

ELEKTRONICA IN HET WEGVERKEER II

Een bundel samenvattingen behorende bij het gelijknamige literatuurover-
zicht

R-84-23 II

Leidschendam, 1984

Stichting Wetenschappelijk Onderzoek Verkeersveiligheid SWOV

TEN GELEIDE

Deze bundel bevat, naast bibliografische gegevens, samenvattingen van de literatuur die geraadpleegd is bij het opstellen van het rapport "Elektronica in het wegverkeer: Een literatuurstudie in opdracht van de Raad voor de Verkeersveiligheid", P.I.J. Wouters, SWOV R-84-23, 1984.

De uitgave geschiedt eveneens in opdracht van genoemde Raad, die er mee de toegankelijkheid van de in het rapport behandelde materie beoogt te vergroten.

De samenvattingen zijn van verschillende bronnen afkomstig en zijn daardoor ook verschillend van karakter. Als bronnen zijn gebruikt de International Road Research Documentation (IRRD), de National Technical Information Service (NTIS), uittreksels opgesteld door auteurs van publikaties en/of bewerkt door de sectie Documentatie en Bibliotheek van de SWOV. De samenvattingen kunnen "indicatief" zijn of "leesvervangend". De nummers in de rechterbovenhoek stemmen overeen met die van de "Literatuuropgave" uit R-84-23.

Prof. E. Asmussen,

Directeur Stichting Wetenschappelijk Onderzoek Verkeersveiligheid SWOV

BENJAMIN, T.E.A.

(1)

Vue internationale des systèmes d'information sur les accidents,
les parcours et les déplacements

Une enquête internationale IDBRA

International Drivers' Behaviour Research Association (IDBRA), 1984.

(A)

Dans le but d'aider l'Administration française (SETRA, Ministère des Transports) à procéder à un examen critique des systèmes d'information concernant l'utilisation des réseaux routiers et des accidents (notamment corporels) qui y surviennent, des renseignements sur les pratiques actuelles dans une douzaine d'autres pays technologiquement développés ont été obtenus et analysés.

Ces renseignements concernent, d'une part, le système de saisie des données sur les débits, les parcours et les déplacements sur les routes de diverses catégories, les vitesses pratiquées, les taux d'occupation, et le port des principaux dispositifs de sécurité passive (ceintures, casques, systèmes de retenue pour enfants); d'autre part, le système de saisie des données sur les accidents (corporels, et, dans certaines juridictions, matériels lorsque le coût des réparations dépasse un seuil déterminé).

Les politiques routières visent un équilibre toujours meilleur entre les besoins de mobilité, la Santé Publique (diminution des atteintes à l'environnement physico-chimique; réduction de la fréquence et de la gravité des accidents), et une utilisation plus rationnelle du pétrole. De telles politiques doivent fatalement être élaborées et évaluées sur la base d'une compréhension pluridisciplinaire - à la fois plus profonde et plus large - du rôle et de l'interaction des variables.

Des données provenant de systèmes d'information plus pertinents alimenteront cette plus complète compréhension et en seront une condition 'sine qua non'.

RIJKSWATERSTAAT

(2)

Verkeersgegevens 1979

Publicatie no. 34

Rijkswaterstaat/Dienst Verkeerskunde, Den Haag, 1983, 62 p.

SWOV PB 18529

(S)

Traffic data for the Netherlands during 1979 are presented.

PROVINCIALE WATERSTAAT VAN NOORD-BRABANT

(3)

Verslag van de verkeerstellingen op provinciale wegen in 1974

Verkeer 1974

Provinciale Waterstaat van Noord-Brabant, 's-Hertogenbosch, 1975.

SWOV PB 8532

(S)

Statistical data of traffic counts carried out in the province of Noord-Brabant during 1974 are presented.

CENTRAAL BUREAU VOOR DE STATISTIEK

(4)

Algemene verkeerstellingen van de rijkswaterstaat 1975

(Voortzetting van Verkeerstellingen 1970).

STA-022

Staatsuitgeverij, Den Haag, 1978, 49 p.

DORSEY, W.F.

(5)

A status report on vehicle detectors

Federal Highway Administration, Washington, D.C., 1975, 84 p.

IRRD 236558

(I)

This report is a status summary of vehicle detector technology that is utilized for traffic control and road counting applications. The report provides background information on vehicle detectors, a cataloging of commercially available detector types, and a field response summary on current vehicle detector usage. The field response summary focuses on the inductive loop detector (ILD). ILD installation techniques, electronics types, problems, and current research are discussed. Novel installation methods for the ILD are also highlighted. The final section of the report describes current vehicle detection research activity. This includes: the radio frequency traffic sensor, the magnetic gradient vehicle detector, and the self powered vehicle detector (FHWA).

KENTON, E

(6)

Highway traffic detectors and detection.

National Technical Information Service, Springfield, 1979.

NTIS/PS-79/0642

(A)

Reports are cited on the development, calibration, testing and operation of motor vehicle detectors and the detection of traffic incidents on highways and roads. Research is included on freeway surveillance, closed circuit television, electronic reconnaissance, magnetic measuring devices, traffic flow monitors, and sensor configurations.

Investigations of snow and ice detection on bridges are noted. Other topics are radar sensors, automatic control equipment, communication, diamond interchange traffic, headway monitoring, critical intersections, overheight truck load detection, and the placement of detectors. (This updated bibliography contains 137 abstracts, 27 of which are new entries to the previous edition).

SIFFERT, M; BRIANT, G.

(7)

Traffic analysis and control by means of magnetic loops and dynamic weighing bridges

Serial, 1976-05/06, No. 83, 39-52.

Laboratoire des Ponts et Chaussées, Paris, 1976

IRRD 104420

(I)

This article describes three types of sensor which facilitate the creation of a complete station for the detailed analysis of traffic. The sensors record the following information per vehicle, (1) date the vehicle passed, interval between the passing of the axles (time sensor with an electronic clock and chronometer), (2) vehicle as an individual unit and immediate speed (vehicle-speed sensor with magnetic loops, (3) individual axle loads (for heavy vehicles) (weight sensor using a dynamic weighbridge). The data provided by these three sensors are organized, controlled and sent to a magnetic cassette recorder. The number of possible combinations of the various parameters recorded facilitates the processing of traffic data under various aspects in many different fields. Because of its mobility, the system is very flexible and can be used for varied applications on the network.

DEAN, K.G.; MACDONALD, D.E.; MORRIS, D.J.

(8)

Vehicle detector loop configurations - phase 4

Report No. R77-28

Amalgamated Wireless (Australasia) Limited, AWA Research Laboratory.

