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SECOND INTERNATIONAL SYMPOSIUM ON
HEAVY VEHICLE WEIGHTS AND DIMENSIONS
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"THE BENEFITS OF 62.5 TONNE, 25m B-TRAINS IN ALBERTA"

by

T.W. Fredericks

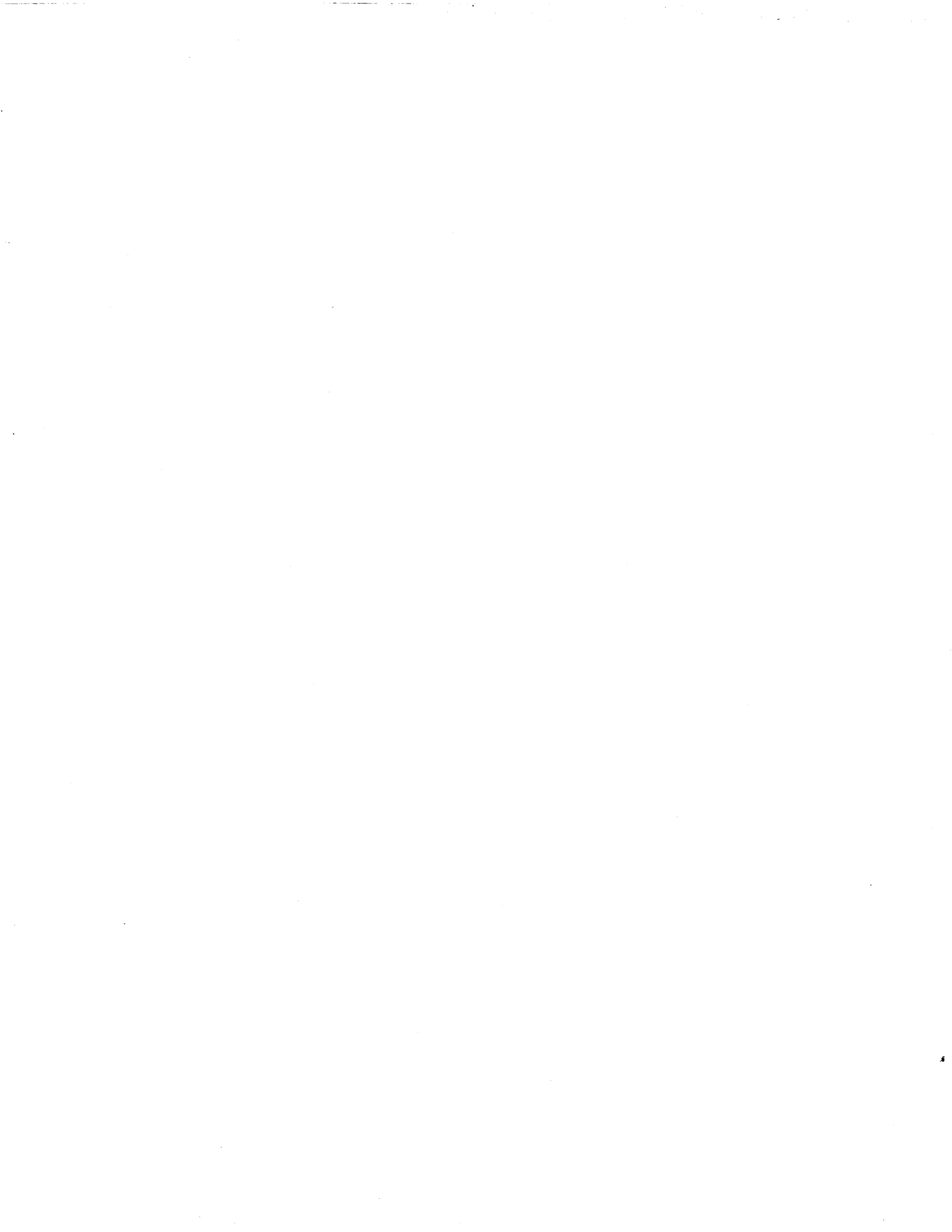
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ABSTRACT

*"The Benefits of 62.5 Tonne, 25m B-Trains in Alberta"*T.W. Fredericks

This presentation focuses upon the benefits which have accrued to both the trucking industry and the shipping industry resulting from the introduction of legislation permitting 8 axle tractor-trailer equipment with gross vehicle weights of 62.5 tonnes and maximum overall lengths of 25 metres.

