle models. Beam/girder, longitudinal concrete deck/slab, and transverse deck/slab bridges in simple or continuous span structures were developed as bridge models. Fatigue life analysis for steel bridges was predicted by using the average daily truck traffic and the design stress range calculated from the static stress-time history. Finally, ten typical examples were studied. In addition, user's manuals for Bridge Rating and Fatigue Life Analysis (BRAF) and BRAF data plotting (BRAF-P) Programs are given in Appendixes. This computer package will be a very powerful tool in evaluating the existing highway bridges. Index Terms: AASHTO, Average Daily Truck Traffic, Bridge Capacity, Case Studies, Computer Systems, Fatigue Life, Highway Bridges, Predictions, Specifications, Steel Bridges, Stress Range, User Manuals Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Lieber90	Title: AUTOMATED PROCEDURE FOR THE REGULATION OF OVERWEIGHT VEHICLES ON WYOMING'S HIGHWAYS Author(s): Lieber, SR: Puckett, JA Publication Date: 11/00/1990 Pagination: 111p Report No: Publisher/Corporate Author(s): Wyoming University P.O. Box 3295, University Station WY 82071 USA Abstract: A twofold methodology for the evaluation of overload vehicles is developed. First, a simple formula has been developed which relates axle weights and spacings to the maximum permissible load. This formula was calibrated using the AASHTO girder-line analyses of 104 typical structures with 20 overload and design vehicles. The resulting analyses were used to create a database upon which the base correlation, multivariable regression, and sensitivity analyses. The analyses were based on AASHTO state-of-practice procedures using the stresses at the operating rating level. Secondly, an automated approach is being developed which is based on a graphical information system that links truck, route, and structure data to perform ratings of all structures along a requested route. The analysis method is identical to the present procedures used by the rating engineer (hereafter referred to as the Rational Method). This aspect of the rating approach is presently in the implementation phase and is briefly described below. In the formula development, numerous bridge, vehicle, and bridge/vehicle parameters were correlated with the maximum load which can be sustained at the operating level. The only statistically significant parameter was determined to be the maximum out-to-out dimension of the load group length parameter, herein called the axle length. The axle length was used to develop a statistically-based formula for the prediction of maximum load capacity for a particular axle weight distribution. Because no useful formula can work conservatively 100 percent of the time, the confidence levels of 90, 95, and 99 percent were formulated. The route is determined by a mapping system which contains pointers to each roadway segment in the state. This pointer toggles to indicate the vehicle route. Index Terms: Analysis, Axle, Axle Load, Axle Weight, Correlation, Girder, Graphic Methods, Information Systems, Load Capacity, Mapping, Methodologies, Oversize Loads, Oversized Vehicles, Overweight Loads, Regulation, Sensitivity Analysis Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Load87	Title: LOAD CAPACITY EVALUATION OF EXISTING BRIDGES Journal Title: NCHRP Report Issue: 301 Publication Date: 12/00/1987 Pagination: 110p Report No: ISBN: 0-309-04570-3 Features: FIGS: Figs. TABS: Tabs. REFS: 54 Ref. APPS: 10 App. Publisher/Corporate Author(s): Abstract: This project developed a proposed guideline for the evaluation of existing bridges. It is primarily intended to replace the present provisions in the AASHTO Manual for Maintenance Inspection of Bridges pertaining to the bridge posting calculations. The proposed procedures for all steel and prestressed concrete spans eliminate the existing inventory and operating stress levels for posting and provide rating levels which depend on the available information and level of effort expended by the rating engineer. A load and resistance factor format similar to the present AASHTO load factor method is proposed for the strength checking equations. The safety margins are calibrated herein by structural reliability procedures similar to those used for developing design codes throughout the world. The report reviews the load information available from bridge tests and numerous weigh-in-motion (WIM) studies. Statistical data are accumulated on overweight trucks, vehicle configuration, multiple presence, distribution of load to stringers and dynamic impact. These data are assembled in a prediction model for extreme load effect. Variables include truck volume, presence of heavy trucks, deck smoothness, method of girder distribution analysis and quality of inspection and maintenance. In a similar manner, statistical data were assembled on component strength for steel and prestressed members. Corrosion data were also studied to estimate the impact on future loss of strength and the effects of inspection and maintenance in assessing short term strength changes. Statistical descriptions of load and strength were meshed together in a reliability formulation to assess the safety index corresponding to the safety margins. The criterium for selecting load and resistance factors is to achieve consistent target reliability for all situations. To simplify calculations the existing AASHTO rating vehicles are utilized to determine nominal member load effects. Available from:

Tag	Abstract
Mackie78	Title: EFFECTS OF HOURS OF SERVICE REGULARITY OF SCHEDULES, AND CARGO LOADING ON TRUCK AND BUS DRIVER FATIGUE Author(s): Mackie, RR: Miller, JC Publication Date: 10/00/1978 Pagination: 282 p. Period Covered: 750500-7810 Report No: Publisher/Corporate Author(s): Human Factors Research, Incorporated 6780 Cortona Drive CA 93017 USA National Highway Traffic Safety Administration 400 7th Street, SW DC 20590 Abstract: A literature review, a nationwide survey of commercial truck and bus driver work patterns, an analysis of accident data, and three extensive field experiments were conducted to establish evidence concerning driver fatigue as a function of regularity or irregularity of work schedules, duration of on-duty cycles, participation in supplemental cargo loading work, and type of operation (relay versus sleeper). Data are presented concerning the relative amounts of fatigue experienced by truck and bus drivers under these various conditions, as reflected in their subjective ratings, in various measures of physiological status and in the quality of their driving performance. The results are related to accident data in which fatigued, drowsy or inattentive drivers were reportedly involved. Conclusions are drawn regarding current DOT regulations on hours of service. Index Terms: *Fatigue Biology, *Motor Vehicle Operators, *Performance Human, *Stress Physiology, Accident, Bus Drivers, Buses Vehicles, Cargo, Circadian Rhythms, Experimental Data, Fatigue, Freight Handling, Humans, Recommendations, Regulation, Reviews, Safety, Scheduling, Subjective, Surveys (Data Collection), Truck Drivers, Trucks, Working Hours Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Moses76	Title: PROBABILITY THEORY FOR HIGHWAY BRIDGE FATIGUE STRESSES PHASE II Author(s): Moses, F: Pavia, AP Publication Date: 08/00/1976 Pagination: 183 pp Report No: Publisher/Corporate Author(s): Case Western Reserve University Department of Civil Engineering OH 44106 USA Abstract: Recent years have seen an increased presence of factors which relate to the occurrence of fatigue cracks on steel highway bridge girders. The 1963 modifications in AASHTO fatigue specifications often caused fatigue limits to govern section sizes and in some cases causing changes in design usage of high strength steel and certain weld attachments. This study combined statistical data on truck loads, bridge behavior and measurements and laboratory tests of steel attachments to develop a model of fatigue life prediction. A fatigue design specification was derived from the study which permits truck volume and loadometer survey data to be considered in calculating the allowable design stresses. This can lead to more economic girder sections. To illustrate the proposed design procedure several single and multi-span bridges are analyzed and compared in detail using the proposed method and current AASHTO fatigue specifications including modification of the distribution factor. The fatigue design loading proposed herein represents the actual behavior conditions with respect to truck dimensions and weights, girder distribution factors, headway spacing between trucks and dynamic impact. This work resulted from examination of the Ohio bridge measurement project which recorded over 20, 000 truck passages on 10 bridges. The data is described in the current report. Based on this study it is possible to specify a load and design technique so that fatigue damage has a small chance of occurrence under proper detailing and inspection procedures. Economic optimization methods based on a risk model including damage consequences are also discussed and may be used for rating and evaluation of possible increased truck load limits. Index Terms: Design Standards, Fatigue Life, Girder Bridges, Highway Bridges, Model, Probability Theory, Truck Load Limits Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service Federal Highway Administration

Tag	Abstract
Moses82	Title: LOAD SPECTRA FOR BRIDGE EVALUATION Foreign Title: SPECTRE DE CHARGES POUR L'EVALUATION DES PONTS Author(s): Moses, F Journal Title: IABSE Reports Volume: 38 Publication Date: 00/00/1982 Pagination: pp 63-73 Report No: Features: FIGS: 3 Fig. REFS: 18 Ref. Publisher/Corporate Author(s): International Assoc for Bridge and Structural Eng ETH-Hoenggerberg Switzerland Abstract: Evaluating existing bridges can be more complex then designing new structures. It is suggested herein that bridge inspections should include load history as well as bridge condition. A recently developed weigh-in-motion technology reduces uncertainty by accurately determining records of truck weights, bridge response and repetitive stress-spectra. Reliability predictions can further assist decision-making by modelling fatigue failure and overall fail-safe capacity. Applications include inspection, posting, legal limits, enforcement, rating and permit assessments. Such evaluation-related problems can all benefit from improved load modelling and site-specific loading statistics formulated into a reliability model. Index Terms: Bridge, Condition Survey, Evaluation, Fail Safe, Fatigue, Law, Loading History, Model, Rating, Reliability, Stresses, Structural Behavior, Truck Weights, Weigh-In-Motion Available from:

Tag	Abstract
Prasad94	Title: COMPUTERIZED OVERLOAD PERMITTING PROCEDURE FOR INDIANA Author(s): Prasad, NBR: Ramirez, JA: White, DW: White, TD: Zaghloul, SM Language: English Journal Title: Transportation Research Record Issue: 1448 Publication Date: 00/00/1994 Pagination: pp 40-52 Report No: ISBN: 0309060575 Features: FIGS: 11 Fig. TABS: 3 Tab. REFS: 18 Ref. Publisher/Corporate Author(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Truck weight regulations are used to control the rate of damage accumulation for pavements and bridges. Permitting heavier loads can increase the rate at which pavement damage and bridge deterioration accumulate and the costs of maintenance. Truck weight limits have always been controversial. Each state has legal truck weight limits. In many cases, trucks carrying weights higher than legal limits need to use the highway system and a special overload permit is required. A study conducted at Purdue University and funded by the Indiana Department of Transportation and FHWA developed an enhanced procedure for permitting overloaded trucks in Indiana. The procedure evaluates damage effects of overloaded trucks for pavements and bridges. Both pavement and bridge analyses use statistical models developed especially for this study. The pavement statistical models are based on a three-dimensional, nonlinear dynamic finite-element analysis of rigid, flexible, and composite pavements. Repeated axle loads moving at different speeds are considered, and realistic material models, such as viscoelastic and elastic-plastic models, are used for pavement materials and subgrades. The bridge statistical models are based on analysis using the AASHTO Bridge Analysis and Rating System and selected samples of bridges and overloaded trucks. User-friendly computer software was developed to implement this enhanced procedure, which allows the user to run damage analysis for overloaded trucks at the network level (e.g., route-independent analysis) as well as at the project level for specific pavement or bridge structures. Three options are available at both project levels: to check for pavements only, to check for bridges only, or to check for both, the default option. At the project level, the user is permitted to enter all cross-section and load parameters. Typical default values are provided for material properties. Index Terms: Bridges, Damage Analysis, Finite Element Analysis, Indiana, Overloads, Pavements, Permits, Software, Statistical Models, Truck Effects (Bridges), Truck Pavement Damage Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Truck82	Title: TRUCK WEIGHT DISTRIBUTION. SAFE, PROPER LOAD BALANCING SAVES WEAR AND REDUCES LOSS Journal Title: Glass Dealer Volume: 32 Issue: 6 Publication Date: 06/00/1982 Pagination: 4p Report No: Publisher/Corporate Author(s): National Glass Dealers Association 1000 Connecticut Avenue, NW DC 20036 USA Abstract: The only way a truck dealer can be sure the truck he sells can meet the requirements specified by the prospective owner is by making a weight distribution analysis when developing the specifications. A truck must have the proper gross vehicle weight rating (GVW), the proper wheelbase to distribute the load to the axles, plus adequate axle, spring and tire capacity to support the load. This article explains how to calculate the weight distribution analysis and includes an example. Several diagrams and descriptions are included: Vehicle Dimensions, Weight Distribution, Weight Distribution Example, and Nominal GVW Rating Guide. Index Terms: Axle Load, Gross Vehicle Weight, Truck Weights, Weight Distribution Analysis, Wheel Base Available from: National Glass Dealers Association 1000 Connecticut Avenue, NW Washington DC 20036 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Abstracts on Truck Weight and Relation to Environment

Tag	Year	Citation
Bullock98	98	00/00/1998 SPRINGTIME THAW WEAKENING AND LOAD RESTRICTIONS IN MINNESOTA Journal: Transportation Research Record No: 1615 AUTHOR(S): Bullock, D Schrader, C Van Deusen, D Worel, B
Clayton98	98	00/00/1998 TRUCK SIZE AND WEIGHT POLICY IN THE MIDCONTINENT CORRIDOR Journal: Transportation Quarterly Vol: 52 No: 3 AUTHOR(S): Clayton, A Montufar, J
Acott97	97	00/00/1997 FUTURE ISSUES FACING THE HOT MIX ASPHALT INDUSTRY Journal: HMAT Vol: 2 No: 3 AUTHOR(S): Acott, M
Federal97	97	08/00/1997 1997 FEDERAL HIGHWAY COST ALLOCATION STUDY
Hoel97a	97	11/00/1997 INTERMODAL FREIGHT PLANNING AT THE MULTI-STATE CORRIDOR LEVEL: STATE OF THE PRACTICE AND FUTURE DIRECTIONS AUTHOR(S): Hoel, LA Williams, BM
Humphrey97	97	00/00/1997 OVERSIZE/OVERWEIGHT TRANSPORTATION STUDY AUTHOR(S): Humphrey, TF
Comprehensive 95c	95	05/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY: SUMMARY REPORT FOR PHASE I-SYNTHESIS OF TRUCK SIZE AND WEIGHT (TS&W) STUDIES AND ISSUES
Comprehensive 95g	95	02/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 11 - ENVIRONMENT AND TRUCK SIZE AND WEIGHT REGULATIONS
Comprehensive 95h	95	02/00/1995 COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 12 - ENERGY CONSERVATION AND TRUCK SIZE AND WEIGHT REGULATIONS
Duleep95	95	00/00/1995 EXPANDING METROPOLITAN HIGHWAYS: IMPLICATIONS FOR AIR QUALITY AND ENERGY USE. APPENDIX A: EMISSION AND ENERGY CHARACTERISTICS OF HEAVY-DUTY DIESEL-POWERED TRUCKS AND BUSES Journal: Transportation Research Board Special Report No: 245 AUTHOR(S): Duleep, KG
Blower93	93	00/00/1993 LARGE-TRUCK TRAVEL ESTIMATES FROM THE NATIONAL TRUCK TRIP INFORMATION SURVEY Journal: Transportation Research Record No: 1407 AUTHOR(S): Blower, DF Campbell, KL Massie, DL

Tag	Yea r	Citation
Hallenbeck93	93	05/00/1993 WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTION OF CURRENT STATE PRACTICES - MONTANA AUTHOR(S): Hallenbeck, M Koehne, J Scheibe, RR
Hallenbeck93a	93	05/00/1993 WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTION OF CURRENT STATE PRACTICES, NEVADA AUTHOR(S): Hallenbeck, M Koehne, J Scheibe, RR
Hallenbeck93b	93	05/00/1993 WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTION OF CURRENT STATE PRACTICES, IDAHO AUTHOR(S): Hallenbeck, M Koehne, J Scheibe, RR
Hallenbeck93c	93	05/00/1993 WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTION OF CURRENT STATE PRACTICES, OREGON AUTHOR(S): Hallenbeck, M Koehne, J Scheibe, RR
Hallenbeck93d	93	05/00/1993 WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTIONS OF CURRENT STATE PRACTICES, WYOMING AUTHOR(S): Hallenbeck, M Koehne, J Scheibe, RR
Massie93	93	04/00/1993 TRUCKS INVOLVED IN FATAL ACCIDENTS, 1990 FACTBOOK AUTHOR(S): Massie, DL Sullivan, KP
Massie92	92	04/00/1992 TRUCKS INVOLVED IN FATAL ACCIDENTS, FACTBOOK 1988. FINAL REPORT AUTHOR(S): Massie, DL Sullivan, KP
Massie92a	92	10/00/1992 TRUCKS INVOLVED IN FATAL ACCIDENTS, 1989. FACTBOOK AUTHOR(S): Massie, DL Sullivan, KP
Blower91	91	12/00/1991 LARGE TRUCK TRAVEL ESTIMATES FROM THE NATIONAL TRUCK TRIP INFORMATION SURVEY. FINAL REPORT AUTHOR(S): Blower, DF Campbell, KL Massie, DL Wolfe, AC
Massie91	91	06/00/1991 TRUCKS INVOLVED IN FATAL ACCIDENTS 1987 FACTBOOK AUTHOR(S): Massie, DL
Thompson91	91	06/07/1991 TRANSPORTATION AND PUBLIC POLICY: LONGER AND HEAVIER TRUCKS. PROCEEDINGS OF A CRS CONGRESSIONAL SEMINAR, MARCH 5, 1991 AUTHOR(S): Thompson, SJ
Parcells90	90	04/00/1990 BIG TRUCKS GETTING A FREE RIDE: ENACT A NATIONAL WEIGHT-DISTANCE TAX AND SAY "NO" TO BIGGER TRUCKS! AUTHOR(S): Parcells, H
Blower89	89	07/00/1989 TURNER TRUCK HANDLING AND STABILITY PROPERTIES AFFECTING SAFETY. FINAL REPORT - VOLUME I - TECHNICAL REPORT AUTHOR(S): Blower, D Campbell, K Fancher, P Mathew, A Winkler, C

Tag	Year	Citation
Blower89a	89	07/00/1989 TURNER TRUCK HANDLING AND STABILITY PROPERTIES AFFECTING SAFETY. FINAL REPORT - VOLUME II - APPENDICES AUTHOR(S): Blower, D Campbell, K Fancher, P Mathew, A Winkler, C
Eicher89	89	09/00/1989 LARGE TRUCKS IN THE UNITED STATES: SIZE AND WEIGHT REGULATIONS Journal: Transportation Planning and Technology Vol: 14 No: 2 AUTHOR(S): Eicher, JP
Generalized88	88	00/00/1988 GENERALIZED LOGLINEAR MODELS OF TRUCK ACCIDENT RATES Journal: Transportation Research Record No: 1172
Butler86	86	03/00/1986 SYSTEMWIDE PAVEMENT DETERIORATION ANALYSIS. FINAL REPORT AUTHOR(S): Butler, BC, Jr Halbach, DS
Umtri86	86	07/00/1986 THE UMTRI LARGE-TRUCK SURVEY PROGRAM Journal: UMTRI Research Review Vol: 17 No: 1
Anticipated83	83	00/00/1983 ANTICIPATED ECONOMIC EFFECTS OF THE SURFACE TRANSPORTATION ASSISTANCE ACT OF 1982
Eicher82	82	07/00/1982 LARGE TRUCK ACCIDENT CAUSATION AUTHOR(S): Eicher, JP Robertson, HD Toth, GR
Bondy80	80	00/00/1980 AN ANALYSIS OF FATALITIES IN ARTICULATED TRUCKS USING AUTOMATED ACCIDENT DATA FILES AUTHOR(S): Bondy, N Partyka, S
Cohen79	79	05/14/1979 ASSESSMENT OF THE EFFECTS OF INCREASED TRUCK SIZE AND WEIGHT LIMITS ON SHIPPERS AND STATES AUTHOR(S): Cohen, S Holcomb, C
Cantwell78	78	01/00/1978 THE ENERGY AND ENVIRONMENTAL CONSEQUENCES OF INCREASED VEHICLE SIZE AND WEIGHT. VOLUME I AUTHOR(S): Cantwell, WC Hicks, RG Layton, RD Mingle, JG Phelps, RE
Cantwell78a	78	01/00/1978 THE ENERGY, ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF INCREASED VEHICLE SIZE AND WEIGHT. VOLUME II. COMPENDIUM OF APPENDICES AUTHOR(S): Cantwell, WC Hicks, RG Layton, RD Mingle, JG Phelps, RE
Pataky78	78	00/00/1978 PROJECTING THE IMPACT OF NEW MEDIUM AND HEAVY TRUCK NOISE REGULATION STRATEGIES ON COMMUNITY NOISE LEVELS Journal: SAE Technical Paper Series AUTHOR(S): Pataky, PP
Belew76	76	01/00/1976 CHARACTERISTICS OF TRUCKS IN SINGLE AND TWO-VEHICLE FATAL CRASHES AUTHOR(S): Belew, WW Helfand, RM Holter, WA Overbey, JW Wuerdemann, H
Johnson75	75	06/00/1975 IMPROVING MOTOR TRUCK SOCIAL{ ENVIRONMENTAL{ AND ECONOMIC UTILIZATION A LITERATURE REVIEW AUTHOR(S): Johnson, M