IRRD 234213

(I)

Cover title reads: vehicle detector loop cables. This report covers phase 4 of the investigation into inductive loops for presence detection at traffic signals. Phase 1 was a preliminary stage in which four nominated loop configurations were examined briefly, whilst in phase 2, additional loops were devised in order to improve electrical performance. The two most important aims were improvement of sensitivity to motor cycles and reduction of sensitivity to motor cycles and reduction of sensitivity to vehicles in adjacent lanes. It was the aim, further, that once a vehicle entered the sensing area it should remain detectable until it left the area, the length of which was taken to be 4.5 m. In order to expedite investigations, a 1/20 scale model technique was evolved. The report was prepared for the New South Wales Department of main roads.

ZIJVERDEN VAN, J.D.; VOORT VAN DER, R.C. (9)

Geometry of loop configurations for speed measurements

Verkeerskunde 30 (1979) 9

IRRD 243427 (I)

In an earlier article (IRRD abstract no. 240964) a search for the ideal loop-configuration of detectors was reported. Sources for errors in speed measurements with loop detectors were classified. In this article it is shown that a better geometry of the loop detectors is hardly possible. Improvements of some importance can only be obtained by the development of better detectors.

ANDERSON, G.M.; KOBLE, H.M.; TIGNOR, S.C.

(10)

Suggested guidelines for locating freeway sensors

Report, 1980-01, 131-7

Institute of Transportation Engineers, Washington, D.C., 1980, 7 p.

IRRD 260532

(I)

This paper reports on one of the project 1C research studies relating to the operation of an electronic freeway management and control system. This article specifically describes research undertaken to aid traffic engineers and managers in determining where roadway sensors should be placed within the freeway lanes where both cost and quality of information are primary system considerations. Compend Tech Paper Annual Meeting Institute of Transportation Engineers, 50th Anniversary Celebration, Pittsburgh, PA, August 17-21, 1980.

RICHARDS, B.E.

(11)

A microprocessor - based data acquisition system

Proceedings 9th ARB Conference, Vol. 9, No. 5, 18-24

Australian Road Research Board, Vermont, South Victoria, Australia,
1979, 7 p.

IRRD 239447

(I)

This paper was presented at session 16 - instrumentation for detection and data acquisition. The instrumentation group of the Australian Road Research Board has developed a data acquisition system based on a general purpose microprocessor. The paper describes this system which, using standardised hardware modules, may be configured to suit a wide range of applications associated with the collection and reduction of data required for road research projects and related activities. A description of the system's modular construction, design considerations and constraints imposed by the mobile/roadside environment is given. The software problem is outlined, covering programming techniques and the major role played by software within the system. Descriptions of current practical applications, including the dynamic weighing of vehicles and the acquisition of data relating to geometric road parameters, are given. The number of the covering abstract of the conference is IRRD no. 239340.

HOOPER, D.E.; HEDLEY, G.R.; HARTLEY, F.T.

(12)

Extension of vehicle detection functions by the application of advanced engineering techniques

Papers, 261-5, Australian Engineering Conference 1978

Institution of Engineers, Barton A.C.T., Australia, 1978, 5 p.

IRRD 234139

(I)

The most versatile and widely used method of vehicle detection is the conventional inductive loop device. The need of accurate and reliable vehicle detection clearly increases as the sophistication of intersection controllers progresses from fixed time through vehicle actuated phase to vehicle actuated group. Currently, vehicle detection is the most unreliable component of traffic management devices and the information communicated is only a fraction of that available. This paper describes how the utilisation of advanced electronic devices and first generation software emulates conventional detection devices. It further defines the areas in which functions may be expanded and costs reduced. The number of the covering abstract of the conference is IRRD no. 234127.

INSTITUT DE RECHERCHE DES TRANSPORTS

(13)

Device for the classified count of road vehicles; eight categories

Report 1976.

Institut de recherche des transports, Arcueil-Cedex, France, 1976, 70 p.

IRRD 105291

(I)

In this publication the authors describe the design and construction of an automatic classifying device for vehicles travelling on a highway network. The four chapters deal mainly with: (1) the principles of its functioning, (2) technical description (the sensors, the radar detectors, electronic measuring systems and logic circuits), (3) installation and operation, (4) results of tests carried out at Savigny on the A6 motorway. An appendix contains two drawings with very detailed information on the positioning of the sensors.

ANDERSON, P; LARSON, R.; LUBKE, R.; PUTNAM, G.; WICK, D.

(14)

Vehicle detection - Phase III. Passive bus detector/intersection priority system development. Volume I. Project overview and technical discussion

Report No. 7666.

Honeywell Incorporated Systems and Research Center, Minneapolis, Federal Highway Administration, Washington, 1975, 212 p.

IRRD 234924

(I)

The passive bus detector/intersection priority system was developed under this project. The system functions as a fully independent traffic controller with completely passive bus detection capability using inductive-loop detectors (ILD) placed in the roadway. Bus detection is based on ILD signal processing (classifier) techniques, thereby eliminating need for any modifications or additions to the bus. Passive bus detection hardware includes special ILD electronics, a high-speed programmable processor, and a microprocessor. Using the same microprocessor, plus programming panel, stored programs, and switching and safety units, the system design is sufficient to exercise bus priority control at urban intersections containing up to 23 signal circuits and 16 ILD transducers. In addition, the system has capability of commanding the traffic signals in either one of three fixed timing patterns, selected at the system by the traffic engineer or controlled by a loop master. See also IRRD abstracts nos 234921-4.

LANDT, J.A.; BOBBETT, R.E.; KOELLE, A.R.; SALAZAR, P.H.

(15)

Los Alamos scientific laboratory electronic vehicle identification system
Report 1979-05.

Department of Energy, Washington, D.C., 1979, 21 p.

IRRD 246956

(I)

A three-digit electronic identification system is described. Digits may be decimal (1000 combinations) or hexadecimal (8192 combinations). Battery powered transponders are interrogated with a low-power (1 W) radio signal. Line-of-sight interrogations up to 33 m (100 ft) are possible. Successful interrogations up to 7 m (20 ft) are possible for concealed transponders (that is, in the engine compartment). Vehicles moving at high rates of speed can be interrogated. This system provides data in a computer-compatible RS232 format. The system can be used for other applications with little or no modification. A similar system is in present use for identification and temperature monitoring of livestock. No unforeseen problems exist for expanding the coding scheme to identify larger numbers of objects.

COMMISSION OF THE EUROPEAN COMMUNITIES

(16)

Euco-Cost 30. European project on electronic traffic aids on major roads

EUR-7154

Commission of the European Communities, Luxembourg, 1981, 124 p.

SWOV PB 19851

(S)

The report describes briefly the international cooperation which preceded the project, summarizes the results of the research, discusses the need for international standards, and recommends an international demonstration project. Topics covered are: information needs of drivers, in-vehicle communication, communication with the driver by variable message signs, broadcasting of traffic information, incident detection, and automatic detection of bad weather conditions.

BAANG, K.; PETERSON, B.

