

Wiwklov

SECOND INTERNATIONAL SYMPOSIUM ON HEAVY VEHICLE WEIGHTS AND DIMENSIONS

June 18-22, 1989
Kelowna, British Columbia

Proceedings

Volume 1



PLENARY SESSION: FUTURE PERSPECTIVES

Chairman: J.R. Sutherland, Deputy Minister,
Saskatchewan Highways and Transportation

Keynote Speakers:

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| Canada | D. Hindmarsh Reimer Express Enterprises Ltd. Winnipeg |
| United States | R. Landis U.S. Federal Highway Administration Washington |
| Europe | To be confirmed |
| Australia | R. Pearson R.A. Pearson & Associates Melbourne |
| New Zealand | G. Walsh Transport Technologies Auckland |

SESSION 1 – PAVEMENTS 1

Chairman: E. Lund, Ministry of Transportation and Highways, British Columbia

Speakers

1. **Impact of Heavy Vehicles on Saskatchewan's Low Strength Roads**
R. Barton, ADI Limited; B. Churko, E. Hopkin, E. Wilson, Saskatchewan Highways and Transportation
2. **Transverse Cracking Distress and Vertical Dynamic Impact Load from Heavy Truck Axles – A Feasibility Study**
G.J. Chong, W. Stephenson, Ministry of Transportation, Ontario
3. **Traffic Loading Data: Their Place in the SHRP Pavement Performance Studies**
N. Hawks, Strategic Highway Research Program, Washington
4. **Measurement and Analysis of the Dynamic Response of Flexible Pavements**
M.S.A. Hardy, D. Cebon, Cambridge University, England
5. **Characteristics of Radial Ply Tires and Their Interaction with Road Structures**
J. Bolegoh, Michelin Tires, Montreal

SESSION 2 – VEHICLE PERFORMANCE 1

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Chairman: Bob Ervin, University of Michigan Transportation Research Institute

Speakers

1. **Development of Design and Operational Guidelines for the C-Converter Dolly**
J.H.F. Woodrooffe, P.A. LeBlanc, M. El-Gindy, National Research Council, Canada
2. **Stability and Control Characteristics of Straight Trucks and Truck Trailer Combinations**
J.R. Billing, C.P. Lam, Ministry of Transportation, Ontario
3. **Estimated Braking Efficiencies of Different Ontario Truck Configurations**
B. Hutchinson, D.J. Parker, University of Waterloo
4. **Use of Heavy Rigid Truck-Trailer-Combination Vehicles in Western Australia**
V. Johnston, A. O'Neill, Main Roads Department, Western Australia
5. **The Influence of Rear-Mounted, Caster-Steered Axles on the Yaw Performance of Commercial Vehicles**
C.B. Winkler, University of Michigan Transportation Research Institute, Ann Arbor

SESSION 3 – SAFETY AND ACCIDENTS

Chairman: Albert Stevens, University of New Brunswick

Speakers

1. **The Analysis of Fleet Specific Accident Experience of Five Fleets Operating in Western Canada**
G. Sparks, University of Saskatchewan
A. Horosko, Saskatchewan Highways and Transportation
2. **Commercial Vehicle Accidents: The Data Gathering Experience**
M.E. Wolkowicz, Ministry of Transportation, Ontario
3. **Safety Trade-offs for Increased Weights and Dimensions in New Zealand**
P.H. Baas, D. White, Department of Scientific and Industrial Research, New Zealand
4. **Analysis of Publicly Available Data on Accidents Involving Heavy Vehicles**
D. Mason, F.R. Wilson, A.M. Stevens, University of New Brunswick
5. **Equipment Related to Accidents Involving Heavy Truck Drivers in Quebec While Carrying Out Jobs Both On and Off the Road**
F. Ruest, Université du Québec, Rimouski

SESSION 4 – VEHICLE/PAVEMENT INTERACTION 1

Chairman: John Woodrooffe, National Research Council

Speakers

1. **Axle Group Spacing: Influence on Infrastructure Damage**
J.J. Hajek, A.C. Agarwal, Ministry of Transportation, Ontario
2. **Dynamic Pavement Loads Measured for a Variety of Truck Suspensions**
C.G.B. Mitchell, L. Gyenes, Transport Road Research Laboratory, England
3. **The Effect of Alternative Heavy Truck Suspension on Flexible Pavement Response**
J.K. Hedrick, K. Yi, University of California, Berkeley
4. **Suitability of Alternative Pavement Roughness Statistics to Describe Dynamic Axle Loads of Heavy Trucks**
A.T. Papagianakis, Memorial University; J.H.F. Woodrooffe, P.A. LeBlanc, National Research Council
5. **High Priority National Program Area Overview**
W. Kennis, Federal Highway Administration