Tag	Year	Citation
Analysis73	73	09/00/1973 AN ANALYSIS OF THE ECONOMICS OF TRUCK SIZES AND WEIGHTS IN RELATION TO STATE AND FEDERAL REGULATIONS

Tag	Abstract
Acott97	Title: FUTURE ISSUES FACING THE HOT MIX ASPHALT INDUSTRY Author(s): Acott, M Language: English Journal Title: HMAT Volume: 2 Issue: 3 Publication Date: 00/00/1997 Pagination: pp 7-11 Period Covered: Fall Report No: Features: PHOT: 2 Phot. Publisher/CorporateAuthor(s): National Asphalt Pavement Association 5100 Forbes Boulevard MD 20706-4413 USA Abstract: This paper describes some of the critical issues facing the hot mix asphalt (HMA) industry. The following major external factors contributing to this era of change are discussed: increasing social concerns, increasing traffic, consolidating firms, reduced road funding, increasing environmental and health concerns, implementing research and technology, evolving trends in materials supply, and changing contract procedures. Overall, there is more emphasis on environmental, social, safety, and health issues related to climate change issues, clean air, occupational safety and health, disposal of wastes and solvents, recycling, congestion mitigation, noise, mass transit, and wetlands protection. This is accompanied by increases in the number, weight, tire pressures, and damaging effects of truck traffic. It is concluded that in the future there will be greater use of recycled asphalt pavement and recycled concrete in HMA, with continued social and political pressure to include many waste materials in HMA. The challenge is to economically utilize these materials so that they do not negatively affect pavement performance and do not create unacceptable particulate emissions, fumes, or odors at the mixing facility. Index Terms: Asphalt, Asphalt Mixtures, Asphalt Pavements, Concrete, Economic And Social Factors, Environmental Protection, Financing, Forecasting, Health Hazards, Hot Mix Paving Mixtures, Industries, Recycled Materials, Traffic, Wastes Available from: Hot Mix Asphalt Technology Editor, National Asphalt Pavement Assn, 5100 Forbe Lanham MD 20706-4413 USA

Tag	Abstract
Analysis73	Title: AN ANALYSIS OF THE ECONOMICS OF TRUCK SIZES AND WEIGHTS IN RELATION TO STATE AND FEDERAL REGULATIONS Publication Date: 09/00/1973 Pagination: 117 pp Report No: Publisher/Corporate Author(s): Voorhees (Alan M) and Associates, Incorporated Westgate Research Park VA 22101 USA Abstract: A survey of the literature was performed to identify the state of the art with respect to the impacts of changes in truck weight and size limits. It was found that techniques for evaluating impacts on transportation and highway costs have been developed. Data were available which indicate accident frequency and severity as a function of vehicle weight. Impact of vehicle size and weight limits on the energy crisis was not documented. Two voids in the state of the art were found: impact on consumer prices and impact on environmental elements. Until these data are filled, it is doubtful that a cost-benefit analysis can be performed which will be sensitive to important issues of impact incidence. /NTIS/ Index Terms: Accident Rate, Accident Severity, Competitive Modes, Energy, Highway Costs, Intermodal Systems, Motor Carriers, Piggyback, Size, Transportation Economics, Truck Laws & Regulations, Truck Transportation Economics, Trucks, Weight Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22151 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Anticipated83	Title: ANTICIPATED ECONOMIC EFFECTS OF THE SURFACE TRANSPORTATION ASSISTANCE ACT OF 1982 Publication Date: 00/00/1983 Pagination: 329p Report No: Features: FIGS: Figs. TABS: Tabs. PHOT: Phots. Publisher/CorporateAuthor(s): United States Congress Senate Committee on Environment and Public Works DC 20510 USA Abstract: In this transcript of hearings before the subcommittee on transportation of the Senate Committee on Environment and Public Works, testimony is given addressing the following issues: the impact of the tax structure implemented by Surface Transportation Assistance Act (STAA) on the trading industry; productivity gains experiences by the truck size and weight provisions in the STAA; legislative proposals which would alter the tax structure in the STAA; the effect of increased truck sizes and weights on the condition of roads and bridges and to what extent reasonable access should be permitted; and the Department of Transportation's preliminary report on alternative tax structures. Index Terms: Economic Impact, Law, Size And Weight Laws, Taxation, Truck Effects (Bridges), Truck Pavement Damage, Trucking Industry Available from: Government Printing Office Superintendent of Documents Washington DC 20402 USA

Tag	Abstract
Belew76	Title: CHARACTERISTICS OF TRUCKS IN SINGLE AND TWO-VEHICLE FATAL CRASHES Author(s): Belew, WW: Helfand, RM: Holter, WA: Overbey, JW: Wuerdemann, H Publication Date: 01/00/1976 Pagination: 12 pp Report No: Publisher/CorporateAuthor(s): Mitre Corporation Westgate Research Park VA 22101 USA National Highway Traffic Safety Administration 400 7th Street, SW DC 20590 Abstract: The influence of truck size (or weight) on occupant injury severity in one and two vehicle fatal crashes was the subject of this exploratory investigation. The analyses were based on the National Highway Traffic Safety Administration's Fatal Accident File (FAF) for the January 1973 - June 1974 period. Exposure and environmental parameters - as well as impact types - were compared for different sizes of truck. Index Terms: *Motor Vehicle Accidents, *Trucks, Casualties, Fatal Accidents, Highway Safety, Impact, Injuries, Motor Vehicle Accidents, Parameters, Traffic Safety, Truck Weights, Trucks, Weight Mass Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	**Abstract**
Blower89	Title: TURNER TRUCK HANDLING AND STABILITY PROPERTIES AFFECTING SAFETY. FINAL REPORT - VOLUME I - TECHNICAL REPORT Author(s): Blower, D: Campbell, K: Fancher, P: Mathew, A: Winkler, C Publication Date: 07/00/1989 Pagination: 207p Period Covered: 880400-8907 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: 23 Ref. Publisher/CorporateAuthor(s): University of Michigan Transp Research Institute 2901 Baxter Road MI 48109-2150 USA Abstract: Based on a review of large-truck performance and safety literature, discussions with persons involved with manufacturing or using trucks, and computer analyses and limited testing of prototype and baseline vehicles, this study provides findings and recommendations aimed at the following objectives: 1) identify vehicle and/or component parameters and size and weight allowances (that is, "design attributes") that will mitigate the crash and injury risk and enhance the operational safety of Turner trucks; 2) identify the environment--traffic, roadway, and weather--within which Turner trucks can be safely operated; 3) assess crash and injury risks of Turner trucks in comparison with those of the trucks they would be expected to replace; and 4) establish minimum performance and handling standards for Turner trucks that seek to limit crash risk to tolerable levels while encouraging innovation in new truck and component design. Index Terms: Accident, Highway Safety, Injuries, Mitigation, Operating Environment, Recommendations, Risk, Turner Trucks, Vehicle Design, Vehicle Handling, Vehicle Performance, Vehicle Stability, Vehicular Safety Available from: University of Michigan Transp Research Institute 2901 Baxter Road Ann Arbor MI 48109-2150 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Blower89a	Title: TURNER TRUCK HANDLING AND STABILITY PROPERTIES AFFECTING SAFETY. FINAL REPORT - VOLUME II - APPENDICES Author(s): Blower, D: Campbell, K: Fancher, P: Mathew, A: Winkler, C Publication Date: 07/00/1989 Pagination: 238p Period Covered: 880400-8907 Report No: Features: FIGS: Figs. TABS: Tabs. APPS: 4 App. Publisher/CorporateAuthor(s): University of Michigan Transp Research Institute 2901 Baxter Road MI 48109-2150 USA Abstract: Based on a review of large-truck performance and safety literature, discussions with persons involved with manufacturing or using trucks, and computer analyses and limited testing of prototype and baseline vehicles, this study provides findings and recommendations aimed at the following objectives: 1) identify vehicle and/or component parameters and size and weight allowances (that is, "design attributes") that will mitigate the crash and injury risk and enhance the operational safety of Turner trucks; 2) identify the environment--traffic, roadway, and weather--within which Turner trucks can be safely operated; 3) assess crash and injury risks of Turner trucks in comparison with those of the trucks they would be expected to replace; and 4) establish minimum performance and handling standards for Turner trucks that seek to limit crash risk to tolerable levels while encouraging innovation in new truck and component design. Index Terms: Accident, Highway Safety, Injuries, Mitigation, Operating Environment, Recommendations, Risk, Turner Trucks, Vehicle Design, Vehicle Handling, Vehicle Performance, Vehicle Stability, Vehicular Safety Available from: University of Michigan Transp Research Institute 2901 Baxter Road Ann Arbor MI 48109-2150 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Blower91	Title: LARGE TRUCK TRAVEL ESTIMATES FROM THE NATIONAL TRUCK TRIP INFORMATION SURVEY. FINAL REPORT Author(s): Blower, DF: Campbell, KL: Massie, DL: Wolfe, AC Language: English Publication Date: 12/00/1991 Pagination: 70p Report No: Features: FIGS: 40 Fig. TABS: 5 Tab. REFS: Refs. APPS: 1 App. Publisher/CorporateAuthor(s): University of Michigan Transp Research Institute Great Lakes Center for Truck Transportation Research, 2901 Baxter Road MI 48109-2150 USA Abstract: This report describes the methodology of the National Truck Trip Information Survey (NTTIS) conducted by the Center for National Truck Statistics of the University of Michigan Transportation Research Institute. The survey was conducted to achieve the two main goals of estimating the registered large truck population of the continental United States and providing detailed data on their annual mileage. Travel in the file can be cross-classified by road type, area type, and time of day and broken down according to truck configuration, cargo type and weight, cargo body style, and driver characteristics. The report compares national population estimates from the NTTIS file with estimates from the Truck Inventory and Use Survey (TIUS) and with annual figures published by the Federal Highway Administration. In general, the agreement between NTTIS and TIUS was found to be good. The different years in which the surveys were carried out and differences in methodology probably account for the minor discrepancies that were noted. On the other hand, FHWA estimates of both vehicle counts and total mileage were found to be substantially higher than the NTTIS and TIUS estimates. It is likely that data submitted by the states to FHWA contain inaccuracies that result in inflated estimates. These comparisons underscore the difficulty involved in measuring large truck travel. While ideally it could be beneficial to ascertain the absolute number of miles traveled by trucks, it is also useful to be able to characterize that travel according to some of the parameters relevant to traffic safety. The report concludes with a series of NTTIS travel distributions based on the operating environments of different truck configurations. Index Terms: Accuracy, Estimates, Mileage, National Truck Trip Information Survey, Umtri, Statistics, Surveys, Data Collection, Travel, Trucking Industry Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Blower93	Title: LARGE-TRUCK TRAVEL ESTIMATES FROM THE NATIONAL TRUCK TRIP INFORMATION SURVEY Author(s): Blower, DF: Campbell, KL: Massie, DL Language: English Journal Title: Transportation Research Record Issue: 1407 Publication Date: 00/00/1993 Pagination: pp 42-49 Report No: ISBN: 0309055520 Features: FIGS: 10 Fig. REFS: 8 Ref. Publisher/CorporateAuthor(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: The methodology of the National Truck Trip Information Survey conducted by the Center for National Truck Statistics of the University of Michigan Transportation Research Institute is described in this paper. The survey was conducted to achieve the two main goals of estimating the registered large truck population of the continental United States and providing detailed data on its annual mileage. Travel in the file can be cross-classified by road type, area type, and time of day, and broken down according to truck configuration, cargo body style, cargo type and weight, gross weight, number of axles, and driver characteristics. This type of detail is useful in risk assessment, because the risk of accident involvement depends on the operating environment as well as the physical characteristics of the truck. Index Terms: Accident Risk Forecasting, Estimates, National Truck Trip Information Survey, Risk Assessment, Travel, Truck Transportation Statistics Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Bondy80	Title: AN ANALYSIS OF FATALITIES IN ARTICULATED TRUCKS USING AUTOMATED ACCIDENT DATA FILES Author(s): Bondy, N: Partyka, S Publication Date: 00/00/1980 Pagination: 48p Report No: Publisher/CorporateAuthor(s): National Highway Traffic Safety Administration National Center for Statistics and Analysis DC 20590 USA Abstract: Data from the Fatal Accident Reporting System (FARS) are analyzed pertaining to articulated truck accidents which occurred in 1979 (985 fatalities involved). Accident, vehicle, collision, and occupant factors are examined. The FARS data are supplemented by accident data (the latest are for 1977) for vehicles in interstate commerce which were collected by the Bureau of Motor Carrier Safety (BMCS); this allows a breakdown of associated factors by gross truck weight. The National Accident Sampling System - Continuous Sampling Subsystem (NASS-CSS) is used to provide estimates of involvement rates for all police-reported truck accidents. The FARS and BMCS data are consistent in their identification of the accident environment for articulated truck fatalities. Rollovers, ejections, and vehicle-to-vehicle collisions are important fatality events. Index Terms: Articulated Vehicle, Data Analysis, Ejection, Fatal Accident Reporting System, Fatal Accidents, Fatalities, National Accident Sampling System, Rollover Accidents, Truck Weights, Trucks Available from: National Highway Traffic Safety Administration 400 7th Street, SW Washington DC 20590 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	Abstract
Bullock98	Title: SPRINGTIME THAW WEAKENING AND LOAD RESTRICTIONS IN MINNESOTA Author(s): Bullock, D: Schrader, C: Van Deusen, D: Worel, B Language: English Journal Title: Transportation Research Record Issue: 1615 Publication Date: 00/00/1998 Pagination: pp 21-28 Report No: ISBN: 0309064600 Features: FIGS: 7 Fig. TABS: 1 Tab. REFS: 22 Ref. Publisher/CorporateAuthor(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: In regions of the United States where pavements are constructed in freeze-thaw environments, springtime load restrictions are used to reduce distress caused by truck loads. During the spring, the pavement layers can be saturated and weakened because of partial thaw conditions and trapped water. Knowledge of the timing of freeze-thaw events is crucial to a successful load restriction strategy. Several studies in Minnesota are being done to evaluate criteria used to predict when to place and remove springtime load restrictions. The objectives are to evaluate current load restriction procedures, investigate pavement strength changes in relation to freeze-thaw events, and suggest improvements to current procedures. Data collected from eight Minnesota Road Research Project (Mn/ROAD) flexible pavement test sections, including falling weight deflectometer, response, and environmental data, were used to assess the effects on pavement strength. In conjunction with the Mn/ROAD work, the Minnesota Department of Transportation is conducting a statewide study using resistivity probes to monitor frost depth beneath various roads around the state. It was found that the existing procedure works well in predicting the thaw if the warming trend is uniform. In addition, over the past four springs the predicted thaw duration was greater than field observations. The date of maximum deflection occurs about 1 to 3 weeks after thawing is complete; the rate of strength recovery is quicker in sections constructed on higher quality base materials with low fines content. On the basis of the results a new criteria and equation for predicting the beginning and duration of the thaw are proposed. Index Terms: Duration, Equations, Flexible Pavements, Freezing Thawing Effects, Frost Depth, Load Restrictions, Minnesota, Monitoring, Pavement Deflection, Pavement Layers, Predictions, Spring Breakup, Test Sections, Thaw Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Butler86	Title: SYSTEMWIDE PAVEMENT DETERIORATION ANALYSIS. FINAL REPORT Author(s): Butler, BC, Jr: Halbach, DS Publication Date: 03/00/1986 Pagination: 173p Period Covered: 8403-8603 Report No: Publisher/CorporateAuthor(s): ARE, Incorporated 2600 Dellana Lane TX 78746 USA Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 Abstract: The EAROMAR 2 (Economic Analysis of Roadway Occupancy for Maintenance and Rehabilitation) computer program was updated to make network level cost estimates. The new EAROMAR SW version has a data base consisting of information from the Highway Performance Monitoring System (HPMS), FHWA truck weight data distributions, and nationwide environmental factors. The new pavement damage models which have been incorporated into EAROMAR SW come from the latest work by the World Bank to update its Highway Design and Maintenance Standards Model (HDM) and the FHWA cost allocation study. The new program retains its original capability of evaluating project level conditions of roadway occupancy. Sensitivity results and regional estimates for the Interstate system demonstrate the system capabilities. Index Terms: Computer Programs, Costs, Deterioration, Economic Analysis, Estimates, Pavement Maintenance Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: Federal Highway Administration