(17)

European project on electronic traffic aids on major roads

Report 9th IRF World Meeting 1981

Svenska Vaegfoereningen, 1981, 12 p.

IRRD 257245

(I)

Eleven European countries and the European commission have 1977-1980 accomplished a cooperative study on the possible application of electronic aids to traffic problems on busy, high-speed roads. Specialist working groups have investigated nine major topics: (1) in-vehicle communication with the driver by spoken words; (2) in-vehicle communication by visual presentation; (3) variable signs or signals; (4) radio broadcasting of traffic information; (5) information needs of drivers and road authorities; (6) automatic or manual detection of incidents affecting traffic; (7) clear, correct and unambiguous terms for use in messages of different languages; (8) automatic detection of bad weather; (9) equipment for control centres and control strategies, data transmission, proposals for an international demonstration. The study concludes that the most appropriate control system should include changeable message signs, variable direction signs, automatic detection of traffic incidents and bad weather, supplemented by area broadcasts of traffic information. To ensure that information for drivers is always given in the same manner, it is proposed that new symbols should be adopted to warn drivers of hazards encountered on high-speed roads, that light-matrix changeable message signs should be sanctioned, and that radio messages should always have the same sequential structure, although they need only be broadcast in the local language(s). An international demonstration of the system, to be decided by 1981 on an action concertee basis, is proposed for a site in the Netherlands. (A) For the covering abstract of this volume see IRRD 257235. For covering abstracts of other volumes see IRRD 257174, 257182, 257202 and 257267.

VERKEER EN WATERSTAAT

(18)

Broadcasting of traffic information

Ministerie Verkeer en Waterstaat 's-Gravenhage, 1982, 56 p.

IRRD 265623

(I)

The authors insist on the importance of the radio to warn drivers of dangers ahead. Warnings should be given especially for fog and slipperiness and the location of congestion in order to prevent accidents. Automatic detection of these problems is therefore important. Recommendations should be added to the warning on how to behave in the given situation. Clear wording is necessary. Broadcasting groups and police should come to an agreement about time and frequency of the broadcasts.

OEI, H.L.

(20)

Route information systems

STT 38

Delft University Press, Delft, 1983, 9 p.

(A)

The present route information system is capable of improvement in various respects. The various sources of information must be better attuned to one another, and distribution should be more even. A relatively large amount of prior knowledge is needed before signposting can be used effectively. The amount of information which drivers have to assimilate must be kept within realistic limits. This applies both to information to be assimilated before the journey and to information fed to drivers en route. As far as possible route information should not compete for the driver's attention with the information he needs to keep the vehicle on the road and to carry out manoeuvres.

The road maps currently available could be improved. Possible improvements include the systematic numbering of roads, the numbering and naming of motorway and other exits, mapping of alternative routes, the inclusion on maps of reference points used in broadcast traffic bulletins, and the addition of indexes of place names and important reference points or landmarks.

Signposting can be improved by attuning it to the functional classification of road networks, and by the numbering of exits coupled with a permanent system of alternative routes with roads numbered systematically.

The reliability of broadcast traffic information should be improved by better data collection.

Research is currently being conducted on the applicability of route information which could be displayed on request at motorway restaurants and petrol stations.

Flexible signposting appears not to have a great deal to offer for the Netherlands due to the lack of proper alternative routes and the relatively rare occurrence of serious congestion.

The greatest possible account should be taken of future developments. Care must be taken to ensure that the introduction of a new system does not hamper the later introduction of foreseeably better systems. Road-user education about the nature and function of mapping and signposting will make drivers' tasks easier (e.g. route planning, choice of orientation points, route following, etc.). The prospects for individual route information in the vehicle appear dubious, considering the equipment needed and its expense.

MAMMANO, F.J.

(21)

Driver information and motorist aid hardware

Resource papers, Volume 1

University of California, California, 1979, 4 p.

IRRD 259855

(I)

This paper presents the state of the art of three types of driver information and motorist aid hardware: variable message signing (VMS), highway advisory radio (HAR), and motorist aid systems (MAS). The evolution of this hardware is discussed as well as the current practices and future direction. This is not intended to be an exhaustive discussion but rather a summary and critique of these hardware types. The paper concludes by identifying some interim steps that are and can be taken before a total integrated driver information and motorist aid system can be implemented. (A) For the covering abstract of the symposium see IRRD 259850.

JEFFERY, D.J.

(22)

Ways and means for improving driver route guidance

Report LR 1016

Transport and Road Research Laboratory, Crowthorne, 1981, 21 p.

IRRD 258441

(I)

This report considers a wide range of possible methods for improving the route guidance information available to drivers, and for saving up to £ 600 m per year of national resource costs which are effectively wasted by drivers who fail to select optimum routes for unfamiliar journeys. The methods considered include improvements to maps and road signs, both of which could prove highly cost effective although they would leave some 80 per cent of the wastage unrecovered. A substantial proportion of this remaining wastage might be avoided with a viewdata route planning and guidance scheme which could be achieved at relatively low cost to public funds, or with automatic systems. Of a range of automatic electronic guidance systems considered the most cost effective solution would be provided by a system which used buried loops to provide a two-way communication link between a roadside and a vehicle unit. Such a scheme would necessarily involve a considerable investment from public funds, but would offer the greatest potential for further development and, in particular, could provide the basis of a comprehensive traffic control tool. (A)

HEININGEN, P. VAN

(23)

Experiment met route-informatie via view-data

Verkeerskunde 30 (1979) 6: 280-281

SWOV PB 14888

(S)

The Public Works Department of the City of Amsterdam reports on a study being carried out - together with the Dutch GPO - on the use of View-data for road-side information on route choice within the town. It is possible to put up displays in road-side restaurants, information kiosks etc. When destination data are keyed in, the display will give instant details about the exit point on the motorway which is most appropriate, diversions to be expected ahead, etc.

VERKEERSKUNDE

(24)

Viewdata alternatief voor verkeersgeleidingssystemen?

Verkeerskunde 33 (1982) 3: 112

(S)

In enkele regels worden 3 verkeersgeleidingssystemen vergeleken: het viewdata systeem en een systeem dat gebruik maakt van inductielussen. Beide hebben voor- en nadelen, zodat er nog onderzoek moet volgen. Het aangeven van reistijden op kaarten zou de goedkoopste oplossing zijn.

VERKEERSKUNDE

(25)

Routeplanning per viewdata

Verkeerskunde 35 (1984) 1: 9

(A)

Route-tel is de aanduiding voor een informatiesysteem voor weggebruikers, ontwikkeld door TRRL. In de TRRL Cyber 170 computer is een netwerk opgeslagen met 6000 wegvakken en 2000 knooppunten en een programma dat de snelste c.q. de voordeligste route betekent. Het ligt in de bedoeling om het systeem in de toekomst ook open te stellen voor weggebruikers die niet van Viewdata gebruik kunnen maken, maar die wel beschikken over een voor Prestel geschikte computer.