The background analysis to this presentation is based upon actual operations data compiled by Economy Carriers Limited, a regional liquid bulk transportation firm. This data provides comparisons between 8 axle-B (Tridem), 8 axle-C and 7 axle vehicle combinations.



The discussion of benefits derived from the utilization of tractor-trailer combinations with gross vehicle weights of 62.5 tonnes and overall lengths of 25 metres must be prefaced with a brief review of Economy Carriers Limited (ECL), their equipment history and scope of operations.

ECL was established in 1947 in Cardston, Alberta, providing general freight services in Southern Alberta. The company also operated a bulk fuel agency, delivering petroleum products to farmers in the surrounding area with a one ton flatdeck truck which had a capacity of carrying six 45 gallon drums, for a total net load of 270 gallons. An immediate appreciation for "progressive truck transport legislation" is apparent when this net load of 1947 is compared to the new RTAC legislation which allows a net load of 388 drums (or 17,460 gallons, or 79,373 litres) on the largest vehicle combinations.

What is equally apparent is the progress of truck transport legislation in Canada as compared to that in the United States. The first pressure trailer purchased by ECL in 1967 to transport liquefied petroleum gases (LPG's) had a capacity of 36,000 litres and this unit is still in use today in Montana. They discouraged the benefits of larger vehicle combinations, through restrictive legislation and, as a result, Montana shippers and customers continue to experience freight rates which are approximately 20% higher than necessary.

In the early 1970's ECL's entire fleet was the 5 axle semi-trailer type combination. A unit which became prominent at this time was known as the "A-train" which provided increased payloads and lower rates to shippers. ECL, however, did not accept these units, mainly because of the perceived safety concern of pulling a smaller 'pup' trailer behind a larger lead, using only a single hitch extension.

As a result, ECL worked together with Westank Industries of Regina to design and build the first liquid bulk "B-train" in Canada which later became the standard configuration in the industry in Western Canada (the major difference with the B-train being the use of a second "fifth wheel" assembly for connecting the two trailers rather than a single hitch).

In the early 1980's another trend developed, namely an economic recession which greatly restricted the amount of capital investment for new equipment. This, combined with the continued need to provide efficient transportation services to the shipping industry, prompted the decision to convert several 5 axle units into "C-train" combinations, by building new pup trailers but using a double draw bar hitch for the lead attachment. We are currently using eighteen "C" type steering dollies from five different manufacturers. The models using the

tubular frame and the Ingersoll-Ceschi steering axle have proved to be the most reliable. Frame cracking has been minimal and the self steering axle when compared with the turntable type provides additional stability in 'soft' off-highway conditions.

In the fall of 1986 permission was granted by Alberta Transportation to build four 8 axle C-train units, to be operated over specified routes due to extensive bridge restrictions. After 2-1/2 years of operations, these units have also been successful, with no accidents being experienced. In 1987, and after gaining a good idea of where the new RTAC specifications were headed, the first 8 axle B-train, using a tridem axle assembly on the rear of the lead trailer, was designed and built. The introduction of these units has been accelerated, through both new construction and conversion of older units, to our present fleet total of twenty-four 8 axle B-trains.

In total, the ECL fleet of equipment consists of 125 tractors and 140 trailer combinations (all company-owned) transporting liquid bulk products such as gasoline, diesel fuel, propane, butane, crude oil, condensate, chemicals and molten sulphur throughout Western Canada and the U.S. Pacific Northwest.

The following Tables and Graphs outline the operational experience of the various types of tractor-trailer combinations.