Tag	Abstract
Cantwell78	Title: THE ENERGY AND ENVIRONMENTAL CONSEQUENCES OF INCREASED VEHICLE SIZE AND WEIGHT. VOLUME I Author(s): Cantwell, WC: Hicks, RG: Layton, RD: Mingle, JG: Phelps, RE Publication Date: 01/00/1978 Pagination: 173 p. Period Covered: 760700-7801 Report No: Publisher/CorporateAuthor(s): Department of Transportation Office of University Research DC 20590 Oregon State University Transportation Research Institute OR 97331 USA Abstract: The study objectives are to determine whether increased size and weight vehicles would be energy efficient and cost effective and to investigate operational and environmental consequences resulting from their use. Not all the objectives were obtained since only Phase I of a proposed two-phase study was completed, and lack of data restricted work in cost responsibility, safety and bridges. Findings include (1) non-uniformity in size and weight regulations between states which creates artificial barriers to economic truck operation, (2) increasing axle loads by 33 percent could reduce pavement surface life by 80 percent unless thickness is increased by 2 1/2 inches, (3) further work is needed to define the effect of heavier trucks on bridges, (4) the effect of larger, heavier trucks on the traffic stream can be quantified using a computer program developed in the study, (5) the data base for safety effects is inadequate, (6) operating costs are less for heavier, larger trucks, (7) environmental effects appear to be less significant than effects on bridges, etc., (8) incremental fuel requirements for different size and weight trucks can be quantified while assessment of energy requirements for highway construction and maintenance needs further work and (9) considerable additional work is needed to define how the costs and benefits attributed to vehicles of various sizes are distributed to impacted or benefitting groups. Index Terms: *Size Determination, *Trucks, Axle Load, Benefit Cost Analysis, Bridge, Computer Programming, Computer Programs, Computerized Simulation, Cost Effectiveness, Energy, Environmental Impact, Fuel Consumption, Highway Construction, Highway Maintenance, Maintenance, Operating Costs, Pavement, Pavement Thickness, Regulation, Safety, Size, Truck Transportation Economics, Truck Weights, Vehicle Operating Cost, Weight Mass Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Cantwell78a	Title: THE ENERGY, ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF INCREASED VEHICLE SIZE AND WEIGHT. VOLUME II. COMPENDIUM OF APPENDICES Author(s): Cantwell, WC: Hicks, RG: Layton, RD: Mingle, JG: Phelps, RE Publication Date: 01/00/1978 Pagination: 404 p. Period Covered: 7607-7801 Report No: Publisher/CorporateAuthor(s): Department of Transportation Office of University Research DC 20590 Oregon State University Transportation Research Institute OR 97331 USA Abstract: This compendium supplements the 'Final Report' and consists of an Introduction, a review of factors affected by increased vehicle size and weight (energy, costs, operations, environmental) including whether these factors are treated from a qualitative, quantitative, or analytical standpoint in the report. (Summary given in eight tables). Appendices A through J give detailed findings and include a summary of a workshop, review of size and weight regulations and permit operations, evaluation of effect of heavier, larger trucks on pavement life, bridge performance, highway costs, truck performance, traffic operations, truck costs, safety and environmental. The detailed information in this compendium is summarized in the companion Volume I, Final Report. Index Terms: *Size Determination, *Trucks, Benefit Cost Analysis, Bridge, Computer Programming, Computerized Simulation, Cost Effectiveness, Costs, Economic Impact, Energy, Environmental Impact, Highway Costs, Maintenance, Operating Costs, Pavement, Pavement Life, Regulation, Safety, Size, Truck Transportation Economics, Truck Weights, Vehicle Operating Cost, Vehicle Performance, Weight Mass Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: National Technical Information Service

Tag	Abstract
Clayton98	Title: TRUCK SIZE AND WEIGHT POLICY IN THE MIDCONTINENT CORRIDOR Author(s): Clayton, A: Montufar, J Language: English Journal Title: Transportation Quarterly Volume: 52 Issue: 3 Publication Date: 00/00/1998 Pagination: pp 69-78 Period Covered: Summer Report No: Features: FIGS: Figs. REFS: Refs. Publisher/CorporateAuthor(s): Eno Transportation Foundation, Incorporated One Farragut Square South, 1634 I Street, NW, Suite 500 DC 20006-4003 USA Abstract: Truck size and weight (TS&W) policies and regulations have an effect on the types of trucks that move on highways, and underlie the impact of those vehicles on the infrastructure, the economy, the environment, and roadway safety. Understanding trucking activity and freight movement is also necessary for evaluating the effects of policies in a region or along a corridor. This article provides insights regarding the current situation of TS&W regulations in the midcontinent corridor, with a view to assist decisionmakers in addressing policy questions from the perspective of this corridor. Index Terms: Midwest, Truck Effects (Bridges), Truck Laws & Regulations, Vehicle Size, Vehicle Weight Available from: Eno Transportation Foundation, Incorporated One Farragut Square South, 1634 I Street, NW, Suit Washington DC 20006-4003 USA