DAWSON, J.A.L.

(26)

Electronic road pricing in Hong Kong: The pilot stage

Serial, 1983-08, Vol. 24, No. 8

Traffic Eng. Control, London, 1983

IRRD 272602

(I)

A high level of car ownership in Hong Kong has resulted in severe traffic congestion problems despite a continuing programme of capital-intensive road and mass transit construction. As government action to restrain vehicle ownership has proved unsatisfactory, a means of restricting vehicle usage such as road pricing is being advocated. Electronic road pricing (ERP) is the most selective of road pricing systems as, for example, it does not require a blanket charge to enter a defined area covered by a supplementary licence scheme, nor need it create the associated effects in time and space. The effect of ERP is to impose, as selectively as possible, a small charge that makes the marginal road user consider the need to make a particular journey at a given time. The system designed for Hong Kong will require every vehicle to be fitted with a physical number plate as well as an electronic version mounted underneath the vehicle. The pilot stage of the project now planned requires co-ordinated action to include transport engineering, traffic planning, road system engineering and legislation. The article describes the operation and installation of the proposed system for Hong Kong.

JEFFERY, D.J.

(28)

A low cost detector developed for use on roads

Report No: TRRL-LR-453

Transport and Road Research Laboratory, Crowthorne, 1972, 24 p.

(A)

A fog detector of the split beam transmissometer type is described. Two light beams, derived from a single modulated solid state source, are detected at the ends of two separate paths, one enclosed and one through the atmosphere. The outputs from the detectors are switched and combined in such a way that the final output is a direct measure of the attenuation undergone by the fog path beam, and is free from zero drift, the effects of ambient light admitted into the apparatus, and photo-detector leakage currents.

COOPER, L.; MOORE, R.L.

(28)

Fog and road traffic

Report LR-446

Transport and Road Research Laboratory, Crowthorne, 1972, 46 p.

(A)

Thick fog occurs in Great Britain on about 10 days each year: it impedes traffic and some serious accidents occur on high speed roads. Overall some two per cent of all road casualties occur in foggy weather. The physics of fog and the prospects of reducing the number of fog accidents by fog dispersal, better warning, improved lighting and the use of electromagnetic and acoustic radar are discussed. Current valuations of accident costs are used to estimate the additional expenditure on vehicles and roads that might be justified assuming that it resulted in a halving of fog accidents. It is probable that the most worthwhile countermeasure to fog accidents may be found in systems of traffic control that have a wider application than only in fog.

BLACKBURN, R.R.

(29)

Pavement and bridge icing

Report No: TRB/TRR-576

Transportation Research Board, Washington, D.C., 1976, 40 p.

(A)

Contents: Economic evaluation of the effects of ice and frost on bridge decks; Survey results of the incidence of premature bridge deck icing; Thermal response of bridges; Development of a frost and ice detection system for highway bridges; Design heat requirements for embedded snow-melting systems in cold climates; Behavior of ferrocyanide and cyanide in relation to deicing salt runoff.

MACKWHINNEY, R.C.; LOVELL, C.C.; RUDEN, R.J.

(30)

Snow and ice detection and warning systems

Report No: MB-R-75/104

Federal Highway Administration, Washington, D.C., 1975, 174 p.

(A)

The report summarizes the activity of a 2-year program to evaluate commercially available ice and snow detection and warning systems. Three detector systems were selected for evaluation. A bridge in the High Sierra Mountains near Truckee, California, was selected for the test site and fully instrumented with the detectors, as well as speed and weather measurement stations. A computerized, fully automatic data acquisition system was used to provide 24-hour-per-day recording of all sensor and detector information. Three optimally placed speed traps provided an approach speed profile for each of some 50,000 vehicles, automatically classified as car or truck that approached the bridge. Although motorist behavior was found to be significantly altered by varying weather conditions, the manually operated motorist warning system also produced significant alterations in behavior.

LEIFER, J.C.

(31)

Present status of the bridge ice detection program at FHWA

Report No: SR 185

Transportation Research Board, Washington, D.C., 1979, 5 p.

IRRD 242001

(I)

This paper discusses the need for an effective ice detection system for bridges, and outlines an early evaluation program that has led to the selection of a spot ice detector for further testing. This small detector is installed flush with the surface of a pavement and, with its associated electronics package, is capable of transmitting surface conditions to a remote location over a telephone or rapid link. The advantages of an area ice detector are discussed and results to date in the development of a microwave radiometer for detection of surface condition are presented. (A) For the covering abstract see IRRD abstract no. 241980.

RAVENSCHOT, W.H.; VERSLUIS, A; VOORT, R.C. VAN DER

(32)

Windwaarschuwingssysteem bij de Moerdijkbrug

Verkeerskunde 30 (1979) 2: 68 - 70

SWOV PB 14422 (IRRD 240594)

(S)

After the old Moerdijk Bridge with its conventional construction was replaced by a new and wider one of modern design, drivers are quite unaware where the A 16 motorway links to the flat bridge deck. Strong sidewinds may therefore cause erratic movements of vehicles. This article describes an automatic warning system that comes into operation at certain weather conditions. It displays both warning signs and speed limit signs when there is a danger of traffic being affected by fresh crosswinds.

WOUTERS, P.I.J.; MOOYMAN, G.L.

(33)

Wind - een gevaar op de weg

Verkeerskunde 31 (1980) 3: 104 - 108

SWOV PB 16373 (IRRD 247454)

(S)

Wind blows generally stronger on high, exposed roads in flat surroundings such as on bridges, dykes and dams, and can therefore hinder traffic. The hindrance can be increased by lorries and buses because, while overtaking, they cut off crosswinds and produce their own air displacement. Other vehicles which are sensitive to wind, can be brought off their course by the combination of wind, wind cut off, and air displacement. Estimations are made of the amount of sideways deviation for various driving and overtaking speeds. The possibilities of limiting the sideways deviation during strong winds to acceptable levels are discussed. The most obvious are temporary restrictions on overtaking and reduction of driving speeds.

MAKELA, M.

(34)

Development of automatic detection of bad weather conditions

Report, date: 1979-08.

Finnish Meteorological Institute, Helsinki, 1979.

IRRD 606534

(I)

The aim of the project is to develop a prototype system for detecting and warning of weather and driving conditions and their predictable changes. The system will detect, predict, and give warning of hazardous changes in each of the following conditions: visibility, wind speed and gustiness, skid risks due to changes in weather and flood risk. Furthermore the aim is to examine the problem of short term weather forecasting and its repercussions on road maintenance, traffic strategy and the identification of bad-weather "blackspots". (Theme 8 of Euco-cost 30 project).

COLLINS, J.F.; HOPKINS C.M.; MARTIN J.A.

(35)

Automatic incident detection - TRRL algorithms HIOCC and PATREG

TRRL SR 526

Transport and Road Research Laboratory, Crowthorne, 1979, 15 p.