TABLE 1
TRACTOR TRAILER SPECIFICATIONS

	GVW	NET	LENGTH	HEIGHT	PIN SETTING
<u>PETROLEUM</u>					
7 AXLE - "B"	56,500 kg	42050 L *	21.58 m	3.34 m	16.76 m
7 Axle - "C"	56,500 kg	43800 L	23 m	3.25 m	18.29 m
8 Axle - "B"	62,500 kg	51000 L	24.16 m	3.25 m	18.66 m
8 Axle - "C"	62,500 kg	49550 L	22.06 m	3.31 m	16.75 m
<u>PRESSURE</u>					
7 Axle - "B"	56,500 kg	57000 L**	22.27 m	3.61 m	16.76 m
7 Axle - "C"	56,500 kg	57000 L	23 m	3.78 m	18.29 m
8 Axle - "B"	62,500 kg	67000 L	23.50 m	3.84 m	18.29 m
8 Axle - "C"	62,500 kg	67000 L	22.1 m	4.06 m	16.76 m

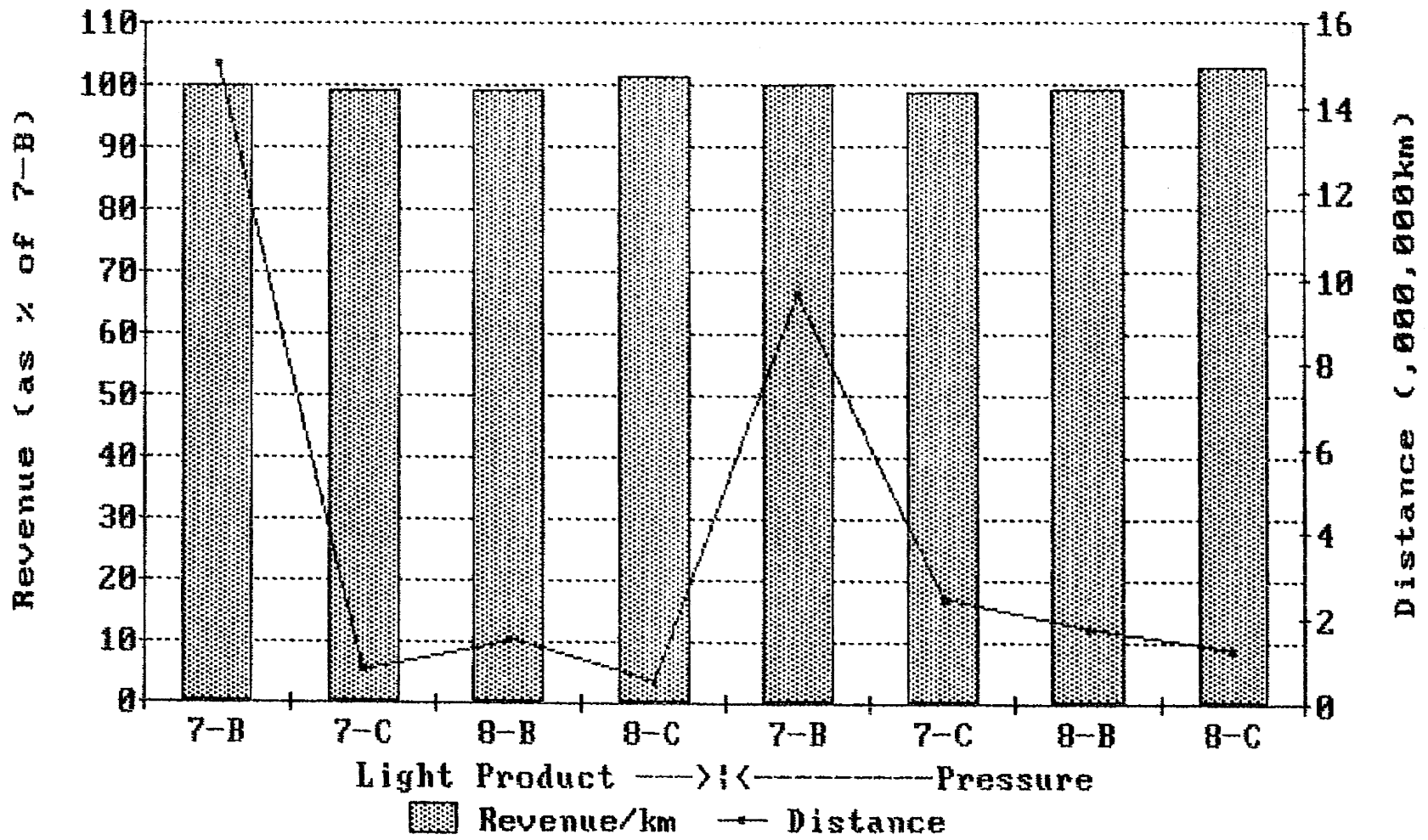
* Specific gravity .85 KG/L