Tag	Abstract
Cohen79	Title: ASSESSMENT OF THE EFFECTS OF INCREASED TRUCK SIZE AND WEIGHT LIMITS ON SHIPPERS AND STATES Author(s): Cohen, S: Holcomb, C Publication Date: 05/14/1979 Pagination: 80 p. Report No: Features: TABS: Tabs. REFS: Refs. APPS: Apps. Publisher/Corporate Author(s): Automated Sciences Group, Incorporated 8555 16th Street, Suite 713 MD 20910 USA Abstract: The first phase is reported of a research project to assess the impacts of two proposed federal uniform truck size and/or weight (TSW) increases in tractor-trailer combinations in two groups: shippers or the users of transport services; and state transportation departments and legislatures. The first TSW alternative would be to increase the length of the trailer combinations without changing federally regulated gross vehicle weight (GVW) and axle loadings. The second proposed alternative would be to increase both the length and GVW of tractor trailer combinations without changing federally regulated axle loadings. This first phase consisted of a literature search and review of existing relevant studies on truck sizes and weight. The literature search covered both state issues (costs of TSW, on highway construction and maintenance, economic benefits of TSW, financing of highway costs, safety of heavier and larger trucks, increase in traffic flows, energy conservation, environmental impacts, and shipper issues (characteristics of the product, location of markets, choice of carrier, physical distribution, equipment, and on/off loading facilities). The search revealed that research of TSW impacts, including the operation of 27-foot trailers, is inconclusive due to the fragmentation of the research efforts. There is little definitive work on the subject, but there have been many attempts to analyze each aspect of the problem. The information base is very poor. Index Terms: Axial Loads, Length, Research, Reviews, Shippers, Size And Weight Laws, State Government, State Transportation Department, Tractor Trailers, Truck Weights, Trucks Available from:

Tag	Abstract
Comprehensive 95c	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY: SUMMARY REPORT FOR PHASE I-SYNTHESIS OF TRUCK SIZE AND WEIGHT (TS&W) STUDIES AND ISSUES Language: English Publication Date: 05/00/1995 Pagination: 58p Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/CorporateAuthor(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: This is the Summary Report of Phase I of the Comprehensive Truck Size and Weight (TS&W) Study announced by the Federal Highway Administrator in June 1994. It summarizes 13 working papers prepared during Phase I. The study is to be completed in three phases: Phase I - Synthesis of TS&W Studies and Issues - assessed past policy studies and technical research. Technical knowledge about relationships between TS&W policy controls and relevant evaluation and decision criteria was synthesized. State and Federal TS&W regulations were summarized. Research needs for later phases were identified. Thirteen working papers were prepared examining the regulations and TS&W policy controls and: truck accidents, vehicle stability and control, pavements, bridges, roadway geometry, traffic operations, truck costs, shipper logistics costs, truck travel and mode share, enforcement, environment, energy, permits and pricing mechanisms. Phase II - a Preliminary Option Analysis - will evaluate specific policy options using existing databases and analytical tools (completion summer 1995). Phase III - an Extended Impact Analysis - will expand the scope and depth of the policy analysis of Phase II using new databases and analytical capabilities becoming available in late 1995 with projected completion by the end of 1996. Index Terms: Bridges, Control, Costs, Decision Making, Energy, Environment, Evaluation, Geometric Design, Logistics, Pavements, Permits, Policy, Pricing, Regulations, Research, Shipping, Size, Stability (Mechanics), Technical Reports, Travel, Truck Accidents, Truck Traffic, Trucks, Weight Candidate Terms: Enforcement Unused Terms: Mode Share Available from:

Tag	Abstract
Comprehensive 95g	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 11 - ENVIRONMENT AND TRUCK SIZE AND WEIGHT REGULATIONS Language: English Publication Date: 02/00/1995 Pagination: 27p Report No: Features: TABS: Tabs. REFS: Refs. Publisher/CorporateAuthor(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: In general, very little work has been done relating the impact of changing truck size and weight (TS&W) regulations to impacts on the environment. Some work was done by the American Trucking Associations in the late 1970s and early 1980s. Other work by the Society of Automotive Engineers, the Environmental Protection Agency and several European sources has focused a great deal on characterizing the heavy duty engine. This includes emission requirements and standards, noise levels, performance standards, noise abatement, and fuel economy. While this is all useful information and a great deal of it was used for the development of this paper, most of the work related directly to truck size and weight issues has focused on the physical and structural impacts to bridges, pavements, etc. The majority of sources for this paper regarding environmental impacts focus on heavy duty engine emissions, noise levels, and other topical areas, not specifically the environmental impact associated with changes in truck size and weight regulations. Topics covered in the paper include: alternative fuel use; vehicle weight; vehicle configuration; intermodalism; truck usage; engine emissions; environmental modeling capabilities; vehicle related noise considerations; and truck induced vibrations. Index Terms: Alternate Fuels, Engines, Environmental Impacts, Fuel Consumption, Heavy Duty Vehicles, Intermodal Transportation, Noise Control, Regulations, Size, Trucks, Vehicle Weight, Vibration, Weight Candidate Terms: Air Quality Models, Emission Requirements, Emission Standards, Engine Emissions, Vehicle Configuration Available from: TOP PREV

Tag	**Abstract**
Comprehensive 95h	Title: COMPREHENSIVE TRUCK SIZE AND WEIGHT STUDY PHASE 1 SYNTHESIS: WORKING PAPER 12 - ENERGY CONSERVATION AND TRUCK SIZE AND WEIGHT REGULATIONS Language: English Publication Date: 02/00/1995 Pagination: 20p Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. Publisher/CorporateAuthor(s): Battelle Team 505 King Avenue OH 43201 Federal Highway Administration Turner Fairbank Hwy Res Cntr, 6300 Georgetown Pike VA 22101 USA Abstract: The research on various truck size and weight considerations and energy conservation is limited. Following the energy crisis in the mid 1970s, there was significant interest and research on energy conservation. Most of the references cited in this working paper are from this period. With the stabilization of fuel supplies and the decline in fuel prices, interest and research in energy conservation was greatly reduced. However, there has been renewed interest in energy conservation in the 1990s, and it appears that some recent research has been conducted which addressed some of the weaknesses of the older research. This paper covers research into the effects on energy conservation of the following: vehicle weight, vehicle dimension, intermodalism, tires, environmental laws, equipment specifications and technology, vehicle performance, and indirect energy consumption. Index Terms: Energy Conservation, Energy Consumption, Environment, Height, Intermodal Transportation, Laws, Length, Regulations, Research, Size, Technology, Tires, Trucks, Vehicle Performance, Vehicle Weight, Weight, Width Unused Terms: Indirect Available from:

Tag	Abstract
Duleep95	Title: EXPANDING METROPOLITAN HIGHWAYS: IMPLICATIONS FOR AIR QUALITY AND ENERGY USE. APPENDIX A: EMISSION AND ENERGY CHARACTERISTICS OF HEAVY-DUTY DIESEL-POWERED TRUCKS AND BUSES Author(s): Duleep, KG Language: English Journal Title: Transportation Research Board Special Report Issue: 245 Publication Date: 00/00/1995 Pagination: pp 237-294 Report No: ISBN: 0309061075 Features: FIGS: 8 Fig. TABS: 12 Tab. REFS: Refs. Publisher/CorporateAuthor(s): Transportation Research Board 2101 Constitution Avenue, NW DC 20418 USA Abstract: Heavy-duty diesel-powered trucks are major contributors to oxides of nitrogen (NOx) emissions and combustion-derived particulate emissions in many urban areas. This appendix provides a brief review of the energy use and emissions characteristics of heavy-duty diesel vehicles (HDDVs) and reviews the effects of expansions of highway capacity on emissions. The structure of the HDDV fleet, which encompasses a wide range of vehicles [from 8, 500 lb gross vehicle weight (GVW) to more than 80, 000 lb GVW], is discussed. Data on sales, populations, and use of the HDDV fleet are presented. Historical and future emissions regulations for HDDVs are reviewed. Since California has been the leader in new emission standards and in-use controls, particular attention is given to the California standards and the proposed low-emission truck standards. Fuel standards and in-use requirements are also discussed in detail. The data that have been used to construct emission factors and speed correction factors for HDDVs are reviewed. In particular, U.S. Environmental Protection Agency (EPA) emission factors and speed correction factors are contrasted with the findings on these issues from other data or engineering analyses. HDDV fuel economy data are reviewed, with emphasis on average fuel economy derived from surveys. Data on the change of fuel economy with speed derived from simulation models or on-road tests are presented. These data and their relationship to the conversion factor used to convert emissions expressed in units of work to the more familiar units of grams per mile are explored. Finally, the findings are summarized in the context of the National Research Council's project goals of estimating the effects of expansions of highway capacity. Index Terms: Air Quality, Buses (Vehicles), California, Data Analysis, Diesel Trucks, Emission Control, Emission Standards, Emissions, Energy Consumption, Energy Utilization, Environmental Protection, Fleet Statistics, Fuel Economy, Heavy Duty Trucks, Highway Capacity Additions, Impacts, Nitrogen Oxides, Particulates, Regulations, Urban Areas Available from: Transportation Research Board Business Office 2101 Constitution Avenue, NW Washington DC 20418 USA

Tag	Abstract
Eicher82	Title: LARGE TRUCK ACCIDENT CAUSATION Author(s): Eicher, JP: Robertson, HD: Toth, GR Publication Date: 07/00/1982 Pagination: 215p Period Covered: 810100-8207 Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: 3 App. Publisher/CorporateAuthor(s): Federal Highway Administration 400 7th Street, SW National Highway Traffic Safety Administration National Center for Statistics and Analysis DC 20590 USA Abstract: Accidents involving large trucks (more than 10, 000 pounds gross vehicle weight) are a serious safety problem on our Nation's highways. In 1979-1980 large trucks were involved in an annual average of 5.7 percent (385, 000) of all police-reported accidents. Yet, they accounted for 11.8 percent (5, 360) of all fatal accidents, in which 5, 874 persons died. This report identifies the driver, vehicle, and the highway/environmental factors and the operational practices which contribute to the frequency and severity of accidents involving large trucks. Analyses did not reveal any single solution which, if implemented, would guarantee alteration of the truck accident problem. They did, however, indicate areas in which the greatest probability exists of reducing the number of truck accidents and their consequences. Index Terms: Environment, Fatal Accidents, Highway, Safety Or Security In Transportation, Traffic Accident, Truck Drivers, Trucks Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: Transportation Statistical Reference File, TSC National Highway Traffic Safety Administration