IRRD 246992

(I)

An automatic incident detection (aid) system, using computer based algorithms to identify the traffic disturbances following an incident, is being developed at TRRL. It incorporates two new algorithms, HIOCC and PATREG. The HIOCC algorithm operates by detecting stationary or slow moving vehicles over individual vehicle detectors. It looks for several consecutive seconds of high detector occupancy to detect queues and incidents in high traffic flows. Off-line tests with recorded data show HIOCC's detection ability to be very good and a low false alarm rate can be achieved. The PATREG algorithm measures the average traffic speed between upstream and downstream detector stations using a pattern recognition technic, detecting incidents by identifying significant speed changes. Preliminary tests suggest that it performs satisfactorily in free-flow conditions up to about 1500 veh/h per lane, and has an acceptably low false alarm rate. By incorporating both HIOCC and PATREG in an aid system a wide range of traffic conditions can be catered for. A new aid site on the M1 in Bedfordshire will be used to complete the development and testing of the algorithms. (A).

The international public demonstration on electronic traffic aids on major roads (The demonstration project in the Netherlands 1982-1983) Euro-cost 30 bis Project, Brussels, 1982, 21 p.

XI/952/82-EN

(A)

The project proposed is primarily a demonstration and not a trial. The purpose will be to demonstrate to an international audience (mainly people responsible for traffic control) equipment and techniques for traffic control on high speed roads. Where alternative equipment is permissible the alternatives will be shown, or, if many alternatives exist, a sample will be shown.

An additional purpose will be served by such a demonstration.

In studies of automatic incident detection, it has not so far been possible to study different techniques at one site in the same traffic conditions. Different techniques have been used in different projects but with results which have not been comparable.

Therefore, the study of automatic incident detection is included in the demonstration project.

JENESON, J.H.; KLIJNHOUT, J.J.

(37)

Keeping congestion under control

Het Nederlandsche Wegencongres, 's-Gravenhage, 1982, 20 p.

IRRD 271125 (SWOV PB 22364)

(I)

Not all traffic can be handled within the existing infrastructure. Measures to improve this situation will have to be implemented. Control of congestion may lead to the best possible use of the infrastructure. Further development of models in the field of network control is desirable. Electronics in cars will not solve the traffic problems in the 15 years to come. For the covering abstract of the conference see IRRD 271122.

MAES, W.

(38)

The automatic detection of incidents on motorways

Serial, No. 5, 1976, 377-400

Ann. trav. publics. Belg. Brussels, 1976, 24 p.

IRRD 106857

(I)

The author recalls that it is desirable that drivers and the police be informed as quickly as possible of all abnormal situations which could present a real danger. This requires an immediate detection of incidents. A description is given of the different methods of detection which can be used. A chapter is devoted to the philosophy behind such a detection system and to the different elements of an automatic system. The algorithms normally used are described together with the different criteria utilized for their evaluation. Research in the USA and Europe is summarized. A cost-benefit analysis and an extensive bibliography are appended.

ILLINOIS DEPARTMENT OF TRANSPORTATION

(39)

Chicago area expressway surveillance and control: Final report

Report, 1979, No. 27

Federal Highway Administration, Springfield, Illinois, 1979, 180 p.

IRRD 251768

(I)

The Chicago area expressway network features the world's first and largest freeway traffic surveillance and control system. From pioneer experiments with detector/telemetry/computer monitoring of traffic flow, and the development of entrance ramp metering, the real-time system now covers 105 miles (169 km), with 1600 detector locations and 54 controlled ramps. This report describes the surveillance and control system and its basic components, documents the implementation and operational experience, evaluates ramp control effectiveness, assesses costs and benefits, and relates the use of electronic traffic aids to overall urban freeway traffic management efforts. The Chicago area case study illustrates successful progress towards reducing freeway congestion, improving flows, increasing safety, expediting emergency responses, and providing motorist aid and information. Expressway surveillance report 27.

PAYNE, H.J., TIGNOR, S.C.

(40)

Freeway incident-detection algorithms based on decision trees with states

Transp. Res. Rec. 682

Federal Highway Administration, Washington, D.C., 1978, 8 p.

IRRD 244945

(I)

Incident-detection algorithms are a part of an overall freeway-traffic management system. These algorithms provide indications of the probable presence of freeway incidents by processing electronic surveillance data. In this paper, a class of algorithms that are designed to discriminate patterns in the data peculiar to incidents are described. The general structure of these algorithms is the decision tree with states, the states corresponding to distinct traffic conditions. Ways to calibrate algorithm thresholds are described and applied to the algorithms. Performance evaluations based on traffic data from the Los Angeles system are presented. (A) This paper appeared in TRB research record No. 682, urban system operation and freeways. For the covering abstract of the whole number, see IRRD abstract no. 244940.

HELLIAR-SYMONS, R.D.

(41)

Automatic close-following warning sign at Ascot

Report LR 1095

Transport and Road Research Laboratory, Crowthorne, 1983, 16 p.

IRRD 273241

(I)

A system, which measures the time-gap between successive vehicles and illuminates a warning sign if this gap is less than a pre-set level, is shown to affect the close-following behaviour of drivers on the A332 at Ascot. To test the effectiveness of the sign, measurements of inter-vehicle gaps were made at two points, 330 metres and 880 metres, 'downstream' from the sign. An improvement of about one third in the proportion of drivers following at less than 1.0 second was detected at both monitor points, after installation of the sign. There was no statistically significant reduction in this effect over the five year period of the experiment. The number of accidents was insufficient to indicate whether there had been a reduction associated with the operation of the sign. (A).

BROWN, S.J. JR

(42)

Point-follower automatic vehicle control: a general analysis

Report 1977-05

Johns Hopkins University, Laurel, Maryland, 1977, 159 p.

IRRD 237915

(I)

This three-part study examines the generic characteristics of the point-follower approach to vehicle control for automated guideway transit systems, under which vehicles are constrained to follow electronic signals that move along the guideway with predetermined speeds and spacings. The first part of the study involves a kinematic analysis of point-follower control during speed transitions and point-transfer manoeuvres that are generally required to resolve merge conflicts. The second part consists of a dynamic analysis of point-follower control, formulated as a problem in classic control theory. The final part addresses the traffic merging problem by development of quasi-synchronous control algorithms for resolution of merge conflicts at network intersections of various geometries. (A).

DUDEK, C.L.

(43)

Human factors considerations for in-vehicle route guidance

Transp. Res. Rec. No. 737

Transportation Research Board, Washington, D.C., 1979, 4 p.