** Specific gravity .505 KG/L

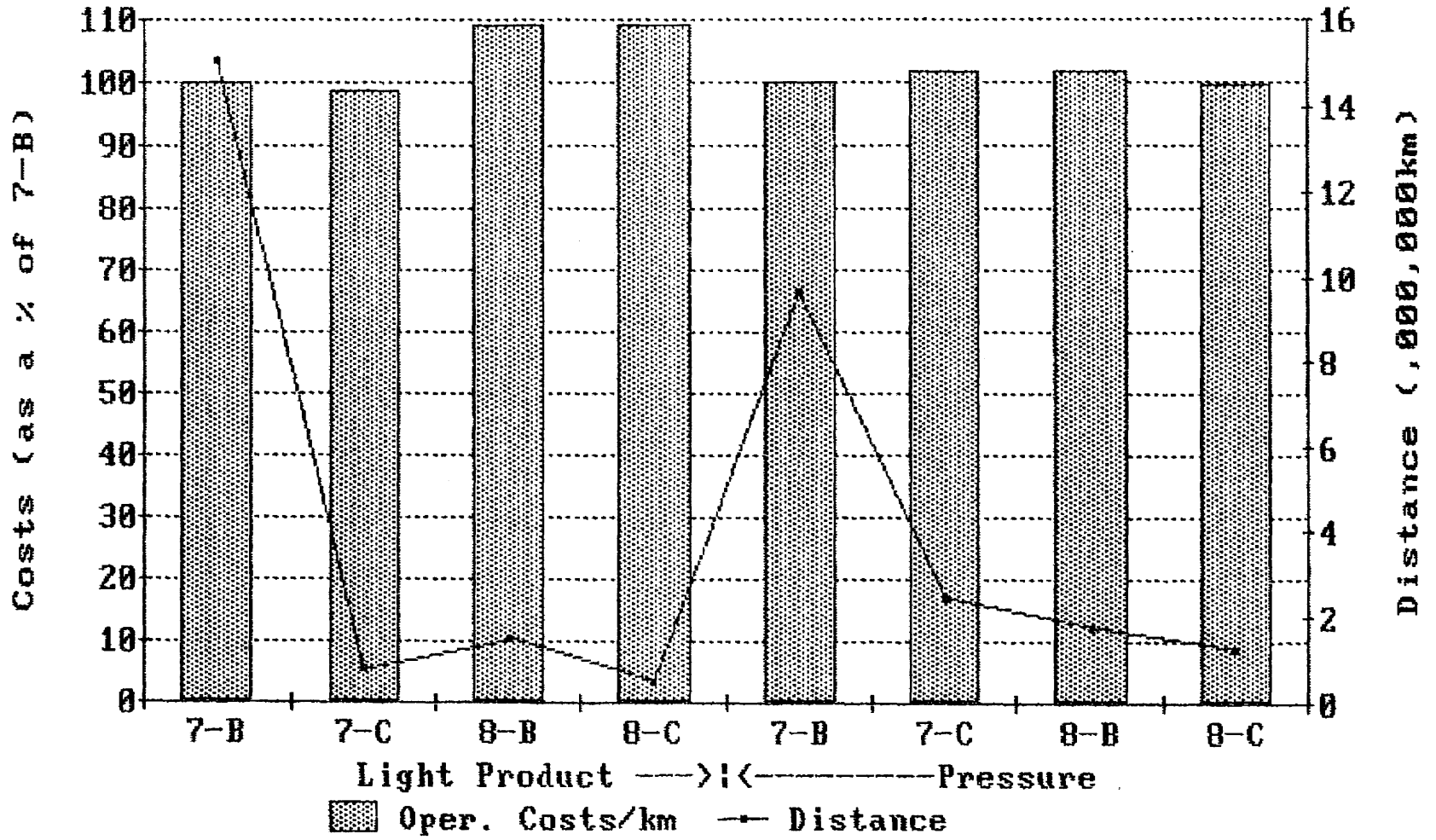
TABLE 2
TRACTOR SPECIFICATIONS

	ENGINE TYPE	TRANSMISSION	DIFFERENTIAL	WHEELBASE
7 Axle	8V92TA - DDEC 400 (DETROIT DIESEL)	RTX 14608 LL (FULLER)	4:56 - 40,000 lbs (EATON)	164"
8 Axle	9V92TA - DDEC 475	RTX 14708 LL	4:56 - 46,000 lbs	164"

GRAPH 1
REVENUES - Unit Type Comparison



GRAPH 2
OPERATING COST - Unit Type Comparison



GRAPH COMPARISONS

It should be noted that the "light product" market (ie. gasoline, diesel fuel, chemicals and other light petroleum products) as well as the "pressure" market (LPG mix, propane and butane) markets were starting to become extremely competitive by 1985.