SESSION 5 – PAVEMENTS 2

Chairman: Pat Ring, Transportation Research Board

Speakers

1. **Precision Without Accuracy: Heavy Trucks and Pavements Revisited**
J.B.L. Robinson, E. Hildebrand, University of New Brunswick,
M. Jackart, New Brunswick Department of Transportation
2. **The Response of Pavement to Heavy Loads**
J.P. Mahoney, D.E. Newcomb, Washington State University
3. **Truck Tire Types and Road Contact Pressures**
P. Yap, Goodyear Tire
4. **Designing Pavements for Realistic Traffic**
J.K. Cable, S. Sermet, Iowa State University

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Chairman: J.R. Sutherland Deputy Minister,
Saskatchewan Highways and Transportation

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JUNE 18, 1989

HEAVY VEHICLE WEIGHTS & DIMENSIONS
INTERNATIONAL SYMPOSIUM

FUTURE PERSPECTIVES

I WOULD LIKE TO THANK YOU FOR GIVING ME THE OPPORTUNITY TO SPEAK BEFORE SUCH A DISTINGUISHED GROUP TODAY IN THIS BEAUTIFUL SETTING.

THE TOPIC FOR OUR DISCUSSION TODAY PRESENTS AN INTERESTING AND DIFFERENT CHALLENGE - "FUTURE PERSPECTIVES AS IT RELATES TO HEAVY VEHICLE WEIGHTS AND DIMENSIONS IN CANADA". THE WORLD AROUND US IS CHANGING. WE ARE RAPIDLY HEADING TOWARDS A CONTINENTAL GLOBALIZATION WHILE AT THE SAME TIME THE VEHICLES USED TO CARRY GLOBAL MARKET GOODS ARE RESTRICTED BY THE LAW OF THE LOWEST COMMON DENOMINATOR. ONE COUNTRY, STATE, PROVINCE, OR TERRITORY CAN (AND DOES) DICTATE THE VEHICLE CONFIGURATIONS ALLOWED. THESE RESTRICTIONS IN RETURN DETERMINE WHAT WE CAN USE PRACTICALLY AS A GLOBAL VEHICLE. AT THIS INTERNATIONAL SYMPOSIUM WE WILL ATTEMPT TO REVIEW THIS SITUATION AND PROPOSE SOME NEW IDEAS FOR THE FUTURE.

WE RECOGNIZE THAT TRANSPORTATION IS, ABOVE ALL, A SERVICE INDUSTRY. WE SHOULD THEREFORE LOOK AT THE MARKET SERVED BEFORE ATTEMPTING TO ANALYZE

THE TRUCKING INDUSTRY SPECIFICALLY. LET'S BRIEFLY CONSIDER THE SITUATION AS IT EXISTS IN NORTH AMERICA. AS YOU ARE ALL AWARE ON JANUARY 1ST, 1989 CANADA AND THE UNITED STATES ENTERED INTO A NEW ERA OF RELAXED TRADE REGULATIONS. SOME WILL CALL THIS **FREE TRADE**, WHILE OTHERS CALL IT **FREER TRADE**. I SIMPLY USE THE WORDS **RELAXED TRADE** BECAUSE THAT IS WHAT IT REALLY IS IN MY OPINION - A RELAXATION OF THE CUSTOMS AND REVENUE REGULATIONS FOR GOODS PRODUCED IN BOTH COUNTRIES.

THE IMPLICATIONS OF THAT **AGREEMENT** WILL BE SIGNIFICANT IN BOTH COUNTRIES. IT IS TOO SOON TO EVALUATE THE IMPACTS OF THE AGREEMENT BUT IT NO DOUBT WILL LEAD TO INCREASED TRADE AND TRANSPORTATION, AND GREATER HARMONIZATION OF OUR TWO ECONOMIES. THE IMPACT ON THE TRUCKING INDUSTRY WILL NO DOUBT BE EVEN MORE SIGNIFICANT, AS **TRUCKING IS THE MOST IMPORTANT MODE OF TRANSPORT FOR TRANS-BORDER TRAFFIC**. IN FACT, THE TRUCKING INDUSTRY TRANSPORTS CLOSE TO 70% OF ALL OF OUR EXPORTS INTO THE U.S., AND ABOUT THE SAME PERCENTAGE OF OUR IMPORTS INTO CANADA. BUT LOOK AT THE TYPES OF VEHICLES THAT CARRY THE **"GLOBAL MARKET GOODS"**! YOU WILL SOON REALIZE THAT THE CONFIGURATION OF THESE VEHICLES AND THE WEIGHT ALLOWED FOR THEIR USAGE ARE DEFINED IN A **REGIONAL AND LOCAL ENVIRONMENT**. **THE LAW OF THE LOWEST DENOMINATOR APPLIES**. IF YOU LOOK AT THE REGULATIONS THEY OFTEN HAVE LITTLE OR NOTHING TO DO WITH SUCH FACTORS AS **ECONOMIES OF SCALE, PRODUCTIVITY, AND GLOBAL MARKETS**. THEREFORE THE MOTOR CARRIERS TRANSPORTING THE **"GLOBAL GOODS"** ARE IN FACT SERVICE CREATIONS OF THE **"LOCAL GOODS**