IRRD 251623

(I)

This paper considers the development and maintenance of credibility in the design, implementation, and operation of a route guidance system. Because drivers will have positive attitudes about a system that provides them with relevant, reliable, and accurate information, all precautions must be taken to ensure that these driver expectations are met. Messages must be presented clearly and must allow ample time for the driver to respond to a given situation. Factors that affect reading time of displays include driver work load, message load, message length, message familiarity, and display format. In order to maintain driver credibility, surveillance must be an integral part of a route guidance system. Such surveillance must be able to detect adverse conditions, validate the adverse conditions, and determine the nature and scope of the problem. Electronic sensor surveillance, however, has some limitations. Because it is a blind system, (A) some form of visual validation and assessment of incidents to ensure the accuracy of displayed messages and (B) some guarantee of adequate system maintenance are necessary. A "forgiving" system - one that alerts the driver and provides instructions about how to return to a scheduled route after a diversion - must also be considered. (A) This paper appeared in transportation research record no. 737, traffic control devices, geometrics, visibility, and route guidance. For the covering abstract of the whole number see IRRD 251605.

BRAEGAS P.

(44)

Function, equipment, and field testing of a route guidance and information system for drivers (ALI)

IEEE Transactions on Vehicular Technology, Vol. VT-19, No. 2, 1980
Blaupunkt-Werke GmbH, Hildesheim

(A)

Traffic flow has already been improved in the German autobahn network by guidance systems utilizing data collection and calculating forecasts. Some examples of this are the remote-controlled traffic signs in the autobahn network Rhein-Main, the congestion warning system on the Aichelberg, and the lane-controlling system of the Frankfurt-Cologne autobahn. An improvement of the prediction accuracy can be expected if the destinations of the vehicles are known. This is the basic idea of the interactive ALI system (guidance and information system for drivers). After indicating his destination, the driver receives individual information about how to reach the destination in the shortest and easiest way. By knowing the destination, the system can improve its prediction ability. At this time, such a system of approximately 100 km in length is being prepared on an autobahn network in the Ruhr area; it is being financially supported by the Federal Ministry of Research and Technology, the Federal Minister of Transport, and several participating authorities of Northrhein-Westfalia. At 83 cross sections all vehicles will be counted and data will be exchanged with the ALI vehicles. This enables one to receive automatic directional information for 32 autobahn exits. For testing purposes, 400 vehicles will be fitted with ALI units. After considering the current traffic situation, the central computer can arrive at a forecast for this partial stretch of the network. For example, if there is a threat of congestion, the computer can modify its program for directional information in the cross sections, thereby informing ALI vehicles as to traveling time, operating costs of the vehicles, as well as the danger of congestion, and the detour route.

Large-scale testing began in mid-1979, accompanied by a series of tests. The effectiveness of the system, an analysis of cost-benefit, and the effect upon driver acceptance will be determined. The evaluation of the large-scale testing will be available by mid-1981. This project is being carried out by Blaupunkt-Werke, the consulting engineers Heusch/Boesefeldt, and the Volkswagenwerke A.G. It is supervised by the Technical Inspection Bureau (TÜV), Rheinland.

NAGAI, K.; KANEYASU, K.; FUJITA, D.; INUI, J.

(45)

An in-vehicle information system for drivers

Proceedings of the international symposium on traffic control systems,
Volume 2B, p. 109 - 132.

Institute of Transportation Studies and Federal Highway Administration,
1979, 24 p.

IRRD 261198 (SWOV PB 17354)

(A)

The dissemination of road traffic information by means of variable signs, telephone, radio broadcasts and various other means has spread almost throughout the country, making a great contribution to traffic safety and the smooth flow of traffic on arterial roads in and around big cities where traffic is very heavy. However, these existing methods are still unable to provide sufficiently detailed information to cope with the possible occurrences of unforeseen contingencies. There is a demand for better road traffic information dissemination services.

In an attempt to solve such problems, we have carried out studies and experiments on an information communication system by which the driver of a vehicle operating on a road will be provided, through an inductive radio installed in his vehicle, with voice information compiled and synthesized by a computer as a means of giving proper guidance, thereby supplementing the existing road traffic information system.

BOESEFELDT, J.; EVERTS, K.

(46)

Traffic guidance and information systems for motorway networks: strategy and application

Proceedings of the international symposium on traffic control systems.

Volume 2C, p. 186 - 206.

Institute of Transportation Studies and Federal Highway Administration, 1979, 21 p.

IRRD 261198 (SWOV PB 17355)

(A)

Strategies and techniques for motorway traffic control have been developed in the Federal Republic of Germany for about the last ten years. One target among others was to guide traffic flow in such a way that traffic density was balanced for those network sections that can be influenced. Then travel time and fuel consumption can be reduced and safety can be improved by reducing the probability of collisions.

The traffic control strategy applied in network control is based on a general concept, which is described in detail in the paper.

Among others, two project areas are installed as application models in the Federal Republic of Germany:

1. The Rhein-Main project for changeable direction signs.
Since 1972, in this area traffic flow has been diverted according to the current situation by altering the destination instructions via self-acting changeable message signs in order to minimize the chosen objective function.
2. Ruhrgebiet project for individual messages.
Here the priority conditions for an individual destination guiding system for highway traffic have been established. A practical application test using about 400 vehicles equipped with special input and display units is now being performed.

DUUNK, C.J.

(47)

Road-vehicle communication in the Ariadne route guidance system
Technische Hogeschool Delft, 1982, 89 p.

IRRD 261962 (SWOV PB 20222)

(I)

The traffic control centre of the Ariadne route-guidance system composes for every instrumented intersection a message which contains coded routing information for the driver. This message, the "codegram" contains information about: (1) the possible routes a driver can choose at the intersection, (2) the physical structure of the intersection, and (3) the weather conditions, road conditions, road blocks, etc. The processor in the car extracts from this "codegram" a direction advice (according to the destination code and aided by the driver) and displays routing instruction(s) on a visual display unit. This report describes a possible layout for the visual display unit, the coding of the routing information (the codegram) and the decoding of the message received from the roadside unit by the processor in the car (A).

TOWNSIN, A.

(48)

Putting a stop to speeding

Serial, 1983-10, Vol: 51, No. 12.

Coach Bus Rev., London, 1983, 2 p.

IRRD 273182

(I)

Recent accidents have renewed public concern of coach speeds on motorways and the interest in the possible application of electronic speed limiting devices. The author suggests that high speeds are not the sole factor in the occurrence of the accidents and examines other arguments, including economy, for the use of speed limiting devices. The author describes the operating principles of three different types of speed limiters, the econocruise, the Lucas Kienzle top speed limiter and the romatic varispeed. These devices are capable of keeping speeds within plus or minus one mile/h making it possible to achieve a slightly faster average speed without infringing the law. All have an intermediate speed facility allowing the selection of one or more speeds lower than the pre-set tamper proof top speed control. In the econocruise, an electronic controller picks up signals from an inductive sensor on the transmission, or from tachograph, and as speed approaches the selected maximum a valve block intervenes in the air throttle contact. Push-pull motion is used to control the fuel injection pump as the set maximum speed is approached in the Lucas Kienzle and a solenoid valve allows pressure from a hydraulic pump to actuate a cylinder unit in the accelerator linkage in the romatic device.