Our objective with the 8 axle equipment was to counteract oncoming competitive factors while maintaining our current profit margins and at the same time reduce the costs to our customers by 15%.

REVENUE COMPARISON (Graph 1)

Light Product Equipment

The 8 axle-B (tridem) produced slightly less revenue than the 7 axle-B while the 8 axle-C produced higher revenue than either. The 8 axle-C trains have been operating for 2-1/2 years to specified points whereas the 8 axle tridems were introduced intermittently over the past year. An increased utilization factor combined with a greater acceptance by the customer (bulk fuel agents) will ultimately bring the 8 axle-B (tridem) revenue up to that of the 8 axle-C.

Pressure Equipment

The 8 axle-C trains show the highest revenue produced as these units were dedicated to a particular 600 mile haul for the 2-1/2 year test period.

Revenue produced by the 8 axle-B (tridem) is slightly less than the 7 axle-B mainly due to a "loaded mile" factor. The 7 axle-B's are used in off-highway gas plant work, which increases the loaded mile factor, while the 8 axle-B (tridems) are utilized mainly on highway trips where they are loaded one way only.

OPERATING COST COMPARISON (Graph 2)

Operating costs include fuel, oil, parts, tires, mechanics labor, driver wages, license, insurance and depreciation.

Light Product Equipment

The abnormally high operating costs of the 8 axle-B (tridem) and the 8 axle-C trains are directly attributed to low utilization over the test periods. Increased utilization, however, will substantially lower the fixed costs such as license, insurance and depreciation. As well, the costs of converting 7 axle-B trains to 8 axle-B trains are included (approximately \$25,000. per conversion).

It should be noted that utilization of the larger equipment was initially hampered by bridge restrictions and customer storage inadequacies. These problems, however, are now being overcome.

Pressure Equipment

The 8 axle-C train costs are lowest because of their dedication to a 600 mile highway haul. The 8 axle-B (tridem) is higher, in comparison, due to higher fixed operating costs per kilometer. As utilization increases, these costs will decrease, however this will likely be offset due to higher maintenance costs.

SUMMARY

In our program to add new 8 axle-B (tridem) trailers and convert existing 7 axle-B trailers to 8 axle units, our overall objective has been to reduce our customers' transportation costs by 15% while still maintaining the profit margins produced by our 7 axle equipment.

Experience has shown our customer costs have been reduced by approximately 15% while our profit margins have decreased slightly. The lower profit margins should increase as a greater utilization of the 8 axle equipment is realized. This will result from fewer bridge restrictions and a wider acceptance by the customer to provide adequate storage for 8 axle deliveries.

We have operated the 8 axle tridem equipment for over 1 year now and through severe winter conditions. The major use of this equipment was from Alberta to the interior of British Columbia over mountainous terrain and also throughout northern Alberta. To date we have not experienced an accident, which is largely the result of good driver acceptance of the new vehicle combinations.

The benefits of larger vehicle combinations to the shipper are reduced transportation costs; to the public, fewer trucks on the highways; and to the trucker, the maintenance of adequate profit margins.

SESSION 10 – MONITORING, ENFORCEMENT AND COMPLIANCE

Chairman: Marc Brenckmann, Transport Canada

Speakers

1. **On Board Truck Weigh Scales**
M. Clark, E. Phillips, Forest Engineering Research Institute of Canada
2. **The Alberta WIM/AVI Interface Demonstration**
A. Lo, J. Lowe, Alberta Transportation and Utilities
3. **Integrated Technologies for Managing Heavy Vehicles on Highways**
C.M. Walton, B.H. Jones, University of Texas
4. **Alberta's Weight Enforcement Program and Its Impact on Pavement Costs**
C.E. Thygesen, S. Khalil, L. Keown, Alberta Transportation and Utilities