MARKET". THE NEW REALITIES ARE, HOWEVER, QUITE DIFFERENT. TO SURVIVE A MOTOR CARRIER MUST THINK GLOBALLY WHETHER THEY LIKE IT OR NOT. THEIR CUSTOMERS DEMAND THIS OF THEM, AND IT THEREFORE BECOMES A REQUIREMENT TO STAY IN BUSINESS.

ALTHOUGH I CAN'T SPEAK SPECIFICALLY ON THEIR BEHALF, LET'S LOOK AT THE SHIPPER'S SIDE, OR HIS POINT OF VIEW. THERE IS NO DOUBT THAT THE SHIPPER/CARRIER RELATIONSHIP IS CHANGING. GLOBALIZATION FACTORS ARE FORCING SHIPPERS TO TAKE A CLOSER LOOK AT THEIR **LOGISTIC AND DISTRIBUTION COSTS**. LARGE MULTI-NATIONAL COMPANIES LIKE GENERAL MOTORS, TOYOTA AND PROCTOR & GAMBLE ARE CHANGING THE WAY THEY DO BUSINESS WITH THEIR SUPPLIERS. WE, IN THE TRUCKING INDUSTRY, ARE THE LINK BETWEEN SHIPPER AND CONSIGNEE OR THE MULTI-NATIONAL AND THEIR SUPPLIERS. AS THESE LEADING COMPANIES INTRODUCE THE SUPPLIERS INTO WHAT IS CALLED THEIR "**COLLECTIVE PROGRESS**" SYSTEM, **TRANSPORTATION BECOMES THE KEY TO THIS PROCESS**. TECHNIQUES SUCH AS **JUST IN TIME, SINGLE SOURCING**, AND OTHERS ARE SIMPLY NEW WAYS TO TELL US THAT TRUCKING IS A FORM OF TRANSPORTATION REQUIRED IN MOST CASES FOR THESE TECHNIQUES TO WORK.

WHAT DO THESE TECHNIQUES MEAN TO **VEHICLE WEIGHTS & DIMENSIONS?** IT MEANS THAT SHIPPERS WILL BE LOOKING AT **PRODUCTIVITY (COSTS), RELIABILITY, AND SAFETY** AS ESSENTIAL ELEMENTS IN THEIR NEW LONG-TERM PARTNERSHIPS. HOW DO WE ACHIEVE THESE THREE IMPORTANT PRINCIPLES?

IN CANADA, TO A CERTAIN EXTENT THE **RTAC SIZES AND WEIGHTS** WERE A STEP IN THE RIGHT DIRECTION, BUT WE **MUST** NOT STOP THERE. INEQUITIES STILL EXIST. FOR INSTANCE, LET'S LOOK AT CARRIER OPERATIONS FROM MY HOME PROVINCE OF MANITOBA. MOST OF THE LARGE CARRIERS BASED IN MANITOBA HAVE TO MAINTAIN DIFFERENT FLEETS DEPENDING UPON WHERE THEY OPERATE ON THE CONTINENT. ON A PRACTICAL BASIS THIS COULD BE AT LEAST THREE DIFFERENT FLEETS, ONE TO RUN EAST, A SECOND TO RUN WEST, AND A THIRD TO RUN SOUTH INTO THE U.S. AT THE SAME TIME I WOULD LIKE TO GIVE FULL CREDIT TO RTAC AND THE MINISTERS RESPONSIBLE FOR TRANSPORTATION FOR ACCOMPLISHING THE SIGNIFICANT IMPROVEMENT IN THE WAY THAT VEHICLE SIZE AND WEIGHT REGULATIONS ARE NOW ARRIVED AT IN CANADA. ALTHOUGH IT IS NOT PERFECT, AND IS NOT COMPLETE, WE DO HAVE IN EFFECT A **MEMORANDUM OF UNDERSTANDING** ESTABLISHING MINIMUM GUIDELINES, WHICH ALLOWS US TO OPERATE ACROSS CANADA WITHOUT SIGNIFICANT IMPEDIMENT. WE STILL HAVE SOME MAJOR PROBLEMS, AND I UNDERSTAND THAT RTAC AND THE MINISTERS OF TRANSPORT ARE FULLY AWARE OF THESE PROBLEMS. WITH COOPERATION AND GOODWILL I WOULD LIKE TO THINK THAT WE CAN RESOLVE THEM SATISFACTORILY. AS I SAID HOWEVER, WE **MUST** NOT STOP HERE.