LASTBILEN

(49)

Automatic regulation of speed wins a prize

Serial, 1979, Vol: 48, No. 6, 46 - 47.

Lastbilien, Stockholm, 1979, 2 p.

IRRD 244672 Publication 80P19198

(I)

A new invention by a hauler automatically regulates the speed of a lorry-trailer combination. The electronic instrument is connected to the red light on the tachograph and actuates the engine brake when this light comes on. The speed is kept at 70 km/h with some margin. If greater acceleration is needed on a steep hill or for overtaking, a push button disengages the regulator for 90 seconds. There is a delay unit to prevent hunting. There is also a safety device to prevent sudden engagement of the engine brake which could cause jack-knifing on a slippery road. The gains are considerable. On a Scania combination which does 150,000 km per year, petrol consumption has been reduced by about 6,000 litres. This alone repays the cost of the regulator - SKR. 1,000 - in less than a month. Other advantages are lower lubricant consumption, less tyre wear, less brake wear, and a better working environment for the driver who need no longer watch the speedometer.

JAUSET, D.

(50)

Les aides à la conduite et à la circulation - les régulateurs de vitesse automobile

Serial, Date: 1980-02/03, No: 2, p. 52 - 57.

Jaeger-France, Paris, 1980, 6 p.

IRRD 110615

(I)

Les appareils qui sont des régulateurs de vitesse en boucle fermée remplissent pratiquement les conditions imposées pour l'équipement des véhicules Européens. Par contre, on peut reprocher aux systèmes à commande mécanique l'usure importante du flexible qu'ils entraînent et leur précision de régulation limitée. On reproche aux actionneurs pneumatiques le fait qu'ils limitent la puissance utilisable sur le moteur et leur "consommation" en air qui peut perturber le fonctionnement du carburateur. Les appareils électroniques à actionneur électrique ne présentent pas ces défauts et leur conception est telle que des possibilités supplémentaires, amenant des agréments de conduite comme la limitation d'accélération, sont possibles. Leur précision de régulation qui peut être meilleure que \pm ou $-$ 1 km/h est également un atout sérieux. Leurs prix supportent la comparaison avec les modèles plus anciens. L'avenir semble assuré à ces dispositifs modernes qui peuvent en plus présenter des caractéristiques telles que: - transmission électrique entre la pédale d'accélérateur et le papillon des gaz du la pompe à injection; - complément assurant une limitation haute de la vitesse moteur; - complément assurant la régulation de la vitesse de ralenti indépendamment de la charge moteur (accessoires en marché ou non) ou de la température moteur. (Voir également fiches 110606 et 110610).

FENTON, R.E.

(51)

On future traffic control - advanced systems hardware

Traffic control systems, 1979, Vol. 1, p. 118 - 137.

University of California, Berkeley, California, 1979, 20 p.

IRRD 259856

(I)

Four advanced system concepts are critiqued: automatic vehicle identification, automatic vehicle monitoring, automatic route guidance, and the automatic highway. Each concept is defined, its potential applications are delineated, an overview of the state of the relevant technology given (and shortcomings noted), and the prospects for future deployments are considered. In addition, an extensive reference list is included. (A) For the covering abstract of the symposium see IRRD 259850.

MASSON, A.L.

(52)

Automatic car-following - a study of possible controllers

Proceedings 29th IEEE vehicular technology conference, March 27-30, 1979, p. 37 - 43.

Institute of Electrical and Electronics Engineers, New York City, 1979, 7 p.

IRRD 246359

(I)

Systems to allow automobiles or other vehicles to automatically follow on another are becoming increasingly desirable. This paper considers a class of linear controllers to determine their relative suitability for maintaining longitudinal separation between individual vehicles. A modified controller using forward and backward-looking sensors is examined using a transmission line analogy. Stability concepts are defined and clarified and characteristics of a well-behaved system are presented. The relative benefits of the linear models for use in a practical system are discussed and areas of future work outlined.

BELOHOUBEK, E.F.; CUSACK, J.M.; RISKO, J.J.; ROSEN, J.R.

(53)

Microcomputer control for the car of the future

Serial, 1977-06, Vol: 23, No. 1, 26 - 31.

Radio Corporation of America, Camden, New Jersey, 1977, 6 p.

IRRD 235911

(I)

The introduction of microprocessors to the automobile opens many new exciting possibilities for improved performance, safety, and convenience in future cars. This paper investigates the use of microprocessors to monitor and display a variety of performance - and safety - related sensors in the automobile and to adapt a noncooperative CW/FM radar to automotive need. A description of the radar is provided including its performance specifications and functions. The radar has successfully demonstrated headway control with respect to other vehicles on the road/collision-mitigation braking when a collision is clearly imminent/and warning the driver of obstacles and cars ahead.

REINECKE, E.

(54)

Vergleich unterschiedlicher Blockierschutzregelsysteme (ABV-Systeme)
bezüglich aktiver Sicherheit und Kosten

Verkehrstechnik 1978, No. 31, 279 - 290.

VDI-Verlag Düsseldorf 1978, 12 p.

IRRD 308527

(I)

Im vorliegenden Bericht wird das Diagonal-individual-regelsystem (DIR-system) vorgestellt. Neben einer Kostenanalyse wird über einen Leistungsvergleich mit anderen bekannten Systemen berichtet. Der Vergleich ergab unter anderen, dass das DIR-system einen hohen Leistungsstand in bezug auf Bremsweg, Kursstabilität und Lenkfähigkeit für alle Fahrzustände zeigt, obwohl es in einigen Fällen das blockieren eines Rades an der Achse zulässt. In der Kurve hat sich das IR-system (Individual-Regelungssystem) in Bezug auf Bremsweg und Stabilität als das beste Regelsystem erwiesen, gefolgt vom IR/SL-system (Individual-Selekt-Low-Regelung) und dem neuen DIR-system. Wird der Vergleich aller untersuchten Systeme unter Berücksichtigung der Kosten und Leistung durchgeführt, so weist das neue DIR-system mit weniger als 60% der Kosten des IR-systems das mit Abstand günstigste Kosten-/nutzenverhältnis auf. Es ist vorgesehen, das DIR-system neben dem IR-system und dem IR/SL-system als kostengünstige Alternative anzubieten. Die 3 Systeme sind mit den gleichen Bausteinen als Baukasten zu verwirklichen.

FARIS, W.R.; TRESSELT, C.P.; YEE, H.C.

(55)

Collision avoidance radar braking systems investigation - phase III study
Report, 1979-05-01, No. 8904.

Bendix Research Laboratories, Michigan and National Highway Traffic Safety
Administration, Washington, D.C., 1979, 249 p.

IRRD 249073

(I)

This document is the final report of the phase III program to study the potential application of an anticipatory radar braking system in preventing motor vehicle accidents. The progress was undertaken by Bendix Research Laboratories for the National Highway Traffic Safety Administration. The report describes the design of the experimental radar braking system by Bendix Research Laboratories. The report also describes the installation of the system on two test vehicles. A summary of the functional tests which demonstrate the performance of the experimental system is included as well. The system description is divided into three sections. Section 2 outlines the design of the radar sensor, including the signal processing electronics, control panel display, and installation of the entire subsystem on the test vehicles. Section 3 and 4 describe the design of the brake actuation subsystem and the anti-lock subsystem, respectively, and include information about installation of these two subsystems on test vehicles. Section 5 outlines functional tests conducted with the two test vehicles equipped with the radar braking system. The preliminary tests outlined in section 5 demonstrate the performance of the radar braking system. In addition to general observations about closed-loop braking performance of the two radar-brake-equipped test vehicles, section 6 outlines the major differences in performance between the two test vehicles. More extensive tests of the radar braking system installed in the test vehicles are recommended. A test plan, separate from this report, has been submitted.

LEIBER, H.; BOSCH, R.; SZINDZEL, A.

(56)

Electronic control unit for passenger car antiskid

Report, 1979, No. 7913799, 65 - 69.

Institute of Electrical and Electronics Engineers, New York City,
1979, 4 p.

IRRD 246013

(I)

In a new antiskid system for passenger cars two wheel speed sensors measure the angular velocity of the front wheels. In order to minimize brake force differences of the rear axle on roadways with split coefficients, a common control for the rear wheels has been chosen. The hydraulic unit consists of three (for front-rear brake systems) or four (for diagonal brake systems) novel solenoid valves and a return pump driven by an electric motor. Brake pressure can be raised in a steady or stepwise way, held at a constant level or decreased. The electronic unit is mainly of digital design and consists of a few integrated circuits. The antiskid system provides many sophisticated functions. As a result the circuitry is highly complex. A digital design was chosen because it allows for greater integration than an analog design. To ensure optimal system safety the main components of the system are checked for proper functioning prior to driving the vehicle. En route the main system components are continuously monitored. The overall antiskid system is switched off once a critical defect has been detected. In that case the normal brake system is available and a warning lamp indicates to the driver that the antiskid system is not functioning.

LASTAUTO - OMNIBUS

(57)

Programmed safety

Serial, 1979-09, Vol: 56, No. 9, 24 - 28.

Vereinigte Motor-Verlage, Stuttgart, 1979, 5 p.

IRRD 311557

(I)

In the development of the anti-locking system (ALS), clear priorities were established: (1) stability, (2) manoeuvrability, (3) braking distance. Measurement and regulation, in a logical combination of electronics and mechanics, are the cornerstones of ALS. Should the system - firstly purely theoretical - operate to its optimum, all wheels, in twin tyred pairs, must be regulated. In the case of cars or light vehicles of normal construction, a single wheel adjustment must follow on the front axle. For the rear axle it is generally sufficient to regulate according to the select-low principle (axle regulation to the wheel with the lowest frictional value). The characteristic anti-locking system for heavy vehicles on the other hand, because of the high rear-axle load, requires the individual regulation of all wheels on the front and rear axles. On carriageways with uniform coefficient of friction this guarantees an optimal utilization of the frictional value. On carriageways with strongly contrasting skid resistance values this regulating procedure leads however to the occurrence of a yawing moment, which can only be corrected by heavy steering action. A special adjustment of the front axle attenuates the yawing moment. The maximum braking force is fully exploited on the rear axle. The introduction of digital techniques in the electronics enables the significant reduction of parts through large switching circuits. Advantages: greatest reliability, less probability of failure and stable long term behaviour.

MISCHKE, A.

(58)

Aufbau und Wirkung des Antiblockiersystems ABS für Nutzfahrzeuge

Periodikum, 1981, Vol: 83, No. 9, 439 - 446.

Automobiltechnik, Stuttgart, 1981, 8 p.

IRRD 313322

(I)

Die beiden Firmen Daimler-Benz AG and Wabco Fahrzeugbremsen GmbH haben gemeinsam ein Antiblockiersystem (ABS) entwickelt, das geeignet ist für Nutzfahrzeuge mit Druckluft als Arbeitsmedium der Bremsanlage. Dieses ABS hat vier Regelkreise mit Einzelradregelung der Hinterräder. Der Bewegungszustand jedes sensierten Rades wird mittels eines Sensors und eines Polrades berührungslos erfasst. Wird die Radverzögerung und der Radschlupf über - bzw. unterschritten, werden Magnetventile angesteuert, um den Bremszylinderdruck zu senken, zu halten oder anzuheben. Die Regelelektronik des ABS ist mit einem Mikrocomputer ausgerüstet. Durch die Kombination der Einzelradregelung der Hinterräder mit einer modifizierten Individualregelung der Vorderachse wird eine ausgewogene Optimierung von Bremsstabilität, Lenkfähigkeit und Bremsweg erreicht. Eine Sicherheitsschaltung zeigt eventuelle Störungen im System an und sorgt für abgestufte Reaktionen. Das ABS eignet sich für zweiachsige und dreiachsige Lastkraftwagen sowie für Fahrzeugkombinationen.

SCHOLZ, H.

(59)

Der Airbag als Verbesserung des zukünftigen Insassenschutzes

Automobiltechnik 1975-11, Vol: 77, No. 11, 314 - 319.

Daimler-Benz AG, Sindelfingen, 1975, 6 p.

IRRD 304171 (SWOV PB 11034)

(I)

Es wird ein Airbag-system des sogenannten 3. Generation vorgestellt, das aufgrund seiner Konzeption als das zur Zeit kompakteste bezeichnet werden kann. Als Hauptkomponenten des Systems werden der Festtreibstoff-gasgenerator, Luftsack, mechanischer und elektronischer Sensor sowie der Knieschutz ausführlich beschrieben und mit photographischen und schematischen Abbildungen veranschaulicht. Ausserdem wird die Schutzwirkung auf Fahrer und Beifahrer dargestellt. Als systembedingte Probleme werden die Faktoren schall, zuverlässigkeit, verhalten im Airbag-fahrzeug, Körpergrösse und Unfallart diskutiert. Das hier beschriebene Airbag-system mit Festtreibstoff zur Gaserzeugung und elektronischer Auslösevorrichtung kann gegenüber den mit herkömmlichen Aufblasmedien betriebenen Gasgeneratoren bezüglich Schutzwirkung als zumindest gleichwertig eingestuft werden. Neben dem Vorteil, leichter und kompakter zu sein, muss vor allem die durch die Gesamtkonzeption sich ergebende Lösung der typischen systemspezifischen Probleme als besonderer Fortschritt bezeichnet werden.