Tag	**Abstract**
Eicher89	Title: LARGE TRUCKS IN THE UNITED STATES: SIZE AND WEIGHT REGULATIONS Author(s): Eicher, JP Journal Title: Transportation Planning and Technology Volume: 14 Issue: 2 Publication Date: 09/00/1989 Pagination: pp 117-124 Report No: Publisher/CorporateAuthor(s): Gordon and Breach, Science Publishers, Inc c/o STBS Limited, One Bedford Street England Abstract: This paper reviews the major changes which have occurred in the trucking industry in the United States, particularly in relation to truck size and weight. It briefly reviews the regulatory environment prior to the establishment of new Federal size and weight limits in 1982. It then outlines current length, width and weight restrictions related to the operation of large trucks, and discusses some of the effects of these regulations. Unresolved issues and on-going or planned studies aimed at resolving some of these issues are addressed. A set of principles for idealized truck size and weight regulations are postulated. Index Terms: Freight Transportation, Regulation, Restrictions, Size, Size And Weight Laws, Truck Weights, Trucks, United States Available from: STBS Limited One Bedford London WC2E 9PP England

Tag	Abstract
Federal97	Title: 1997 FEDERAL HIGHWAY COST ALLOCATION STUDY Language: English Publication Date: 08/00/1997 Pagination: 177p Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/CorporateAuthor(s): Department of Transportation 400 7th Street, SW DC 20590 USA Abstract: This is the first Federal Highway Cost Allocation Study (HCAS) since 1982. There are two key reasons for conducting this study. The first is to determine how changes in the Federal highway program and user fees which support that program have affected the equity of Federal highway user fees. The second is to coordinate this effort with the concurrent U.S. Department of Transportation Comprehensive Truck Size and Weight (1997 U.S. DOT TS&W) Study. The 1997 U.S. DOT TS&W Study uses analytical tools developed for this HCAS in estimating impacts of TS&W scenarios on infrastructure, environmental, and other costs and in estimating changes in user fees on various vehicle classes that would reflect changes in highway program costs associated with those scenarios. The base period for this study is 1993 to 1995, which covers the most up-to-date information available on Federal highway expenditure patterns since the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was enacted. The analysis year is 2000. A 3-year average of highway costs and revenues is used to represent the base period to reduce the effects of annual variations in costs and revenues. The report is organized as follows: Executive Summary; (I) Study Background, Objectives, Scope, and Approach; (II) Trends and Forecasts of Highway Use; (III) Trends and Forecasts of Highway Costs; (IV) Trends and Forecasts of Highway User Revenues; (V) Highway Cost Responsibility; (VI) Equity and Efficiency of Highway User Fees; and (VII) Study Conclusions. Index Terms: Cost Allocations, Economic Efficiency, Equity, Forecasts, Highway Costs, Highway Users, Trends, User Charges Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Generalized88	Title: GENERALIZED LOGLINEAR MODELS OF TRUCK ACCIDENT RATES Journal Title: Transportation Research Record Issue: 1172 Publication Date: 00/00/1988 Pagination: pp 23-31 Report No: ISBN: 0-309-04709-9 Features: FIGS: 1 Fig. TABS: 6 Tab. REFS: 18 Ref. Publisher/CorporateAuthor(s): Abstract: Several methods for calibrating statistical models of truck accident rates are considered. A loglinear approach is suggested for assessing the effect of traffic environment on truck accident rates. A number of concerns associated with using a weighted least squares algorithm for estimating Beta parameters in the loglinear expression are noted, including the presence of reduced cell membership in the contingency tables of accidents and input variable incompatibilities between continuous exposure and categorical accident measures. An alternative form of generalized linear interactive model (GLIM) is proposed for calibrating loglinear expressions of truck accident rates. GLIM uses maximum likelihood techniques for estimating Beta parameters in loglinear expressions. As in the classical weighted least squares algorithm, this approach permits a stepwise statistical analysis of higher-order interactions in the traffic environment as related to accident frequencies, while adjusting directly for continuous measures of exposure. The results of a calibration of GLIM loglinear expressions are presented using 1983 truck accident and exposure data for Ontario as a basis. Available from:

Tag	Abstract
Hallenbeck93	Title: WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTION OF CURRENT STATE PRACTICES - MONTANA Author(s): Hallenbeck, M: Koehne, J: Scheibe, RR Language: English Publication Date: 05/00/1993 Pagination: 112p Report No: Publisher/CorporateAuthor(s): Washington State Transportation Center 15700 Dayton Avenue WA 98133- USA Abstract: As part of a national effort to achieve a more efficient transportation system, the 'transparent borders' concept is aimed at developing technologies and systems that provide a less expensive and more efficient operating environment for commercial vehicle operations (CVO), and ultimately, one which will allow unimpeded passage of trucks across state boundaries. The report results from the first phase of the Transportation Borders Project, a seven-state study to identify the institutional barriers to implementation of various Intelligent Vehicle Highway Systems (IVHS) technologies for CVO. It describes the current practices within state and federal agencies and organizations that affect CVO in Montana. Particular emphasis is placed on the primary CVO functions in Montana, including driver and vehicle licensing, operating authority, permitting tax collection, weight and size regulation, and safety regulation. Index Terms: Commercial Vehicles, Institutional Factors, Intelligent Vehicle Highway Systems, Montana, Technology Assessment, Trucking Industry Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Hallenbeck93a	Title: WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTION OF CURRENT STATE PRACTICES, NEVADA Author(s): Hallenbeck, M: Koehne, J: Scheibe, RR Language: English Publication Date: 05/00/1993 Pagination: 110p Report No: Publisher/CorporateAuthor(s): Washington State Transportation Center 15700 Dayton Avenue WA 98133- USA Abstract: As part of a national effort to achieve a more efficient transportation system, the 'transparent borders' is aimed at developing technologies and systems that provide a less expensive and more efficient operating environment for commercial vehicle operations (CVO), and ultimately, one which will allow unimpeded passage of trucks across state boundaries. The report results from the first phase of the Transportation Borders Project, a seven-state study to identify the institutional barriers to implementation of various Intelligent Vehicle Highway Systems (IVHS) technologies for CVO. It describes the current practices within state and federal agencies and organizations that affect CVO in Nevada. Particular emphasis is placed on the primary CVO functions in Nevada, including driver and vehicle licensing, operating authority, permitting, tax collection, weight and size regulation, and safety regulation. Index Terms: Commercial Vehicles, Institutional Factors, Intelligent Vehicle Highway Systems, Nevada, Transportation Planning, Trucking Industry Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Hallenbeck93b	Title: WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTION OF CURRENT STATE PRACTICES, IDAHO Author(s): Hallenbeck, M: Koehne, J: Scheibe, RR Language: English Publication Date: 05/00/1993 Pagination: 114p Report No: Publisher/CorporateAuthor(s): Washington State Transportation Center 15700 Dayton Avenue WA 98133- USA Abstract: As part of a national effort to achieve a more efficient transportation system, the 'transparent borders' concept is aimed at developing technologies and systems that provide a less expensive and more efficient operating environment for commercial vehicle operations (CVO), and ultimately, one which will allow unimpeded passage of trucks across state boundaries. The report results from the first phase of the Transportation Borders Project, a seven-state study to identify the institutional barriers to implementation of various Intelligent Vehicle Highway Systems (IVHS) technologies for CVO. It describes the current practices within state and federal agencies and organizations that affect CVO in Idaho. Particular emphasis is placed on the primary CVO functions in Idaho, including driver and vehicle licensing, operating authority, permitting, tax collection, weight and size regulation, and safety regulation. Index Terms: Commercial Vehicle Operations, Commercial Vehicles, Institutional Barriers, Intelligent Transit Systems, Intelligent Vehicle Highway Systems, Transparent Borders Project, Trucking Industry Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Hallenbeck93c	Title: WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTION OF CURRENT STATE PRACTICES, OREGON Author(s): Hallenbeck, M: Koehne, J: Scheibe, RR Language: English Publication Date: 05/00/1993 Pagination: 108p Report No: Publisher/CorporateAuthor(s): Washington State Transportation Center 15700 Dayton Avenue WA 98133- USA Abstract: As part of a national effort to achieve a more efficient transportation system, the 'transparent borders' concept is aimed at developing technologies and systems that provide a less expensive and more efficient operating environment for commercial vehicle operations (CVO), and ultimately, one which will allow unimpeded passages of trucks across state boundaries. The report results from the first phase of the Transportation Borders Project, a seven-state study to identify the institutional barriers to implementation of various Intelligent Vehicle Highway Systems (IVHS) technologies for CVO. It describes the current practices within state and federal agencies and organizations that affect CVO in Oregon. Particular emphasis is placed on the primary CVO functions in Oregon, including driver and vehicle licensing, operating authority, permitting, tax collection, weight and size regulation, and safety regulation. Index Terms: Commercial Vehicle Operations, Commercial Vehicles, Institutional Barriers, Intelligent Transit Systems, Intelligent Vehicle Highway Systems, Technological Development, Transparent Borders Project, Trucking Industry Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Hallenbeck93d	Title: WESTERN STATES TRANSPARENT BORDERS PROJECT: DESCRIPTIONS OF CURRENT STATE PRACTICES, WYOMING Author(s): Hallenbeck, M: Koehne, J: Scheibe, RR Language: English Publication Date: 05/00/1993 Pagination: 106p Report No: Publisher/CorporateAuthor(s): Washington State Transportation Center 15700 Dayton Avenue WA 98133- USA Abstract: As part of a national effort to achieve a more efficient transportation system, the 'transparent borders' concept is aimed at developing technologies and systems that provide a less expensive and more efficient operating environment for commercial vehicle operations (CVO), and ultimately, one which will allow unimpeded passage of trucks across state boundaries. The report results from the first phase of the Transportation Borders Project, a seven-state study to identify the institutional barriers to implementation of various Intelligent Vehicle Highway Systems (IVHS) technologies for CVO. It describes the current practices within state and federal agencies and organizations that affect CVO in Wyoming. Particular emphasis is placed on the primary CVO functions in Wyoming, including driver and vehicle licensing, operating authority, permitting, tax collection, weight and size regulation, and safety regulation. Index Terms: Commercial Vehicle Operations, Commercial Vehicles, Institutional Barriers, Intelligent Transit Systems, Intelligent Vehicle Highway Systems, Technological Development, Transparent Borders Project, Transportation Systems Analysis, Trucking Industry Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	Abstract
Hoel97a	Title: INTERMODAL FREIGHT PLANNING AT THE MULTI-STATE CORRIDOR LEVEL: STATE OF THE PRACTICE AND FUTURE DIRECTIONS Author(s): Hoel, LA: Williams, BM Language: English Publication Date: 11/00/1997 Pagination: 50p Report No: Features: FIGS: 1 Fig. TABS: 2 Tab. REFS: Refs. Publisher/CorporateAuthor(s): Mid-Atlantic Universities Transportation Center Pennsylvania State University, Research Office Building 16802-4710 Virginia Department of Transportation 1401 East Broad Street PA 23219 Virginia University Department of Civil Engineering VA 22903 USA Abstract: With the completion of the Interstate highway system the transportation planning focus has changed. Fiscal constraints preclude system expansion at the pace needed to support continued robust economic growth. Therefore, attention in the public sector has shifted to getting more productivity out of the existing modal infrastructure through improvements in system operation and management. This shift from capital construction to asset management is also motivated by increased emphasis at all governmental levels on minimizing the adverse environmental and societal effects of transportation activities. In concert with these public sector forces has been the emergence of a vibrant and highly competitive global marketplace. International trade and transportation agreements have opened the door to continued explosive growth in global commerce. The successful global enterprises are characterized by efficient logistics involving just-in-time inventory systems and a strong emphasis on customer service. The transport demands of international corporations are forcing transportation service providers to be more efficient and responsive. The combined effect of these public and private sector forces is a sea change in the way the transportation system is planned, designed, and deployed. A major element of this transportation paradigm shift involves a view of the modal systems as components of a single, integrated transportation system where each mode plays a role based on its inherent strengths. This view motivates a search for technical and institutional improvements to enhance the "seamless" flow of goods and people between the modes. In this emerging intermodal era, there will be increasing opportunities for the public and private sectors to make worthwhile investments in intermodal facilities and technology. It follows, therefore, that planning attention will be focused on improving intermodal interconnectivity. Also, the public sector will be faced with important transport policy decisions, such as carrier regulation/deregulation, truck size and weight restriction changes, and continued consolidation of the major rail carriers. Planners and decision makers will need reliable data and transportation systems analysis tools to evaluate intermodal project and policy alternatives. Within this overall global transportation system context, this report focuses on the freight transportation planning for a major corridor. The Interstate 81 corridor is a case in point. I-81 runs from upstate New York to Tennessee through Pennsylvania, the Maryland and West Virginia panhandles and Virginia and is characterized by a high level of truck travel over much of the corridor. In spite of this corridor focus, several of the conclusions drawn in this report are relevant for freight transportation planning in general. Index Terms: Data Needs, Economic Growth, Freight Transportation, Global Aspects, Institutional Issues, Intermodal Transportation, Multi-State Corridors, Systems Analysis, Transportation Planning, Transportation Policy Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA

Tag	**Abstract**
Humphrey97	Title: OVERSIZE/OVERWEIGHT TRANSPORTATION STUDY Author(s): Humphrey, TF Language: English Publication Date: 00/00/1997 Pagination: v.p. Report No: Features: FIGS: Figs. TABS: Tabs. REFS: Refs. APPS: Apps. Publisher/Corporate Author(s): Massachusetts Institute of Technology Center for Transportation Studies, 77 Massachusetts Avenue MA 02139 USA Abstract: Throughout the United States, oversize/overweight trucking is a strong viable industry. In Fiscal Year 1994 alone, 1, 927, 010 permits were issued for overweight vehicles, an 8% increase from FY93. It is important to gain an understanding of the oversize/overweight trucking industry and the vital role it plays in keeping the nation's economy moving ahead. That task was accomplished in a large part by a comprehensive report conducted by the Center for Transportation Studies at the Massachusetts Institute of Technology (MIT). The Specialized Carriers & Rigging Association (SC&RA) requested the SC&R Foundation to undertake the research. The report includes a state by state breakdown of oversize/overweight permits for FY93 and FY94, provided by the Federal Highway Administration (FHWA). This information is further broken down into overweight categories: nondivisible single trip, nondivisible multiple trip, divisible single trip, and divisible multiple trip. The report also includes all 13 working papers commissioned by FHWA for its ongoing Comprehensive Truck Size and Weight Study (TS&W). This study's ultimate objective was to estimate the effects of various elements of regulatory policy on a transport system as it evolves to serve a modern global economy. It examines how changing logistics costs, production strategies and shipping patterns must be balanced with the needs and concerns of carriers, managers of infrastructure, shippers, consumers and the traveling public. TS&W policy touches upon safety, infrastructure design and wear, States' rights and national uniformity, environment, energy use, intermodal competition and cost recovery. Index Terms: Cost Recovery, Costs, Energy Consumption, Environmental Aspects, Infrastructure, Intermodal Competition, Logistics, Motor Carriers, Oversized Vehicles, Overweight Loads, Permits, Production, Regulatory Policy, Safety, Shipping Trends, States United States, Trip, Trucking Industry, Trucks, User Needs Available from: Specialized Carriers & Rigging Foundation 2750 Prosperity Avenue, Suite 620 Fairfax VA 22031-4312 USA

Tag	Abstract
Johnson75	Title: IMPROVING MOTOR TRUCK SOCIAL{ ENVIRONMENTAL{ AND ECONOMIC UTILIZATION A LITERATURE REVIEW Author(s): Johnson, M Publication Date: 06/00/1975 Pagination: 113 pp Report No: Features: REFS: Refs. Publisher/CorporateAuthor(s): Motor Vehicle Manufacturers Association 320 New Center Building MI 48202 USA Abstract: This business literature review (covering the years 1973, 1974 and the first 6 months or 1975) presents statements of the major and subsidiary proposals (together with the arguments for a against), and identifies the organizations and individuals supporting each position. The major topics covered in the literature are economic regulation, equipment utilization, logistics, highways and roads, environment impact, financing, and driver safety. The arguments for and the major issues discussed in this area are the freedom of entry and exit, market-regulated pricing, and trucking as an instrument of social policy. The quantification of the effects of deregulation is discussed. The controversy about improving motor truck utilization has certered on the reduction of the "empty backhauls" of line[haul operations, and consolidating urban goods movements. Five areas of logistics in which improvements could lead to better transportation economics and energy conservation are termainal automation, containerization, freight forwarding, intermodal operations, and piggyback. In the area of highways and roads the major issues have been the financing of transportation systems? arguments relate to the highway trust fund and local options. Areas of concern in the field of environment have been the search for alternative powerplants, noise control, and size and weight legislation. Securities regulation and debt financing are discussed in relation to financing. Driver health and safety programs and vehicle safety standards are also covered. Index Terms: Drivers (Vehicle), Energy, Environmental Impact, Equipment, Financing, Freight Transportation, Highways, Linehaul, Logistics, Piggyback, Regulation, Reviews, Socioeconomic Aspects, Substitutes, Transportation Economics, Truck Drivers, Trucks, Urban Areas, Utilization, Vehicular Safety Available from:

Tag	Abstract
Massie91	Title: TRUCKS INVOLVED IN FATAL ACCIDENTS 1987 FACTBOOK Author(s): Massie, DL Publication Date: 06/00/1991 Pagination: 124p Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/CorporateAuthor(s): University of Michigan Transp Research Institute 2901 Baxter Road MI 48109-2150 USA Abstract: This report contains a series of distributions of variables from UMTRI's file of Trucks Involved in Fatal Accidents, 1987. This file combines the coverage of the Fatal Accident Reporting System (FARS) data with the detail of the Office of Motor Carrier (OMC) data. When no OMC report existed for a medium or heavy truck listed by FARS, UMTRI conducted a telephone interview to obtain the desired information on ownership, type of trip, vehicle configuration, cargo weights, and lengths. The 1987 TIFA dataset contains 5, 275 cases, up 0.6% from the 5, 244 in 1986. Following an introductory section on the TIFA survey procedure, a trend section tracks the incidence of large truck fatal involvements from 1980, the initial data year of TIFA, through 1987. The next section provides an overview of the fatal involvements in 1987, with most of the distributions presented on the basis of power unit type, comparing straight trucks with tractor combinations. Most of the variables in the overview section are based on the FARS file variables and describe basic information on the time and place of the accident, environmental conditions, and collision type. Following this are a pair of sections that focus separately on straight trucks and tractor combinations in more detail, with the distributions presented on the basis of cargo body style. The majority of the variables in these sections were derived from telephone interviews and OMC reports and describe the cargo type, cab style, vehicle weight, and trailer and axle configurations of the trucks. The final section compares the fatal accident experience of tractor-semitrailers with that of tractors with twin trailers. Index Terms: Day, Double Trailers, Dry Conditions, Fatal Accidents, Fatalities, Heavy Duty Trucks, Highway Classification, Ice, Intersection, Medium Trucks, Night, Rural Area, Snow, Statistics, Tractor Semitrailers, Tractor Trailers, Trends, Trucks, Urban Areas, Wet Conditions Available from: University of Michigan Transp Research Institute 2901 Baxter Road Ann Arbor MI 48109-2150 USA