THE CHALLENGE AHEAD: HOW DO WE CONVERT OUR KNOWLEDGE AND KNOW-HOW INTO MORE PRODUCTIVE AND SAFER TRUCKS, AND AT THE SAME TIME IMPROVE OUR TWO COUNTRIES' PRODUCTIVITY?

FIRST, ONE HAS TO LOOK AT THE **EXISTING TRENDS**. IF I TAKE A LOOK AT WHAT EXISTS OUT THERE I CAN SEE THAT ON THE NORTH AMERICAN CONTINENT THERE IS **MAJOR DISPARITY IN THE WEIGHTS** PERMITTED FOR VEHICLES, BUT A FAIR AMOUNT OF **UNIFORMITY IN THE SIZES** OF THESE VEHICLES, I.E. TRACTORS AND TRAILERS. WE DON'T HAVE UNIFORMITY HOWEVER IN THE WAY THESE UNITS ARE CONNECTED, AND ALLOWED TO OPERATE.

ON THE **WEIGHT SIDE** OF THE VEHICLES, WE IN CANADA HAVE A TRUCKING INDUSTRY THAT IS A GOOD REFLECTION OF OUR STRENGTH (FOR EXAMPLE RESOURCE RELATED INDUSTRIES). BUT THE SERIOUS QUESTION IS HOW DO THESE VEHICLES RELATE TO THE **NORTH/SOUTH TREND?** AS I SAID, THE TYPES OF TRAILERS AND TRACTORS ARE SIMILAR BUT THE COMBINATIONS OF THESE UNITS ARE CERTAINLY NOT THE SAME. FOR INSTANCE, WE IN CANADA, THROUGH THE **RTAC STUDY**, HAVE STRONGLY SUPPORTED THE DEVELOPMENT OF THE **B-DOLLIES**, COMPARED TO THE **A** AND THE **C**. THE MAIN REASON FOR THIS IS THE **SAFETY ISSUE**. WITH THESE CHANGES IT IS VERY LIKELY THAT THE USE OF **A-DOLLIES** WILL DECLINE IN CANADA. ON THE **SINGLE TRAILER** SIDE IT APPEARS THAT THE **48 FOOT TRAILER** WILL BE THE GENERAL STANDARD FOR SOME TIME, WHILE A SIGNIFICANT PUSH WITHIN THE U.S. IS TOWARD **53 FOOT TRAILERS**.

ARE THE CANADIAN TRENDS SIMILAR TO THE U.S. TRENDS? I BELIEVE NOT, IN MANY CASES. I UNDERSTAND THAT THE U.S. ARE STILL RELYING HEAVILY

(ALMOST EXCLUSIVELY) ON THE USE OF **A-DOLLIES**. I FURTHER UNDERSTAND THAT THERE ARE SOME STUDIES BEING DONE, BUT OVERALL THE INDUSTRY TREND SEEMS TO INDICATE THAT A-DOLLIES ARE HERE TO STAY. ON THE **SINGLE TRAILER** SIDE I UNDERSTAND THAT THE U.S. ARE STUDYING A NEW PROPOSAL, OFTEN REFERRED TO AS THE "TURNER PROPOSAL", AND THAT THE 48 FOOT TRAILER LENGTH WOULD REMAIN THE MINIMUM STANDARD FOR SOME TIME. WHERE IS UNIFORMITY, AND WHAT BECOMES THE OVERALL STANDARD? ONCE AGAIN IT IS THE **LOWEST COMMON DENOMINATOR**. IS IT ACCEPTABLE AFTER YEARS OF TRIAL AND TESTING, AND EXCELLENT ROAD EXPERIENCE THAT THE INDUSTRY CANNOT MAKE BETTER USE OF THE CONFIGURATIONS THAT WILL MAKE US PART OF THAT "COLLECTIVE PROGRESS" IN THE FUTURE? THE TRUCKING INDUSTRY CAN, I BELIEVE, CONTRIBUTE A GREAT DEAL TO PRODUCTIVITY INCREASES AND IMPROVEMENT IN NORTH AMERICA, IF WE ARE PERMITTED TO. THE SAME APPLIES TO GLOBAL TRANSPORTATION.

THE TIME HAS NOW COME FOR A STEP FORWARD TOWARD THE GLOBALIZATION OF **LONGER COMBINATION VEHICLES**. THESE TYPES OF CONFIGURATIONS HAVE PROVEN THEMSELVES AS BOTH **SAFE** AND EXTREMELY **PRODUCTIVE** VEHICLES. FURTHERMORE, IT WILL HELP BOTH THE INDUSTRY AND SOCIETY TO ADDRESS TWO SERIOUS ISSUES WHICH WE MUST FACE:

- i) **A SHORTAGE OF QUALIFIED DRIVERS IN NORTH AMERICA**

AND

**ii) CONGESTION AND POLLUTION IN AND AROUND
METROPOLITAN CENTRES.**

LONGER COMBINATION VEHICLES, PROPERLY USED AND APPLIED, WILL REDUCE THE NUMBER OF POWER UNITS REQUIRED SIGNIFICANTLY, AND PROVIDE PART OF THE SOLUTION.

YOU MAY THINK THAT THIS SOLUTION IS NOT WHAT WE SHOULD AIM FOR, BUT I WOULD LIKE TO CHALLENGE YOU TO TAKE A GOOD LOOK AT A MAP OF NORTH AMERICA AND PLOT ON THAT MAP THE STATES AND PROVINCES WHERE THESE UNITS ARE ALLOWED. YOU WILL SOON FIND THAT THESE VEHICLES ARE ALREADY ALLOWED IN MANY PARTS OF THE CONTINENT, AND THAT THEY ARE USED PRODUCTIVELY AND SAFELY. IN FACT, TURNPIKE DOUBLES ARE ALLOWED IN 21 STATES AND 5 CANADIAN PROVINCES. ROCKY MOUNTAIN DOUBLES ARE ALLOWED IN 17 STATES AND 4 CANADIAN PROVINCES. FURTHER RESEARCH WOULD PROVE THAT IN THE STATES AND IN THE PROVINCES WHERE THESE VEHICLES ARE NOT ALLOWED ONE OF THE MAIN REASONS BEHIND THESE DECISIONS IS **MORE POLITICAL RATHER THAN TECHNICAL.**

I WOULD LIKE TO CHALLENGE THE RESEARCH COMMUNITY TO WORK WITH THE INDUSTRY AND NOT SIMPLY TO REDESIGN VEHICLES ON A NORTH AMERICAN BASIS, BUT TO HELP US ACHIEVE THAT NEW GENERATION OF NORTH AMERICAN CONFIGURATIONS - **THE GLOBAL VEHICLES.**

TIME IS MOVING ON QUICKLY - WE ARE FACING CHANGES AT EVERY TURN. THE TRUCKING INDUSTRY MUST FACE THE "COLLECTIVE PROGRESS" CHALLENGE EVERY DAY - TODAY. I WOULD GO SO FAR AS TO RECOMMEND THE CREATION OF A JOINT CANADA/U.S. COMMITTEE TO LOOK AT THE POSSIBILITY OF AUTHORIZING THE OPERATION OF TURNPIKE DOUBLES AND ROCKY MOUNTAIN DOUBLES ACROSS INTERNATIONAL BORDERS, AND THAT SUCH A GROUP SHOULD SET FORTH THE CONDITIONS FOR OPERATION OF THESE VEHICLES I.E. PERMITS, HITCHING MECHANISMS, DRIVER TRAINING, ETC. THIS COMMITTEE COULD LOOK AT OTHER VITAL AREAS OF UNIFORMITY WHICH WOULD BE OF MUTUAL BENEFIT TO ALL CONCERNED.

I CAN SPEAK WITH CONFIDENCE WHEN I SAY THAT THE TRUCKING INDUSTRY WILL BE PLEASED TO COOPERATE WITH SUCH AN INITIATIVE WHENEVER IT TAKES PLACE. LET'S BE PART OF THE SOLUTION, RATHER THAN PART OF THE PROBLEM! THINK PROGRESSIVELY! THINK GLOBALLY!

THANK YOU.

D. I. HINDMARSH
SENIOR CORPORATE VICE PRESIDENT
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DIH/dk