Tag	Abstract
Massie92	Title: TRUCKS INVOLVED IN FATAL ACCIDENTS, FACTBOOK 1988. FINAL REPORT Author(s): Massie, DL: Sullivan, KP Language: English Publication Date: 04/00/1992 Pagination: 126p Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/CorporateAuthor(s): Contract 2164 TRIS20 University of Michigan Transp Research Institute 2901 Baxter Road MI 48109-2150 USA Abstract: This report contains a series of distributions of variables from UMTRI's file of Trucks Involved in Fatal Accidents, 1988. This file combines the coverage of the Fatal Accident Reporting System (FARS) data with the detail of the Office of Motor Carrier (OMC) data. When no OMC report existed for a medium or heavy truck listed by FARS, UMTRI conducted a telephone interview to obtain the desired information on ownership, type of trip, vehicle configuration, cargo weights, and lengths. The 1988 TIFA dataset contains 5, 467 cases, up 3.6% from the 5, 275 in 1987. Following an introductory section on the TIFA survey procedure, a trend section tracks the incidence of large truck fatal involvements from 1980, the initial data year of TIFA, through 1988. The next section provides an overview of the fatal involvements in 1988, with most of the distributions presented on the basis of power unit type, comparing straight trucks with tractor combinations. Most of the variables in the overview section are based on the FARS file variables and describe basic information on the time and place of the accident, environmental conditions, and collision type. Following this are a pair of sections that focus separately on straight trucks and tractor combinations in more detail, with the distributions presented on the basis of cargo body style. The majority of the variables in these sections were derived from telephone interviews and OMC reports and describe the cargo type, cab style, vehicle weight, and trailer and axle configurations of the trucks. The final section compares the fatal accident experience of tractor-semitrailers with that of tractors with twin trailers. Index Terms: Fatal Accident Reporting System, Fatal Accidents, Heavy Vehicles, Medium Trucks, Statistics, Tractor Trailers, Trucks Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Tag	Abstract
Massie92a	Title: TRUCKS INVOLVED IN FATAL ACCIDENTS, 1989. FACTBOOK Author(s): Massie, DL: Sullivan, KP Language: English Publication Date: 10/00/1992 Pagination: 124p Report No: Publisher/CorporateAuthor(s): Contract 3164 TRIS20 University of Michigan Transp Research Institute 2901 Baxter Road MI 48109-2150 USA Abstract: This report contains a series of distributions of variables from UMTRI's file of Trucks Involved in Fatal Accidents, 1989. This file combines the coverage of the Fatal Accident Reporting System (FARS) data with the detail of the Office of Motor Carriers (OMC) data. When no OMC report existed for a medium or heavy truck listed by FARS, UMTRI conducted a telephone interview to obtain the desired information on ownership, type of trip, vehicle configuration, cargo weights, and lengths. The 1989 TIFA dataset contains 5, 288 cases, down 3.3% from the 5, 467 in 1988. Following an introductory section on the TIFA survey procedure, a trend section tracks the incidence of large truck fatal involvements in 1989, with most of the distributions presented on the basis of power unit type, comparing straight trucks with tractor combinations. Most of the variables in the overview section are based on the FARS file variables and describe basic information on the time and place of the accident, environmental conditions, and collision type. Following this are a pair of sections that focus separately on straight trucks and tractor combinations in more detail, with the distributions presented on the basis of cargo body style. The majority of the variables in these sections were derived from telephone interviews and OMC reports and describe the cargo type, cab style, vehicle weight, and trailer and axle configurations of the trucks. The final section compares the fatal accident experience of tractor-semitrailers with that of tractors with twin trailers. Index Terms: Fatal Accident Reporting System, Fatal Accidents, Heavy Vehicles, Medium Trucks, Statistics, Tractor Trailers, Trucks Available from: National Technical Information Service 5285 Port Royal Road Springfield VA 22161 USA Acknowledgement of Document Source: UNIVERSITY OF MICHIGAN TRANSPORTATION RESEARCH INSTITUTE

Tag	**Abstract**
Massie93	Title: TRUCKS INVOLVED IN FATAL ACCIDENTS, 1990 FACTBOOK Author(s): Massie, DL: Sullivan, KP Language: English Publication Date: 04/00/1993 Pagination: 126p Report No: Features: FIGS: Figs. TABS: Tabs. Publisher/CorporateAuthor(s): University of Michigan Transp Research Institute 2901 Baxter Road MI 48109-2150 USA Abstract: This report contains a series of distributions of variables from UMTRI's file of Trucks Involved in Fatal Accidents, 1990. This file combines the coverage of the Fatal Accident Reporting System (FARS) data with the detail of the Office of Motor Carriers (OMC) data. When no OMC report existed for a medium or heavy truck listed by FARS, UMTRI conducted a telephone interview to obtain the desired information on ownership, type of trip, vehicle configuration, cargo weights, and lengths. The 1990 TIFA dataset contains 5, 003 cases, down 5.4% from the 5, 288 in 1989. Following an introductory section on the TIFA survey procedure, a trend section tracks the incidence of large truck fatal involvements from 1980, the initial data year of TIFA, through 1990. The next section provides an overview of the fatal involvements in 1990, with most of the distributions presented on the basis of power unit type, comparing straight trucks with tractor combinations. Most of the variables in the overview section are based on the FARS file variables and describe basic information on the time and place of the accident, environmental conditions, and collision type. Following this is a pair of sections that focus separately on straight trucks and tractor combinations in more detail, with the distributions presented on the basis of cargo body style. The majority of the variables in these sections were derived from telephone interviews and OMC reports and describe the cargo type, cab style, vehicle weight, and trailer and axle configurations of the trucks. The final section compares the fatal accident experience of tractor-semitrailers with that of tractors with twin trailers, and discusses the fatal accident involvement of longer combination vehicles (LCVs). Index Terms: Cargo Body Style, Fatal Accident Reporting System, Fatal Accidents, Heavy Vehicles, Longer Combination Vehicles, Medium Trucks, Power Unit Type, Statistics, Tractor Trailers, Trucks Available from: University of Michigan Transp Research Institute 2901 Baxter Road Ann Arbor MI 48109-2150 USA

Tag	Abstract
Parcells90	Title: BIG TRUCKS GETTING A FREE RIDE: ENACT A NATIONAL WEIGHT-DISTANCE TAX AND SAY "NO" TO BIGGER TRUCKS! Author(s): Parcells, H Publication Date: 04/00/1990 Pagination: 8p Report No: Features: FIGS: Figs. TABS: Tabs. PHOT: Phots. Publisher/CorporateAuthor(s): National Association of Railroad Passengers 236 Massachusetts Avenue, NE DC 20002 USA Abstract: This study examines the pavement damage problems being caused by trucks and current Federal policy with regard to trucks and concludes that (1) increases in truck size and weights should be opposed and (2) Congress should enact a national weight-distance tax (WDT) on heavy trucks. The study finds that Federal treatment of big trucks is inconsistent with the strong national need to enhance overall transport efficiency, environmental protection and safety. Index Terms: Energy Efficiency, Environmental Protection, Federal Government, Government Policies, Highway Safety, Size And Weight Laws, Truck Laws & Regulations, Truck Pavement Damage, Weight-Distance Taxes Available from: National Association of Railroad Passengers 236 Massachusetts Avenue, NE Washington DC 20002 USA

Tag	Abstract
Pataky78	Title: PROJECTING THE IMPACT OF NEW MEDIUM AND HEAVY TRUCK NOISE REGULATION STRATEGIES ON COMMUNITY NOISE LEVELS Author(s): Pataky, PP Journal Title: SAE Technical Paper Series Publication Date: 00/00/1978 Pagination: 16p Report No: Features: REFS: Refs. Publisher/CorporateAuthor(s): Society of Automotive Engineers, Incorporated 400 Commonwealth Drive PA 15096 USA Abstract: A mathematical modeling technique for studying the effects of various medium and heavy truck noise regulation strategies on community noise levels is presented. Assumptions and input data, traffic scenarios modeled, and output are discussed. Two new-vehicle noise regulation strategies were evaluated for medium and heavy trucks in excess of 10, 000 lb. gross vehicle weight. The first was originally contemplated by the Environmental Protection Agency: 83 dB (1977 through 1980), 80 dB (1981 through 1982), and 75 dB (1983 and beyond). The second strategy represented a General Motors' recommendation which maintained an 83 dB maximum sound level requirement for all trucks manufactured after 1977. The model projected that, for two typical traffic situations, the reduction of new-truck sound levels below current requirements (83 dB) does not result in a corresponding decrease in community noise levels. It was concluded that the potential benefits anticipated from the implementation of new-truck noise regulations will not be realized without the effective enforcement of operator in-use standards and the control of truck tire noise. Index Terms: Mathematical Models, Noise Level, Regulation, Tires, Truck Noise Available from: Society of Automotive Engineers, Incorporated 400 Commonwealth Drive Warrendale PA 15096 USA Acknowledgement of Document Source: National Highway Traffic Safety Administration

Tag	**Abstract**
Thompson91	Title: TRANSPORTATION AND PUBLIC POLICY: LONGER AND HEAVIER TRUCKS. PROCEEDINGS OF A CRS CONGRESSIONAL SEMINAR, MARCH 5, 1991 Author(s): Thompson, SJ Publication Date: 06/07/1991 Pagination: 30p Report No: Publisher/CorporateAuthor(s): Library of Congress Congressional Research Service DC 20540 USA Abstract: As Congress considers proposals to reauthorize the Federal-aid Highway Program, parts of which expire on September 30, 1991, it is considering whether to allow all States to exercise the grandfather rights now enjoyed by some States in authorizing longer and heavier trucks. Groups representing commercial trucking management support such proposals, while groups representing environmental, safety, non-truck highway users, and railroad interests oppose such proposals. The Congressional Research Service, on March 5, 1991, sponsored another in a series of congressional seminars organized around major transportation policy themes, examining, in particular, issues associated with proposals for Congress to allow States greater discretion in authorizing longer and heavier trucks. This report contains the proceedings of the seminar. Following an introduction by Stephen J. Thompson, Specialist in Transportation, Congressional Research Service, the case for and the case against longer and heavier trucks are made. Robert E. Farris presents the position of the American Trucking Associations that States not currently having a weight limit above 80, 000 on Federal-aid roads should be allowed to set a standard up to 143, 000 pounds. William H. Dempsey addresses the concerns about that proposal that are held by the Association of American Railroads, highway safety groups, and others. Gary E. Maring discusses various truck safety and other issues from the perspective of the Federal Highway Administration. The proceedings conclude with questions and comments that followed the presentations. Index Terms: Economic Impact, Environmental Impact, Highway Safety, Longer Combination Vehicles, Seminars, Size And Weight Laws, Transportation Policy, Truck Highway Damage, Truck Laws & Regulations Available from: Library of Congress Congressional Research Service Washington DC 20540 USA

Tag	Abstract
Umtri86	Title: THE UMTRI LARGE-TRUCK SURVEY PROGRAM Journal Title: UMTRI Research Review Volume: 17 Issue: 1 Publication Date: 07/00/1986 Pagination: 12p Report No: Features: FIGS: 1 Fig. TABS: Tabs. REFS: 4 Ref. Publisher/CorporateAuthor(s): Abstract: A University of Michigan Transportation Research Institute survey program is reported which will establish an ongoing national accident survey, and conduct the first national exposure survey to address daily variations in truck use. This survey combined information from the Fatal Accident Reporting System (FARS) with accident data from the Federal Highway Administration Bureau of Motor Carrier Safety (BMCS), police accident reports, and the results of telephone surveys to produce a comprehensive data file called Trucks Involved in Fatal Accidents (TIFA). Accident data from TIFA will be combined with data on miles traveled from the National Truck Trip Information Survey (NTTIS) to calculate fatal accident involvement rates by vehicle type and road class. UMTRI will address the size, weight, configuration, and use of large trucks to assess the relative involvement of different kinds of trucks in serious accidents, after controlling for environmental factors such as road class and time of day. Data collection is discussed, and the TIFA and NTTIS data bases are described. Some of UMTRI's analytical work on a wide range of issues is noted with special emphasis on two issues: safety comparison of single- and twin-trailer vehicles; and the probability of rollover. Available from: